COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT

DATE: April 22, 2015

TO: Planning Commission

FROM: Planning Staff

SUBJECT: EXECUTIVE SUMMARY: Consideration of a Coastal Development Permit, Timberland Preserve/Coastal Zone Minor Development Permit and Grading Permit for the removal and replacement of an existing vehicular bridge at a location on Purisima Creek, in the Purisima Creek Redwoods Open Space Preserve. This project is appealable to the California Coastal Commission.

County File Number: PLN 2015-00006
(Mid-Peninsula Regional Open Space District)

PROPOSAL

The Mid-Peninsula Regional Open Space District proposes to remove and replace a deteriorated railroad car bridge over Purisima Creek. The existing bridge is deteriorating and can no longer safely carry significant vehicle loads. The current bridge serves as a crossing for patrol, fire, and other emergency vehicles. These vehicles can be quite heavy, so the bridge has to be able to carry those loads safely. The existing bridge will be removed and replaced with a new bridge approximately 100 feet upstream of the existing bridge. The southern concrete abutment and wing wall will be constructed entirely outside the stream channel and above the 100-year flood event elevation. The northern abutment and wing wall are to be built just below the break in slope of the stream channel, but above the elevation of a 100-year flood event. Grading for this project is limited to both bridge approaches and minor re-contouring for slope stabilization and restoration purposes around the existing bridge.

Approximately 15 feet of the Whittemore Gulch Trail will be realigned to approach the proposed bridge from the north and approximately 60 feet of the Purisima Creek Trail will be realigned to approach the proposed bridge from the south. In addition to the removal and replacement of the bridge, the design includes the restoration of the old bridge location with native vegetation, and new bio-technically stabilized slopes.

RECOMMENDATION

Approve the Coastal Development Permit, Timberland Preserve/Coastal Zone Minor Development Permit and Grading Permit, County File Number PLN 2015-00006, by adopting the required findings and conditions of approval.

SUMMARY

As a governmental agency, the Mid-Peninsula Regional Open Space District (District) has assumed the role of lead agency for purposes of compliance with California Environmental Quality Act (CEQA). As such, they have prepared their own environmental review document. However, the District does not qualify for exemption from County building and zoning regulations as provided for by Section 53091 of the Government Code. Additionally, the provisions of the California Coastal Act are applicable to all governmental bodies in the State.

The District wishes to replace the existing bridge because it is very deteriorated and poses an immediate hazard to vehicle traffic. The bridge serves not only as a connection for existing hiking trails, but also provides a crossing for patrol, fire and other emergency vehicles. Replacing the bridge at its current location is impractical because stream conditions at this spot create localized flooding that impact the ability to utilize the existing bridge during major storm events. Constructing a replacement bridge approximately 60 feet upstream moves the new bridge out of the flood zone and reduces the need to import a significant amount of fill material. Staff has reviewed the project and found that the District is proposing an environmentally superior alternative that will, as conditioned by staff, comply with the County's Local Coastal Program, Zoning Regulations, and the Grading Ordinance.

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COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT

DATE: April 22, 2015

TO: Planning Commission

FROM: Planning Staff

SUBJECT: Consideration of a Coastal Development Permit and Timberland Preserve/ Coastal Zone Minor Development Permit, pursuant to Sections 6328.4 and 6965 of the County Zoning Regulations respectively; and a Grading Permit, pursuant to Section 8602 of the County Grading Ordinance; for the removal and replacement of an existing vehicular bridge at a location on Purisima Creek, in the Purisima Creek Redwoods Open Space Preserve. This project is appealable to the California Coastal Commission.

County File Number: PLN 2015-00006
(Mid-Peninsula Regional Open Space District)

PROPOSAL

The Mid-Peninsula Regional Open Space District proposes to remove and replace a deteriorated railroad car bridge over Purisima Creek, at the intersection of Whittemore Gulch and Purisima Creek Trails. The existing bridge is deteriorating and can no longer safely carry significant vehicle loads. The current bridge serves as a crossing for patrol, fire, and other emergency vehicles. These vehicles can be quite heavy, so the bridge has to be able to carry those loads safely. The existing bridge will be removed and replaced with a new bridge approximately 100 feet upstream of the existing bridge. The southern concrete abutment and wing wall will be constructed entirely outside the stream channel and above the 100-year flood event elevation. The northern abutment and wing wall are to be built just below the break in slope of the stream channel, but above the elevation of a 100-year flood event. Grading for this project is limited to both bridge approaches and minor re-contouring for slope stabilization and restoration purposes around the existing bridge.

Approximately 15 feet of the Whittemore Gulch Trail will be realigned to approach the proposed bridge from the north, and approximately 60 feet of the Purisima Creek Trail will be realigned to approach the proposed bridge from the south. In addition to the removal and replacement of the bridge, the design includes the restoration of the old bridge location with native vegetation, and new bio-technically stabilized slopes.

RECOMMENDATION

Approve the Coastal Development Permit, Timberland Preserve/Coastal Zone Minor Development Permit and Grading Permit, County File Number PLN 2015-00006, by adopting the required findings and conditions of approval in Attachment A.

BACKGROUND

Report Prepared By: Michael Schaller, Project Planner, Telephone 650/363-1849

Applicant/Owner: Mid-Peninsula Regional Open Space District

Location: Purisima Creek Open Space Preserve, approximately 100 yards east of the intersection of Higgins Canyon Road and Purisima Creek Road, on the Whittemore Gulch Trail.

General Plan Designation: Public Recreation (Rural)

Zoning: Timber Production Zone – Coastal Zone (TPZ-CZ)

Flood Zone: Zone X (Areas of minimal flood hazard), FEMA Community Panel 06081C-0280E, Effective Date: October 16, 2012.

Existing Land Use: The project site is an undeveloped evergreen forest area. The project site encompasses a portion of Purisima Creek, a perennial stream. The surrounding land use is open space preserve.

Environmental Evaluation: For purposes of compliance with California Environmental Quality Act (CEQA), the Mid-Peninsula Regional Open Space District (District) is claiming the role of lead agency. As such, they have filed a Notice of Determination with the State Clearinghouse and the County Recorder, on March 12, 2015 (See Attachment E).

Setting: The project site is located within the Purisima Creek riparian corridor. Most of the project site is impacted by current or past human disturbance and consists primarily of an existing trail, the existing bridge and an overflow parking area. Land uses in the surrounding region, outside of the project area, consist primarily of undeveloped land, grazing/agriculture, or rural residential development. The project will occur primarily within the riparian woodland habitat of the creek. Staging and equipment storage will occur within the overflow parking area that is dominated by ruderal vegetation. The riparian corridor vegetation is dominated by red alder, with occasional big-leaf maple, redwood, shining willow, creek dogwood, red elderberry, thimbleberry, stinging nettle, and California blackberry. The staging area habitat is composed of either bare ground or weedy, non-native species such as poison hemlock, English plantain, and curly dock.

DISCUSSION

A. DETAILED PROJECT DESCRIPTION

The Mid-Peninsula Regional Open Space District is proposing to remove the existing 60-foot long, steel bridge and replace it with a 60-foot-long, prefabricated steel bridge upstream of the current location. The project involves working in an approximately 180-foot reach of Purisima Creek that is approximately 20 to 50 feet wide. The project footprint for the old and new bridge location is approximately 3,500 square feet (0.08 acres). Approximately 0.01 acres of riparian vegetation removal will be required around the proposed bridge approaches primarily on the southern end and around the northern end. Two alder trees (12" and 20" dbh) will be removed adjacent to the proposed northern bridge approach to allow for adequate vehicle access. Grading for this project is limited to both bridge approaches and minor re-contouring for slope stabilization and restoration purposes around the existing bridge. Almost all of the grading will occur within soils that were previously disturbed by the construction of the log landing built in approximately the 1850s. Additional project details include:

Construction Timeline: Construction activities will occur over a 16 to 24 week period, between April 1 and December 31. Construction hours will be limited to one and half hours after sunrise to one and a half hours before sunset on weekdays and weekends during marbeled murrelet nesting season (April 1 to September 15), after which construction will be limited to 7:00 am to 6:00 pm during weekdays and 9:00 am to 5:00pm on Saturday.

Construction Access: The site will be accessed from Purisima Canyon Road. A temporary culvert crossing and road will be constructed at the existing bridge crossing to allow vehicular access to the other side of Purisima Creek for construction activities.

Grading and Erosion Control: Grading and other earth-disturbing activities will be limited to the dry season (generally between April 15 and October 15). Construction will be supervised by experienced District staff and engineering consultants and will incorporate erosion control techniques from the District's Details and Specifications Guidelines. The channel banks along the riffles and grade control structures will be planted with willow and alder stakes to ensure that vegetation cover becomes part of the overall channel structure. Additional riparian planting will be completed on the floodplain and channel banks to ensure long-term stability of the channel.

Demolition: The existing bridge and access road (approximately 0.03 acres) will be demolished and the rubble will be hauled off site to an appropriate refuse and recycling facility. Demolition of the affected portion of the road will generate approximately 200 cubic yards of waste. The existing bridge is a 60-foot long, 12-foot wide old railroad car steel bridge that will be demolished and hauled

off-site. Tarps will be placed underneath the bridge during demolition to prevent debris from entering the creek. Dirt from the bridge fill will be temporarily stored at an adjacent staging area, and suitable soil will later be used as backfill for the restoration of the old bridge site. Generally, significant trees on the site are being avoided; however the project will entail the removal of two alder trees.

Staging: Once the bridge, fill, and road are removed from the site, a temporary dirt access road to the channel bed will be constructed to allow access to the other side of the creek. Two (2) 18 inch pipes will be installed across the active creek and a temporary crossing will be constructed to allow for construction traffic to the north abutment. Clean gravel and soil fill will be used to construct the temporary crossing. A staging area will be established on the southern side of the construction area where materials and equipment will be stored.

Water Diversion and Fish Exclusion Plan: A creek flow bypass will be required during the majority of construction activities. The proposed flow bypass system will collect all of the creek flow and provide a temporary crossing via two 18" culverts for construction equipment at the original bridge location. Only resident trout use Purisma Creek. There are no steelheads present. A qualified fish biologist will install a fish exclusion net prior to in-channel work at the upper boundary of the in-stream construction area. Any fish below the exclusion with be flushed downstream and a net will be installed at the southern boundary of the construction area. Once the temporary stream crossing is constructed, the fish exclusion netting will be removed. The same fish exclusion process will be repeated during the temporary crossing removal. A series of silt fence and water barriers will be installed at the base of the banks of each new bridge abutment. These fences will direct the flowing water away from the work area so that a dry working environment can be preserved. The anticipated length of channel flow control is approximately 180 linear feet. Upon completion of construction, all diversion and temporary crossing material will be removed from the streambed.

Temporary Trail Access: The southern side of the construction area will be fenced off to preserve a 10-foot wide road and trail width for visitors using Purisima Creek Trail. Visitors using the Whittemore Gulch and Harkins Ridge Trails that desire to access the parking lot or Purisima Creek Trail will have to use the temporary culvert crossing. A brief period between the demolition of the existing bridge and construction of the temporary culvert crossing will close access over Purisima Creek. Appropriate signs posted at trailheads and along the temporary trail will provide warnings to the public of the temporary closure and information on the project status and will advise cyclists to walk their bikes.

New Bridge Construction: Once removal of the old bridge and temporary road crossing is complete, construction on the bridge will begin. Vertical and denuded banks downstream of the bridge will be stabilized and replanted using locally harvested willow and alder stakes in combination with biodegradable erosion control products. The new bridge will be built upon two new lateral foundations

from either side of the creek at the top of bank. The bridge structure itself will be a prefabricated metal bridge 60 feet long and 15 feet wide. The foundations will be installed first, and then the bridge will be assembled on-site and dropped into place with a crane. A new approach roadway, approximately 0.03 acres, will be graded and compacted. Backfill will be placed and compacted; road base and will then be installed in the last 18 inches of depth. All disturbed areas will be seeded and/or revegetated to prevent soil erosion. Disturbed bank slopes will be seeded and covered with erosion control blankets.

Construction Sequence: The following sequence of construction task will take place:

1. Project site mobilization
2. Biologic surveys, education, monitoring
3. Signage, grading and establishment of temporary access ways
4. Construction of dewatering/diversion system
5. Project site water diversion and biological monitoring and fish relocation
6. Bridge, roadway demolition, and fill excavation
7. Temporary access road and crossing installation
8. Bridge foundation construction
9. Place backfill and headwalls
10. Construct roadway
11. Assemble and install bridge
12. Remove detour; decommission temporary access road; complete erosion control
13. Final site planting and punch list
14. Site cleanup and demobilization

B. KEY ISSUES

1. Conformance with the County General Plan

Pursuant to Section 53091 of the State Government Code, projects undertaken by the Mid-Peninsula Regional Open Space District are exempt from review against the County's General Plan.

2. Conformance with the Local Coastal Program

A Coastal Development Permit is required pursuant to San Mateo County Local Coastal Program Policy 2.1, which mandates compliance with the California Coastal Act for any government agency wishing to undertake development in the Coastal Zone. Listed categories of development include all publicly financed recreational facilities (Policy 2.2). Summarized below are the following sections of the Local Coastal Program that are relevant to this project:

a. Sensitive Habitats Component

Policy 7.1 – *Definition of Sensitive Habitats*. This policy defines sensitive habitats as any area in which plant or animal life or their habitats are either rare or especially valuable. This includes all perennial and intermittent streams and their tributaries. Sensitive habitat areas include riparian corridors, wetlands, and habitats supporting rare, endangered, and unique species. Purisima Creek is a perennial stream and qualifies as a sensitive habitat under this definition. There is an associated buffer zone for this area, as discussed under Policy 7.11.

Policy 7.3 – *Protection of Sensitive Habitats*. This policy requires that development in areas adjacent to sensitive habitats be sited and designed to prevent impacts that could significantly degrade these resources. All uses shall be compatible with the maintenance of biologic productivity of the habitats. The abutments for the new bridge have been sited so that they are above the ordinary high water level of the creek as well as the estimated 100 year flood level. Extensive use of erosion control measures during and after construction will reduce the potential for sediment to enter the creek. The applicant is also proposing an extensive revegetation plan for the area of the old bridge to stabilize this area and create new habitat to offset the vegetation that will be removed to accommodate the new bridge.

Policy 7.5 – *Permit Conditions*. This policy requires, as part of the development review process, that the applicant demonstrate that there will be no significant impact on sensitive habitats. This is achieved by having the applicant submit a biological report outlining what resources exist at the project location and how the project may impact those resources. As discussed previously, the applicant has submitted a biological report for the

site, which identifies potential impacts and recommended mitigation measures to minimize those impacts. They are as follows:

Impacts to special-status plant species: Ground disturbance associated with the project could potentially result in adverse impacts to Dudley's lousewart specimens, if they occur within the project area.

Recommended Mitigation: A focused plant survey shall be conducted for Dudley's lousewort during the April-June blooming period. If the species is not observed during the focused survey, no additional mitigation measures for special-status plants are necessary. If observed, the population shall be mapped and a suitable buffer zone (based on species requirements, proximity to the work area, and other site specific factors) established, along with other protection measures, such as fencing installed around the population to protect it from project impacts. If the population cannot be avoided by the proposed project, impacts to the population shall be quantified and the regulatory agencies contacted for guidance.

Impacts to San Francisco dusky-footed woodrat: Five San Francisco dusky-footed woodrat houses were observed within the study area. The woodrat houses are located outside of the project site boundary, but mitigation measures are recommended due to the proximity of woodrat houses to the disturbance envelope.

Recommended Mitigation: Within 30 days prior to project construction, a qualified biologist shall inspect the work area and adjacent areas (including woodpiles or other man-made structures that woodrats could potentially colonize) within 50 feet of the project disturbance envelope for woodrat houses. An exclusion zone shall be erected around the existing woodrat houses (located outside of the project disturbance envelope) using a temporary fence that does not inhibit the natural movements of wildlife (such as steel T-posts and a single strand of yellow rope or similar materials). If new woodrat houses are located that will be affected by construction and relocation is necessary, the California Department of Fish and Wildlife (CDFW) shall be contacted for guidance. Approval to relocate shall be acquired from the County and California Department of Fish and Wildlife. To reduce impacts to young, relocation shall take place after July 1 and must be completed before the rainy season. Relocation may also happen during the month of March but only during a 3-day period when no rain forecast and only if night temperatures are above 40 degrees Fahrenheit.

Impacts to California Red-legged Frog (CRLF): The study area does not support breeding habitat for California red-legged frog. However, foraging, sheltering, and dispersal habitat for CRLF occurs along Purisima Creek and the associated Riparian Woodland. The proximity of the project site to this

habitat could result in CRLF occurring on the project site, potentially resulting in direct mortality during construction.

Recommended Mitigation: Prior to the start of construction, a worker education program shall be presented at the project site by a qualified biologist. Associated written material will be distributed. It shall be the on-site foreman's responsibility to ensure that all construction personnel and subcontractors receive a copy of the education program. The education program shall include a description of the CRLF and its habitat, the general provisions of the Endangered Species Act, the necessity of adhering to the Act to avoid penalty, and measures implemented to avoid affecting CRLF specific to the project and the work boundaries of the project.

Additionally, a qualified biologist shall monitor the initial removal of vegetation on the project site. Immediately prior to vegetation removal, the qualified biologist shall survey the work area for California red-legged frog. If any CRLF are observed in the work area, work shall cease and the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) contacted for guidance. After all vegetation and other debris that may provide cover for CRLF is removed, a qualified biologist shall inspect the work area daily prior to the start of construction. If no CRLF are observed, work may proceed without a qualified biologist present although a biological monitor shall be designated. If a CRLF is observed at any time during the construction, work shall cease and CDFW and USFWS contacted for guidance.

Impacts to bird nesting habitat: Nesting habitat is present for olive-sided flycatcher, saltmarsh common yellowthroat, and other native birds in trees and shrubs on the project site and surrounding study area. Vegetation removal, as well as noise and other disturbance during construction, could adversely impact nesting bird species, if present, potentially resulting in nest destruction or abandonment.

Recommended Mitigation: Vegetation removal shall be limited to the minimum necessary to conduct the project. If feasible, project construction shall take place outside of the breeding bird season (the breeding bird season is generally February 15 to August 15). If work must be conducted during the breeding season, a qualified biologist shall conduct a pre-construction breeding bird survey throughout areas of suitable habitat within 300 feet of the project site within 30 days prior to the onset of any construction activity. If bird nests are observed, an appropriate buffer zone shall be established around all active nests to protect nesting adults and their young from construction disturbance. Buffer zones shall be determined by a qualified biologist in consultation with CDFW based on the site conditions and the species potentially impacted. Work within the buffer zone shall

be postponed until all the young are fledged, as determined by a qualified biologist.

Impacts to bat habitat: Potential roosting habitat for pallid bat, western red bat, fringed myotis, and long-legged myotis occurs in mature trees and snags in the study area, and possibly under the existing bridge. Roost destruction, or work in close proximity to roost sites, could result in adverse impacts to special-status bat species.

Recommended Mitigation: If mature trees or snags will be removed during the bat breeding season (April 1 through August 31), a qualified bat biologist shall inspect trees for potential roost sites. If no potential roost sites are found, no additional mitigation is necessary. If bat roosts are found, direct disturbance to the roost shall be avoided during the breeding season.

Staff has included all the biologist's recommended mitigation measures as conditions of approval, please see Attachment A.

Policy 7.9 – *Permitted Uses in Riparian Corridors*. This policy lists the permitted uses within a corridor, including trails and scenic overlooks on public land. When no feasible or practicable alternative exists, this policy also permits bridges when supports are not in significant conflict with corridor resources. The project is a recreation trail and is an allowed use by the policy. The proposed bridge has been designed so that its footings are outside of the actual stream channel. The proposed new trail segments, from both sides of the creek, down to the bridge have been designed to minimize the amount of earthwork necessary to access the site and minimize the amount of vegetation removal.

Policy 7.10 – *Performance Standards in Riparian Corridors*. This policy requires development permitted in corridors to: (1) minimize removal of vegetation, (2) minimize land exposure during construction and use temporary vegetation or mulching to protect critical areas, (3) minimize erosion, sedimentation, and runoff by appropriately grading and replanting modified areas, (4) use only adapted native or non-invasive exotic plant species when replanting, (5) provide sufficient passage for native and anadromous fish as specified by CDFW, (6) minimize adverse effects of waste water discharges and entrainment, and (7) minimize alteration of natural streams.

- The new bridge will be located approximately 100 feet upstream of the existing bridge. There is a large downed redwood tree immediately downstream of the existing bridge that restricts high storm flows. This in turn causes storm flows to back up and flood the adjacent approach to the existing bridge. The downed tree serves an important biological and hydrological purpose and its removal could cause significant

unanticipated impacts downstream of this location. To ensure continued trail access during high water events, the applicant wishes to move the bridge to a higher location.

- The applicant is only proposing to remove two significant size trees, (12" and 20" diameter red alders) as part of this project.

- The applicant has condensed down the footprint of the project so that only 3,500 sq. ft. of ground surface will be disturbed during construction.

- The area of the old bridge will be re-graded and re-vegetated, using native plant species, as part of the project. However, the applicant is only proposing a 2:1 re-vegetation ratio for the 435 sq. ft. of riparian vegetation to be removed by the new bridge. The California Coastal Commission has recommended a 3:1 replacement ratio, which is their standard practice. Staff concurs with the Coastal Commission recommendation and has included a condition of approval (Condition No. 10) reflecting this request.

- In order to protect fish within the creek as well as protect downstream water quality, the applicant is proposing to construct a creek flow bypass, which is described in detail in their application materials.

Implementation of these various measures ensure that this project is in compliance with the requirements of Policy 7.10

Policy 7.11 – *Establishment of Buffer Zones*. This policy requires the establishment of buffer zones around all riparian corridors. In cases where no riparian vegetation exists along both sides of riparian corridors, the buffer shall extend 50 feet from the predictable high water point for perennial streams. Within these buffer zones, Policy 7.12 states that the uses allowed in riparian corridors are also allowed.

Policy 7.13 – *Performance Standards in Buffer Zones*. This policy requires uses permitted in buffer zones to: (1) minimize removal of vegetation, (2) conform to natural topography to minimize erosion potential, (3) make provisions (i.e., catch basins) to keep runoff and sedimentation from exceeding pre-development levels, (4) replant where appropriate with native and noninvasive exotics. As stated above, the proposed bridge location, and the trails leading to it, have been designed and routed to avoid impacting the riparian zone around the creek as much as possible. Unfortunately, two trees must be removed to allow for the northern bridge approach. The applicant has also proposed to install erosion control measures in all areas of work and to plant an erosion control seed mix on

all disturbed soil areas and then cover the seed with erosion control blankets to protect it.

b. Visual Resources Component

Policy 8.6 – *Streams, Wetlands, and Estuaries*. This policy prohibits structural development in the coastal zone which will adversely affect the visual quality of perennial streams and associated riparian habitat, except for those uses permitted by Sensitive Habitats Component Policies. As stated above, recreational trails and bridges are allowed in riparian corridors under Policy 7.9; however, the applicant has taken steps to preserve the visual attributes of the site, by limiting the amount of vegetation removal to only that which is necessary to construct the bridge and to use materials and colors which blend with the surrounding character of the site.

Policy 8.17 – *Alteration of Landforms; Roads and Grading*. This policy requires development to be located and designed to conform with, rather than change landforms. As stated previously, the existing bridge is old and deteriorated beyond repair. Its replacement is necessary to ensure continued vehicular emergency access within the Purisima Creek Open Space Preserve. The applicant's project engineer has provided the following information:

> "(R)eplacing the bridge at its current location is impractical and not as cost-effective as replacing it in a new, nearby location. A 5-foot diameter redwood log recently fell into the creek immediately downstream of the bridge. This log blocks the majority of stream flow during 100-year storm events, and therefore will cause flooding at the existing bridge location. If the bridge were to be raised above the flood zone, significant fill material would be required to raise the bridge approaches and overall bridge elevation. The downed redwood log is a welcome addition to stream complexity for aquatic habitat; also, removing it would not fully eliminate the need to import fill at the current bridge location. Fortunately, there is a better location to cross the creek about 60 feet upstream, outside of the influence of the redwood log. This new location reduces the need to import fill material to almost zero, allows for a shorter overall bridge span, and reduces construction costs. Some small alder trees (a quick growing, short-lived successional species) and annual riparian vegetation will need to be removed."

The use of the alternate location substantially reduces grading for this project and complies with the intent of the policy.

3. Conformance with Zoning Regulations

a. Development Requirements.

The management of land for recreation purposes is considered a "Compatible Use" under Section 6953.1(c) (*Timberland Preserve Zone-Coastal Zone District – TPZ-CZ*) of the County Zoning Regulations. A compatible use is one that does not significantly detract from the use of the property for growing and harvesting timber. Construction of a compatible use requires the securing of a Minor Development Permit, as required by Section 6965 of the Zoning Regulations. Any proposed development in the TPZ/CZ shall show compliance with the following development design criteria:

(1) Environmental Design Criteria.

(a) *All developments shall be designed to conserve energy; to minimize air pollutants to meet County, State and Federal standards; to exclude significant levels of noxious odors; to use only biocides having no significant adverse environmental effects and to avoid discharging other chemicals which unbalance the major ecosystems; to exclude long-term noise levels; to avoid extensive change of vegetation; and to avoid adverse impacts on wildlife habitat, to minimize impacts on perennial streams and riparian habitat.*

The project is a recreational trail. There will be no long-term energy consumption associated with this project. The proposed grading is relatively minimal and will be performed with small equipment. There is no reason to believe that abnormal levels of air pollution will result from this project. No biocides are proposed for use on this site. As stated above there will be only minimal vegetation removal and the applicant has proposed conducting surveys for special status plants, California red-legged frogs, nesting birds and dusky footed woodrat prior to the beginning of construction to ensure that no impact will occur to these species. As discussed above, this project will have minimal impact upon Purisima Creek or its riparian habitat.

(2) Fish and Wildlife Habitat Areas Design Criteria. All development shall:

(a) *Be designed to prevent reduction or removal of habitat areas.*

As discussed above, the project has been designed so that no portions of the bridge will encroach into the stream channel.

There will be minimal disturbance of the site in order to construct the bridge and associated access roads/trails. Their use will not prohibit the use of the area for habitat.

(b) *Insure that any spawning and nesting areas or wetlands are not developed, altered, filled or dredged.*

Purisima Creek does not provide spawning habitat for anadramous steelhead. A 30-foot waterfall at the river mouth is a complete barrier to passage. The creek is, however, home to resident rainbow trout. Potential impacts to resident trout due to construction were identified in the Initial Study and measures were proposed to mitigate these impacts. Measures include the installation of fish exclusion netting up and downstream of the project site, as well as erosion control and dewatering measures to reduce potential downstream sediment and turbidity issues. The biotic report for this project did not identify any raptor nests adjacent to the project alignment. Staff endorses these recommendations and has included them as conditions of approval.

b. Timber Management Plan

One of the requirements for the issuance of a Minor Development Permit, is the submittal of a Timber Management Plan (Plan). The purpose of this Plan is to ensure that the proposed project is consistent with the purposes of the TPZ-CZ and will not impair the present or potential uses of adjacent properties for timber use. Additionally, the Plan must show how the timber resources on a parcel will be managed for their long-term harvesting and regeneration. As a Mid-Peninsula Regional Open Space District committed to preserving the forests resources on their lands in perpetuity, the District requested a waiver from this application requirement. Given the minor nature of this project and the purpose of the Mid-Peninsula Regional Open Space District, staff has waived this application requirement.

Staff recommends that the Commission find the project complies with the definition of a Minor Development under County Zoning Regulation Section 6953.1(c) and grant a Minor Development Permit in accordance with Section 6968 of the County Zoning Regulations.

4. Conformance with County Grading Regulations

The total amount of proposed grading for this project is approximately 238 cubic yards of material. This includes excavation and restoration of the old bridge site, excavation for the new bridge footings and construction of new road segments to tie into the new bridge. This project was reviewed by the Department of Public

Works and the Geotechnical Section, both of whom believe the project can be completed without significant harm to the public or damage to the environment or property of adjacent landowners. Planning staff reviewed the proposal against the required findings for a grading permit. Staff believes that, as conditioned, there will not be a significant adverse affect on the environment. Staff believes that the project conforms to the criteria for review contained in the Grading Ordinance. Finally, as outlined above, the project conforms to the Local Coastal Program and the Zoning Regulations. In order to approve this project, the Planning Commission must make the required findings contained in the Grading Regulations. The findings and supporting evidence are outlined below:

a. That the project will not have a significant adverse affect on the environment.

As stated previously, the applicant, acting as the Lead Agency, conducted an environmental review as required by CEQA. After reviewing this document and its findings, staff believes that, if all mitigation measures contained in that document are implemented, there will not be a significant adverse affect on the environment. These measures include:

(1) *Focused plant surveys shall be conducted prior to initial ground breaking to confirm that no special status plant species are present in the area of construction.*

(2) *Pre-construction surveys for San Francisco dusky-footed woodrat, California red-legged frog, nesting birds and bats and required measures to address each species if found.*

(3) *Worker education on potential for encountering subsurface cultural resources.*

(4) *Measures to reduce wildland fire potential.*

b. That the project conforms to the criteria of the San Mateo County Grading Ordinance and is consistent with the General Plan.

The project, as conditioned, conforms to the criteria for review contained in the Grading Ordinance, including an erosion and sediment control plan, dust control measures, and revegetation plans. As discussed above, the applicant, as a governmental agency, is exempt from the County's General Plan.

C. ENVIRONMENTAL REVIEW

For purposes of compliance with CEQA, the District is claiming the role of lead agency. As such, they have filed a Notice of Determination with the State Clearinghouse and the County Recorder, on March 12, 2015.

D. REVIEWING AGENCIES

Department of Public Works
Building Inspection Section
Geotechnical Section
County Fire Marshal
California Coastal Commission
California Department of Fish and Wildlife
Regional Water Quality Control Board
U.S. Fish and Wildlife Service

ATTACHMENTS

A. Recommended Findings and Conditions of Approval
B. Location Map
C. Site Plans
D. Mid-Peninsula Regional Open Space District's Initial Study and Mitigated Negative Declaration (includes technical appendices)
E. Mid-Peninsula Regional Open Space District's recorded Notice of Determination

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Attachment A

County of San Mateo
Planning and Building Department

RECOMMENDED FINDINGS AND CONDITIONS OF APPROVAL

Permit or Project File Number: PLN 2015-00006 Hearing Date: April 22, 2015

Prepared By: Mike Schaller
Senior Planner

For Adoption By: Planning Commission

RECOMMENDED FINDINGS

Regarding the Environmental Review, find:

1. That the Commission, acting as a responsible agency, has reviewed and considered the Mitigated Negative Declaration, prepared by Mid-Peninsula Regional Open Space District (District) as Lead Agency.

Regarding the Coastal Development Permit, find:

2. That the project, as described in the application and accompanying materials required by Zoning Regulations Section 6328.7 and as conditioned in accordance with Section 6328.14, conforms with the plans, policies, requirements and standards of the San Mateo County Local Coastal Program, including protection of biological resources as discussed in Section 2(a) of the attached report.

3. That the project conforms to the specific findings required by policies of the San Mateo County Local Coastal Program, including protection of biological resources.

Regarding the Grading Permit, find:

4. That the project will not have a significant adverse effect on the environment. Staff reviewed the Initial Study, prepared by the applicant, pursuant to California Environmental Quality Act (CEQA) regulations, and determined that the project, if undertaken with appropriate mitigation measures, would not have a significant adverse impact on the environment. The Negative Declaration's mitigation measures have been incorporated into the recommended conditions of approval to ensure that the project will have no adverse impacts to the environment.

5. That the project conforms to the criteria of the San Mateo County Grading Ordinance and is consistent with the General Plan. As stated previously, this project is exempt from review against the County General Plan. However, it was

reviewed against the policies of the Local Coastal Program (as subset of the General Plan specifically for the Coastal Zone) and the County Zoning Regulations, which implement the policies of the General Plan. As stated above, the project was found consistent with both sets of regulations. The project, as proposed and conditioned, conforms to the standards in the Grading Ordinance, including those relative to an erosion and sediment control plan, dust control plan, and the timing of grading activity.

Regarding the Minor Development Permit, find:

6. That the pedestrian/vehicle bridge and trail comply with the definition of a Minor Development under County Zoning Regulations Section 6953.1(c) (Timberland Preserve Zone - Coastal Zone).

RECOMMENDED CONDITIONS OF APPROVAL

Current Planning Section

1. The approval applies only to the proposal as described in this report and materials submitted for review and approval by the Planning Commission on April 22, 2015. The Community Development Director may approve minor revisions or modifications to the project if they are found to be consistent with the intent of and in substantial conformance with this approval.

2. These permits shall be valid for two (2) years from the date of approval in which time a building permit shall be issued. Any extension of the permits shall require submittal of an application for permit extension and payment of applicable extension fees sixty (60) days prior to the expiration date.

Mitigation Measures

3. Focused plant surveys for each species listed in the Biological Assessment shall be conducted in the spring prior to initial ground breaking to determine the species' presence or absence in areas that would be disturbed by construction and earth-movement activities. If any special-status plant species are found, areas supporting the species shall be avoided, where feasible. Work shall not start if a special-status plant specimen and its required habitat conditions are found within the impact area while a plan detailing on-site mitigation is developed based on consultation with the California Department of Fish and Wildlife (CDFW). Construction work may start once such plan has been approved by the CDFW.

4. The following avoidance measures for the San Francisco dusky-footed woodrat will be implemented:

    A. Preconstruction Surveys: A qualified biologist shall conduct San Francisco dusky-footed woodrat nest surveys prior to initial groundbreaking to

determine the presence or absence of nests in areas that would be disturbed by construction and earth-movement activities. If feasible, disturbance of woodrat nests shall be avoided by staging construction-related equipment and materials away from known nest sites. If during the survey, a woodrat nest is detected, the District will complete one of the following avoidance minimization measures. These measures are listed in order of priority, where the first measure is the preferred measure to be implemented as it provides the least amount of impact to the woodrat. If the first measure cannot be implemented due to extenuating site conditions, the second shall be implemented and so forth down the list.

1. Any trail alignment, access road or staging area will be relocated to avoid the woodrat nest by at least 5 feet. Safety and/or silt fencing (for nests downslope) will be erected around all nests within 25 feet of the trail alignment, road or staging area to avoid impacts during construction.

2. For all woodrat nests that cannot be avoided by project activities (i.e., will require relocation), the CDFW should be consulted with one of the two following options:

    a. If the nest appears inactive (e.g., no scat or fresh leaves and twigs), approval will be sought from the CDFW to dismantle the nest and replace the lost resource by building an artificial nest. One artificial nest should be built for every one existing inactive nest that is dismantled.

    b. If the nest appears active, approval will be sought from the CDFW to (1) trap the occupant(s) of the nest, (2) dismantle the nest, (3) construct a new artificial nest with the materials from the dismantled nest, and (4) release the occupant(s) into the new artificial nest. The new nest should be placed no more than 20 feet from its original location and as far from the project footprints as necessary to be protected from construction activities. Nests should only be moved in early morning during the nonbreeding season (October through February). If trapping has occurred for three consecutive nights and no wooodrats have been captured, the nest should be dismantled and a new nest constructed.

A California Natural Diversity Database (CNDDB) form shall be filled out and submitted to the CDFW for any San Francisco dusky-footed woodrats that are trapped. Once trapped, nests shall be torn down and rebuilt surrounding an inverted wooden planter (or similar structure) having at least one entrance and exit hole that is slightly buried into the ground to anchor. Any nest material encountered shall be placed within the nest structure

during rebuilding. A small handful of seeds shall be placed within the relocated structure. Relocated nests are intended to provide a release site and opportunity for the woodrats to relocate to another nest (most woodrats average more than one nest and often do not remain with a relocated nest). Once nests are moved, any trapped woodrats should be released into the reconstructed nest during daylight hours so that they seek refuge in the reconstructed nests. In most instances, it is expected that the animal will remain in the reconstructed nest until it has an opportunity to relocate to another nest site at night. Relocated nests are expected to eventually be re-colonized and should be monitored one year post-construction using visual surveys to determine if a relocated nest has returned to use. A monitoring report should be submitted to the CDFW to document use or nonuse of relocated nests.

B. Employee and Contractor Education Program: The District will conduct an employee education program prior to the initiation of project activities. The program will consist of a brief presentation by persons knowledgeable in special-status species biology and legislative protection to explain concerns to contractors and their employees. The program would include the following: a description of woodrats and their habitat needs; an explanation of the status of the woodrats and their protection under state law; and a list of measures being taken to reduce impacts to woodrats during project activities. If a woodrat nest is found on the project footprint, it is to be left alone and all operations should stop. Notify the Project Site Lead and District Staff (if the site lead is a contractor) or notify the District Natural Resources Program Manager if the Project Lead is a District Staff.

C. Daily Monitoring: During the construction phase of the project, a qualified biologist, District Natural Resources staff or a trained, on-site monitor will check the site in the morning every day before construction activities begin for the presence of woodrats or other wildlife within the work area. If a woodrat is found, the monitor shall have the authority to stop construction in the immediate area and immediately notify appropriate District Staff (Natural Resources Program Manager or designated staff). If the monitor is the District's Natural Resources Staff, or qualified biologist, they will have the authority to notify the CDFW for guidance on procedure. Subsequent recommendations made by the CDFW shall be followed. The monitor would not handle or try to relocate any special-status species.

D. Speed Limit: Vehicles shall not drive more than 5 miles per hour within the construction area if these species have been determined to be present. If any woodrat is seen in the path of a vehicle, the vehicle shall stop until the animal is out of the path. Parked vehicles shall be thoroughly checked underneath before they are moved to ensure that no woodrat is on the ground below the vehicle.

5. The following avoidance measures for the California red-legged frogs will be implemented:

   A. Pre-Construction Surveys for Special-Status Amphibians including the California Red-Legged Frog (CRLF): Surveys for the CRLF and other special-status amphibians shall be conducted before construction begins. In the unlikely event CRLF eggs or tadpoles are found, a 100-foot buffer shall be established around the location until juveniles disperse from the breeding site, as determined by a qualified biologist. If adults are present in the construction area, work shall be stopped until individuals are allowed to disperse on their own volition, or the species is relocated by a qualified biologist with permission to handle the CRLF. With these measures in place, the impact for the CRLF would be reduced to a less than significant level.

   B. Employee and Contractor Education Program: An employee and contractor education program shall be implemented to educate all construction personnel on CRLF identification and procedures should CRLF be observed in the project area. If a CRLF is found on the project footprint, it is to be left alone and all operations should stop. Notify the Project Site Lead and District Staff (if the site lead is a contractor) or notify the District Natural Resources Program Manager if the Project Lead is a District Staff.

   C. Daily Monitoring: During the construction phase of the project, a qualified biologist, District Natural Resources staff or a trained, on-site monitor will check the site in the morning every day before construction activities begin for the presence of the CRLF or other wildlife within the work area. If a CRLF is found, the monitor shall have the authority to stop construction in the immediate area and immediately notify appropriate District Staff (Natural Resources Program Manager or designated staff). The monitor would not handle or try to relocate any special-status species.

   D. Speed Limit: Vehicles shall not drive more than 5 miles per hour within the construction area if these species have been determined to be present. If any CRLF is seen in the path of a vehicle, the vehicle shall stop until the animal is out of the path. Parked vehicles shall be thoroughly checked underneath before they are moved to ensure that no CRLF is on the ground below the vehicle.

6. Project Compliance with All State and Federal Permits: The project may potentially affect a number of species that fall under the jurisdiction of the CDFW, USFWS, and NMFS. Each of these permits would be reviewed by agency personnel who are experts in conservation of these sensitive species. The federal permits granted under Section 404 of the Clean Water Act would be required for the construction of the project. The State of California would also have to issue a streambed alteration agreement for the project. The project shall attain and

comply with all state and federal permits for the project. Implementation of this mitigation would reduce the impacts on candidate, sensitive, or special-status species to a less than significant level.

7. If noise-generating construction activity takes place during the breeding season (April 1 to September 15), construction activity shall be restricted between 1.5 hours after sunrise to 1.5 hours before sunset to minimize disturbance of potential nesting murrelets using forest habitat as a travel corridor between inland nesting and coastal habitat.

8. A qualified biologist will conduct pre-construction nesting bird surveys within 30 days of project beginning, of all trees and snags greater than 6 inches DBH and all shrubs taller than 8 feet proposed for removal. If bird nests are observed, an appropriate buffer zone will be established around all active nests to protect nesting adults and their young from construction disturbance. Removal of trees, snags, or woody shrubs with identified avian nests shall be postponed until all young are fledged and have left the tree.

9. If mature trees or snags will be removed during the bat breeding season (April 1 through August 31), a qualified bat biologist shall inspect trees and the bridge for potential roost sites. If no potential roost sites are found, no additional mitigation is necessary. Surveys will consist of a daytime pedestrian survey looking for evidence of bat use (e.g., guano) and/or an evening emergency survey to note the presence or absence of bats. If evidence of bat use is observed, the number and species of bats using the roost will be determined. Bat detectors may be used to supplement survey efforts, but are not required.

   If roosts of pallid bats are determined to be present and must be removed, the bats will be excluded from the roosting site before the bridge is removed. A program addressing compensation, exclusion methods, and roost removal procedures will be developed in consultation with the CDFW before implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave but not reenter), or sealing roost entrances when the site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young). The loss of each roost (if any) will be replaced in consultation with the CDFW and may include construction and installation of bat boxes suitable to the bat species and colony size that was excluded from the original roosting site. Roost replacement will be implemented before bats are excluded from the original roost sites. The District has successfully constructed bat boxes elsewhere that have subsequently been occupied by bats. Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost site, the bridge may be removed.

10. Replant appropriate vegetation at a 3:1 ratio in the project area, as seen in Figure 5. This would include planting within the rock slope protection placed on the channel banks. Planting within the site shall occur in four general planting zones: active channel, lower shaded riparian, upper riparian/upland, and direct seeding (upland). Active channel is the zone nearest to the channel flow and represents the planting that shall be completed around the pools, habitat structures, and riffle edges. This zone is comprised of willows. The second zone, lower shade riparian, is comprised of riparian shrub-like dogwood, coffeberry, and current. The third zone is upper riparian/upland that is largely composed of trees, such as red alders and redwoods, and woody shrubs. The highest elevation zone shall consist of a native erosion control mix.

11. Prior to the initiation of construction or ground disturbing activities, the District staff or archaeological monitor shall conduct a meeting to train all construction personnel of the potential for exposing subsurface cultural resources and to recognize possible buried cultural resources.

12. If there is an unanticipated discovery of archaeological deposits or remains during project implementation, construction crews shall stop all work within 100 feet of the discovery and notify District staff. A qualified archaeologist will assess the discovery, complete an archaeological evaluation and provide recommendations.

13. In the event human remains, including skeletal remains, graves, or Native American burial sites or graves, are discovered, such as during the course of any ground disturbing activities (grading, excavating, trenching, digging), construction or maintenance activities, the following procedures shall be followed:

    a. All work shall immediately cease and there shall be no further excavation or disturbance of the site or the area in the vicinity of the discovery.

    b. Notify District staff immediately.

    c. District staff shall immediately notify the San Mateo County Coroner to evaluate the remains, and follow the procedures and protocols set forth in §15064.5(e) of the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387).

    d. Secure the area and no further disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has made a determination of origin and disposition, which shall be made within two working days from the time the Coroner is notified of the discovery, pursuant to State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98.

    e. If the Coroner determines that the remains are or may be of a Native American, the Coroner shall notify the California Native American Heritage

Commission (NAHC) pursuant to subdivision (c) of the State Health and Safety Code within 24 hours, which will determine and notify the Most Likely Descendant (MLD). The MLD may recommend within 48 hours of their notification by the NAHC the means of treating or disposing of, with appropriate dignity, the human remains and grave goods. In the event of difficulty in locating a MLD or failure of the MLD to make a timely recommendation, the human remains and grave goods shall be reburied with appropriate dignity on the property in a location not subject to further subsurface disturbance.

f. If the Coroner determines that the remains are not those of a Native American, the Coroner would make recommendations for the treatment and disposition of the remains. Construction work shall not begin again until the County Coroner has examined the remains, assessed their significance, and offered recommendations for any additional exploratory measures deemed necessary for the further evaluation of, and/or mitigation of adverse impacts.

14. All equipment to be used during construction must have an approved spark arrestor.

15. Cut grass and reduce fuels around construction sites where vehicles are allowed to park.

16. Minimize use of mechanical construction equipment during hot, dry, windy weather.

17. Hired contractors shall be required to:

    a. Provide water to suppress potential fires caused by the work performed.

    b. Remind workers that smoking is prohibited at the work site and on any District land per contract conditions and District Ordinance.

    c. Maintain working ABC fire extinguishers on all vehicles in the work area.

Grading Permit Conditions

18. The provision of the San Mateo County Grading Ordinance shall govern all grading on and adjacent to this site. Per San Mateo County Ordinance Section 8605.5, all equipment used in grading operations shall meet spark arrester and fire-fighting tool requirements, as specified in the California Public Resources Code.

19. No grading activities shall commence until the applicant has been issued a grading permit (issued as the “hard card” with all necessary information filled out and signatures obtained) by the Current Planning Section.

20. The engineer who prepared the approved grading plan shall be responsible for the inspection and certification of the grading as required by Section 8606.2 of the Grading Ordinance. The engineer's responsibilities shall include those relating to non-compliance detailed in Section 8606.5 of the Grading Ordinance.

21. For the final approval of the grading permit, the applicant shall ensure the performance of the following activities within thirty (30) days of the completion of grading:

    a. The engineer shall submit written certification to the Department of Public Works and the Geotechnical Section that all grading has been completed in conformance with the approved plans, conditions of approval, and the Grading Ordinance.

    b. All applicable work during construction shall be subject to observation and approval by the geotechnical consultant. Section II of the Geotechnical Consultant Approval form must be submitted to the County's Geotechnical Engineer and the Current Planning Section.

22. The applicant shall implement their proposed erosion control measures, as shown on the plans and materials submitted on January 6, 2015, prior to the beginning of grading or construction operations. Re-vegetation of denuded areas shall begin immediately upon completion of grading/construction operations as shown on the plans and materials submitted on January 6, 2015.

23. The grading permit "hard card" and the building permit shall be issued at the same time. No grading shall occur until the "hard card" has been issued.

24. Unless approved, in writing, by the Community Development Director, no grading shall be allowed during the winter season (October 1 to April 30) to avoid potential soil erosion.

25. The applicant shall submit a letter to the Current Planning Section, a minimum of two (2) weeks prior to commencement of grading, stating the date when grading will begin.

Building Inspection Section

26. Sediment and erosion control measures must be installed prior to beginning any site work and maintained throughout the term of the permit. Failure to install or maintain these measures will result in stoppage of construction until the corrections have been made and fees paid for staff enforcement time.

Geotechnical Section

27. The applicant shall comply with all requirements of the Geotechnical Section prior to the issuance of a grading permit and/or building permit.

Department of Public Works

28. Prior to the issuance of the building permit or planning permit (for Provision C3 Regulated Projects), the applicant shall have prepared, by a registered civil engineer, a drainage analysis of the proposed project and submit it to the Department of Public Works for review and approval. The drainage analysis shall consist of a written narrative and a plan. The flow of the stormwater onto, over, and off of the property shall be detailed on the plan and shall include adjacent lands as appropriate to clearly depict the pattern of flow. The analysis shall detail the measures necessary to certify adequate drainage. Post-development flows and velocities shall not exceed those that existed in the pre-developed state. Recommended measures shall be designed and included in the improvement plans and submitted to the Department of Public Works for review and approval.

29. Plans, with specific construction details, shall be stamped and signed by the registered civil engineer and submitted to the Fire Department, the Building Inspection Section, and the Department of Public Works for review and approval prior to construction. The applicant shall provide a profile of the bridge and approaches to the bridge prior to construction. Maximums slopes shall not exceed 15%.

30. The applicant shall submit a traffic control plan prior to issuance of a building permit to direct foot and vehicular traffic around this location

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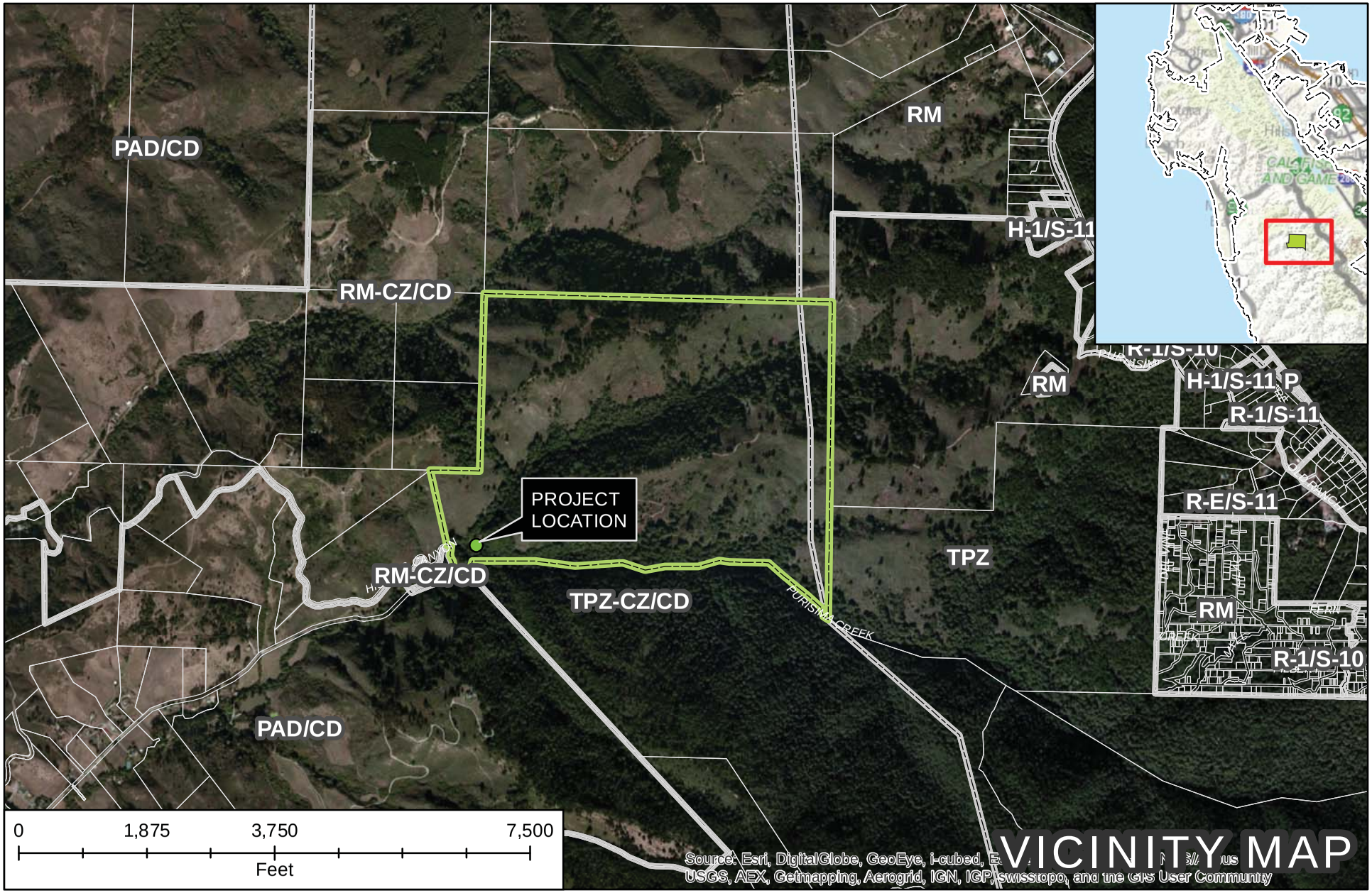
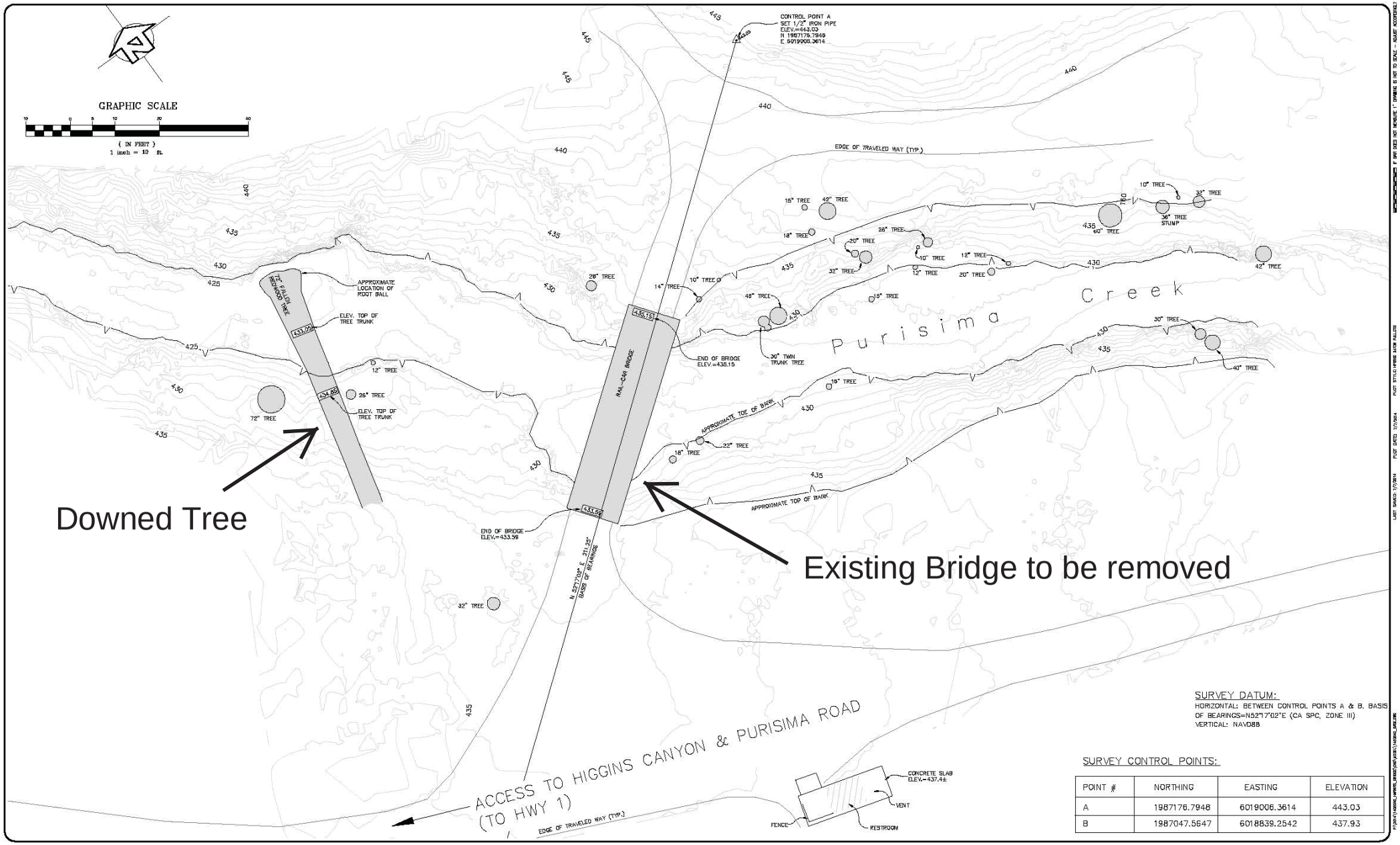


San Mateo County Planning Commission Meeting

Owner/Applicant: Mid-Peninsula Open Space District

Attachment: B

File Numbers: PLN2015-00006



POINT #	NORTHING	EASTING	ELEVATION
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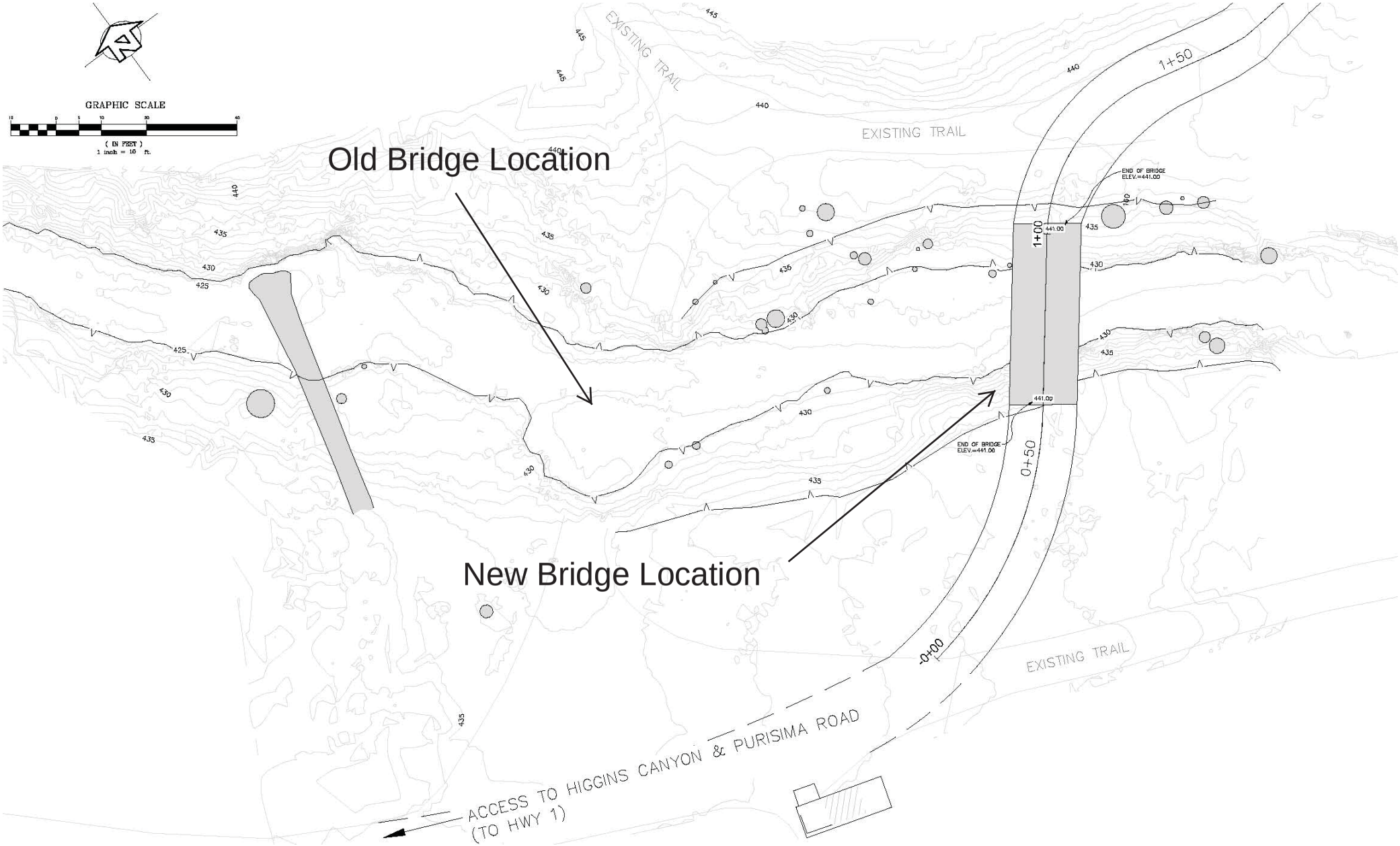
San Mateo County Planning Commission Meeting

Owner/Applicant: Mid-Peninsula Open Space District

Attachment: C-1

File Numbers: PLN2015-00006

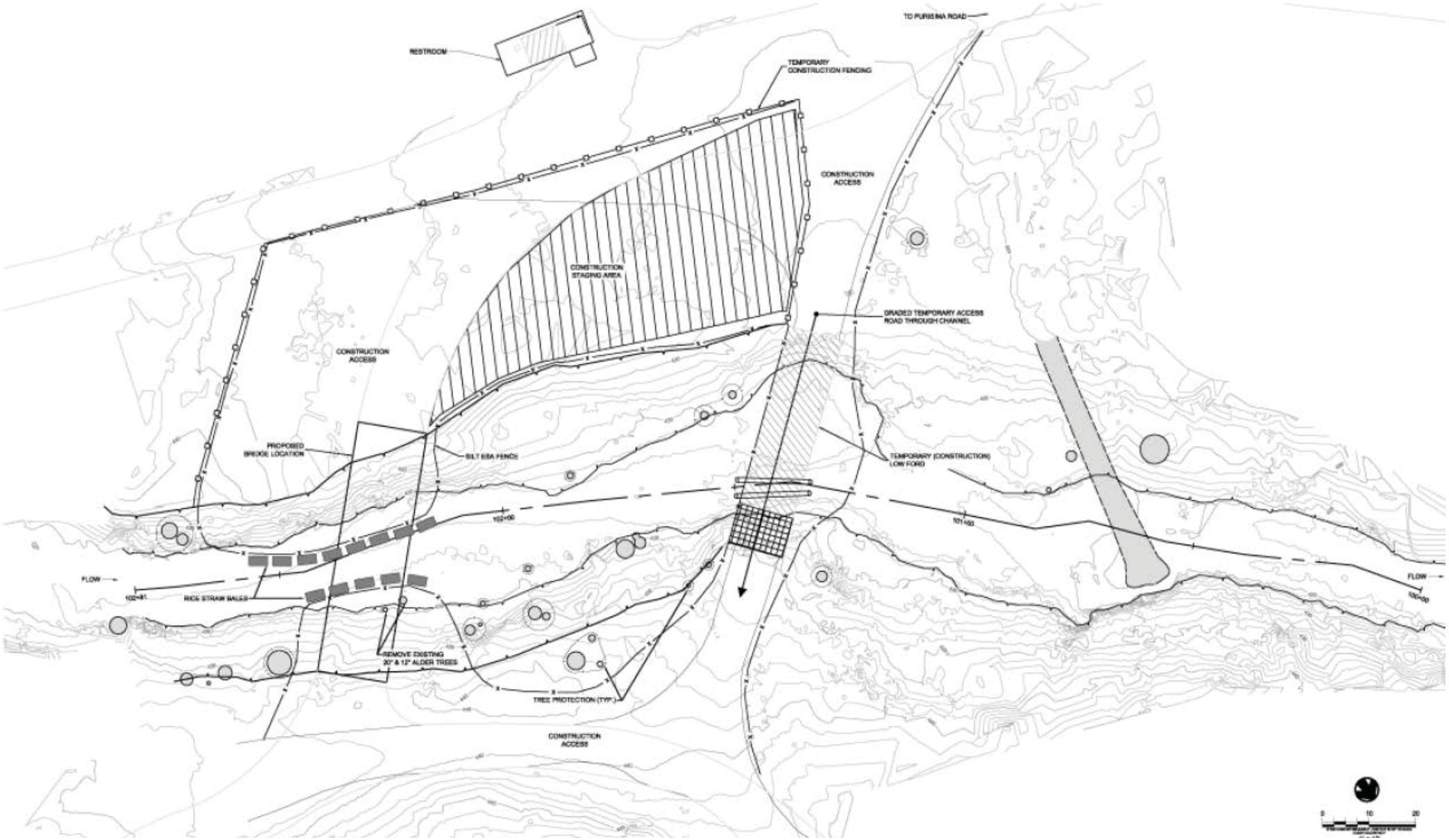


San Mateo County Planning Commission Meeting

Owner/Applicant: Mid-Peninsula Open Space District

Attachment: C-2

File Numbers: PLN2015-00006



Demolition, Staging and Access Plan

San Mateo County Planning Commission Meeting

Owner/Applicant: Mid-Peninsula Open Space District

Attachment: C-3

File Numbers: PLN2015-00006

County of San Mateo - Planning and Building Department

ATTACHMENT D

Regional OpenSpace | Midpeninsula Regional Open Space District

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION

Harkins Bridge Replacement Project
Purisima Creek Open Space Preserve
San Mateo County, CA

October 17th 2014

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022
650-691-1200

Table of Contents

Figures

Appendices

Midpeninsula Regional Open Space District
PROPOSED INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

A notice, pursuant to the California Environmental Quality Act of 1970, as amended (Public Resources Code 21,000, et seq.) that the District proposes to determine that the Harkins Bridge Replacement Project, when implemented, will not have a significant impact on the environment.

PROJECT DESCRIPTION

Project Location and Surrounding Land Uses

The Harkin Bridge Replacement Project site is located approximately 100 yards east of the intersection of Higgins Canyon Road and Purisima Creek Road, on the Whittemore Gulch Trail, in the Purisima Creek Open Space Preserve. **Figure 1**, *Area Map,* shows the regional context of the project site. Purisima Creek Redwoods Open Space Preserve is an 4,711-acre preserve that includes a 24-mile trail system for hikers, bikers, and equestrians. Purisima Creek, a large perennial stream, flows from the top of the Preserve at Skyline Blvd (Highway 35) down to the coastal terraces south of Half Moon Bay. The project site is located at the very western extent of the Preserve, adjacent to the only public parking from the coastside of the Preserve.

Project Goals and Objectives

The Project involves the removal and replacement of a deteriorated railroad car bridge crossing over Purisima Creek, which would entail demolition of an existing access road to the old bridge location, site restoration of the area of the old bridge location; construction of a temporary culvert crossing with associated water diversion plan; installation of a new bridge, construction of a new access roadway and trail to the proposed bridge, and temporary fencing along Purisima Creek Trail to exclude the public from construction activities.

The project goals and objectives are as follows:

- Remove the existing deteriorated bridge over Purisima Creek and restore the bridge approaches and bridge area to reduce soil erosion.
- Construct a new bridge and associated new access roadway approximately 100 feet upstream of the existing bridge that will improve public safety for the District with safe vehicular access for patrol, fire and other emergency vehicles.

Project Characteristics

Project implementation would involve removing the existing 60-foot long, steel bridge and replacing it with a 60-foot-long, prefabricated steel bridge upstream of the current location. The project is shown in **Figures 2 to 6**. The existing bridge is deteriorating and can no longer safely carry significant vehicle loads. The current bridge serves as a crossing for patrol, fire, and other emergency vehicles. These vehicles can be quite heavy, so the bridge has to be able to carry those loads safely. The new bridge will entail the construction of structural concrete abutments (drilled piers), and maintaining adequate turning radius and grades on the new approaches to the bridge. Approximately 15 feet of the Whitmore Gulch Trail will be realigned to approach the proposed bridge from the north and approximately 60 feet of the Purisima Creek Trail will be realigned to approach the proposed bridge from the south.

The bridge replacement project involves working in an approximately 180-foot reach of Purisima Creek that is approximately 20 to 50 feet wide. The project construction footprint for the old and new bridge location is approximately 3,500 square feet (0.08 acres). Approximately 0.01 acres of riparian vegetation removal will be required around the proposed bridge approaches primarily on the southern end and around the northern end, as seen as Figure 7 and 9. Two alder trees (12" and 20" dbh) are proposed for removal adjacent to the proposed northern bridge approach, as seen in Figure 3 and 8.

In this river reach the river banks are 8 to 10 feet high; however the channel bottom is significantly wider downstream of the proposed new bridge. The slope along the reach is approximately 2.2%. The large downed redwood tree immediately downstream of existing bridge restricts high storm flows. This restriction causes storm flows to back up and flood the adjacent approach to the existing bridge.

The existing bridge will be replaced with a new bridge approximately 100 feet upstream of the existing bridge. The southern concrete abutment and wingwall will be constructed entirely outside the stream channel and above the 100-year flood event elevation. The northern abutment and wing wall are to be built just below the break in slope of the stream channel, but above the elevation of an 100-year flood event, as seen in Figure 4. Grading for this project is limited to both bridge approaches and minor recontouring for slope stabilization and restoration purposes around the existing bridge. The quantities of excavation and fill are detailed below, under Project Implementation, f. New Construction, and seen in Figures 3 and 4. Almost all of the grading will occur within soils that were previously disturbed by the construction of the log landing built in approximately the 1850s.

In addition to the removal and replacement of the bridge, the design includes the restoration of the old bridge location with native vegetation, and new bio-technically stabilized slopes. More detailed information regarding the various phases of the proposed project is provided below.

Project Implementation

a. Construction Timeline. Construction activities would occur over a 16 to 24 week period, beginning and ending between April 1 to December 31st. Construction hours would be limited to one and half hours after sunrise to one and a half hours before sunset on weekdays and weekends during marbeled murrelet nesting season (April 1st to September 15th), after which construction would be limited to 7:00 am to 6:00 pm during weekdays and 9:00 am to 5:00pm on Saturday, as described in mitigation measure BIO-5.

b. Construction Access. The site would be accessed from Purisima Canyon Road, directly off Highway 1. Construction vehicles would utilize Purisima Creek Road in order to access the site and haul materials from the site. A temporary culvert crossing and road would be constructed at the existing bridge crossing to allow vehicular access to the other side of Purisima Creek for construction activities.

c. Construction Equipment. The project would require the use of heavy equipment, such as cranes, excavators, loaders, backhoes, water trucks, dump trucks and fuel tanks.

d. Grading and Erosion Control. Grading and other earth-disturbing activities proposed project would be limited to the dry season (generally between April 15 and October 15). Construction will be supervised by experienced District staff and engineering consultants and would incorporate erosion control techniques from the District's Details and Specifications Guidelines. In addition, Best Management Practices (BMPs) approved by the California Department of Fish and Wildlife

and Regional Water Quality Control Board and in use by the District for proper design and use of silt fencing, would be implemented during project construction to avoid impacts such as erosion at the project site.

Channel erosion potential would change over time as the planted vegetation matures. Typically, the erosion potential of the channel and banks decreases as the project ages, and mature, stable vegetation is established. Approaches that integrate vegetation and biodegradable products such as fiber blankets, bio-blocks, and coir products will be used. The biodegradable products are used to provide temporary erosion protection and allow for the vegetation to mature and provide the primary erosion control within 3 to 5 years, giving re-vegetation plantings time to establish. The channel banks along the riffles and grade control structures will be planted with willow and alder stakes to ensure that vegetation cover becomes part of the overall channel structure. Additional riparian planting will be completed on the floodplain and channel banks to ensure long term stability of the channel.

e. Demolition. As part of the proposed project, the existing bridge and access road (approximately 0.03 acres) would be demolished and the rubble would be hauled off site to an appropriate refuse and recycling facility. Demolition of the affected portion of the road would generate approximately 200 cubic yards of waste. The existing bridge is a 60-foot long, 12-foot wide old railroad car steel bridge that would be demolished and hauled offsite. Tarps would be placed underneath the bridge during demolition to prevent debris from entering the creek. Dirt from the bridge fill would be temporarily stored on an adjacent staging area, and suitable soil would later be used as backfill fill for the restoration of the old bridge site. Generally, significant trees on the site are being avoided; however the project will entail the removal of two alder trees.

f. Staging. Once the bridge, fill, and road are removed from the site, a temporary dirt access road to the channel bed will be constructed to allow access to the other side of the creek. Two (2) 18 inch pipes will be installed across the active creek and a temporary crossing will be constructed to allow for construction traffic to the north abutment. Clean gravel and soil fill will be used to construct the temporary crossing. A staging area will be established on the southern side of the construction area where materials and equipment will be stored. The temporary dirt access road and staging area are shown in Figure 3.

g. Project Site Water Diversion and Fish Exclusion Plan. A creek flow bypass will be required during the majority of construction activities. The proposed flow bypass system will collect all of the creek flow and provide a temporary crossing via two 18" culverts for construction equipment at the original bridge location. Only resident trout use Purisma Creek. There are no steelheads present. A qualified fish biologist will install a fish exclusion net prior to in-channel work at the upper boundary of the in-stream construction area. Any fish below the exclusion with be flushed downstream and a net will be installed at the southern boundary of the construction area. Once the temporary stream crossing is constructed, the fish exclusion netting will be removed. The same fish exclusion process will repeated during the temporary crossing removal. A series of silt fence and water barriers will be installed at the base of the banks of each new bridge abutment. These fences will direct the flowing water away from the work away so a dry working environment can be preserved. The anticipated length of channel flow control is approximately 180 linear feet. The Contractor will develop a diversion plan and ensure that all materials and equipment will be available for the water diversion prior to the commencement of work. The water diversion system should include the following components:

- Confinement Structure
- Bypass Piping/Pipeline
- Point of Discharge Protection (as needed)

Upon completion of the construction all diversion and temporary crossing material will be removed from the streambed.

e. Temporary Trail Access . The Contractor will fence off the southern side of the construction area to preserve a 10 feet wide road and trail width for visitors using Purisima Creek trail. Visitors using the Whittemore Gulch and Harkins Ridge trail that desire to access the parking lot or Purisima Creek trail will have to use the temporary culvert crossing. A brief period between the demolition of the existing bridge and construction of the temporary culvert crossing will close access over Purisima Creek. Appropriate signs would be posted at trailheads and along the temporary trail to provide warning to the public of the temporary closure, construction vehicles and information on the project status and advise cyclists to walk their bikes.

f. New Bridge Construction. Once removal of the bridge and temporary road crossing is complete, construction on the bridge will begin.

Vertical and denuded banks downstream of the bridge will be stabilized and replanted using locally harvested willow and alder stakes in combination with biodegradable erosion control products. The new bridge will be built upon two new lateral foundations from either side of the creek at the top of bank. The bridge structure itself will be a prefabricated metal bridge 60 feet long and 15 feet wide. The foundations will be installed first, and then the bridge will be assembled on-site and dropped into place with a crane. New approach roadway, approximately 0.03 acres, will be graded and compacted. Backfill will be placed and compacted; road base and will then be installed in the last 18 inches of depth. All disturbed areas will be seeded and/or revegetated to prevent soil erosion. Disturbed bank slopes will be seeded and covered with erosion control blankets.

Construction Material

Description= Unit, Quantity
1. Remove Bridge = 200 Cubic Yards (CY)
2. Structural Excavation= 53 CY
3. Structural Backfill = 185 CY
4. Class 2 Aggregate Base= 20 CY
5. Structural Concrete= 40 CY
6. Reconstructed channel (soil/rock) = 42 CY

Construction Sequence. The following sequence of construction task will take place.

1. Project site mobilization
2. Biologic surveys, education, monitoring
3. Signage, grading and establishment of temporary access ways
4. Construction of dewatering/diversion system
5. Project site water diversion and biological monitoring and fish relocation
6. Bridge, roadway demolition, and fill excavation

7. Temporary access road and crossing installation
8. Bridge foundation construction
9. Place backfill and headwalls
10. Construct roadway
11. Assemble and install bridge
13. Remove detour; decommission temporary access road; complete erosion control
14. Final site planting and punchlist
15. Site cleanup and demobilization

FINDINGS AND BASIS FOR MITIGATED NEGATIVE DECLARATION

The Midpeninsula Regional Open Space District, based upon substantial evidence in the record, finds that:

1. The mitigation measures, as listed below and incorporated into the project, are adequate to mitigate the environmental effects to a less than significant level.

2. The project will not adversely affect agricultural resources, mineral resources, population and housing, and public services in that such impacts simply do not apply to the proposed project, given the rural, vegetated environment of the project, the low-intensity recreational uses that are associated with the project, and the minor construction disturbance expected by the project.

3. The project will not adversely affect land use or public services, based on project-specific factors that allow the project to avoid potentially significant impacts.

4. The project will not adversely affect air quality, aesthetics, geology & soils, hydrology and water quality, noise, recreation, or utilities and service systems based on project-specific factors that reduce impacts to a less than significant level.

5. The project will not adversely affect biological resources, cultural resources, hazards and hazardous materials, or traffic and transportation because the incorporation of mitigation measures into the project has reduced the impacts to a less than significant level.

6. In addition, the project will not:
   - Create impacts that degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, due to the project's fundamentally small scale, localized nature.
   - Create impacts that are individually limited, but cumulatively considerable, based on project-specific factors that reduce these impacts to a less than significant level.
   - Create environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly, based on project-specific factors that reduce these impacts to a less than significant level.

Therefore, the District has determined that the project will have no significant effect on the environment.

MITIGATION MEASURES incorporated into the project

Mitigation incorporated into project for impacts to special-status plants species:

Mitigation Measure BIO-1. Focused plant surveys for each species listed in the Biological Assessment shall be conducted in the spring prior to initial ground breaking to determine the species' presence or absence in areas that would be disturbed by construction and earth movement activities. If any special-status plant species are found, areas supporting the species shall be avoided, where feasible. Work shall not start if a special-status plant specimen and its required habitat conditions are found within the impact area while a plan detailing on-site mitigation is developed based on consultation with CDFW. Construction work may start once such plan has been approved by CDFW.

Implementation: Qualified District Natural Resources Staff or Qualified Consulting Biologist.
Timing: In the spring prior to construction of the project.
Monitoring: District staff

Mitigation incorporated into project for impacts to San Francisco dusky-footed woodrat:
Mitigation Measure BIO-2. The following avoidance measures for San Francisco dusky-footed woodrat will be implemented:

1. Preconstruction Surveys. A qualified biologist shall conduct San Francisco dusky-footed woodrat nest surveys prior in the February prior to initial ground breaking and just prior to groundbreaking to determine the presence or absence of nests in areas that would be disturbed by construction and earth movement activities. If feasible, disturbance of woodrat nests shall be avoided by staging construction-related equipment and materials away from known nest sites.

   If during the survey, a woodrat nest is detected, the District will complete one of the following avoidance minimization measures. These measures are listed in order of priority, where the first measure is the preferred measure to be implemented as it provides the least amount of impact to the woodrat. If the first measure cannot be implemented due to extenuating site conditions, the second shall be implemented and so forth down the list.

   a. Any trail alignment, access road or staging area will be relocated to avoid the woodrat nest by at least 5 feet. Safety and/or silt fencing (for nests downslope) will be erected around all nests within 25 feet of the trail alignment, road or staging area to avoid impacts during construction.
   b. For all woodrat nests that cannot be avoided by project activities (i.e. will require relocation), the CDFW should be consulted with one of the two following options:
      i. If the nest appears inactive (e.g. no scat or fresh leaves and twigs), approval will be sought from CDFW to dismantle the nest and replace the lost resource by building an artificial nest. One artificial nest should be built for every one existing inactive nest that is dismantled.
      ii. If the nest appears active, approval will be sought from CDFW to (1) trap the occupant(s) of the nest, (2) dismantle the nest, (3) construct a new artificial nest with the materials from the dismantled nest, and (4) release the occupant into the new artificial nest. The new nest should be placed no more than 20 feet from its original location and as far from the project footprints as necessary to be protected from construction activities. Nests should only be moved in early morning during the non-breeding season (October through February). If trapping has occurred for three

consecutive nights and no wooodrats have been captured, the nest should be dismantled and a new nest constructed.

A CNDDB form shall be filled out and submitted to CDFW for any San Francisco dusky-footed woodrats that are trapped. Once trapped, nests shall be torn down and rebuilt surrounding an inverted wooden planter (or similar structure) having at least one entrance and exit hole that is slightly buried into the ground to anchor. Any nest material encountered shall be placed within the nest structure during rebuilding. A small handful of seeds shall be placed within the relocated structure. Relocated nests are intended to provide a release site and opportunity for the woodrats to relocate to another nest (most woodrats average more than one nest and often do not remain with a relocated nest). Once nests are moved, any trapped woodrats should be released into the reconstructed nest during daylight hours so that they seek refuge in the reconstructed nests. In most instances it is expected that the animal will remain in the reconstructed nest until it has an opportunity to relocate to another nest site at night. Relocated nests are expected to eventually be re-colonized and should be monitored one year post construction using visual surveys to determine if a relocated nest has returned to use. A monitoring report should be submitted to CDFW to document use or non/use of relocated nests.

2. Employee and Contractor Education Program. The District will conduct an employee education program prior to the initiation of project activities. The program will consist of a brief presentation by persons knowledgeable in special status species biology and legislative protection to explain concerns to contractors and their employees. The program would include the following: a description of woodrat and their habitat needs; an explanation of the status of the woodrat and their protection under state law; and a list of measures being taken to reduce impacts to woodrat during project activities. If a woodrat nest is found on the project footprint, it is to be left alone and all operations should stop. Notify Project site lead and District Staff (if the site lead is a contractor) or notify District Natural Resources Program Manager if Project Lead is District Staff.

3. Daily Monitoring. During the construction phase of the project, a qualified biologist, District Natural Resources staff or a trained, on-site monitor will check the site in the morning every day before construction activities begin for the presence of woodrat or other wildlife present within the work area. If a woodrat is found, the monitor shall have the authority to stop construction in the immediate area and immediately notify appropriate District Staff (Natural Resources Program Manager or designated staff). If the monitor is the District's Natural Resources Staff, or qualified biologist, they will have the authority to notify the CDFW for guidance on procedure. Subsequent recommendations made by the CDFW shall be followed. The monitor would not handle or try to relocate any special-status species.

4. Speed Limit. Vehicles shall not drive more than 5 miles per hour within the construction area if these species have been determined to be present. If any woodrat is seen in the path of a vehicle, the vehicle shall stop until the animal is out of the path. Parked vehicles shall be thoroughly checked underneath before they are moved to ensure that no woodrat is on the ground below the vehicle.

Implementation: Qualified District Natural Resources Staff or Qualified Consulting Biologist, project supervisor and project crew members.
Timing: The February prior , just prior to construction and during construction as specified

Monitoring: District staff

Mitigations Incorporated into project for impacts to California red-legged frog:
Mitigation Measure BIO-3: The following avoidance measures for California red-legged frogs will be implemented:

1. Pre-Construction Surveys for Special-Status Amphibians including California Red-Legged Frog (CRLF). Surveys for CRLF and other special-status amphibians shall be conducted before construction begins. In the unlikely event CRLF eggs or tadpoles are found, a 100-foot buffer shall be established around the location until juveniles disperse from the breeding site, as determined by a qualified biologist. If adults are present in the construction area, work shall be stopped until individuals are allowed to disperse on their own volition or the species is relocated by a qualified biologist with permission to handle CRLF. With these measures in place, the impact for CRLF would be reduced to a less than significant level.

2. Employee and Contractor Education Program. An employee and contractor education program shall be implemented to educate all construction personnel on CRLF identification and procedures should CRLF be observed in the project area. If a CRLF is found on the project footprint, it is to be left alone and all operations should stop. Notify Project site lead and District Staff (if the site lead is a contractor) or notify District Natural Resources Program Manager if Project Lead is District Staff.

3. Daily Monitoring. During the construction phase of the project, a qualified biologist, District Natural Resources staff or a trained, on-site monitor will check the site in the morning every day before construction activities begin for the presence of CRLF or other wildlife present within the work area. If a CRLF is found, the monitor shall have the authority to stop construction in the immediate area and immediately notify appropriate District Staff (Natural Resources Program Manager or designated staff). The monitor would not handle or try to relocate any special-status species.

4. Speed Limit. Vehicles shall not drive more than 5 miles per hour within the construction area if these species have been determined to be present. If any CRLF is seen in the path of a vehicle, the vehicle shall stop until the animal is out of the path. Parked vehicles shall be thoroughly checked underneath before they are moved to ensure that no CRLF is on the ground below the vehicle.

Mitigation Measure BIO-4: Project Compliance with All State and Federal Permits. The project may potentially affect a number of species that fall under the jurisdiction of CDFW, USFWS, and NMFS. Each of these permits would be reviewed by agency personal experts in conservation of these sensitive species. The federal permits granted under Section 404 of the Clean Water Act would be required for the construction of the project. The State of California would also have to issue a streambed alteration and agreement for the project. The project shall attain and comply with all state and federal permits for the project. Implementation of this mitigation would reduce the impacts on candidate, sensitive, or special-status species to less than significant level.

Implementation: Qualified District Natural Resources Staff or Qualified Consulting Biologist, project supervisor and project crew members.
Timing: Prior to construction and during construction as specified
Monitoring: District staff

Mitigations Incorporated into project for impacts to Marbeled murrelet:
Mitigation Measure BIO-5. If noise generating construction activity takes place during the breeding season (April 1 to September 15), construction activity shall be restricted between 1.5 hours after sunrise to 1.5 hours before sunset to minimize disturbance of potential nesting murrelets using forest habitat as a travel corridor between inland nesting and coastal habitat.

Implementation: Contractor and District Staff
Timing: During construction
Monitoring: District Staff

Mitigation incorporated into project for raptors and other nesting species:
Mitigation Measure BIO-6. A qualified biologist will conduct pre-construction nesting bird surveys within 30 days of the onset of all trees and snags greater than 6 inches DBH and all shrubs taller than 8 feet proposed for removal. If bird nests are observed, an appropriate buffer zone will be established around all active nests to protect nesting adults and their young from construction disturbance. Removal of trees, snags, or woody shrubs with identified avian nests shall be postponed until all young are fledged and tree

Implementation: Qualified Consulting Biologist
Timing: Prior to construction
Monitoring: District staff

Mitigation Incorporated into the project for impacts to pallid bats:
Mitigation Measure BIO-7**:** If mature trees or snags will be removed during the bat breeding season (April 1 through August 31), a qualified bat biologist shall inspect trees and the bridge for potential roost sites. If no potential roost sites are found, no additional mitigation is necessary. Surveys will consist of a daytime pedestrian survey looking for evidence of bat use (e.g., guano) and/or an evening emergency survey to note the presence or absence of bats. If evidence of bat use is observed, the number and species of bats using the roost will be determined. Bat detectors may be used to supplement survey efforts, but are not required.

If roosts of pallid bats are determined to be present and must be removed, the bats will be excluded from the roosting site before the bridge is removed. A program addressing compensation, exclusion methods, and roost removal procedures will be developed in consultation with CDFW before implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave but not reenter), or sealing roost entrances when the site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young). The loss of each roost (if any) will be replaced in consultation with CDFW and may include construction and installation of bat boxes suitable to the bat species and

colony size that was excluded from the original roosting site. Roost replacement will be implemented before bats are excluded from the original roost sites. The District has successfully constructed bat boxes elsewhere that have subsequently been occupied by bats. Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost site, the bridge may be removed.
Implementation: Qualified Consulting Biologist
Timing: Prior to construction
Monitoring: District staff

Mitigation incorporated into project for riparian habitat:
Mitigation Measure BIO-8:
Replant appropriate vegetation at a 2:1 ratio in the project area, as seen in Figure 5. This would include planting within the rock slope protection placed on the channel banks. Planting within the site shall occur in four general planting zones: active channel, lower shaded riparian, upper riparian/upland, and direct seeding (upland). Active channel is the zone nearest to the channel flow and represents the planting that shall be completed around the pools, habitat structures, and riffle edges. This zone is comprised of willows. The second zone, lower shdade riparian, is comprised of riparian shrub like dogwood, coffeberry, and current. The third zone is upper riparian/upland that is largely composed of trees, such as red alders and redwoods, and woody shrubs. The highest elevation zone shall consist of a native erosion control mix.

Implementation: Contractor and District Staff
Timing: During construction
Monitoring: District Staff

Mitigation Incorporated into project for impacts to federally protected wetlands:
Mitigation Measure BIO-9:
To mitigate for impacts on federally protected wetlands, Mitigation Measure BIO-4 shall be implemented. This mitigation measure would reduce impacts to wetland habitats to less than significant by requiring the area to be revegetated with native grasses and other herbaceous perennial wetland species.
Implementation: Contractor and District Staff
Timing: During construction
Monitoring: District Staff

Mitigations incorporated into project for impacts to cultural resources:
Mitigation Measure CULT-1:
Prior to the initiation of construction or ground disturbing activities, District staff or archaeological monitor shall conduct a meeting to train all construction personnel of the potential for exposing subsurface cultural resources and to recognize possible buried cultural resources.

Implementation: District staff

Timing: During a pre-construction field meeting with Contractors and Sub-Contractors
Monitoring: District Staff shall require contractor and subcontractors to have each employee attend training session and sign training materials indicating attendance at education program.

Mitigation Measure CULT-2:
If there is an unanticipated discovery of archaeological deposits or remains during project implementation, construction crews shall stop all work within 100 feet of the discovery and notify District staff. A qualified archaeologist will assess the discovery, complete an archaeological evaluation and provide recommendations.

Implementation: District staff
Timing: During construction
Monitoring: Construction contractor and District staff

With the application of the mitigations above, this impact would be less than significant with mitigations incorporated

Mitigation incorporated into project for disturbance of human remains:

Mitigation Measure CULT-4. In the event human remains, including skeletal remains, graves, or Native American burial sites or graves, are discovered, such as during the course of any ground disturbing activities (grading, excavating, trenching, digging), construction or maintenance activities, the following procedures shall be followed:

- All work shall immediately cease and there shall be no further excavation or disturbance of the site or the area in the vicinity of the discovery.
- Notify District staff immediately.
- District staff shall immediately notify the San Mateo County Coroner to evaluate the remains, and follow the procedures and protocols set forth in §15064.5(e) of the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387).
- Secure the area and no further disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has made a determination of origin and disposition, which shall be made within two working days from the time the Coroner is notified of the discovery, pursuant to State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98.
- If the Coroner determines that the remains are or may be of a Native American, the Coroner shall notify the California Native American Heritage Commission (NAHC) pursuant to subdivision (c) of the State Health and Safety Code within 24 hours, which will determine and notify the Most Likely Descendant (MLD). The MLD may recommend within 48 hours of their notification by the NAHC the means of treating or disposing of, with appropriate dignity, the human remains and grave goods. In the event of difficulty locating a MLD or failure of the MLD to make a timely recommendation, the human remains and grave goods shall be reburied with appropriate dignity on the property in a location not subject to further subsurface disturbance.
- If the Coroner determines that the remains are not those of a Native American, the Coroner would make recommendations for the treatment and disposition of the remains.

Construction work shall not begin again until the County Coroner has examined the remains, assessed their significance, and offered recommendations for any additional exploratory measures deemed necessary for the further evaluation of, and/or mitigation of adverse impacts.

Mitigation measure CULT-3 under section V(b) calls for stopping work and evaluating significance if an artifact find is made, which will also reduce the potential for disturbance of human remains.

Implementation: District staff
Timing: During construction
Monitoring: Construction contractor and District staff

Mitigation incorporated into project for wildland fire:

HAZ-1. All equipment to be used during construction must have an approved spark arrestor.

HAZ-2. Cut grass and reduce fuels around construction sites where vehicles are allowed to park.

HAZ-3. Minimize use of mechanical construction equipment during hot, dry, windy weather.

HAZ-4. Hired contractors shall be required to:

i) Provide water to suppress potential fires caused by the work performed.
ii) Remind workers that smoking is prohibited at the work site and on any District land per contract conditions and District Ordinance.
iii) Maintain working ABC fire extinguishers on all vehicles in the work area.

Contact both Mountain View Dispatch at (650) 968-4411 and the California Department of Forestry, Skylonda, at (650) 851-1860 for emergency response in the event of a fire (these numbers are to report emergencies only).

Implementation: Contractors
Timing: During construction
Monitoring: District Staff

RESPONSIBLE AGENCY CONSULTATION

California Department of Fish and Wildlife (also a Trustee Agency)
San Francisco Bay Regional Water Quality Control Board
County of San Mateo
U.S. Army Corps of Engineers

INITIAL STUDY

A copy of the initial study is attached.

REVIEW PERIOD

The Review Period is October 17th, 2014 through November 17th, 2014. If you have any comments about the proposed Mitigated Negative Declaration or Initial Study, have information that should be included, and/or disagree with the findings of our study as set forth in the proposed Mitigated Negative

Declaration, please submit your comments in writing no later than 5 p.m. on November 17th, 2014 to Midpeninsula Regional Open Space District, 330 Distel Circle, Los Altos, CA 94022.

CONTACT PERSON
Aaron Hébert, Project Manager, 650-691-1200
Ahebert@openspace.org

Jane F. Mark, AICP, Planning Manager
Midpeninsula Regional Open Space District

Midpeninsula Regional Open Space District
INITIAL STUDY

Project title: Harkins Bridge Replacement Project

Lead agency name and address: Midpeninsula Regional Open Space District (District)
330 Distel Circle, Los Altos, CA 94022

Contact person and phone number: Aaron Hebert, (650) 691-1200

Project location: The project is situated in Purisima Creek Redwoods Open Space Preserve (Preserve), a 4,711-acre public preserve located in unincorporated San Mateo County, outside of the City of Half Moon Bay, generally located west of Skyline Boulevard (Highway 35) and inland of Highway 1. The project is located approximately 100 yards east of the public access parking lot at the intersection of Purisima Creek Road and Higgins Canyon Road. The project area encompasses an existing railroad car vehicle bridge, a new bridge location approximately 100' upstream, and a construction staging area on the southern side of the construction area.

Project APN: 067-320-220

Project sponsor's name and address: Midpeninsula Regional Open Space District
330 Distel Circle, Los Altos, CA 94022

General plan designation: Public Recreation

Zoning: Timberland Preserve-Coastal Zone District (TPZ-CZ)

Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)

PROJECT DESCRIPTION

Project Location and Surrounding Land Uses

The Harkin Bridge Replacement Project site is located approximately 100 yards east of the intersection of Higgins Canyon Road and Purisima Creek Road, on the Whittemore Gulch Trail, in the Purisima Creek Open Space Preserve. **Figure 1**, *Area Map*, shows the regional context of the project site. Purisima Creek Redwoods Open Space Preserve is an 4,711-acre preserve that includes a 24-mile trail system for hikers, bikers, and equestrians. Purisima Creek, a large perennial stream, flows from the top of the Preserve at Skyline Blvd (Highway 35) down to the coastal terraces south of Half Moon Bay. The project site is located at the very western extent of the Preserve, adjacent to the only public parking from the coastside of the Preserve.

Project Goals and Objectives

The Project involves the removal and replacement of a deteriorated railroad car bridge crossing over Purisima Creek, which would entail demolition of an existing access road to the old bridge location, site restoration of the area of the old bridge location; construction of a temporary

culvert crossing with associated water diversion plan; installation of a new bridge, construction of a new access roadway and trail to the proposed bridge, and temporary fencing along Purisima Creek Trail to exclude the public from construction activities.

The project goals and objectives are as follows:

- Remove the existing deteriorated bridge over Purisima Creek and restore the bridge approaches and bridge area to reduce soil erosion.
- Construct a new bridge and associated new access roadway approximately 100 feet upstream of the existing bridge that will improve public safety for the District with safe vehicular access for patrol, fire and other emergency vehicles.

Project Characteristics

Project implementation would involve removing the existing 60-foot long, steel bridge and replacing it with a 60-foot-long, prefabricated steel bridge upstream of the current location. The project is shown in **Figures 2 to 6**. The existing bridge is deteriorating and can no longer safely carry significant vehicle loads. The current bridge serves as a crossing for patrol, fire, and other emergency vehicles. These vehicles can be quite heavy, so the bridge has to be able to carry those loads safely. The new bridge will entail the construction of structural concrete abutments (drilled piers), and maintaining adequate turning radius and grades on the new approaches to the bridge. Approximately 15 feet of the Whitmore Gulch Trail will be realigned to approach the proposed bridge from the north and approximately 60 feet of the Purisima Creek Trail will be realigned to approach the proposed bridge from the south.

The bridge replacement project involves working in an approximately 180-foot reach of Purisima Creek that is approximately 20 to 50 feet wide. The project construction footprint for the old and new bridge location is approximately 3,500 square feet (0.08 acres). Approximately 0.01 acres of riparian vegetation removal will be required around the proposed bridge approaches primarily on the southern end and around the northern end, as seen as Figure 7 and 9. Two alder trees (12" and 20" dbh) are proposed for removal adjacent to the proposed northern bridge approach, as seen in Figure 3 and 8.

In this river reach the river banks are 8 to 10 feet high; however the channel bottom is significantly wider downstream of the proposed new bridge. The slope along the reach is approximately 2.2%. The large downed redwood tree immediately downstream of existing bridge restricts high storm flows. This restriction causes storm flows to back up and flood the adjacent approach to the existing bridge.

The existing bridge will be replaced with a new bridge approximately 100 feet upstream of the existing bridge. The southern concrete abutment and wingwall will be constructed entirely outside the stream channel and above the 100-year flood event elevation. The northern abutment and wing wall are to be built just below the break in slope of the stream channel, but above the elevation of an 100-year flood event, as seen in Figure 4. Grading for this project is limited to both bridge approaches and minor recontouring for slope stabilization and restoration purposes around the existing bridge. The quantities of excavation and fill are detailed below, under Project

Implementation, f. New Construction, and seen in Figures 3 and 4. Almost all of the grading will occur within soils that were previously disturbed by the construction of the log landing built in the approximately in the 1850s.

In addition to the removal and replacement of the bridge, the design includes the restoration of the old bridge location with native vegetation, and new bio-technically stabilized slopes. More detailed information regarding the various phases of the proposed project is provided below.

Project Implementation

e. Construction Timeline. Construction activities would occur over a 16 to 24 week period, beginning and ending between April 1 to December 31st. Construction hours would be limited to one and half hours after sunrise to one and a half hours before sunset on weekdays and weekends during marbeled murrelet nesting season (April 1st to September 15th), after which construction would be limited to 7:00 am to 6:00 pm during weekdays and 9:00 am to 5:00pm on Saturday, as described in mitigation measure BIO-5.

f. Construction Access. The site would be accessed from Purisima Canyon Road, directly off Highway 1. Construction vehicles would utilize Purisima Creek Road in order to access the site and haul materials from the site. A temporary culvert crossing and road would be constructed at the existing bridge crossing to allow vehicular access to the other side of Purisima Creek for construction activities.

g. Construction Equipment. The project would require the use of heavy equipment, such as cranes, excavators, loaders, backhoes, water trucks, dump trucks and fuel tanks.

h. Grading and Erosion Control. Grading and other earth-disturbing activities proposed project would be limited to the dry season (generally between April 15 and October 15). Construction will be supervised by experienced District staff and engineering consultants and would incorporate erosion control techniques from the District's Details and Specifications Guidelines. In addition, Best Management Practices (BMPs) approved by the California Department of Fish and Wildlife and Regional Water Quality Control Board and in use by the District for proper design and use of silt fencing, would be implemented during project construction to avoid impacts such as erosion at the project site.

Channel erosion potential would change over time as the planted vegetation matures. Typically, the erosion potential of the channel and banks decreases as the project ages, and mature, stable vegetation is established. Approaches that integrate vegetation and biodegradable products such as fiber blankets, bio-blocks, and coir products will be used. The biodegradable products are used to provide temporary erosion protection and allow for the vegetation to mature and provide the primary erosion control within 3 to 5 years, giving re-vegetation plantings time to establish. The channel banks along the riffles and grade control structures will be planted with willow and alder stakes to ensure that vegetation cover becomes part of the overall channel structure. Additional riparian planting will be completed on the floodplain and channel banks to ensure long term stability of the channel.

e. Demolition. As part of the proposed project, the existing bridge and access road (approximately 0.03 acres) would be demolished and the rubble would be hauled off site to an appropriate refuse and recycling facility. Demolition of the affected portion of the road would generate approximately 200 cubic yards of waste. The existing bridge is a 60-foot long, 12-foot wide old railroad car steel bridge that would be demolished and hauled offsite. Tarps would be placed underneath the bridge during demolition to prevent debris from entering the creek. Dirt from the bridge fill would be temporarily stored on an adjacent staging area, and suitable soil would later be used as backfill fill for the restoration of the old bridge site. Generally, significant trees on the site are being avoided; however the project will entail the removal of two alder trees.

f. Staging. Once the bridge, fill, and road are removed from the site, a temporary dirt access road to the channel bed will be constructed to allow access to the other side of the creek. Two (2) 18 inch pipes will be installed across the active creek and a temporary crossing will be constructed to allow for construction traffic to the north abutment. Clean gravel and soil fill will be used to construct the temporary crossing. A staging area will be established on the southern side of the construction area where materials and equipment will be stored. The temporary dirt access road and staging area are shown in Figure 3.

g. Project Site Water Diversion and Fish Exclusion Plan. A creek flow bypass will be required during the majority of construction activities. The proposed flow bypass system will collect all of the creek flow and provide a temporary crossing via two 18" culverts for construction equipment at the original bridge location. Only resident trout use Purisma Creek. There are no steelheads present. A qualified fish biologist will install a fish exclusion net prior to in-channel work at the upper boundary of the in-stream construction area. Any fish below the exclusion with be flushed downstream and a net will be installed at the southern boundary of the construction area. Once the temporary stream crossing is constructed, the fish exclusion netting will be removed. The same fish exclusion process will repeated during the temporary crossing removal. A series of silt fence and water barriers will be installed at the base of the banks of each new bridge abutment. These fences will direct the flowing water away from the work away so a dry working environment can be preserved. The anticipated length of channel flow control is approximately 180 linear feet. The Contractor will develop a diversion plan and ensure that all materials and equipment will be available for the water diversion prior to the commencement of work. The water diversion system should include the following components:

- Confinement Structure
- Bypass Piping/Pipeline
- Point of Discharge Protection (as needed)

Upon completion of the construction all diversion and temporary crossing material will be removed from the streambed.

e. Temporary Trail Access . The Contractor will fence off the southern side of the construction area to preserve a 10 feet wide road and trail width for visitors using Purisima Creek trail. Visitors using the Whittemore Gulch and Harkins Ridge trail that desire to access the parking lot or Purisima Creek trail will have to use the temporary culvert crossing. A

brief period between the demolition of the existing bridge and construction of the temporary culvert crossing will close access over Purisima Creek. Appropriate signs would be posted at trailheads and along the temporary trail to provide warning to the public of the temporary closure, construction vehicles and information on the project status and advise cyclists to walk their bikes.

f. New Bridge Construction. Once removal of the bridge and temporary road crossing is complete, construction on the bridge will begin.

Vertical and denuded banks downstream of the bridge will be stabilized and replanted using locally harvested willow and alder stakes in combination with biodegradable erosion control products. The new bridge will be built upon two new lateral foundations from either side of the creek at the top of bank. The bridge structure itself will be a prefabricated metal bridge 60 feet long and 15 feet wide. The foundations will be installed first, and then the bridge will be assembled on-site and dropped into place with a crane. New approach roadway, approximately 0.03 acres, will be graded and compacted. Backfill will be placed and compacted; road base and will then be installed in the last 18 inches of depth. All disturbed areas will be seeded and/or revegetated to prevent soil erosion. Disturbed bank slopes will be seeded and covered with erosion control blankets.

Construction Material

Description= Unit, Quantity
1. Remove Bridge = 200 Cubic Yards (CY)
2. Structural Excavation= 53 CY
3. Structural Backfill = 185 CY
4. Class 2 Aggregate Base= 20 CY
5. Structural Concrete= 40 CY
6. Reconstructed channel (soil/rock) = 42 CY

Construction Sequence. The following sequence of construction task will take place.

1. Project site mobilization
2. Biologic surveys, education, monitoring
3. Signage, grading and establishment of temporary access ways
4. Construction of dewatering/diversion system
5. Project site water diversion and biological monitoring and fish relocation
6. Bridge, roadway demolition, and fill excavation
7. Temporary access road and crossing installation
8. Bridge foundation construction
9. Place backfill and headwalls
10. Construct roadway
11. Assemble and install bridge
13. Remove detour; decommission temporary access road; complete erosion control
14. Final site planting and punchlist

15. Site cleanup and demobilization

SUBSEQUENT ACTIONS
Upon District Board certification of this negative declaration, the following actions will occur:

1. Application for San Mateo County Coastal Development Permit
2. Application for Clean Water Act Section 404 Nationwide permit from the U.S. Army Corps of Engineers (USACE)
3. Application for Clean Water Act Section 401 Water Quality Certification from the San Francisco Bay Regional Water Quality Control Board
4. Application for California Department of Fish and Wildlife (CDFW) Streambed Alteration Permits.
5. Release of bid package, bid opening, Board of Directors authorization for award of bid
6. Construction of the project

Surrounding land uses and setting: Briefly describe the project's surroundings:

The project is located within and Purisima Creek Redwoods Open Space Preserve, a 4,711-acre preserve owned and managed by Midpeninsula Regional Open Space District, containing more than 24 miles of predominantly multiple-use (hiking, mountain biking, and equestrian use) trails. The Preserve is located in unincorporated San Mateo County, approximately 5.3 miles outside of the City of Half Moon Bay, and west of Skyline Boulevard (Highway 35).

The project site is near the western boundary of Purisima Creek Redwoods Open Space Preserve. Rural residential homes, agricultural operations, and Burleigh Murray Ranch State Park lie to the west of the Preserve and project site. East of the project site is the main portion of the Preserve, which includes recreational uses by the public and natural resource management by the District.

Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

- California Department of Fish and Wildlife Streambed Alteration Permit
- Clean Water Act Section 404 Nationwide permit from the U.S. Army Corps of Engineers
- Clean Water Act Section 401 Water Quality Certification from the San Francisco Bay Regional Water Quality Control Board
- San Mateo County Coastal Development Permit

Document availability:

All documents referenced in the Initial Study are available for review from 8:30 a.m. to 5:00 p.m. Monday through Friday at the Midpeninsula Regional Open Space District administrative office at the address listed above. It will also be available at the District's website: http://www.openspace.org/news/public_notices.asp

Figure 1: Regional Location Map

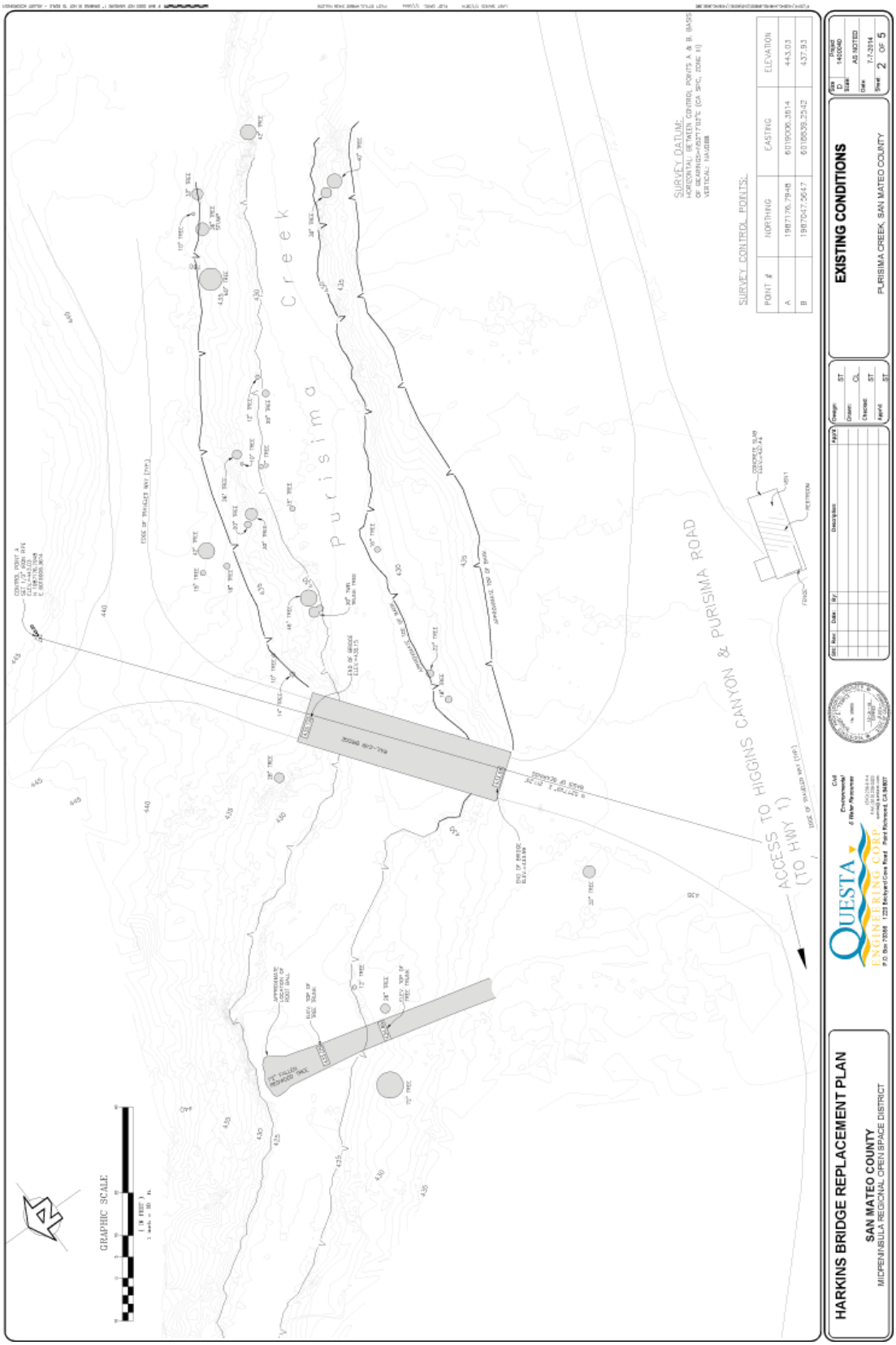


Figure 2: Existing Conditions

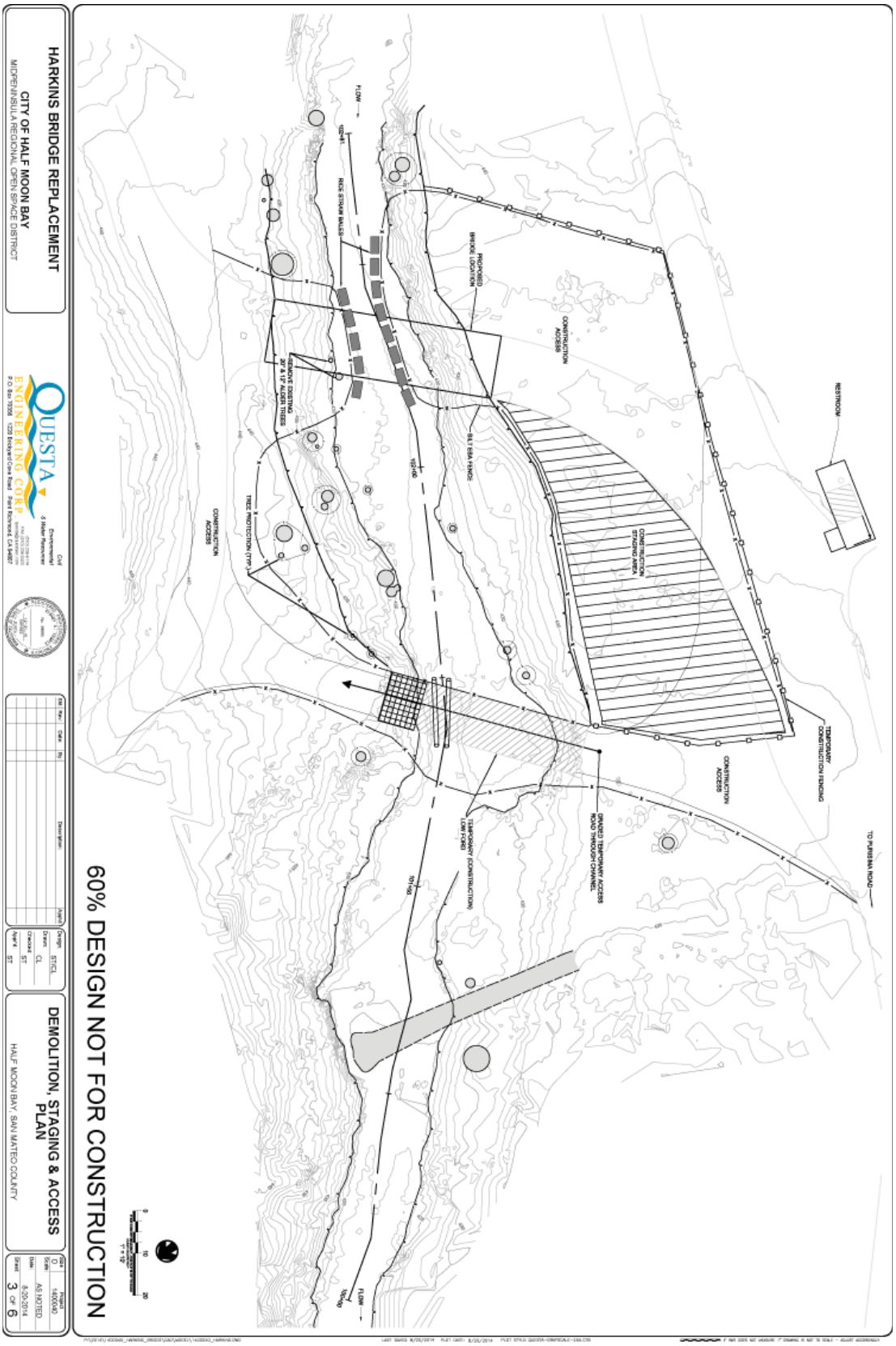


Figure 3: Proposed Bridge

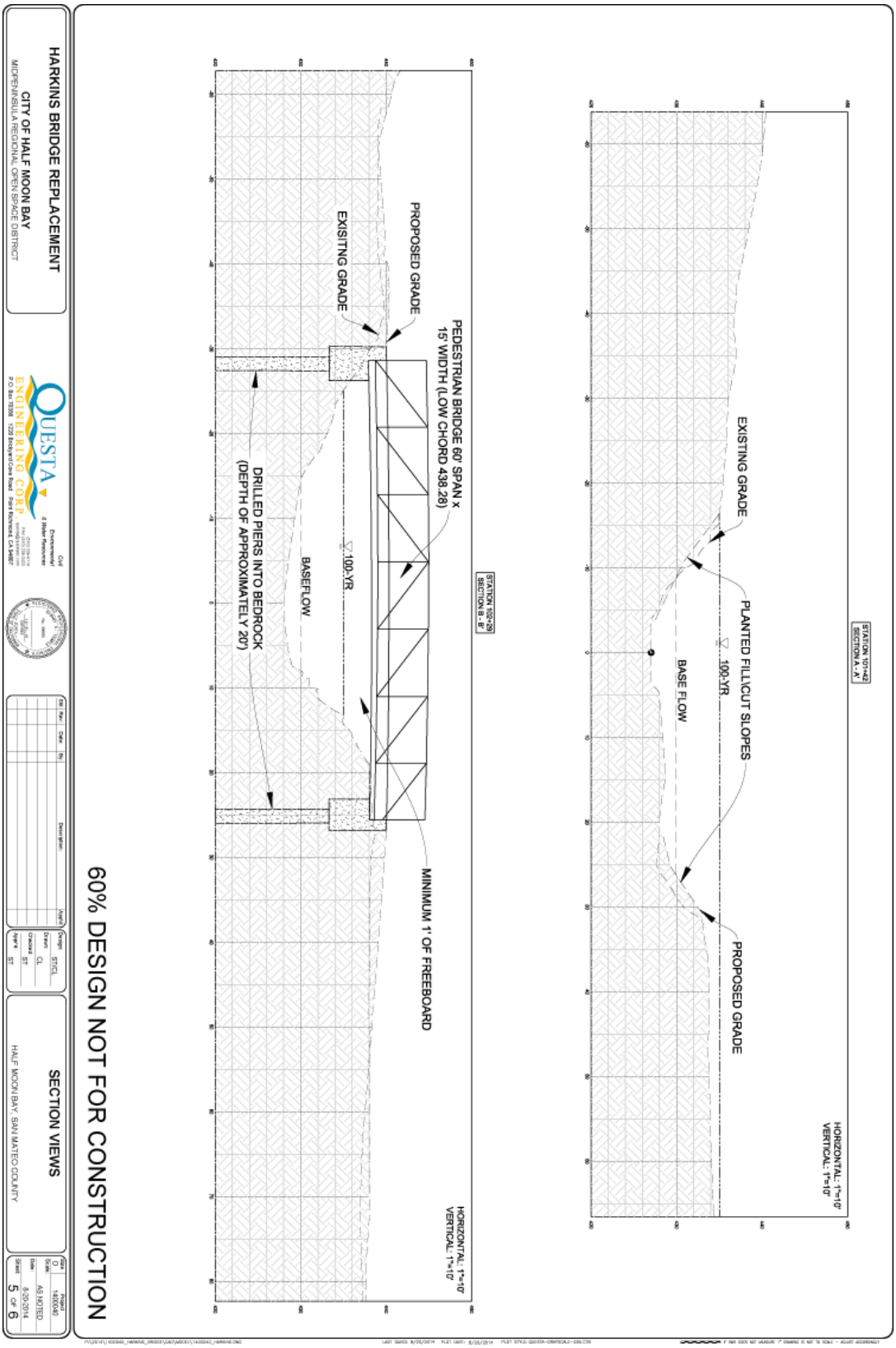


Figure 4: Proposed Bridge Profile

Figure 5: Proposed Restoration Area Where Existing Bridge Removed

Figure 6: Photo of Existing Bridge Looking Upstream

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☒ Biological Resources	☒ Cultural/Historic/Archaeological Resources	☐ Geology/Soils
☐ Greenhouse Gas Emissions	☒ Hazards & Hazardous Materials	☐ Hydrology/Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☐ Utilities/Service Systems	☐ Mandatory Findings of Significance

DETERMINATION:

(To be completed by the Lead Agency)

On the basis of this initial evaluation:

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

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

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

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

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

Signature

Jane F. Mark, AICP, Planning Manager

10/16/14

Date

Midpeninsula Regional Open Space District

INSTRUCTIONS FOR EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL CHECKLIST and DISCUSSION OF IMPACTS

Issues:

I. AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
I(a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐

Explanation: (Sources: 1, 2, and 6). The project is located in the 4,711-acre Purisima Creek Redwood Open Space Preserve (Preserve) approximately 430 feet above mean sea level at the crest of the Santa Cruz Mountains, and about 5.3 miles southeast of Half Moon Bay, San Mateo County, California.

Higgins Canyon Road and Purisima Creek Road are designated as a scenic corridor by San Mateo County. The corridor is defined as the visual boundary of the landscape. The project is within San Mateo County's map of visual corridors depicting the extent of the corridor around the scenic roads. Development within the corridor is required to be set back 100' from the center line of the roadway, greater when possible and as little as 50' when vegetation can shield the structure from public view. The project is located 100 yards from the centerline of Higgins-Purisima Road. The project is not visible from Higgins Canyon Road and Purisima Creek Road primarily due to vegetation, existing development (a public parking lot), and topography.

Redwood forest surrounds the project site and the visual corridor as the public approaches the site. The tall trees limit visibility to the local area; no vistas are present within the visual corridor of the project or the scenic roads as the public approaches the site. As the public drives away from the Preserve parking lot and the creek itself, grasslands and chaparral provide open views. These vistas are located outside the visual boundary the project site. This project will therefore have a less than significant impact on views within or into the Preserve.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
I(b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐

Explanation: (Sources:1, 2, and 8). Potential scenic impacts of the proposed project are limited to the removal of riparian vegetation around the southern approach of the proposed bridge and two alder trees, 12" and 20" dbh, removed around the northern abutment of the proposed bridge, which are not considered a 'heritage tree' in San Mateo County.

Construction vehicles and equipment will access the project site by way of the scenic corridor described

in I.A. These temporary activities will not a have a significant impact on the scenic corridor.

As discussed in I(a), the project is within a scenic corridor and may therefore contain scenic resources. The project, however, is obscured from the scenic roads primarily due to vegetation, existing development (a public parking lot), and topography.

The demolished road approach to the existing railcar bridge will be replanted in a 2:1 ratio with riparian vegetation and alders, as described in IV(e) and mitigation measure BIO-8.

Figure 7. Photo of Riparian Vegetation at the Southern Approach of the Proposed Bridge

Figure 8: Photo from Higgins-Purisima Centerline Looking Towards Project Site

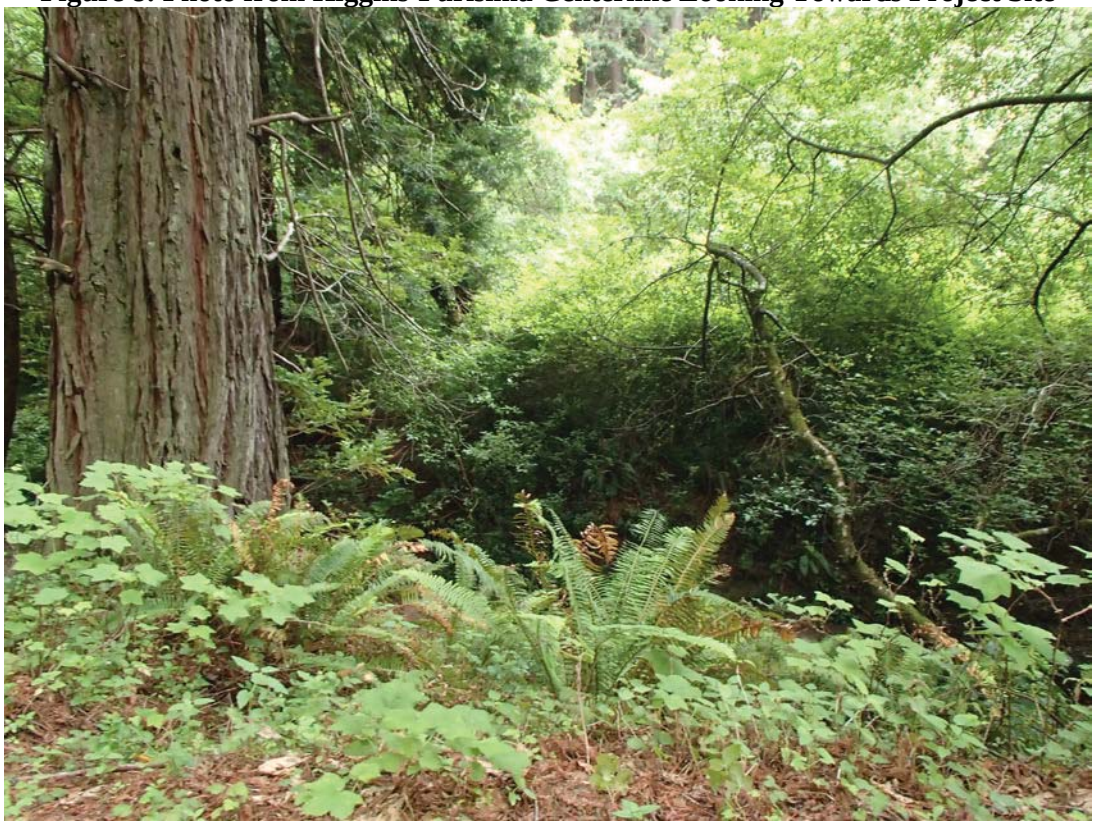


Figure 9. Photo of Trees at the North Approach of the Proposed Bridge (Alders visible right)

Figure 10: Photo of Existing Staging Area and Vault Toilet

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

I(c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Explanation: (Sources: 3). The project occurs in areas that are largely disturbed by previous use, with the exception of the southern side of the replacement bridge. Riparian vegetation, redwood forests, the railcar bridge, the access gate, vault toilet, preserve signage, and the adjacent trails define the visual character of the site. The railcar bridge sits at a low elevation with respect to the creek and is adjacent to the floodplain of the creek. The railcar site is relatively open in the winter months and obscured by annual spring vegetation until late summer. The replacement bridge will be partially obscured by mature riparian and redwood trees. The existing railcar bridge has 40" tall wooden railings, wooden decking, and a steel substructure. The replacement bridge will have a steel substructure, steel truss, and the style of railings and decking will be determined. The new railings and the truss structure will have a larger vertical profile, while the substructure will be thinner in profile compared to the railcar bridge. The modernization of the bridge will not degrade the existing visual character of the site. Replanting the railcar site with native vegetation will restore a more natural visual character (see mitigation BIO-8). The replacement bridge is of a similar size and scale to the existing railcar bridge and will be less visible. It is therefore expected that the project will have a less than significant impact on the visual character of the site.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
I(d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Explanation: (Sources: 5). The project does not include exterior lighting fixtures or reflective surfaces that might cause glare during the day. District Ordinance 93-1, Section 805.2 prohibits the use of the Preserve by the public between one-half hour after sunset and sunrise. The project will therefore not create a new source of substantial light or glare.

Aesthetics Section Sources:

1. San Mateo County General Plan, 1986. http://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/GP_Scenic_Corridor.pdf
2. *Harkins Bridge Relocation Study,* Questa Engineering, July 2014.
3. *Sawmills in the Redwoods: Logging on the San Francisco Peninsula from 1849-1967,* Frank Stanger, 1967.
4. Minutes of the Board of Directors Meeting on April 23rd, 2014.
5. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.
6. San Mateo County Local Coastal Program Policies, June 2013, Component 8.28-8.34 "Scenic Roads and Corridors".
7. San Mateo County. *Zoning Regulations*. *Chapter 37: Timberland Preserve Zone-Coastal Zone (TPZ-CZ) District, Section 6950* December 2012. https://planning.smcgov.org/sites/planning.smcgov.org/files/2012_ZoneRegs%5BFINAL%5D.pdf
8. San Mateo County. *San Mateo County Ordinance Code*. *Section 12000. The Significant Tree Ordinance of San Mateo County*. May 15, 1990.
9. San Mateo County. *Zoning Maps.*Access August 2014. http://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/smc_zoning.pdf

II. AGRICULTURAL AND FORESTRY RESOURCES

II. AGRICULTURE AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
II(a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
II(b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
IIc) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
IId) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
II(e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Explanations for a, b, c, d, and e: (Sources: 1, 2, 3). The subject parcel (067-320-220) that would be affected by the project are part of a larger collection of land holdings totaling 4,711 acres that together create the Purisima Creek Redwoods Open Space Preserve. This Preserve is managed for resource protection and ecologically sensitive public recreational use, in keeping with the District's mission. No change in land management or use of the Preserve is proposed as part of this project.

The California Department of Conservation Farmland Mapping and Monitoring Program maps for the project vicinity indicate that no prime farmland, unique farmland, or farmland of statewide importance would be disturbed by the project. The closest farmlands are grazing areas west and north of the

project site, outside of the Preserve boundaries. This project will have no impact on nearby grazing lands.

The property is not under Williamson Act contracts. The project area is zoned Timberland Preserve Zone-Coastal Zone (TPZ-CZ). Allowable uses for TPZ-CZ Districts in San Mateo County include outdoor public recreation and development to support recreation. The project does not conflict with the permitted land uses per the San Mateo Zoning Ordinance and will not involve or create changes in the existing environment that could result in conversion of Farmland or Timberland.

Agricultural Resources Section Sources:

1. California Department of Conservation. *Farmland Mapping and Monitoring Program maps for San Mateo County*. 2012. http://www.consrv.ca.gov/dlrp/fmmp.
2. San Mateo County. *Zoning Regulations. Chapter 34: Timberland Preserve Zone.* July 1999. http://www.co.sanmateo.ca.us/vgn/images/portal/cit_609/9441580Zregs-wp.pdf
3. San Mateo County Zoning Maps http://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/smc_zoning.pdf

III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
III(a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
III(b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
III(c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐

Explanation: (Source: 1 through 7). Ambient air quality standards for criteria pollutants have been established by both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (ARB). The EPA sets national standards for six criteria pollutants: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. The EPA also oversees state air quality programs to meet these standards. The ARB makes state area designations for ten criteria pollutants: ozone, suspended particulate matter (PM10), fine suspended particulate matter (PM2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles. These standards represent levels of air quality considered to be safe with an adequate margin of safety to protect public health and safety. They are designed to protect "sensitive receptors," those people who are most susceptible to further respiratory stress, such as asthmatics, the elderly, very young children, people already weakened by disease or illness, and people who are engaged in strenuous work or exercise. At a local and regional level, the Bay Area Air Quality Management District (BAAQMD) regulates and monitors levels of air pollutants in the San Francisco Bay Area Basin (Bay Area) and the Bay Area's attainment status.

Project

The project is located in a 4,711-acre preserve approximately 435 feet above mean sea level, and about 5.3 miles east of Half Moon Bay, San Mateo County, California. The prevailing winds are from the west and average from 5 to 25 mph.

Due to the anticipated short construction period of four months, the proposed control measures to be implemented, the projected low emissions generated by the bridge replacement, and the low amount of dust generated by the new bridge, the project's construction and operations emissions are not anticipated to conflict with or obstruct implementation of the applicable air quality plan or produce levels of emissions that violate any air quality standard or contribute substantially to an existing or projected air quality violation. The project is not expected to result in a cumulatively considerable net increase of any

criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Construction

The nature of particulates is that larger, coarser material settles out quickly and closer to the emission source whereas smaller particulates are in suspension for a longer period of time and are able to travel further. Due to the dense vegetative buffer and the discrete, small-scale area of the approximately 0.08 acre bridge construction zone, any potential dust emissions created by the project's construction activities would tend to remain more localized and limited to the short-term, four to five month construction period for each project component.

Construction-related earthmoving activities that will occur primarily during the summer and fall, when increased use of wood burning stoves and fireplaces begin to occur, cool temperatures, low wind speeds, low inversion layers, and high humidity favor the buildup of PM levels. The control measures listed below from the BAAQMD CEQA Guidelines will be implemented during construction to minimize PM emissions. Mobile source control measures related to ozone precursor emissions will include limiting idling time for diesel powered construction equipment and limiting hours of operation for construction equipment.

Measures Based on Basic and Enhanced Control Measures for Construction Emissions of PM10 from BAAQMD 1999 CEQA Guidelines:

- Water all active construction areas at least twice daily where needed, based on site and ambient conditions, to reduce dust emissions.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites where needed, based on site and ambient conditions, to reduce dust emissions.
- Sweep daily all paved access roads, parking areas and staging areas at construction sites if visible soil material is accumulating on surfaces.
- Sweep streets daily if visible soil material is carried onto adjacent public streets.
- Enclose, cover, water daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

Modeling

Estimates for the bridge construction and operational emissions (pounds per day) were prepared using the Sacramento Metropolitan Air Quality Management District (SMAQMD)'s Roadway Construction Emissions Model, Version 5.2, prepared by Jones & Stokes under the financial support and direction of SMAQMD.

The estimated emissions for grading are below BAAQMD's thresholds of significance for ROG, NOx, and PM10. Under the model, construction emissions from for ROG, NOx, and PM10 were each found to be in the range of 10 to 30 pounds per day, well below 54, 54, and 82 pounds per day respectively, BAAQMD's recommended thresholds of significance for these pollutants. Levels of CO emissions were

estimated to be below BAAQMD's threshold of significance, and generation of SO_2 and lead emissions is not anticipated.

Operations

The existing bridge is currently suitable for public recreation, as visitors are not permitted to drive into the Preserve (see District Ordinance 96-1) and will continue serving the existing uses of the visitors at the project site, which are primarily hikers, bikers, and equestrians. Ranger patrol and resource management vehicles also use the Preserve. Replacement of the existing bridge with a new bridge will have no affect on visitor use of the Preserve. The Preserve is currently accessed by vehicle for District patrol, natural resource management, and emergency response for medical, fire, and law enforcement activities. The proposed bridge will open areas of the preserve that were previously accessed by District vehicles. Access to these areas will not, however, increase the frequency or duration of District patrol (the most common vehicle trip), but rather provide greater circulation for Patrol and points of contract for patrol staff. Vehicles will be less likely to turn around part way through the Preserve and doubleback, but will instead have the option of circulating through the Preserve.

Due to the minimal footprint of the new bridge, it is not anticipated to conflict with applicable air quality plans, regulations, or programs. In addition, the project's operations are not expected to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
III(d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

Explanation: (Sources: 3, 5, 8). According to the BAAQMD, sensitive receptor groups include people who are most susceptible to further respiratory stress, such as asthmatics, the elderly, very young children, people already weakened by disease or illness, and people who are engaged in strenuous work or exercise. Such receptor groups are particularly vulnerable to the harmful effects of air pollutants. The ARB has indicated that a correlation has been found between the proximity of sensitive land uses (residences, schools, day care centers, playgrounds, or medical facilities) to specific air pollution sources (freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing facilities).

Due to the projected short construction period of four to five months and the limited vehicle trips generated by the project, it is expected that the project will not expose sensitive receptors or sensitive land uses to substantial pollutant concentrations.

Individuals who are visiting the Preserve for recreation and exercise may be considered at a higher risk of suffering adverse health effects from the inhalation of minute dust particles classified as particulate matter, which are small enough to be inhaled into the deepest part of the lungs.

The project area will include a 10' wide bypass trail for Preserve users along the southern edge of the project area. The majority of users access the Preserve during the late afternoon on weekdays and all day on weekends and will therefore largely avoid the localized effects of construction activities. The adjacent parking lot has six parking spaces and another six roadside parking pullouts are often utilized by the

public during busy periods. For this reason, carpooling to the site is frequent. Assuming all spots are occupied and all cars contain two people, a likely maximum of twenty-four users may walk around the construction site twice in a given outing.

The construction requires a minor amount of grading. Because the new bridge location makes use of existing roads and minimizes the amount of vegetation disturbance, localized levels of dust are anticipated to be minimal. A 60' stretch of 'road' needs to be constructed between Purisima Creek Trail and the proposed southern bridge abutment and 10'of road from the north abutment to the adjacent road. 50' of the new road will be constructed over previously disturbed soils. The revegetation and replanting of the existing bridge location will exceed the area disturbed by the new construction footprint.

Dust emissions from construction activities can also affect properties adjacent to project sites. The nature of particulates is that larger, coarser material settles out quickly and closer to the emission source whereas smaller particulates are in suspension for a longer period of time and are able to travel further. However, due to the vegetative buffer surrounding the construction zones, any potential dust emissions created by the project's construction activities would tend to remain more localized and limited to the short-term, four to five month construction period.

The closest building to the project site is ~700 feet to the west at 3600 Higgins Canyon Road and is at a lower elevation than the project site, is well screened by vegetation on the project site and on their property. Purisima Creek takes a sharp turn from its east-west flow in the project area to a southern direction between the project site and the closest building. The variations in topography and landform that guide the creek also obscure the closest building to the project site. The second closet building is located over 1/4 mile away from the project and with the dense, vegetated buffer and varied topography should not be significantly impacted by the construction activities.

To address emissions from construction activities, control measures as listed above under III(a-c) from the BAAQMD CEQA Guidelines will be implemented during construction to minimize PM emissions the construction. Examples of control measures include watering active construction areas, limiting traffic speeds on unpaved roads, and limiting grading and excavating activity during periods of high wind gusts. In addition, mobile source control measures related to ozone precursor emissions will include limiting idling time for diesel powered construction equipment and limiting hours of operation for construction equipment. Thus, the project is not expected to have a significant construction impact on the exposure of sensitive receptors to substantial pollutant concentrations.

The project's operational impact to sensitive receptors is expected to be insignificant as well due to the projected low emissions generated by the replacement bridge and the low amount of dust generated by the roads as they approach the new bridge location. The project is not expected to have a significant operational impact on the exposure of sensitive receptors to substantial pollutant concentrations.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

III(e) Create objectionable odors affecting a substantial number of people?

Explanation: The bridge primarily provides for low-intensity, non-motorized recreational uses of the Preserve by the public. These uses do not emit objectionable odors, and would not contribute to a

significant impact. In addition, as described above in III(a-c), due to the small-scale nature of the project area and projected low emissions generated, the bridge itself is also not expected to create any objectionable odors affecting a substantial number of people.

In addition, construction activities for demolishing the existing bridge and constructing a new bridge will be localized and limited to a short-term, four month construction period. As described in III(d), public access to the construction site largely occurs outside of the weekday construction hours. No picnic tables or other recreational facilities that encourage prolonged visitation in the project area exist.

Air Quality Section Sources:

1. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands*. Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004
2. U.S. EPA. *National Ambient Air Quality Standards (NAAQS)*. Posted on http://www.epa.gov/air/criteria.html. Last updated March 28, 2008.
3. California Environmental Protection Agency and California Air Resource Board. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005
4. Bay Area Air Quality Management District. *BAAQMD CEQA Guidelines*. May 2012
5. Bay Area Air Quality Management District. *Bay Area 2005 Ozone Strategy*. Final adopted January 4, 2006.
6. Bay Area Air Quality Management District. *Particulate Matter Implementation Schedule*. November 9, 2005.
7. Bay Area Air Quality Management District. *Ambient Air Quality Standards & Bay Area Attainment Status*. http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed September, 2014.

IV. BIOLOGICAL RESOURCES

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IV(a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS)?	☐	☒	☐	☐

Explanation: (Sources: 1 through 17). A number of special-status species surveys and resource inventory projects have been completed within the Preserve. In 2011, Coast Range Biological conducted a thorough Biological Assessment of the project site in order to identify special status species and other sensitive biological resources such as riparian resources and wetlands, and to identify mitigation measures to avoid potential impacts, if warranted. District staff revisited the project site in 2013 and 2014 to evaluate any changes. There were no changes observed from the 2011 Biological Assessment.

The project is located in the following habitats: riparian woodland, coastal redwood, red alder forest, and Developed/Ruderal. The project will not have a significant impact on special status species through significant habitat removal, landscape alteration, or food chain modification. Potential adverse impacts to sensitive species, as well as sensitive habitats, would be generally limited to temporary construction impacts. All potential adverse impacts can be either avoided or reduced to insignificant levels through incorporation of the mitigation measures listed in this section.

1. SPECIAL STATUS PLANT SPECIES

A search of U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and California Native Plant Society (CNPS) special status plant species lists indicated no known special status plant occurrences in the project area. The nearest recorded special status plant species are: Choris' popcorn-flower (*Plagiobothrys chorisianus var. chorisianus*) two miles north of the project site; Santa Cruz Manzanita (*Arctostaphylos andersonii)* 1.8 miles northeast; and Kings Mountain Manzanita 1.8 northeast. No individuals of Choris' popcorn-flower (*Plagiobothrys chorisianus var. chorisianus*) or Kings Mountain Manzanita (*Arctostaphylos regis-montana*) shrubs were observed at the site.

Twenty-four (24) special-status plant species have the potential to occur in the project area. None were found at the project site. The presence of Dudley's lousewort (*Pedicularis dudleyi*) could not be determined due to the timing of the surveys and has a moderate potential to occur in the project area.

Impact BIO-1:
Ground disturbance associated with the project could potentially result in adverse impacts to the above special-status species, if they occur within the project area.

Mitigation incorporated into project for impacts to special-status plants species:

Mitigation Measure BIO-1. Focused plant surveys for each species listed in the Biological Assessment shall be conducted in the spring prior to initial ground breaking to determine the species' presence or absence in areas that would be disturbed by construction and earth movement activities. If any special-status plant species are found, areas supporting the species shall be avoided, where feasible. Work shall not start if a special-status plant specimen and its required habitat conditions are found within the impact area while a plan detailing on-site mitigation is developed based on consultation with CDFW. Construction work may start once such plan has been approved by CDFW.

Implementation: Qualified District Natural Resources Staff or Qualified Consulting Biologist.
Timing: In the spring prior to construction of the project.
Monitoring: District staff

2. SPECIAL STATUS ANIMAL SPECIES

Special status animal species that have the potential to occur within the project area include California red-legged frog (*Rana draytonii*), olive-sided flycatcher (*Contopus cooperi*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), white-tailed kite (*Elanus leucurus)*, yellow warbler *(Dendroica petechia brewsteri),* marbeled murrelet (*Brachyramphus marmoratus),* pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus borealis*), fringed myotis (*Myotis thysanodes*), long-legged myotis (*Myotis volans*), hoary bat *(Lasiurus cinereus),* San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), and monarch butterfly *(Danaus plexippus).* Other sensitive animal species that could occur within the project area include a variety of migratory bird species protected under the Migratory Bird Treaty Act.

Central California Coast Steelhead

Anadramous steelhead (*Oncorhynchus mykiss irideus*) does not occur in the project area; a 30 foot waterfall at the river mouth is a complete barrier to passage. The nearest occurrence is approximately 1.8 miles north in Mills Creek. Purisima Creek is home to resident rainbow trout, however. Impacts to resident trout include potential increases in sediment, turbidity, and water temperatures through a change in canopy cover. The two alder trees proposed for removal cover a small area with their canopies and rise above the understory but below the overstory and therefore will create a less than significant impact to the stream temperatures. Replanting of the disturbed areas, as described in BIO-9, will restore canopy cover along with adjacent trees releasing into the remove mid-canopy area.

Prior to any in-stream construction activities, the Contractor under the supervision of a qualified expert will install a fish exclusion net at the upper extent of the project area, flush any resident trout

downstream, and install an exclusion net on the downstream end of the project area. No pools are present in the stream reach; the site is unlikely to contain any resident trout. The netting will removed after the temporary crossing construction, installed during the temporary crossing removal, and removed upon completion.

Best practices to address the potential impacts related to sediment and turbidity are incorporated into the project design, will follow the recommendations of the geotechnical report, and will be reduced through the guidelines described in IX, Hydrology and Water Quality. **Less than significant impact.**

San Francisco dusky-footed woodrat

The San Francisco dusky-footed woodrat is a State species of concern. Woodrats are small mammals that build nests made of sticks typically at the base of trees and shrubs. The species prefers forested habitat with a moderate canopy and brushy understory, particularly on the upper banks of riparian forests. The dusky-footed woodrat is known to feed on a variety of woody plants, fungi, flowers and seeds. Suitable habitat exists in the project site. Five woodrat nest were discovered in 2011, but have not been resurveyed since. The surveys need to be repeated immediately prior to construction to ensure validity after the passage of time.

Impact BIO-2:

Habitat for San Francisco dusky-footed woodrats in the project area could be disturbed by project activities or by vehicle or human access from temporary equipment and material staging, that may potentially result in the removal and loss of woodrat nests. The riparian vegetation along the southern approach of the proposed bridge will be removed during the construction and is suitable nesting and foraging habitat for the woodrat.

Mitigation incorporated into project for impacts to San Francisco dusky-footed woodrat:

Mitigation Measure BIO-2. The following avoidance measures for San Francisco dusky-footed woodrat will be implemented:

1. Preconstruction Surveys. A qualified biologist shall conduct San Francisco dusky-footed woodrat nest surveys prior in the February prior to initial ground breaking and just prior to groundbreaking to determine the presence or absence of nests in areas that would be disturbed by construction and earth movement activities. If feasible, disturbance of woodrat nests shall be avoided by staging construction-related equipment and materials away from known nest sites.

   If during the survey, a woodrat nest is detected, the District will complete one of the following avoidance minimization measures. These measures are listed in order of priority, where the first measure is the preferred measure to be implemented as it provides the least amount of impact to the woodrat. If the first measure cannot be implemented due to extenuating site conditions, the second shall be implemented and so forth down the list.

   a. Any trail alignment, access road or staging area will be relocated to avoid the woodrat nest by at least 5 feet. Safety and/or silt fencing (for nests downslope) will be erected around all nests within 25 feet of the trail alignment, road or staging area to avoid impacts during

construction.

b. For all woodrat nests that cannot be avoided by project activities (i.e. will require relocation), the CDFW should be consulted with one of the two following options:
    i. If the nest appears inactive (e.g. no scat or fresh leaves and twigs), approval will be sought from CDFW to dismantle the nest and replace the lost resource by building an artificial nest. One artificial nest should be built for every one existing inactive nest that is dismantled.
    ii. If the nest appears active, approval will be sought from CDFW to (1) trap the occupant(s) of the nest, (2) dismantle the nest, (3) construct a new artificial nest with the materials from the dismantled nest, and (4) release the occupant into the new artificial nest. The new nest should be placed no more than 20 feet from its original location and as far from the project footprints as necessary to be protected from construction activities.. Nests should only be moved in early morning during the non-breeding season (October through February). If trapping has occurred for three consecutive nights and no woooodrats have been captured, the nest should be dismantled and a new nest constructed.

A CNDDB form shall be filled out and submitted to CDFW for any San Francisco dusky-footed woodrats that are trapped. Once trapped, nests shall be torn down and rebuilt surrounding an inverted wooden planter (or similar structure) having at least one entrance and exit hole that is slightly buried into the ground to anchor. Any nest material encountered shall be placed within the nest structure during rebuilding. A small handful of seeds shall be placed within the relocated structure. Relocated nests are intended to provide a release site and opportunity for the woodrats to relocate to another nest (most woodrats average more than one nest and often do not remain with a relocated nest). Once nests are moved, any trapped woodrats should be released into the reconstructed nest during daylight hours so that they seek refuge in the reconstructed nests. In most instances it is expected that the animal will remain in the reconstructed nest until it has an opportunity to relocate to another nest site at night. Relocated nests are expected to eventually be re-colonized and should be monitored one year post construction using visual surveys to determine if a relocated nest has returned to use. A monitoring report should be submitted to CDFW to document use or non/use of relocated nests.

2. Employee and Contractor Education Program. The District will conduct an employee education program prior to the initiation of project activities. The program will consist of a brief presentation by persons knowledgeable in special status species biology and legislative protection to explain concerns to contractors and their employees. The program would include the following: a description of woodrat and their habitat needs; an explanation of the status of the woodrat and their protection under state law; and a list of measures being taken to reduce impacts to woodrat during project activities. If a woodrat nest is found on the project footprint, it is to be left alone and all operations should stop. Notify Project site lead and District Staff (if the site lead is a contractor) or notify District Natural Resources Program Manager if Project Lead is District Staff.

3. Daily Monitoring. During the construction phase of the project, a qualified biologist, District Natural Resources staff or a trained, on-site monitor will check the site in the morning every day before construction activities begin for the presence of woodrat or other wildlife present within

the work area. If a woodrat is found, the monitor shall have the authority to stop construction in the immediate area and immediately notify appropriate District Staff (Natural Resources Manager or designated staff). If the monitor is the District's Natural Resources Staff, or qualified biologist, they will have the authority to notify the CDFW for guidance on procedure. Subsequent recommendations made by the CDFW shall be followed. The monitor would not handle or try to relocate any special-status species.

4. Speed Limit. Vehicles shall not drive more than 5 miles per hour within the construction area if these species have been determined to be present. If any woodrat is seen in the path of a vehicle, the vehicle shall stop until the animal is out of the path. Parked vehicles shall be thoroughly checked underneath before they are moved to ensure that no woodrat is on the ground below the vehicle.

Implementation: Qualified District Natural Resources Staff or Qualified Consulting Biologist, project supervisor and project crew members.
Timing: The February prior, immediately prior to construction and during construction as specified
Monitoring: District staff

California red-legged frog

California red-legged frog (CRLF) is a federally listed threatened species and California species of special concern that is known to occur in western San Mateo County. CRLFs are generally found along marshes, streams, ponds, and other permanent sources of water where dense scrubby vegetation such as willows, cattails, and bulrushes dominate, and water quality is good. Breeding sites occur along watercourses with pools that remain long enough for breeding (usually between late November and April depending on winter rains) and the development of larvae. Appropriate refugia for CRLF include small mammal burrows, downed logs or vegetation, or dense forest litter.

There are three documented occurrence of California red-legged frog (*Rana aurora draytonii, CRLF*) within three miles of the project area: 1.4-miles southwest of the project site, 1.5-miles south southwest, and 2.4-miles southeast, along Tunitas Creek Road in the Purisima Creek watershed (as seen in **Figure 9**). There are no other documented CRLF occurrences within the watershed, but there are numerous other documented CRLF occurrences within 5-miles of the project area. No suitable breeding habitat is present in the project area for CRLF, but Purisima Creek and associated Riparian Woodland provides suitable summer habitat for foraging and sheltering. At least one potential breeding pond is located 0.7 miles to the southwest. Though unlikely to be present at the project site, construction activities such as vegetation removal, grading, and dewatering could result in adverse impacts on this species.

Potential indirect impacts to CRLF, if present in this area, could include temporary increase in turbidity and downstream sedimentation during construction activities. However, the project includes water quality protection measures that reduce the potential for such impacts to a less than significant level. During the breeding season, upland migration from breeding habitat, though none is located near the project, through the construction area could result in adverse impacts to CRLF. Erosion control and water quality considerations are discussed further in Sections IX. Therefore, the project would avoid

direct and indirect impacts to California red-legged frogs.

Impacts BIO-3 and BIO-4:
CRLF utilize streams, riparian vegetation, and upland areas (during the winter). Given their potential presence in the project area, construction equipment could disturb or harm CRLF.

Mitigation Incorporated into project for impacts to California red-legged frog:
Mitigation Measure BIO-3: The following avoidance measures for California red-legged frogs will be implemented:

1. Pre-Construction Surveys for Special-Status Amphibians including California Red-Legged Frog (CRLF). Surveys for CRLF and other special-status amphibians shall be conducted before construction begins. In the unlikely event CRLF eggs or tadpoles are found, a 100-foot buffer shall be established around the location until juveniles disperse from the breeding site, as determined by a qualified biologist. If adults are present in the construction area, work shall be stopped until individuals are allowed to disperse on their own volition or the species is relocated by a qualified biologist with permission to handle CRLF. With these measures in place, the impact for CRLF would be reduced to a less than significant level.

2. Employee and Contractor Education Program. An employee and contractor education program shall be implemented to educate all construction personnel on CRLF identification and procedures should CRLF be observed in the project area. If a CRLF is found on the project footprint, it is to be left alone and all operations should stop. Notify Project site lead and District Staff (if the site lead is a contractor) or notify District Natural Resources Manager if Project Lead is District Staff.

3. Daily Monitoring. During the construction phase of the project, a qualified biologist, District Natural Resources staff or a trained, on-site monitor will check the site in the morning every day before construction activities begin for the presence of CRLF or other wildlife present within the work area. If a CRLF is found, the monitor shall have the authority to stop construction in the immediate area and immediately notify appropriate District Staff (Natural Resources Manager or designated staff). The monitor would not handle or try to relocate any special-status species.

4. Speed Limit. Vehicles shall not drive more than 5 miles per hour within the construction area if these species have been determined to be present. If any CRLF is seen in the path of a vehicle, the vehicle shall stop until the animal is out of the path. Parked vehicles shall be thoroughly checked underneath before they are moved to ensure that no CRLF is on the ground below the vehicle.

Mitigation Measure BIO-4: Project Compliance with All State and Federal Permits. The project may potentially affect a number of species that fall under the jurisdiction of CDFW, USFWS, and NMFS. Each of these permits would be reviewed by agency personal experts in conservation of these sensitive species. The federal permits granted under Section 404 of the Clean Water Act would be required for the construction of the project. The State of California would also have to issue a

streambed alteration and agreement for the project. The project shall attain and comply with all state and federal permits for the project. Implementation of this mitigation would reduce the impacts on candidate, sensitive, or special-status species to less than significant level.

Implementation: Qualified District Natural Resources Staff or Qualified Consulting Biologist, project supervisor and project crew members.
Timing: Prior to construction and during construction as specified
Monitoring: District staff

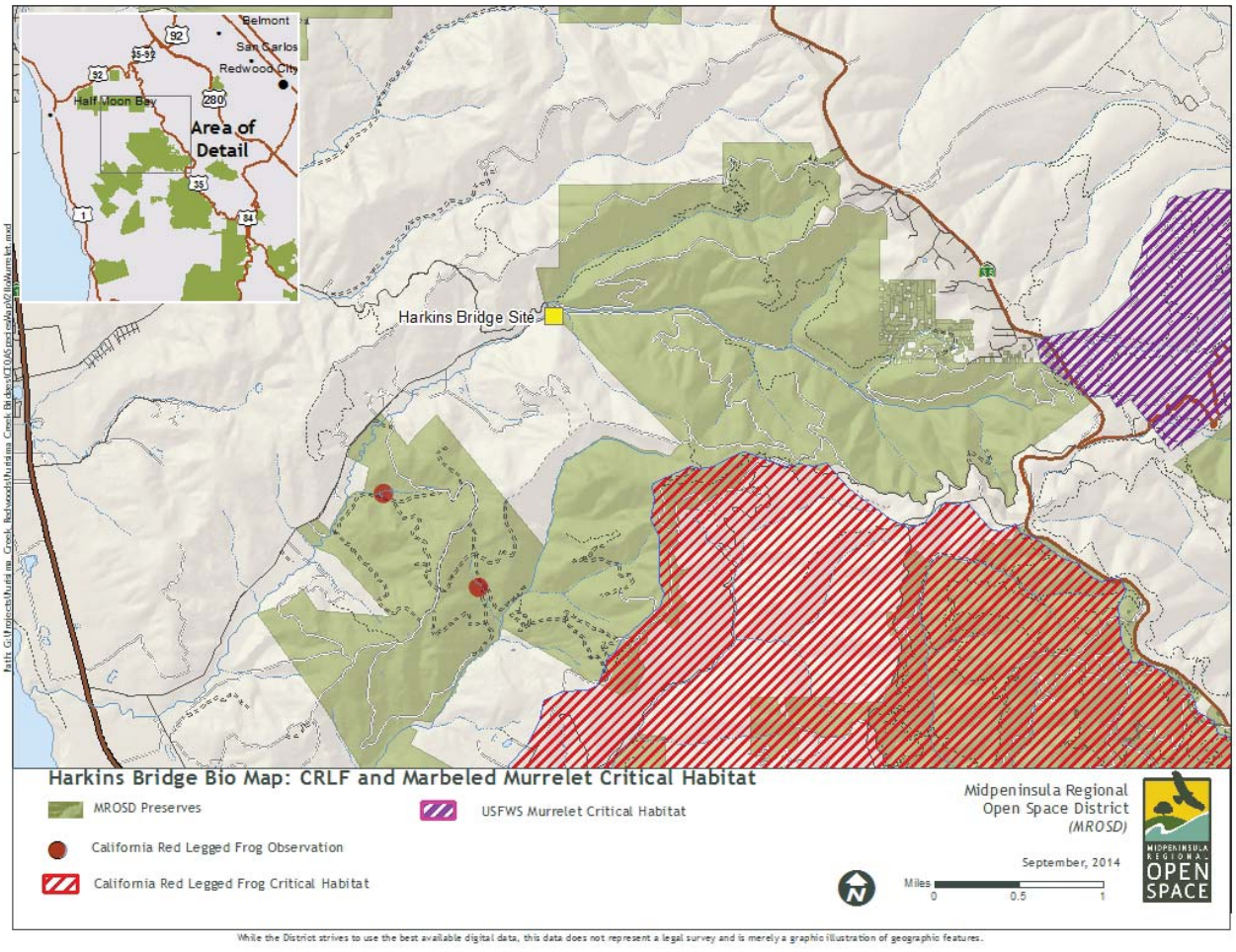


Figure 9

<u>Marbled Murrelet</u>
The marbled murrelet, a federally listed threatened species, is dependent on old growth coniferous forests for nesting and near-shore marine waters for foraging. In the Santa Cruz Mountains, and redwood forests in general, most murrelet nests occur in large branches, or structures associated with

large branches of old growth trees. USFWS describes individual marbled murrelet nest trees as large trees, generally more than 32 inches in diameter at breast height (dbh) with the presence of potential nest platforms or deformities sufficient in size to support adult murrelets. In California, murrelets begin nesting from early April to early July. Adults usually fly from ocean feeding areas to nest sites at dusk and dawn to feed their young.

For suitable habitat to occur, nest trees (platform trees) must be present and need to be surrounded by other large trees (a nest tree cannot be an isolated tree). The surrounding trees need not be platform trees, but serve more to provide shelter to the platform tree.

A marbled murrelet habitat assessment was prepared in March 2007, **Figure 10**. Several observations of marbled murrelet have been recorded in the Preserve. Radar surveys and protocol level surveys have detected murrelet 1/2 mile upstream (east) from the project site. The nearest potentially suitable habitat (older stands with structure) is ¾ mile away and occupied habitat was documented 1-mile upstream. When the District acquired the property, few old growth trees are known to remain in the Preserve. It is likely, however, the murrelets fly over the project site. No suitable habitat exists within the project site for the marbled murrelet: the open canopy and small diameter redwood trees do not meet the nesting requirements of the marbeled murrelet. Due to the short-term nature of the project, the distance to potential suitable habitat, the minimal equipment involved in project construction, and avoiding work during murrelet foraging hours, no indirect adverse noise-related impacts to nesting marbled murrelets would occur as a result of the project.

The project avoids tree removal to the extent practicable by constructing the bridge in a previously disturbed site. Nonetheless, the project will require the removal of two alder trees, approximately 12" and 20" inches diameter, neither of which is suitable for a nest.

Impact BIO-5:
Construction noise during the breeding season has the potential to impact murrelet overhead flight patterns and foraging behavior, though these potential impacts to murrelet flight patterns overhead are not well researched.

Mitigations Incorporated into project for impacts to Marbeled murrelet:
Mitigation Measure BIO-5. If noise generating construction activity takes place during the breeding season (April 1 to September 15), construction activity shall be restricted between 1.5 hours after sunrise to 1.5 hours before sunset to minimize disturbance of potential nesting murrelets using forest habitat as a travel corridor between inland nesting and coastal habitat.

Implementation: Contractor and District Staff
Timing: During construction
Monitoring: District Staff

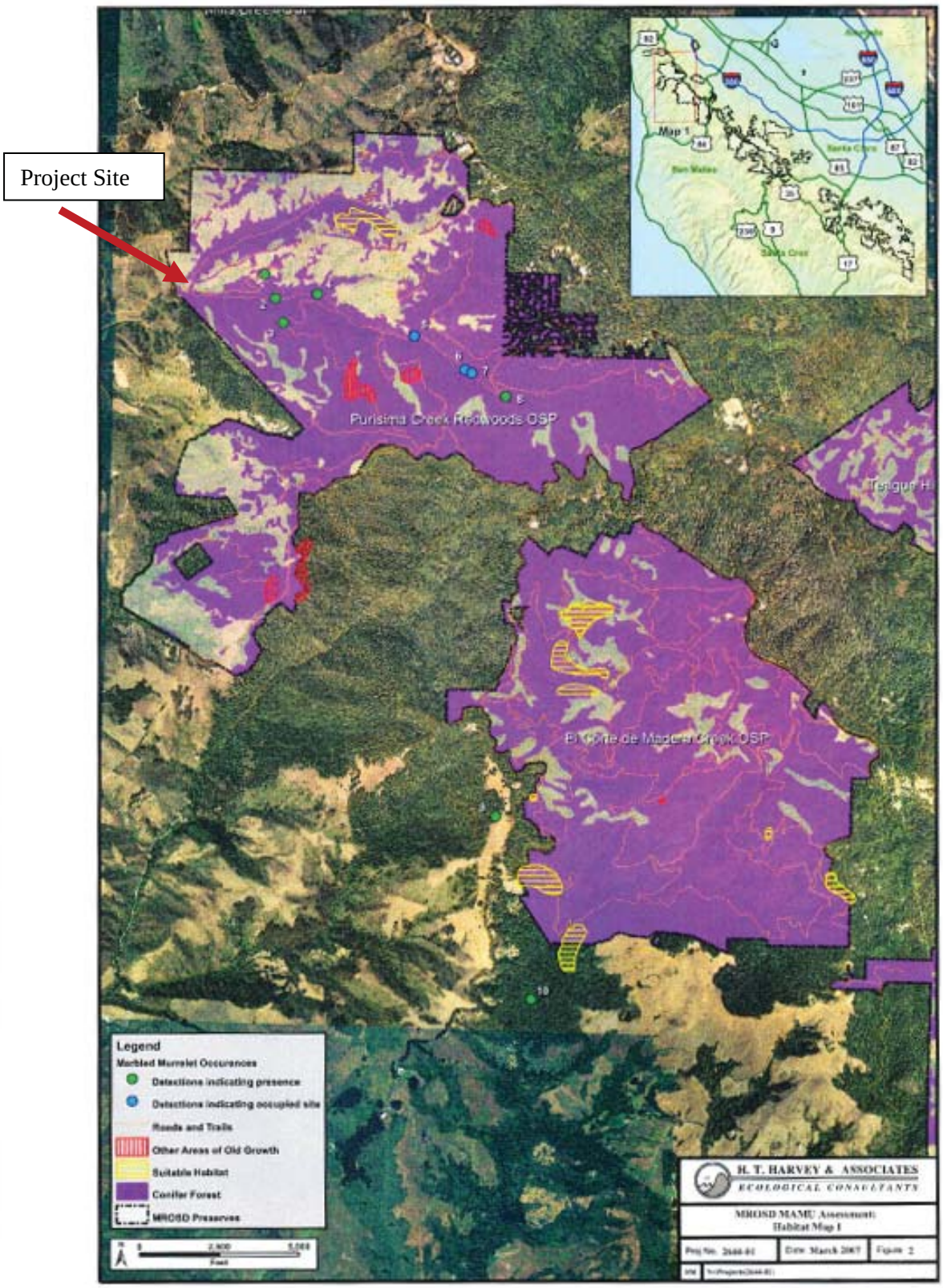

Project Site
Purisima Creek Redwoods OSP
Legend
Marbled Murrelet Occurences
Detections indicating presence
Detections indicating occupied site
Roads and Trails
Other Areas of Old Growth
Suitable Habitat
Conifer Forest
MROSD Preserves
H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
MROSD MAMU Assessment:
Habitat Map 1

Figure 10

Cooper's hawk and sharp-shinned hawk

The Cooper's hawk and sharp-shinned hawk are both State species of special concern that are considered rare breeders in the Santa Cruz Mountains. Cooper's hawks prefer forested habitats in mountainous regions, but also use lowland riparian woodlands and forage in both dense cover and open habitats. In California, nests are usually constructed in oak trees. The local breeding season spans from March through July. Sharp-shinned hawks prey mostly on small songbirds and breed from April through July. Potentially suitable breeding habitat for sharp-shinned hawks occurs over much of the forested mountainous terrain of the Santa Cruz Mountains. Nesting sharp-shinned hawks typically inhabit dense coniferous forests adjacent to foraging habit. Densely foliaged conifers that are surrounded by dense canopy cover are considered prime nesting trees.

Potential Impacts to Cooper's and sharp-shined hawks

The project area may offer potential nesting and migrating habitat for Cooper's and sharp-shinned hawks. Temporary construction noise may create a disturbance to nesting hawks and potentially result in nest abandonment and mortality of young. Removal of trees containing hawk nests may potentially result in the loss of an active nest and mortality of young.

The four to five month construction period for the project component would occur between the months of April and January and will partially overlap with raptor breeding season (April through August). See BIO-7 for Mitigations.

Migratory Bird Species and Nesting Species

The Migratory Bird Treaty Act (MBTA), amended in 1992, includes all migratory bird species. MBTA generally prohibits the taking, killing, possession of, or harm to migratory birds species listed in Title 50 code of federal regulation (CFR) Section 10.13. Section 3513 of the California Fish and Wildlife Code supports the MTBA. Nesting habitat for different species may occur in the project area, including olive-sided flycatcher (*Contopus cooperi*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), white-tailed kite (*Elanus leucurus)*, and yellow warbler*(Dendroica petechia brewsteri).* Cavity nesters such as acorn woodpeckers (Melanerpes formicivorus), pygmy nuthatches (Sitta pygmaea) and chestnut-backed chickadees (Parus rufescens) may occur in snags and debris left from past logging operations.

Impact BIO-6 Removal of trees, shrubs or snags suitable for avian nesting (trees and snags greater than 6 inches dbh or woody shrubs greater than 8 feet tall) within the project area during the breeding season (February 1 to August 1) could destroy active nest sites or stress nesting adults and result in nest abandonment or failure. Two alder trees, greater than 6 inches DBH, are required to be removed during the final phase of construction.

Mitigation incorporated into project for raptors and other nesting species:

Mitigation Measure BIO-6. A qualified biologist will conduct pre-construction nesting bird surveys within 30 days of the onset construction and survey all trees and snags greater than 6 inches DBH and all shrubs taller than 8 feet proposed for removal. If bird nests are observed, an appropriate buffer zone will be established around all active nests to protect nesting adults and their young from construction disturbance. Removal of trees, snags, or woody shrubs with identified avian nests shall be postponed until all young are fledged and tree

Implementation: Qualified Consulting Biologist

Timing: Prior to construction
Monitoring: District staff

Bats

Pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus borealis*), fringed myotis (*Myotis thysanodes*) , long-legged myotis (*Myotis volans*), and hoary bat *(Lasiurus cinereus)* have the potential to occur in the project area. Mature trees and redwood 'goosepen' hollows may provide roosting habitat. Bridges are also potential roosting sites for bats. The underside of the existing bridge has been inspected by District staff several times in the past two years and no bats were present. Bats forage in riparian vegetation for insects.

Impacts BIO-7:

Removal of the two alder trees and riparian vegetation has the potential to remove roosting habitat and foraging habitat for pallid bats.

Mitigation Incorporated into the project for impacts to pallid bats:

Mitigation Measure BIO-7**:** If mature trees or snags will be removed during the bat breeding season (April 1 through August 31), a qualified bat biologist shall inspect trees and the bridge for potential roost sites. If no potential roost sites are found, no additional mitigation is necessary.

Surveys will consist of a daytime pedestrian survey looking for evidence of bat use (e.g., guano) and/or an evening emergency survey to note the presence or absence of bats. If evidence of bat use is observed, the number and species of bats using the roost will be determined. Bat detectors may be used to supplement survey efforts, but are not required.

If roosts of pallid bats are determined to be present and must be removed, the bats will be excluded from the roosting site before the bridge is removed. A program addressing compensation, exclusion methods, and roost removal procedures will be developed in consultation with CDFW before implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave but not reenter), or sealing roost entrances when the site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young). The loss of each roost (if any) will be replaced in consultation with CDFW and may include construction and installation of bat boxes suitable to the bat species and colony size that was excluded from the original roosting site. Roost replacement will be implemented before bats are excluded from the original roost sites. The District has successfully constructed bat boxes elsewhere that have subsequently been occupied by bats. Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost site, the bridge may be removed.

Implementation: Qualified Consulting Biologist
Timing: Prior to construction
Monitoring: District staff

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IV(b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☐	☒	☐

Explanation: (Source: 1, 5, 21, 22). Special-status natural communities are those that are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection, e.g. critical habitat designated by the USFWS under the Endangered Species Act, §404 of the Clean Water Act, and/or the CDFW §1600 *et seq.* of the California Fish and Wildlife Code. The California Natural Diversity Database has also designated a number of natural communities as rare. Riparian habitats are considered to be sensitive and declining resources by CDFW and the USFWS. The San Mateo County Local Coastal Plan also discusses sensitive habitat.

Purisima Creek and the associated vegetation community within the project site is considered riparian habitat under San Mateo County's Local Coastal Plan. The project's erosion control measures allow the project to avoid adverse erosion and water quality degradation impacts to riparian areas as a result of ground-disturbing construction activities. Refer to Sections VI(b) and VIII(c) for further discussion. No net less of in riparian habitat will occur as a result of this project; replanting the existing bridge site provides a 2:1 area to replant.

Impact BIO-8
Removal of riparian vegetation around the proposed bridge will have an adverse impact on riparian habitat.

Mitigation incorporated into project for riparian habitat:
Mitigation Measure BIO-8:
Replant appropriate vegetation at a 2:1 ratio in the project area, as seen in Figure 5. This would include planting within the rock slope protection placed on the channel banks. Planting within the site shall occur in three general planting zones: active channel, lower shaded riparian, upper riparian/upland, and direct seeding (upland). Active channel is the zone nearest to the channel flow and represents the planting that shall be completed around the pools, habitat structures, and riffle edges. This zone is comprised of willows. The second zone, lower shade riparian, is comprised of riparian shrubs like dogwood, coffeberry, and currant. The third zone is upper riparian/upland that is largely composed of trees, such as red alders and redwoods, and woody shrubs. The highest elevation zone shall consist of a native erosion control mix.

Implementation: Contractor and District Staff
Timing: During construction
Monitoring: District Staff

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IV(c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐

Explanation: (Sources: 1, 10). The Clean Water Act is a broad statute with the goal of maintaining and restoring waters of the United States. Among many provisions for the control of water pollution, Section 404 of the Act requires permits for filling of or discharge of dredged materials into wetlands and waters of the United States.

Impact BIO-9:
The project includes removal of the existing railcar bridge, a temporary crossing at the existing bridge site, and construction of a new bridge 100' upstream. Installation of these structures may result in minimal fill, less than .01 acres, entering jurisdictional waters. However, given the minor extent of disturbance and the abundance of wetlands within the larger project area, the project would not have a substantial adverse impact on the federally protected wetland resources of the Preserve. Consequently, the project is not expected to result in a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act.

Mitigation Incorporated into project for impacts to federally protected wetlands:
Mitigation Measure BIO-9:
To mitigate for impacts on federally protected wetlands, Mitigation Measure BIO-4 shall be implemented. This mitigation measure would reduce impacts to wetland habitats to less than significant by requiring the area to be revegetated with native grasses and other herbaceous perennial wetland species.

Implementation: Contractor and District Staff
Timing: During construction
Monitoring: District Staff

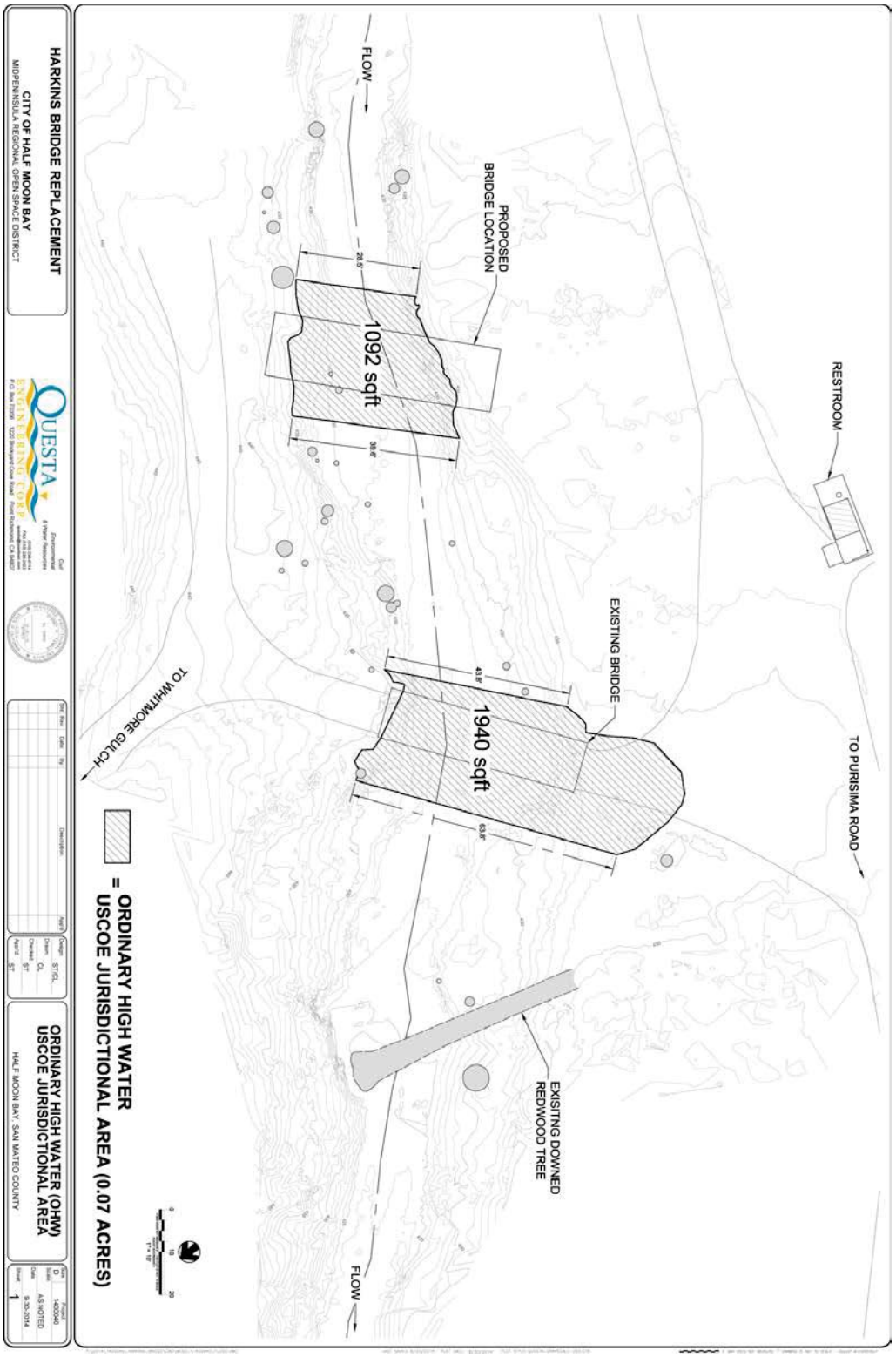

HARKINS BRIDGE REPLACEMENT
CITY OF HALF MOON BAY
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
QUESTA
ORDINARY HIGH WATER (OHW)
USCOE JURISDICTIONAL AREA
HALF MOON BAY, SAN MATEO COUNTY
RESTROOM
TO PURISIMA ROAD
PROPOSED
BRIDGE LOCATION
EXISTING BRIDGE
FLOW
1092 sqft
1940 sqft
TO WHITMORE GULCH
EXISTING DOWNED
REDWOOD TREE
= ORDINARY HIGH WATER
USCOE JURISDICTIONAL AREA (0.07 ACRES)

Figure 11

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

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

Explanation: (Source: 1). Resident trout will need to be excluded from the project area as the temporary culvert crossing is constructed and then deconstructed. There would be a temporary loss of fish movement. The duration of construction and deconstruction is estimated to be less than one week, making the interference a less than significant impact.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☒	☐

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

Explanation: (Source: 13, 14, 15) The project area is located in a densely forested setting within the Timberland Preserve-Coastal Zone (TPZ-CZ), which is exempt from permitting requirements for tree removal under San Mateo County's Significant Tree Ordinance. Removal of non-significant trees within the Timberland Preserve Zone does not require a permit, unless the trees are located within 100 feet of a County or State scenic road or highway. The aesthetic impact of the project as it pertains to a County scenic highway is addressed in Section I. The project avoids tree removal to the extent practicable. The project will require the removal of two trees, 12" and 20" dbh red alders in the footprint of the proposed bridge, as seen in Figure 3. As discussed in section I(b), the two trees to be removed will be replaced per the County's Zoning Ordinance. Therefore, tree removal will remain consistent with local tree ordinances. Since the project includes tree protection and revegetation of disturbed areas, the project would remain consistent with local ordinances protecting other biological resources and has a less than significant impact.

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
☐	☐	☐	☒

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

Explanation: (Source: 16, 17). No Habitat Conservation Plan or Natural Community Conservation Plan applies to the project area.

Biological Resources Section Sources:

1. Coast Range Biological. *Biotic Assessment and Riparian Delineration*. January , 2011.
2. Federal Emergency Management Agency, Region IX. Sandro Amaglio, Regional Environmental Officer. *Letter to Wayne White, Field Supervisor, U.S. Fish and Wildlife Service.* April 2001.
3. U.S. Fish and Wildlife Service. Jan Knight, Chief, Endangered Species Division. *Letter to Sandro Amaglio, Regional Environmental Officer, Federal Emergency Management Agency*. May 14, 2001.
4. Federal Emergency Management Agency, Region IX. *Supplemental Environmental Assessment: FEMA-1203-DR-CA, Virginia Mill Trail Project.* June 21, 2001.
5. Seymour, R. and M. Westphal. *Results of a one-year survey for amphibians on lands managed by the Mid-peninsula Regional Open Space District in the Santa Cruz Mountains, California*. Report submitted to Midpeninsula Regional Open Space District. 2000.
6. Calflora website. http://www.calflora.org/. November 26, 2002.
7. California Native Plant Society. *Inventory of Rare and Endangered Vascular Plants of California*. Special Publications Number 1, Fifth Edition. February 1994.
8. Sander, S. California Department of Fish and Game and California Interagency Wildlife Task Group. *California Wildlife Habitat Relationship System.* http://www.dfg.ca.gov/whdab/B240.html. November 26, 2002.
9. San Mateo County Ordinance Code. *Section 12000: Regulation of Removal of Significant Trees*. June 11, 1990.
10. San Mateo County Ordinance Code. *Section 11000: Regulation of Removal of Heritage Trees*. April 5, 1977.
11. San Mateo County Department of Public Works. *Endangered Species and Watershed Protection Program, Volume 1: Maintenance Standards*. February 20, 2001.
12. California Department of Fish and Game, Habitat Conservation Planning Branch. http://www.dfg.ca.gov/hcpb/conproj/conproj.shtml. November 4, 2002.
13. California Department of Fish and Game, Natural Community Conservation Planning Program. http://www.dfg.ca.gov/nccp/. November 4, 2002.
14. Keith L. Bildstein and Ken Meyer. *Sharp-shinned Hawk* (Accipiter striatus). In *The Birds of North America, No. 482* (A. Poole and F. Gill, Eds.). 2000.
15. R.N. Rosenfield and J. Bielefeldt. *Cooper's Hawk (*Accipiter cooperii). In *The Birds of North America, No. 75* (A. Poole and F. Gill, Eds.). 1993.
16. California Department of Forestry and Fire Protection. *California Forest Practice Rules*. January 2007.
17. H.T. Harvey and Associates, *California Bat Mitigation Techniques, Solutions, and Effectiveness.* December 2004.

V. CULTURAL/HISTORIC/ARCHAEOLOGICAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V(a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐

Explanation: (Source: 1 through 4). No above-grade historic structures are present within the project area. The project area is a disturbed site and had been subject to past logging activities as early as 1850 and continuing through the 1970sand prior construction of the existing bridge, restrooms and other Preserve amenities in the early 1980s). A literature review and records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University conducted in September 2014 indicates that the project area contains no recorded Native American or historic cultural resources. A surface inventory of the project area found no surface indications of either significant prehistoric or historic cultural materials.

Subsurface excavation will be limited to removing the redwood crib logs that support the existing bridge, minor grading and replanting the area of the existing bridge, and drilling piers to support the new bridge. The existing bridge location was heavily disturbed during its construction in the mid 1970s.

Impacts CULT-1 and CULT-2:
Ground disturbance associated with construction in an area with the potential for unknown cultural and archaeological resources may potentially result in impacts to unknown historic, pre-historic or paleontological resources.
Mitigations incorporated into project for impacts to cultural resources:
Mitigation Measure CULT-1:
Prior to the initiation of construction or ground disturbing activities, District staff or archaeological monitor shall conduct a meeting to train all construction personnel of the potential for exposing subsurface cultural resources and to recognize possible buried cultural resources.

Implementation: District staff
Timing: During a pre-construction field meeting with Contractors and Sub-Contractors
Monitoring: District Staff shall require contractor and subcontractors to have each employee attend training session and sign training materials indicating attendance at education program.

Mitigation Measure CULT-2:
If there is an unanticipated discovery of archaeological deposits or remains during project implementation, construction crews shall stop all work within 100 feet of the discovery and notify District staff. A qualified archaeologist will assess the discovery, complete an archaeological evaluation and provide recommendations.

Implementation: District staff
Timing: During construction
Monitoring: Construction contractor and District staff

With the application of the mitigations above, this impact would be less than significant with mitigations incorporated

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V(b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐

Explanation: (Source: 1 through 4)**.** The records search performed by NWIC of the California Historical Resources Information System at Sonoma State University did not identify any archaeological or historic resources in the project area. However, there is a possibility that Native Americans may have inhabited the project area prehistorically or at the time of Spanish entry into the Bay region. This region of the Santa Cruz mountains was also developed for timber harvesting and residential purposes during the 19th and 20th centuries, and it is possible that there are unknown archaeological remains from this historic period.

Basin Research Associates conducted field surveys to the construction area for investigations of potential cultural resources. No surface artifacts indicative of significant archaeological resources were observed. The site was used in the 1970s to stage heavy equipment for logging operations. A pit toilet was constructed in the project site in 1980s. Therefore, the potential for discovery of intact archaeological deposits during construction of the staging area location is low.

Impact CULT-3:
Since the construction involves ground disturbance in an area with the potential of unknown cultural resources, the project may potentially disturb or unearth archaeological resources. Archeological resources include buried features such as stone or adobe foundations or walls, wooden remains with square nails, other historic artifacts, chert or obsidian flakes, projectile points, mortars and pestles, dark friable soil containing shell and bone dietary debris, and heat-affected rock.

Mitigation incorporated into project for archaeological resources:
Mitigation Measure CULT-3 Implementation of the following measures will reduce potential impacts to cultural and historical resources, including buried and unknown archeological, paleontological, and human remains, to a less than significant level:

- If cultural and/or historical resources are encountered during construction, every reasonable effort shall be made to avoid the resources. Work shall stop within 50 feet of the find until a qualified cultural and/or historical resources expert can assess the significance of the find.
- A reasonable effort will be made by the District to avoid or minimize harm to the discovery until significance is determined and an appropriate treatment can be identified and implemented. Methods to protect finds include fencing and covering remains with protective material such as culturally sterile soil or plywood.
- If vandalism is a threat, 24-hour security shall be provided.
- Construction operations outside of the find location can continue during the significance evaluation period and while mitigation for cultural and/or historical resources is being carried out, preferably with a qualified cultural and/or historical resources expert monitoring any subsurface excavations.
- If a resource cannot be avoided, a qualified cultural and/or historical resources expert will develop an appropriate Action Plan for treatment to minimize or mitigate the adverse effects.

The District will not proceed with construction activities within 100 feet of the find until the Action Plan has been reviewed and approved.

- The treatment effort required to mitigate the inadvertent exposure of significant cultural and/or historical resources will be guided by a research design appropriate to the discovery and potential research data inherent in the resource in association with suitable field techniques and analytical strategies. The recovery effort will be detailed in a professional report in accordance with current professional standards. Any non-grave associated artifacts will be curated with an appropriate repository.

Project construction documents shall include a requirement that project personnel shall not collect cultural and/or historical resources encountered during construction. This measure is consistent with federal guideline 36 CFR 800.13(a) for invoking unanticipated discoveries.

Implementation: District staff
Timing: During construction
Monitoring: Construction contractor and District staff

With the application of the mitigation above, this impact would be less than significant with mitigations incorporated.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V(c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

Explanation: No unique paleontological resources are known to exist within the project area. Mitigation Measure CULT-3 under section V(b) calls for stopping work and evaluating significance if an artifact find is made, which will also reduce potential impacts and inadvertent damage to unknown paleontological resources to a less than significant level.

There are no known unique geologic features within the project area. The proposed project will not substantially change the overall landform and therefore the uniqueness of any geologic feature will not be significantly impacted by the project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V(d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Explanation: (Source: 1, 4, 5). No human remains are known to exist within the project area. However, given the possibility of prehistoric resources, as discussed under V(b) above, unknown human remains may be present in the project area and may be discovered during project construction.

Impact CULT-4:
Since the construction of the project involves ground disturbance in an area with a possibility of cultural and historical resources, the project may accidentally disturb unknown human remains.

Mitigation incorporated into project for disturbance of human remains:
Mitigation Measure CULT-4. In the event human remains, including skeletal remains, graves, or Native American burial sites or graves, are discovered, such as during the course of any ground disturbing activities (grading, excavating, trenching, digging), construction or maintenance activities, the following procedures shall be followed:

- All work shall immediately cease and there shall be no further excavation or disturbance of the site or the area in the vicinity of the discovery.
- Notify District staff immediately.
- District staff shall immediately notify the San Mateo County Coroner to evaluate the remains, and follow the procedures and protocols set forth in §15064.5(e) of the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387).
- Secure the area and no further disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has made a determination of origin and disposition, which shall be made within two working days from the time the Coroner is notified of the discovery, pursuant to State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98.
- If the Coroner determines that the remains are or may be of a Native American, the Coroner shall notify the California Native American Heritage Commission (NAHC) pursuant to subdivision (c) of the State Health and Safety Code within 24 hours, which will determine and notify the Most Likely Descendant (MLD). The MLD may recommend within 48 hours of their notification by the NAHC the means of treating or disposing of, with appropriate dignity, the human remains and grave goods. In the event of difficulty locating a MLD or failure of the MLD to make a timely recommendation, the human remains and grave goods shall be reburied with appropriate dignity on the property in a location not subject to further subsurface disturbance.
- If the Coroner determines that the remains are not those of a Native American, the Coroner would make recommendations for the treatment and disposition of the remains.

Construction work shall not begin again until the County Coroner has examined the remains, assessed their significance, and offered recommendations for any additional exploratory measures deemed necessary for the further evaluation of, and/or mitigation of adverse impacts.

Mitigation measure CULT-3 under section V(b) calls for stopping work and evaluating significance

if an artifact find is made, which will also reduce the potential for disturbance of human remains.

Implementation: District staff
Timing: During construction
Monitoring: Construction contractor and District staff

With the application of the mitigation above, this impact would be less than significant with mitigations incorporated.

Cultural Resources Section Sources:

1. Stanger, Frank M. *Sawmills in the Redwoods: Logging in the San Francisco Peninsula, 1849-1967.* San Mateo County Historical Association. San Mateo, California. 1967.
2. Basin Research Associates, *Archaeological Review Four Bridges in Midpeninsula Regional Open Space District, Purisima Creek Redwoods Open Space Preserve.* September 2014.
3. CEQA Guidelines, Section 15064.5. http://ceres.ca.gov/ceqa/guidelines/. Accessed on September, 2014.
4. California Law. Official California Legislative Information website. California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387; State Health and Safety Code Section 7050.5; Public Resources Code Section 5097.98 http://www.leginfo.ca.gov/calaw.html. Accessed on September, 2014

VI. GEOLOGY AND SOILS **Would the project:**	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI(a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
VI(c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐

Explanation for a and c: (Sources: 1-12). The proposed project is located within a near-wilderness rural mountain setting. No structures for human occupancy are proposed. A geotechnical investigation of the project and project area was conducted to identify engineering methods to design the safest bridge construction.

The Project site lies in the tectonically active Coast Ranges Geomorphic Province of Northern California. The geologic and geomorphic structure of the northwest trending ridges and valleys in the region, including the Santa Cruz Mountains, Marin Headlands, the Hamilton-Diablo Range, and San Francisco Bay, are controlled by active tectonism along the boundary between the North American and Pacific Tectonic Plates, defined by the San Andreas Fault System. Regional faults have predominantly right-lateral strike-slip (horizontal) movement, with lesser dip-slip (vertical) components of displacement. Horizontal and vertical movement is distributed on the various fault strands within a fault zone. Throughout geologic time the fault strands experiencing active deformation change in response to regional shifts in stress and strain from plate motions.

The nearest known active fault is the San Andreas fault, located approximately 4 miles to the northeast. Other nearby active faults include the San Gregorio fault located approximately 7 miles to the southwest, the Seal Cove fault located approximately 8 miles to the northwest, the Hayward fault approximately 24 miles east-northeast and the Calaveras fault located approximately 26 miles to the east-northeast (CDMG 1994)[1]. A listing of active earthquake faults located in the project vicinity is presented in **Table 1.**

Seismicity of the Project region has resulted in several major earthquakes during the historic period,

including the 1868 Hayward Earthquake, the 1906 San Francisco Earthquake, and most recently, the 1989 Loma Prieta Earthquake. Given this history, it is likely that major earthquakes will occur in the region in the future.

Table 1. Active Earthquake Faults in Project Vicinity

Fault Name	Distance from Project Site (mi.)	Direction	Last Surface Rupture	Status	Maximum Characteristic Moment Magnitude
San Andreas	4	NE	Historic	Active	7.
San Gregorio	7	SW	Holocene	Active	6.
Seal Cove	8	NW	Holocene	Active	6.
Hayward	24	E/N	Historic	Active	6.
Calaveras	26	E/N	Historic	Active	6.

REGIONAL GEOLOGY

The regional geology of the area is characterized by northwest trending mountain ranges and valleys oriented sub-parallel to faults of the San Andreas Fault System. In the San Francisco Bay area west of the San Andreas fault, regional geology is dominated by the Salinian Block granitic basement and overlying sedimentary rocks of Mesozoic and Cenozoic age.

Bedrock outcrops in the hills surrounding the site consist of the Vaqueros Formation (lower Miocene and Oligocene), arkosic sandstones, mudstone and shale, the Mindego Basalt (Miocene and/or Oligocene), volcanic basalt and tuffs, and the Lambert Shale (Oligocene and lower Miocene), mudstone, siltstone and claystone with minor chert, sandstone, and dolomite. West of the site, the Purisima Formation (Pliocene and Upper Miocene), sandstone, siltstone and mudstone, is exposed in the hills and in road cuts. East of the site along the mountain ridge, the Whiskey Hill Formation (middle and lower Eocene), including arkosic sandstone, silty claystone, glauconitic sandstone, and tuffaceous siltstone is exposed[3].

SITE GEOLOGY

The geologic map of San Mateo County shows the site vicinity as underlain by bedrock of the Vaqueros Formation, the Mindego Basalt and the Lambert Shale. A portion of the map representing the project site and vicinity is presented as **Figure 10.** In our Field Investigation, as described below, we encountered alluvial soils associated with the Purisima Creek valley and bedrock consisting of arkosic sandstone, likely of the Vaqueros Formation. Gravels within the alluvial soils included sandstone, siltstone, shale, basalt and volcanic tuff.

PRIMARY SEISMIC HAZARDS

Fault Rupture

(i) Fault rupture is a seismic hazard that affects structures situated above an active fault. The hazard from fault rupture is the movement of the ground surface along a fault. Typically, this movement takes place during the short time of an earthquake, but can also occur slowly over many years in a process known as fault creep. As shown on the Earthquake Fault Zone (EFZ) map of the Woodside Quadrangle[5], the project site does not lie within an Alquist-Priolo Earthquake Fault Zone Boundary. The nearest Alquist-Priolo Earthquake Fault Zone Boundary to the site is for the San Andreas fault and is located approximately 5 miles northeast of the project site.

The site is not located in an Alquist-Priolo Earthquake Fault Zone boundary. Surface fault rupture is not expected to occur at the site.

Ground Shaking

(ii) Strong ground, or seismic, shaking is a major hazard in the San Francisco Bay Region. The severity of ground shaking at any location depends on several variables such as earthquake magnitude, epicenter distance, local bedrock geology, thickness and seismic response of soil and sediment materials, ground water conditions, and topographic relief. The California Geological Survey has developed a Probabilistic Seismic Hazards Assessment Program where probabilities for estimated peak ground acceleration are given for any location within the State. The estimates of the peak ground acceleration at the project site are approximately 69% of the acceleration due to gravity, with a 10% chance of being exceeded in 50 years[6]. According to maps developed by the Association of Bay Area Governments (ABAG)[7], violent ground shaking (Modified Mercalli Intensity- MMI- Level IX) is possible in response to a large earthquake along the San Andreas fault. A major earthquake on the San Gregorio fault is expected to produce very strong ground shaking, MMI VIII on the site.

The hazard of strong seismic ground shaking would be mitigated by designing structures in accordance with the California Building Code and using Seismic Design Criteria developed for the site. The hazard of strong seismic ground shaking is considered less than significant with incorporation of all applicable regulations for design and construction.

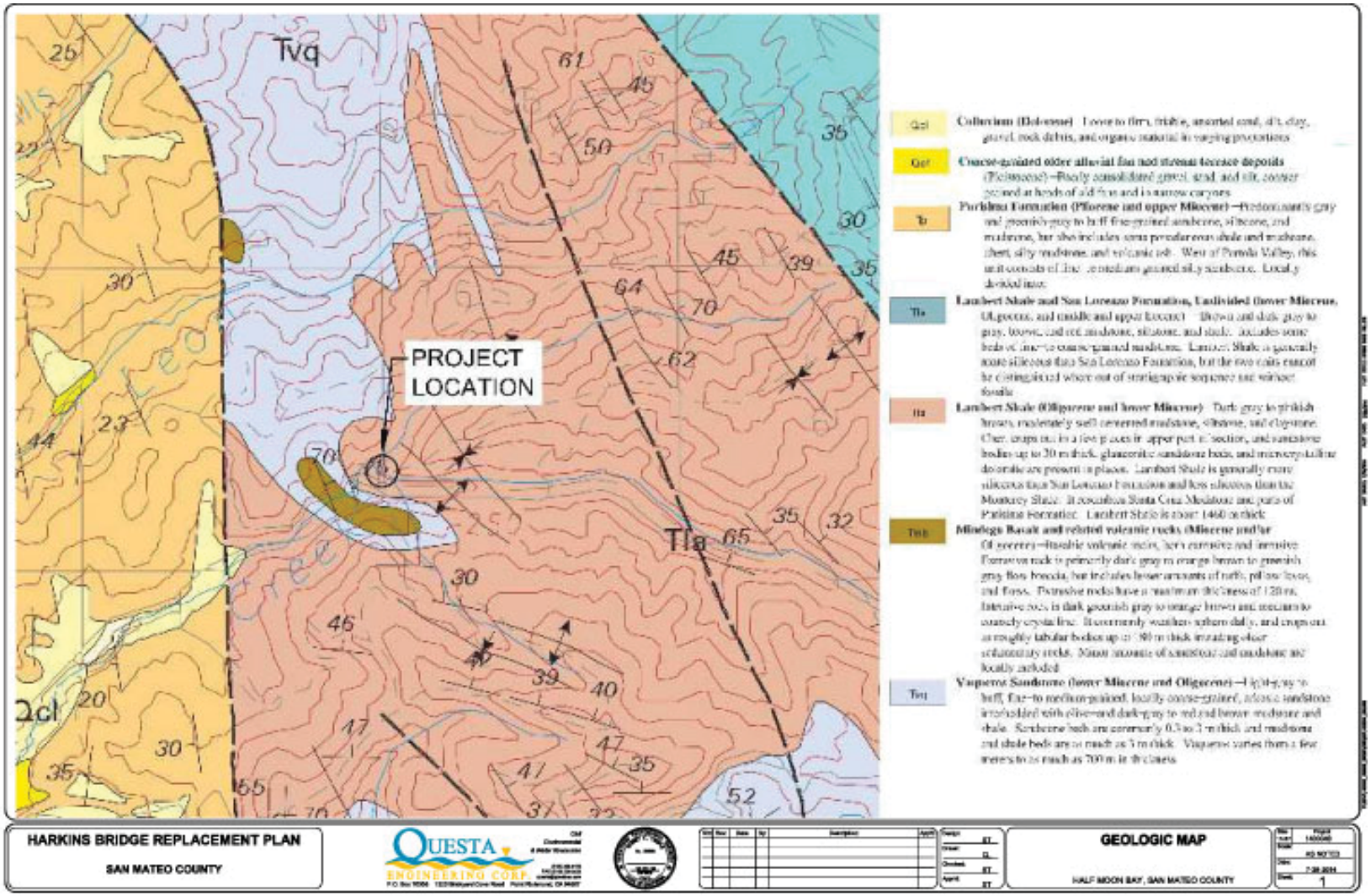

Tvq
Tla
Qcl
PROJECT LOCATION
Qal
Colluvium (Holocene) – Loose to firm, friable, unsorted sand, silt, clay, gravel, rock debris, and organic material in varying proportions
Qof
Coarse-grained older alluvial fan and fluvial terrace deposits (Pleistocene)—Poorly consolidated gravel, sand, and silt, commonly capped at heads of alluvial fans and in narrow canyons
Tp
Purisima Formation (Pliocene and upper Miocene)—Predominantly gray and greenish-gray to buff fine-grained sandstone, siltstone, and mudstone, but also includes some pre-dominantly shale and mudstone, chert, silty mudstone, and volcanic ash. West of Pescadero Valley, this unit consists of fine- to medium-grained silty sandstone. Locally divided into:
Tla
Lambert Shale and San Lorenzo Formation, Undivided (lower Miocene, Oligocene, and middle and upper Eocene)—Brown and dark gray to gray, brown, and red mudstone, siltstone, and shale. Includes some beds of fine- to coarse-grained sandstone. Lambert Shale is generally more siliceous than San Lorenzo Formation, but the two units cannot be distinguished where out of stratigraphic sequence and without fossils
Tla
Lambert Shale (Oligocene and lower Miocene)—Dark gray to pinkish brown, moderately well cemented mudstone, siltstone, and claystone. Chert crops out in a few places in upper part of section, and sandstone beds up to 20 m thick, glauconitic sandstone beds, and microscopic siliceous diatomite are present in places. Lambert Shale is generally more siliceous than San Lorenzo Formation and less siliceous than the Monterey Shale. It overlies Santa Cruz Mudstone and parts of Purisima Formation. Lambert Shale is about 1460 m thick
Tmb
Miralegs Basalt and related volcanic rocks (Miocene and/or Oligocene)—Basaltic volcanic rocks, both extrusive and intrusive. Extrusive rock is primarily dark gray to orange brown to greenish gray flow breccia, but includes lesser amounts of ruffi, pillow lavas, and flows. Extrusive rocks have a maximum thickness of 120 m. Intrusive rock is dark greenish gray to orange brown and medium to coarsely crystalline. It commonly weathers to form dull, and crops out as roughly tabular bodies up to 30 m thick intruding older sedimentary rocks. Minor amounts of sandstone and mudstone are locally included
Tvq
Vaqueros Sandstone (lower Miocene and Oligocene)—Light-gray to buff, fine- to medium-grained, locally coarse-grained, arkosic sandstone interbedded with olive- and dark-gray to red and brown mudstone and shale. Sandstone beds are commonly 0.3 to 3 m thick and mudstone and shale beds are as much as 5 m thick. Vaqueros varies from a few meters to as much as 700 m in thickness
HARKINS BRIDGE REPLACEMENT PLAN
SAN MATEO COUNTY
QUESTA ENGINEERING CORP
GEOLOGIC MAP
HALF MOON BAY, SAN MATEO COUNTY
1

Figure 10

SECONDARY SEISMIC HAZARDS

Seismically Induced Ground Failure

(iii) Seismically induced ground failure refers to a loss of ground strength and/or cohesion as a result of seismically induced ground shaking (generated by an earthquake). There are multiple types of ground failure hazards, including liquefaction, differential settlement, lurch cracking, lateral spreading and seismically induced landslides. Seismically induced ground failure could also result in landsliding on the adjacent steeply sloping areas resulting in landslide deposition in the creek valley. Large landslides could potentially cause changes to the drainage patterns within the creek.

The soils that are most susceptible to liquefaction consist of clean sands and silty sands, which were not found in the bore holes on the project site. Groundwater was present in each of the bore holes at depths of approximately commensurate with the channel bottom. However, there are clayey sand and silty sandy soils that are medium dense in the area have a low likelihood of liquefaction during earthquake-induced strong to violent ground motions.

Explanation: (Sources: 12).

SLOPE INSTABILITY AND LANDSLIDES

(iv) The project site is a creek valley located adjacent to moderately to steeply sloping areas. The slopes in the area vary from 30 to 60 percent. Creek banks vary from 30 to 90 percent in steepness, with local instabilities caused by erosional forces in the stream and by the falling of trees in wind storms. These banks are subject to erosional and scour forces during storm events. Bank stability could also be affected by earthquake induced ground shaking resulting in bank failures. Based on potential for bank instability along Purisima Creek, the abutments for the new bridge will be protected from scour and shallow bank instabilities. In addition, following removal of the existing Harkins Bridge, the disturbed stream banks will be protected to prevent scour and planted with appropriate native vegetation to provide long term stability and riparian habitat. In accordance with the design recommendations of a Certified Geotechnical Engineer and District BMPs related to road and trail work near watercourses, the bridge will be designed and constructed to minimize future erosion and geologic failures and is no considered to have a significant impact on slope instability and landslides.

The construction work would be completed in the area of the existing bridge and in the river channel. No new areas of topsoil are anticipated to be required for removal. If topsoil is removed during the project, it would be replaced during final stabilization activities. The impact of the loss of topsoil is considered less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI(d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐

Explanation: (Source: 2).
EXPANSIVE SOILS

Expansive soils are those that shrink and swell in response to changes in moisture content. Native soils on the site consist predominantly of clayey sand and sandy lean clay soils with a low to moderate expansion potential. The site is generally susceptible to low to moderate soil expansion due to soil moisture fluctuations. However, within a redwood forest environment moisture fluctuations seasonally are not as extreme as in open, non-coastal areas. Facility improvements at the site will be designed to resist the effects of soil heave and settlement in response to seasonal moisture fluctuations in underlying soils, in areas where moisture fluctuations are expected. The potential effects of expansive clay soils would be mitigated by designing structures in accordance with the California Building Code. The hazard of expansive soils is considered less than significant with incorporation of all applicable regulations for design and construction.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI(b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI(e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☒	☐

Explanation: The self-contained, vault restroom that is installed adjacent in the project area does not use a septic system, but stores effluent waste in a contained, concrete vault. This waste is pumped out of the restroom vault at least two to three times per year and is properly disposed of. No effluent waste will be discharged as a result of this project. Effluent waste is transported via a service truck to an appropriate offsite wastewater receiving facility. The project will have no affect on the existing vault toilet.

Geology and Soils Section Sources:

1. California Division of Mines and Geology, 1994, Fault Activity Map of California and Adjacent Areas, CDMG Geologic Data Map No. 6.
2. 2007 Working Group on California Earthquake Probabilities (WGCEP). Uniform California Earthquake Rupture Forecast, Version 2. USGS Open File Report 2007-1437, CGS Special Report 20, 2008.
3. US Geological Survey, Geology of the Onshore Part of San Mateo County, California, Open-File Report 98-137
4. US Department of Agriculture, 2012, Soil Survey of San Mateo County, California
5. California Division of Mines and Geology, 2000, Digital Images of Alquist-Priolo Earthquake Fault Zone Map of the Richmond Quadrangle, California, 1982, 1:24,000.
6. California Geological Survey, 1996, Probabilistic Seismic Hazard Assessment for the State of California
7. Association of Bay Area Governments, 2007, Earthquake Ground Shaking Scenario Maps
8. San Mateo County Department of Public Works. *Endangered Species and Watershed Protection Program, Volume 1: Maintenance Standards*. April 14, 2004.
9. California Division of Mines and Geology CD-ROM 2000-004 (2000). *Official Map of Alquist-Priolo Earthquake Fault Zones, Woodside Quadrangle*. 1974, revised 2000.
10. Weaver, William, and Hagans, Danny. Pacific Watershed Associates. *Handbook for Forest and Ranch Roads*. June 1994.
11. Midpeninsula Regional Open Space District. *Details and Specifications Guidelines.* September 2009.
12. Questa Engineering, Harkins Bridge Geotechnical Investigation Report, July 2014.

VII. GREENHOUSE GAS EMISSIONS **Would the project:**	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VII(a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
B) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐
C) Would the project increase greenhouse gas emissions that hinder or delay the State's ability to meet the reduction target (25% by 2020) contain in Global Warming Solutions Act of 2006 (AB 32)?	☐	☐	☒	☐

Explanation for A and B.

Environmental Setting

Global temperatures are affected by naturally occurring and anthropogenic-generated (generated by humankind) atmospheric gases, such as water vapor, carbon dioxide (CO2), methane (CH4), and nitrous oxide (Intergovernmental Panel on Climate Change, 2007). Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Solar radiation enters the earth's atmosphere from space, and a portion of the radiation is absorbed at the surface. The earth emits this radiation back toward space as infrared radiation. GHGs, which are mostly transparent to incoming solar radiation, are effective in absorbing infrared radiation and redirecting some of this back to the earth's surface. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This is known as the "greenhouse effect." The greenhouse effect helps maintain a habitable climate. Emissions of GHGs from human activities, such as electricity production, motor vehicle use, and agriculture, are elevating the concentration of GHGs in the atmosphere and are reported to have led to a trend of unnatural warming of the earth's natural climate, known as global warming or global climate change. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred because it implies that there are other consequences to the global climate in addition to rising temperatures. Other than water vapor, the primary GHGs contributing to global climate change include the following gases:

- CO2, primarily a byproduct of fuel combustion;

- Nitrous oxide (N2O), a byproduct of fuel combustion that is also associated with agricultural operations such as the fertilization of crops;
- CH4, commonly created by off-gassing from agricultural practices (e.g. livestock), wastewater treatment, and landfill operations;
- Chlorofluorocarbons (CFCs), which were used as refrigerants, propellants, and cleaning solvents, although their production has been mostly prohibited by international treaty;
- Hydrofluorocarbons (HFCs), which are now widely used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- Perfluorocarbons (PFCs) and sulfur hexafluoride (SF6), emissions of which are commonly created by industries such as aluminum production and semiconductor manufacturing.

These gases vary considerably in terms of Global Warming Potential (GWP), a term developed to compare the propensity of each GHG to trap heat in the atmosphere relative to another GHG. GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time of gas remains in the atmosphere. The GWP of each GHG is measured relative to CO2. Accordingly, GHG emissions are typically measured and reported in terms of CO2 equivalent (CO2e). For instance, sulfur hexafluoride (SF6) is 22,800 times more intense in terms of global climate change contribution than CO2.

In 2011, BAAQMD published CEQA Air Quality Guidelines that included recommended thresholds for GHG emissions. BAAQMD developed these emission thresholds as a basis for meeting the overall goals adopted by California to reduce GHG emissions to 1990 levels by 2020 (per Assembly Bill 32 – Global Warming Solutions Act). A description of the justification for these thresholds was published by BAAQMD on June 2, 2010, titled BAAQMD California Environmental Quality Act Guidelines Update – Thresholds of Significance. In this document, BAAQMD recommended that land use projects with emissions exceeding 1,100 metric tons per year of equivalent carbon dioxide emissions (CO2e) should be considered significant if they have per capita emissions that exceed 4.6 metric tons of CO2e per capita. These are the only quantitative thresholds that we are aware of that are used in the Bay Area, including San Mateo County. These thresholds only apply to project operation. BAAQMD does not have GHG emission thresholds for construction activities. The temporary construction would result in short-term emissions that would certainly be below any threshold used for evaluating operational impacts.

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
The project would result in temporary GHG emissions as a result of construction activities. The Roadway Construction Emissions Model, Version 7.1.5.1, was used to predict these emissions. Assuming bridge/overpass construction of 0.05 miles (and 0.1 acres) for five months, the model predicts emissions of 71 tons throughout the entire project. These emissions are not anticipated to contribute considerably to significant GHG emissions that contribute to the adverse effects of climate change. Significance thresholds, in terms of emissions, have not been identified for construction emissions.

This project has no long-term operational GHG impacts since the site would return to Preserve lands with natural habitats once construction and restoration activities are complete. There would be ***no impact*** from GHG after construction and restoration activities are complete.

b) Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?
San Mateo County does not currently have an adopted Climate Action Plan. The project would beconsistent with applicable local plans, policies, and regulations and would not conflict with the provisions of AB 32, the applicable air quality plan, or any other State or regional plan, policy or regulation of an agency adopted for the purpose of reducing greenhouse gas emissions. Therefore, this impact would be less than significant.

VIII. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒

Explanation: (Source: 1). This project will not result in the routine transport, use, or disposal of hazardous materials. The District does not currently routinely transport, use, or dispose of hazardous materials at the Preserve, and District Ordinance 93-1, Section 409.2 prohibits persons from possessing or using harmful substances on District lands. Potential risks associated with releases during the construction process are discussed in section (b), below.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐

Explanation: (Source: 1, 6, 7). Under District Ordinance 93-1, the operation of unauthorized motor vehicles within the interior of the Preserve is prohibited. General public use of the Preserve is limited to low-intensity, non-motorized, and non-emitting uses, including hiking, bicycling, and equestrian use. The possibility of the incidental release of motor vehicle oil, grease, or fuel is therefore limited to the infrequent use of the interior Preserve trails and roads by District patrol and maintenance vehicles and occasional emergency responders, the vehicles and machinery used during the construction process, and the vehicles that will park in the parking area.

The project will not result in a significant increase in maintenance, patrol, or emergency response use of the Preserve. Construction activities will include best management practices (BMPs), based on the Regional Water Quality Control Board's *Erosion and Sediment Control Field Manual*, to reduce the potential for release of construction-related fuels and other hazardous materials into the environment, as follows:

BMP Category	BMP Description	Timing	Inspection and Maintenance
Solid Waste Management	Remove all trash and construction-related waste to a secured, covered location at the end of each working day to maintain a clean worksite. Dispose of hazardous materials according to all specified regulations.	Implement during construction.	Inspect for trash on a daily basis.
Materials Storage	Store chemicals in a non-reactive container. Store bagged, dry reactive materials in a secondary container. Protect all material storage areas from vandalism.	Implement during construction.	Inspect storage areas daily to ensure no leaks or spills have occurred.

Spill Prevention and Control	Good housekeeping practices shall be followed to minimize storm water contamination from any petroleum products or other chemicals. Maintain spill cleanup materials where readily accessible during use.	Implement during construction.	Clean up leaks and spills immediately using absorbent materials and as little water as possible.
Vehicle and Equipment Maintenance & Fueling	Conduct proper and timely maintenance of vehicles and equipment. Cleaning or equipment maintenance shall be prohibited except in designated areas located near the entrance to the Preserve. If fueling must occur on-site, use designated areas located away from drainage courses and use a drip pan to catch spills. Place drip pans under heavy equipment stored onsite overnight.	Implement during construction.	Inspect on-site vehicles and equipment for leaks on a routine basis; periodically check incoming vehicles for leaking oil and fluids while on paved roads near the entrance to the Preserve.
Training	All personnel shall be instructed regarding the correct procedure for spill prevention and control, waste disposal, use of chemicals, and storage of materials.	Implement during construction.	None.

The risk of accidental release of hazardous materials into the environment is therefore considered less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

Explanation: (Source: 2). The project area is not located within one-quarter mile of an existing or proposed school. The nearest school, Alvin Hatch Elementary, is located approximately five miles northwest of the project area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒

Explanation: (Source: 3). The project site is not located on the list of hazardous materials sites. No EPA regulated facilities are found in the project area or the Preserve.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
VII(f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

Explanation for e and f: (Source: 4). The project is not within an airport land use plan, within two miles of an airport, or within the vicinity of a private airstrip. The closest airport is the Half Moon Bay Airport, some 10 miles away.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

Explanation: The project will not interfere with any adopted emergency response plans and evacuation plans, as there are none for the area. The project will not add residents or significantly increase the number of visitors to the area and therefore will not increase resources required for emergency response or evacuation. Because the project requires minimal import of construction materials, vehicle trips up and down public roads are limited. Emergency traffic along Purisima Creek Road is unlikely to be affected by equipment or vehicle trips to and from the site. The new bridge will support the weight of emergency vehicles and will therefore increase the ability of emergency responders to operate within the Preserve.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII(h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☒	☐	☐

Explanation: (Sources: 1, 5). The project area is located in a minimally developed portion of unincorporated San Mateo County in the Santa Cruz Mountains. The California Department of Forestry and Fire Protection (CAL FIRE) designates the project area as lying within a zone of Very high fire hazard severity, based on local vegetation type (fuel loading), slope and weather. However, the project will not change the degree of exposure to wildfires, because the Preserve is already open to public use. The Preserve has approximately 24 miles of trails and unpaved roads open to hiking, mountain bicycling, and equestrian use, including trails that are located within the project area. .

District Ordinance 93-1 Section 404 prohibits fires and smoking on District lands. In addition, District Rangers, who are trained in fire-fighting techniques and carry fire suppression equipment, regularly patrol the Preserve. District staff generally serve as first responders to fire emergencies within the preserves, with the primary fire protection responsibility falling to CAL FIRE, County Fire Departments, and municipal fire protection agencies. The District's radio and repeater system combined with ranger patrols and staff on call 24 hours per day enable prompt and effective communication with emergency service providers in the event of a wildland fire or an emergency response call.

During project construction, the most likely source of ignition is by mechanical activities such as chain saw operations, re-fueling, or mowing. The chance for an ignition can be greatly reduced through equipment features, fuel treatment, and management of behavior.

Impacts HAZ-1, HAZ-2, HAZ-3 and HAZ-4:
Construction activities increase the risk of wildland fire.

Mitigation incorporated into project for wildland fire:
HAZ-1. All equipment to be used during construction must have an approved spark arrestor.

HAZ-2. Cut grass and reduce fuels around construction sites where vehicles are allowed to park.

HAZ-3. Minimize use of mechanical construction equipment during hot, dry, windy weather.

HAZ-4. Hired contractors shall be required to:

i) Provide water to suppress potential fires caused by the work performed.
ii) Remind workers that smoking is prohibited at the work site and on any District land per contract conditions and District Ordinance.
iii) Maintain working ABC fire extinguishers on all vehicles in the work area.
iv) Contact both Mountain View Dispatch at (650) 968-4411 and the California Department of Forestry, Skylonda, at (650) 851-1860 for emergency response in the event of a fire (these numbers are to report emergencies only).

Implementation: Contractors
Timing: During construction
Monitoring: District Staff

Hazards and Hazardous Materials Section Sources:

1. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.
2. Google Maps. www.google.com/maps. Search of project site and school locations. Information accessed on August 15th, 2014.
3. United States Environmental Protection Agency. http://www.epa.gov/myenvironment/
4. United States Geological Survey. Woodside 7.5-minute series quadrangle map. 1991.

5. CAL FIRE. *Maps of Fire Hazard Severity Zones in the State Responsibility Area of California, San Mateo County.* Adopted November 7, 2007.
6. Midpeninsula Regional Open Space District. *Details and Specifications Guidelines.* September 2009.
7. Regional Water Quality Control Board. *Erosion and Sediment Control Field Manual.* August 2002.

IX. HYDROLOGY AND WATER QUALITY

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
IX(c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
IX(f) Otherwise substantially degrade water quality?	☐	☐	☒	☐

Explanation for a, c, and f: (Sources: 1 through 6). These three items are interrelated and therefore are being discussed together to avoid repetition. This project involves the demolition of an existing bridge, construction of a new bridge and footings, and minor vegetation removal to connect the existing roads to the new bridge.

The demolition of the existing bridge requires removing or modifying the redwood crib logs that currently serve as abutments to the bridge.

The construction of the new bridge, minor grading on the approach, and vegetation removal on the approach will cause minor changes in the drainage pattern of the road. No significant changes in the pattern or amount runoff is anticipated. The new bridge will be located above the 100-year flood plain, thus avoid direct interaction with the stream and the potential for altering the course of the stream.

The construction activities are designed with drainage and erosion prevention measures as shown in Figure 3 and detailed in the District's BMPs for road and trail construction and maintenance near watercourses. These BMPs for erosion and sediment control, previously approved by the California Department of Fish and Wildlife and Regional Water Board and in use by the District, would be implemented during project construction to avoid impacts such as erosion at the project site.

All exposed soil surfaces in the construction area will be seeded and mulched. These measures and the design of the new bridge will prevent the concentration of surface runoff that could result in erosion or siltation and allow the project to avoid substantial erosion on-site or siltation off-site, thus reducing the potential impact under item IX(c) to a less than significant level.

Sedimentation can also result from wind and water erosion. As discussed in Section III(b), the project's dust suppression measures and the dense vegetation and tree canopy buffering the construction zone from winds will minimize the potentially negative water quality effects of wind erosion. As discussed in Section VI(b), the project will be constructed during a mostly dry but potentially wet time of year (July-October), and erosion control measures will be installed prior to the onset of rains to avoid erosion due to surface runoff. Potential negative water quality impacts from construction involving the accidental release of hazardous materials are discussed in Section VII(b). Therefore, potential for the project to otherwise substantially degrade water quality or violate any water quality standard is reduced to a less than significant level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒

Explanation: The project will not pump groundwater and therefore does not interfere with groundwater recharge and has no impact on groundwater supplies.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?	☐	☐	☒	☐
IX(e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
IX(h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	☐	☐	☒	☐
IX(i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒

Explanation for d, e, h, and i: (Source: 5). These four checklist items are interrelated and therefore are being discussed together to avoid repetition. The Preserve is located in the Purisima Creek watershed approximately five miles east of Half Moon Bay, California. Precipitation in the watershed is highly seasonal, with 90% falling between October and April. The extensive open space lands surrounding the project provide a vegetated buffer for the project and allow rain to percolate into the ground rather than running off rapidly.

By following the recommendations outlined in the Geotechincal Report and through the measures outlined in the explanations for A, C, and F, these design features little to no storm water is anticipated to exit the site as a result of this project. The project would not substantially alter the site drainage patterns or increase the amount of runoff.

The new bridge has been designed to accommodate a 100-year flood flow. The proposed project will not place any structures within the 100-year floodplain that might impede flood flows.

Per standard District practice, District personnel regularly check drainage structures during and after storms, provide signage and barricades if needed, and perform maintenance as needed to ensure proper functioning of drainage structures and reduce the possibility that the project would expose people to significant flood risks. Therefore, potential for the project to result in flooding, expose people to flooding risks, exceed the capacity of drainage systems, or impede flood flows is reduced to a less than significant level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒

Explanation: The project does not involve housing.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

Explanation: (Sources: 4, 5). The project is situated at approximately 435 feet above mean sea level, approximately 4 miles from the ocean. Seiche or tsunamis would have no impact on the site.

Landslides are common in the Santa Cruz Mountains and are one of the dominant geologic forces shaping the current landscape. Oversteepened slopes due to tectonic uplift and rapid downcutting of streams coupled with high intensity rainfall or intense seismic activity have resulted in a number of large and small-scale landslides.

Large, deep-seated bedrock landslides are also common in the Santa Cruz Mountains, and typically appear to be initiated or reactivated by strong ground motions during earthquakes. These failures are characterized by benched topography and are formed by translational movement of a relatively intact mass with a failure plane that extends below the colluvial layer into the underlying bedrock layer.

Natural slide movement is attributed to weak earth materials that underlie much of the slopes in conjunction with high groundwater conditions. The rate of deep-seated slide movement is considered to be slow and episodic and in response to long duration rainfall, undercutting of the slope by stream bank erosion, and/or seismic ground shaking from nearby faults. Future movement should be expected to be in response to intense, extended rainfall events or intense ground shaking during earthquakes, and most likely as small scale displacements similar to what has occurred in the past. Catastrophic failure of large slides is not expected.

Mudflows are a form of shallow-seated landsliding known as debris flows. Shallow-seated landsliding is common throughout the Santa Cruz Mountains and is characterized by rapid, shallow downslope movement of surficial soil, colluvium, and weathered bed rock. Generally located on steep to very steep hillsides, most shallow slides are a result of a loss of soil tension due to the over-saturation of the soil profile from extended or intense storm events, and travel down slope in existing drainages. Old failures along old logging roads and skid trails are attributed to thick fill that was loosely sidecasted onto steep slopes, poor drainage, or failure of oversteepened cuts. Few failures have occurred in recent years, in part due to current, improved management practices. Future shallow landslides will occur within the Preserve during adverse climatic or seismic conditions regardless of land use activities.

Debris or mudflows could expose District personnel and the public to a life-threatening event if a flow occurred while people were present. The proposed project will not increase or decrease the hazard level from such an event. However, the low probability of such an event and the limited likelihood of District personnel or the public to be in harm's way during an intense storm necessary to precipitate such an event reduce this potential impact to a less than significant level.

Hydrology and Water Quality Section Sources:

1. San Mateo County Department of Public Works. *Endangered Species and Watershed Protection Program, Volume 1: Maintenance Standards*. February 20, 2001.
2. Weaver, William, and Hagans, Danny. Pacific Watershed Associates. *Handbook for Forest and Ranch Roads*. June 1994.
3. Association of Bay Area Governments. *Manual of Standards for Erosion and Sediment Control*. May 1995.
4. United States Geological Survey. *Woodside 7.5-minute series quadrangle map*. 1991.
5. Best, Timothy. *Purisima Creek Road Inventory Report*. 1999.
6. Questa Engineering, Harkins Bridge Geotechnical Investigation Report, July 2014.
7. Midpeninsula Regional Open Space District, 2007. Best Management Practices and Standard Operating Procedures for Routine Maintenance Activities in Water Courses.

IX. LAND USE AND PLANNING

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(a) Physically divide an established community?	☐	☐	☐	☒

Explanation: The project is located in an existing 4,711-acre open space preserve in unincorporated San Mateo County near the city of Half Moon Bay, adjacent to Skyline Boulevard (also known as Highway 35). The project scope is contained within the Preserve. The project components will maintain public access to a popular Preserve, remove a safety hazard with the existing bridge, and support emergency response within and around the Preserve. The project will not physically divide an established community.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Explanation: (Sources: 1 through 7).

San Mateo County Zoning

The project area is located within unincorporated San Mateo County and the land is zoned Timberland Preserve Zone District –Coastal Zone (TPZ-CZ). The TPZ-CZ was in part established to protect timberlands within the County and the ecological balance of such timberlands. Compatible land uses in a TPZ that would not inhibit the growing and harvesting of timber include "management of land for wildlife habitat" and "management for recreation," including "outdoor recreation requiring some development." Therefore, the replacement of a vehicle bridge for access to recreational trails and emergency responses consistent with San Mateo County's zoning ordinance.

San Mateo County General Plan

The designated land use throughout most of the project site, per the San Mateo County General Plan, is "Public Recreation Rural." The District will continue to manage the Preserve for public recreation and resource protection, which is compatible with the land use designation. This project supports public recreation.

Local Coastal Program Area

The entire project area and much of the Preserve are within the Local Coastal Program (LCP) Area. Public recreation is a permissible use in San Mateo County's LCP. The project allows continued recreational use of the Preserve and is compatible with the LCP.

County Scenic Roadways and Caltrans Scenic Highway Guidelines

Refer to Section I(b) for discussion.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX(c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Explanation: (Sources: 5 and 6). No Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP) applies to the project area.

Land Use and Planning Section Sources:

1. San Mateo County. *General Plan. Section 6 Park and Recreation Resources Policies, Section 9 Rural Land Use Policies*. 1986.
2. San Mateo County. *Zoning Maps*. *Sheet 27*. May 1992 Edition.
3. San Mateo County. *Zoning Regulations*. *Chapter 34: Timberland Preserve Zone (TPZ) District.* July 1999.
4. San Mateo County Parks and Recreation Commission. MHA Environmental Consulting, Inc. *San Mateo County 2001 Trails Plan*. 2001.
5. California Department of Fish and Game, *Habitat Conservation Branch*, http://www.dfg.ca.gov/habcon/nccp/status.html, accessed on April 22, 2008.
6. United States Fish and Wildlife Service, *Conservation Plans and Agreements Database*, http://ecos.fws.gov/conserv_plans/public.jsp, accessed on April 22, 2008.
7. San Mateo County. *Local Coastal Program.* June 2012.

XI. MINERAL RESOURCES

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XI(a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
XI(b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Explanation for questions a and b: (Sources: 1, 2). The project would not result in the loss of availability of a known or locally important mineral resource. The site has not been classified as a Mineral Resource Zone, nor is it included in a Resource Sector in the *Update of Mineral Land Classification* or the mineral resources section of the San Mateo County General Plan. Field observations by District staff have revealed no evidence of the presence of mineral resources in the project area.

Mineral Resources Section Sources:

1. San Mateo County. *General Plan. Chapter 3: Mineral Resources.* 1986.
2. California Division of Mines and Geology. *Update of Mineral Land Classification: Aggregate Materials in the South San Francisco Bay Production-Consumption Region.* Open File Report 96-03. 1996.

XII. NOISE
Would the project result in:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XII(a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
XII(b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐

Explanation: (Source: 1, 4 through 8). Noise impacts are considered significant based on their levels and proximity to sensitive receptors, including schools, hospitals, religious facilities, and parks. Purisima Creek Redwoods Open Space Preserve is an undeveloped open space area with low levels of ambient noise. A developed neighborhood is located approximately .75 miles from the Preserve boundaries. The main area of the project site is located approximately 700 feet from the nearest residences and separated by Preserve lands. However the construction site is located within proximity to a parking lot, an existing trail and proposed trail detour.

The standard unit of measurement for sound is the decibel (dB). Sounds can range from 0 decibels (threshold of hearing) to 160 dB (instant perforation of eardrum). Normal conversation at three feet is roughly 60 dB, busy street traffic is 70 dB, and the threshold of pain is 130 dB. The Community Noise Equivalent Level (CNEL) is another unit of measure for noise that is used as a standard for San Mateo County. CNEL measurements represent an average of measured noise levels obtained over a 24-hour period of time. A time-weighted factor is applied to account for the increased sensitivity of humans to noise in the morning, evening, and nighttime hours. This factor adds 5 dB to sounds occurring in the evening (7 p.m. to 10 p.m.) and 10 dB to sounds occurring in the late evening and early morning hours (between 10 p.m. and 7 a.m.).

According to the County's General Plan Noise Policies, noise impact areas are defined as areas with noise levels of 60 CNEL or greater. The General Plan does not specify where noise levels are measured nor for what land uses. Exterior noise exposure levels of 70 CNEL or greater are considered significant for residential developments according to the State of California. Measured in decibels, exterior noise levels in quiet residential areas are typically 40 dB or 45 to 50 CNEL. Within the Preserve and the project area, current ambient noise levels are expected to be less than 60 CNEL, similar to exterior noise levels in quiet residential areas. Conversations among users in the nearby parking lot, the non-motorized, low-intensity recreational uses and Purisima Creek are not expected to generate noise in excess of local agency standards or generate ground borne noise or vibration.

The County's General Plan Noise Policies promote measures which incorporate noise abatement into the design of roadway projects. Such measures can include smooth road surfaces and noise barriers. Slow speeds over the roadway and bridge surface and the very low volume of traffic anticipated would not generate noise in excess of local agency standards or generate ground borne noise or vibration.

The construction phase of the project component is expected to last four months and would include demolition, earthmoving, and bridge construction activities. During construction, construction machinery may generate temporary increases in noise to levels as high as 95 dB. Short-term construction noise impacts would occur in discrete phases and would occur during the daylight hours of the summer and fall and buffered from adjacent properties by distance, elevation, and dense vegetation. The construction site is located approximately 300 feet from Higgins Canyon Road, far outside the line of site of the nearest house located approximately 700 feet away and is screened by topography and

vegetation. Trail users approach the site may experience increased noise during construction activities. Given the small size of the project area, potential impacts will be minor and ephemeral.

Since the project is small-scale in nature, any potential generation of noise levels in excess of 70 CNEL resulting from the project would be localized and limited to the short-term construction period. Any potential exposure to and generation of excessive vibration or noise resulting from the project would also be localized and limited to the short-term, three to four month construction period of the project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XII(c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

Explanation: (Source: 2, 4 through 7). Within the Preserve and project area, current ambient noise levels are under 60 CNEL. The surrounding roads and trails have non-motorized low-intensity recreational uses, which would not generate substantial noise. In addition, under District Ordinance 96-1, operation of motor vehicles by the public within the Preserve itself is prohibited, thus limiting motor vehicle activity within the Preserve to ranger patrol and maintenance vehicles. No expansion of maintenance or patrol levels would be required by the project and therefore, potential vehicular noise generated by District patrol vehicles would be localized and intermittent. Because the project will not increase vehicular traffic or engine starts beyond existing levels, the project will not generate a permanent, substantial increase in ambient noise. Moreover, District Ordinance 93-1 prohibits after-hours use of the Preserve.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XII(d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

Explanation: (Source: 6, 8, 7, and 9). Within the Preserve and project area, current ambient noise levels are under 60 CNEL. During the construction phase, which is expected to last three to four months, construction machinery may generate temporary increases in noise levels. However, short-term construction noise impacts would occur in discrete phases and would occur during the daylight hours of the summer and fall, located in an area that and buffered from adjacent properties by distance, elevation, and dense vegetation.

The following activities are exempt from Chapter 4.88 of the San Mateo County Ordinance Code:

- Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property, provided said activities do not take place between the hours of 6:00 P.M. and 7:00 A.M. weekdays, 5:00 P.M. and 9:00 A.M. on Saturdays or at any time on Sundays, Thanksgiving and Christmas.

The project construction activities will only occur during the hours in the above County ordinance. Therefore, the temporary increase in noise is not expected to be substantial.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XII(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XII(f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Explanation for e and f: (Source: 3). The project is neither located within an airport land use plan, within two miles of an airport, nor within the vicinity of a private airport.

Noise Section Sources:

1. San Mateo County. *General Plan. Chapter 16 Man-Made Hazards Policies, Noise Policies.* 1986.
2. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.
3. United States Geological Survey. *Woodside 7.5-minute series quadrangle map*. 1991.
4. Roger L. Wayson, Ph.D., P.E. *National Cooperative Highway Research Program. NCHRP Synthesis 268. Relationship Between Pavement Surface Texture and Highway Traffic Noise.* 1998.
5. California Department of Transportation. *Pavement Advisory PSTPA-02: Designing Quieter Pavements.* September 6, 2005.
6. California Department of Transportation. *Typical Noise Levels, Intensity and the Decibel Scale Chart.* http://www.dot.ca.gov/hq/esc/Translab/ope/NoiseLevels.html. Accessed September 16, 2009.
7. California Department of Transportation. *Safety Manual. Chapter 13 Hearing Protection Program.* June 2008. http://www.dot.ca.gov/hq/opo/safety/safetymanual_toc.htm
8. CPWR (The Center to Protect Workers' Rights). *Construction Noise Hazard Alert.* December 29, 2003.
9. San Mateo County Ordinance Code, Title 4, Chapter 4.88 – Noise Control, Section 4.88.360.

XIII. POPULATION AND HOUSING
Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XIII(a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
XIII(b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIII(c)Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Explanation for questions a, b and c: The project neither induces population growth nor displaces housing or people. The project also does not include the construction or removal of habitable structures. The project replaces an existing vehicular roadway and bridge, that is not accessible to the public and is used strictly by District staff and emergency responders. Therefore, the project will have no affect on population growth.

XIV. PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XIV(a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire protection? Police protection? Schools? Parks? Other public facilities?	☐	☐	☐	☒

Explanation: The District's Operations Department already provides ranger patrol in the Preserve and maintenance staff to care for trails, bridges and parking areas. The District coordinates with other local agencies via mutual aid arrangements in providing public services, including police and fire protection. District Staff is responsible for enforcing District regulations and certain selected sections of California code pertaining to vandalism, bicycle helmets, and parking. The San Mateo County Sheriff's Office is involved in enforcement of all other code sections. District staff serves as a possible first responder for fire emergencies, with California Department of Forestry and Fire Protection (CAL FIRE) acting as the responsible agency for fire prevention, (i.e. within the State Responsibility Area) and suppression at Purisima Creek Redwoods Open Space Preserve. Nearby Preserves include Burleigh Murray Ranch State Park, Miramontes Ridge Open Space Preserve, and El Corte de Madera Creek Open Space Preserve. This project will have any direct or indirect affect on these other parks and preserves. Because the project will not substantially increase usage of the Preserve, no new or altered governmental facilities will be needed to provide public services to the Preserve as a result of the project.

XV. RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XV(a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
XV(b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☒	☐

Explanation for questions a and b: (Source: 1 and 2). Replacing the existing bridge will not increase the recreational use of Purisima Creek Redwood Open Space Preserve to a level that would result in a substantial physical deterioration of the Preserve, the natural resources, or the existing trail systems.

The 4,711-acre Preserve is currently open to the public and offers approximately 24 miles of mostly multiple-use trail. Preserve visitors currently park at three locations: (a) a six vehicle parking lot just adjacent to the existing bridge along Higgins Canyon Road, (b) a 22-car parking lot at the top of the Preserve along Skyline Boulevard, and (c) along a informal parking lot pullout on Skyline Boulevard. This project would not affect the desirability of parking at the nearby Higgins Canyon parking lot, as it only replaces an existing bridge and allows continued existing uses. As observed by District Ranger staff, highest visitation occurs on weekends and holidays in the summer months. The nearby parking lot is almost always full during the weekend, weekdays after normal working hours, and holidays. Due to the trail system and the subsequent dispersal of users throughout the Preserve, this increase is not expected to result in substantial impacts to the trail system or to the natural resources in the Preserve. For a discussion on bridge design and construction and the potential impacts to water quality or loss of topsoil, please refer to Section VI and Section IX.

Recreation Section Sources:

1. Midpeninsula Regional Open Space District. *Visitor Estimate Survey Project Counts completed by the Public Affairs Department*. June 25, 2007 – July 8, 2007.
2. Midpeninsula Regional Open Space District. *Visitor Counts.* 1995 through 1997.

XVI. TRANSPORTATION/TRAFFIC

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐
XVI(b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
XVI(f) Result in inadequate parking capacity?	☐	☐	☒	☐

Explanation for a, b, and f:

As explained in Section XV, replacing the bridge will not increase public visitation to the Preserve. The existing bridge is used by the public (hiking, biking, and equestrian use) and the public will be able to continue use of the new bridge. District patrol and maintenance currently use the Preserve by way of Purisima Creek Road, Higgins Canyon Road, and Highway 35. The bridge will not increase District traffic on public roads. These patrol and maintenance visits are infrequent (a maximum of seven visits per week can be assumed) and therefore the impact is considered less than significant. Additional trips during the construction period will occur as contractors, engineers, District staff, and construction equipment access the site. The surrounding area is sparsely populated and is a mix of rural resident and agricultural land uses. Vehicles are generally leaving homes along Purisima Creek, headed towards working areas. Construction related trips are headed in the opposite direction. Therefore, the impact is considered less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒

Explanation: The project has no effect on air traffic patterns.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(e) Result in inadequate emergency access?	☐	☐	☒	☐

Explanation for D and E:
Within the Preserve and trail system, motorized vehicles by the public are not allowed per District ordinance. Motor vehicle access within the Preserve will be limited to ranger patrol and maintenance vehicles, and the number of patrol vehicles accessing the Preserve would not be increased as a result of the project. The new bridge will be designed with a 50' turn radius to accommodate emergency vehicles, such as fire trucks, and infrequent heavy equipment use by District maintenance. The current bridge is inadequate and hazardous with heavy vehicles and the project will improve the access roadway and bridge for safer emergency access.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI(g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

Explanation: This project supports existing alternative modes of transportation, principally walking, biking, and equestrian use. The Preserve and the bridge itself are not open to public transportation and will not have any impact on alternative transportation. The closest public transportation is SamTrans 17 along Highway 1, 3.5 miles away.

XVII. UTILITIES AND SERVICE SYSTEMS

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVII(a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
XVII(b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

Explanation for a and b: The project does not provide water services, would not consume water, and would not generate wastewater. The project thus does not include new or increased needs for wastewater treatment or wastewater treatment facilities.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVII(c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

Explanation: (Sources: 1). The proposed bridge is located on an existing, previously disturbed area on the Preserve, which would result in minimal impact on the surrounding environment. The design minimizes runoff through a number of erosion control measures, including BMPs for road and trail construction previously approved by the RWQCB and CDFW. There are no storm water drainage facilities on site and the project does not propose any expansion of existing facilities or new facilities.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVII(d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
XVII(e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒

Explanation for d and e: The project does not provide water services, would not consume water, and would not generate wastewater.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVII(f)Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
XVII(g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

Explanation for questions f and g: (Source: 1). The demolition debris consists of rusted steel girders, which will be recycled, untreated redwood decking, which will be recycled, and bolts and other fixtures. The debris generated by the project is minimal and will comply with all federal, state, and local statues.

Utilities and Service Systems Section Sources:

1. Midpeninsula Regional Open Space District. *Regulations for Use of Midpeninsula Regional Open Space District Lands.* Adopted by Ordinance No. 93-1, July 28, 1993. Last Revised and Adopted by Ordinance No. 04-01, August 25, 2004.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVIII(a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

Explanation: As previously discussed in other sections of this document, the project (including mitigation measures incorporated into the project) would not degrade the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. The implementation of the mitigation measures set forth in this document (all of which have been incorporated into the project) would reduce any potential impacts to a less than significant level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVIII(b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐

Explanation: As previously discussed in other sections of this document, the impact analysis identifies possible future open space management projects that may produce related impacts, and then examines how the proposed project and these possible future open space management actions may potentially result in cumulative impacts. In general, the inherently low intensity uses in the Preserve and dispersed nature of the open space management program minimizes the potential for cumulative impacts, since any less than significant impact would generally be site-specific, localized, and not expected to have the potential for considerable combined cumulative impacts throughout the region. The possibility of cumulatively considerable impacts is minimized by the overall lack of disturbance to the watershed as a whole associated with open space use.

Unlike residential and economic development projects in urban or suburban areas, the District only implements minimal improvements such as parking lots, bridges, unpaved roads, and natural surface trails within its open space lands. The proposed project, along with similar land management actions by the District or other open space and recreation agencies, would tend to support regional resource protection and enhance public recreational opportunities for local and regional residents and as such have

a beneficial combined cumulative impact.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVIII(c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Explanation: The purpose of the project is to provide emergency vehicle and patrol access to portions of the Preserve. Both of these functions ensure the safety of the Preserve users are met and would provide a beneficial impact to people. There are many beneficial aspects for preserve users to open space recreation that are supported by this project. The project will not result in environmental effects that will cause substantial adverse effects on human beings.

BIOTIC ASSESSMENT AND RIPARIAN DELINEATION

PURISIMA CREEK STUDY AREA
SAN MATEO COUNTY, CALIFORNIA

JANUARY 2011

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COAST RANGE BIOLOGICAL LLC

EXECUTIVE SUMMARY

At the request of the Midpeninsula Regional Open Space District, Coast Range Biological LLC conducted a biotic assessment and riparian delineation along a reach of Purisima Creek, located along the western boundary of Purisima Creek Redwoods Open Space Preserve, southeast of Half Moon Bay in unincorporated San Mateo County, California. The proposed project involves the expansion of a parking lot and widening of an existing access road for public access to the Preserve.

No special-status plant species were observed on the study area during the January 2011 field visits, but the presence or absence of one special-status plant species, Dudley's lousewort (*Pedicularis dudleyi*), could not be determined because of the season in which the work was conducted. A spring plant survey is recommended to determine the presence or absence of Dudley's lousewort on the study area.

One special-status wildlife species, San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), was observed on the study area during the January 2011 field visits. An additional seven special-status wildlife species were considered to have a moderate potential for occurrence on the study area: California red-legged frog (*Rana draytonii*), olive-sided flycatcher (*Contopus cooperi*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus borealis*), fringed myotis (*Myotis thysanodes*) and long-legged myotis (*Myotis volans*). In addition, trees and shrubs on the study area provide nesting habitat for native bird species protected under the Migratory Bird Treaty Act and state Fish and Game Codes. Mitigation measures are recommended to address potential adverse impacts that may occur to these species as a result of the project.

Riparian Woodland meeting the LCP definition of Riparian Corridor was delineated on the study area along Purisima Creek. A disjunct stand of Red Alder Forest, meeting the LCP Riparian Corridor definition, is located south of Purisima Creek trail, >50 feet from Purisima Creek. This stand of red alder has no obvious hydrologic or topographic connection to the creek (e.g., rooted at or below top of bank), and likely represents either an area that was previously part of a broader Riparian Woodland prior to construction of the logging road (now called the Purisima Creek trail), or represents an area of natural recruitment of red alder after road construction was completed. The proposed project would impact Red Alder Forest, and a portion of the project would also take place within the 50 foot riparian buffer zone. Due to topographic (steep slopes), hydrologic (Purisima Creek), and biotic (Riparian Corridor, woodrat nests) limitations, potential locations to expand the parking lot on the study area are limited. For the project to proceed, the CCC would need to determine whether the Red Alder Forest, though it meets the LCP Riparian Corridor definition, is considered a "Sensitive Habitat," as defined in Section 7.1 of the LCP, and whether the project, with the incorporation of mitigation measures, would be allowed to encroach into the riparian buffer zone.

TABLE OF CONTENTS

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

At the request of the Midpeninsula Regional Open Space District ("District"), Coast Range Biological LLC conducted a biotic assessment and riparian delineation along a reach of Purisima Creek, located along the western boundary of Purisima Creek Redwoods Open Space Preserve ("Preserve"), southeast of Half Moon Bay in unincorporated San Mateo County, California (Figure 1). The proposed project involves the expansion of a parking lot and widening of an existing access road for public access to the Preserve. There is currently a six-car parking lot adjacent to Purisima Creek Road, which frequently fills up during peak hours, causing visitors to park along the road, resulting in safety issues related to cars and pedestrians. According to the current conceptual design, the new parking lot will accommodate 25 vehicles.

The study area for this biotic assessment, where habitats are mapped and evaluated for the potential presence of special-status biological resources, includes the proposed parking lot expansion footprint[1] ("project site") and adjacent areas extending outward a minimum of 50 feet (Figure 2). This biotic assessment addresses the potential for occurrence on the study area of special-status[2] plant and wildlife species and Riparian Corridors (as defined in the San Mateo County Local Coastal Program [LCP]). Potential significant impacts that may occur to these resources as a result of the project are identified and mitigation measures suggested to reduce impacts to less than significant levels.

2.0 METHODS

2.1 Literature Review

Prior to conducting field studies, a background literature search was conducted to determine which special-status species have potential to inhabit the study area region based on documented occurrences and range distribution (Appendix A). The primary sources for this search included the California Natural Diversity Data Base (CNDDB) (CDFG 2010), the CNPS Online Inventory (CNPS 2010), and the U.S. Fish and Wildlife Service (USFWS) (2010) records for the Half Moon Bay, Montara Mountain, San Mateo, Woodside, La Honda, and San Gregorio 7.5' USGS quadrangles[3] (the study area is in the western portion of the Woodside quad). In addition, other lists and publications were consulted, including the CDFG Special Animals list (CDFG 2009), Zeiner, et al. (1988; 1990a; 1990b), Hickman (1993), and the San Mateo County LCP.

2.2 Field Studies

Plant Ecologist Tom Mahony and Wildlife Biologist Mark Allaback conducted reconnaissance-level field studies on January 6 and 12, 2011. The study area was traversed on foot to document habitat conditions to determine the potential for occurrence of special-status biotic resources. The potential for occurrence of special-status plant and wildlife species was assessed based on the presence of necessary habitat characteristics, confirmed records from the region, and the biologist's knowledge of the target species. No focused field surveys were performed.

[1] Specific plans on the proposed road widening were not available, so this portion of the project is discussed only in general terms.

[2] Special-status species are defined here to include: (1) all plants and animals that are listed under the Federal or State Endangered Species Acts as rare, threatened or endangered; (2) all federal and state candidates for listing; (3) California Department of Fish and Game (CDFG) Species of Special Concern; (4) all plants included in Lists 1 through 4 of the California Native Plant Society (CNPS) Online Inventory (CNPS 2010); and (5) plants that qualify under the definition of "rare" in the California Environmental Quality Act (CEQA), section 15380.

[3] The initial raw species list was refined to remove species that are documented in the general region but are not expected to occur in western San Mateo County due to range limitation or extirpation, or occur in habitats obviously lacking from the study area, such as marine habitats. The remaining species were analyzed for their potential to occur on the study area (Appendix A).

Figure 1. Study area location map.

Figure 2. Habitats on the study area.

2.2.1 Special-status Species

Potential for occurrence of special-status species was classified as follows: None, Low, Moderate, High, or Present. For species with a potential for occurrence of None or Low, habitat for the species was lacking or otherwise degraded or unsuitable, and the species was considered unlikely to inhabit the study area. Species were considered to have a Moderate or High potential for occurrence if suitable habitat was present and the species was documented to occur in the surrounding region. Species were considered Present on the study area if they were observed during field work and/or documented to occur on the study area during the background literature search.

2.2.2 Riparian Corridors

Riparian Corridors[4] are defined in Section 7.7 of the LCP by the "limit of riparian vegetation (i.e. a line determined by the association of plant and animal species normally found near streams, lakes, and other bodies of freshwater: red alder, jaumea, pickleweed, big leaf maple, narrowleaf cattail, arroyo willow, broadleaf cattail, horsetail, creek dogwood, black cottonwood, and box elder). Such an area must contain at least a 50% cover of some combination of the plants listed."

Where a GPS signal was available, potential riparian vegetation was mapped in the field using a Trimble GPS unit (sub-meter accuracy). Where a GPS signal was unavailable due to topography and forest cover, field measurements and aerial photograph interpretation were used to map the riparian boundary. Field data were overlain on a digital orthophoto (obtained from the District) using ArcGIS software. Riparian vegetation was delineated based the presence of the species listed in the Riparian Corridor definition. Other habitats were drawn directly onto the orthophoto based on variation in texture, color, and structure.

3.0 PROJECT SITE AND STUDY AREA DESCRIPTION

The study area is located along the western boundary of Purisima Creek Redwoods Open Space Preserve southeast of Half Moon Bay, in unincorporated San Mateo County (Figure 1), at ~400 feet elevation (USGS 1991). The study area includes the project site (where the parking lot expansion is proposed on a terrace south of Purisima Creek) and a minimum 50-foot buffer around this area (Figures 1 and 2). Most of the project site is impacted by current or past human disturbance and consists primarily of an existing trail, overflow parking area, bathroom facilities, and Red Alder Forest. Land uses in the surrounding region, off of the study area, consist primarily of undeveloped land, grazing/agriculture, or rural residential development.

3.1 Habitats

Four habitats are present on the study area: Redwood Forest, Riparian Woodland, Red Alder Forest, and Developed/Ruderal (Figure 2). Redwood Forest, composed of the Redwood series[5], occurs primarily above the creek channel and on adjacent slopes and is dominated by a canopy of redwood (*Sequoia sempervirens*[6]), with a subcanopy of widely scattered big-leaf maple (*Acer macrophyllum*) and tanoak (*Lithocarpus densiflorus*), and an understory of native shrubs and herbs including swordfern (*Polystichum munitum*), California blackberry (*Rubus ursinus*), California hazelnut (*Corylus cornuta* var. *californica*), oceanspray (*Holodiscus discolor*), and hedge nettle (*Stachys*

[4] There are many ways to define "riparian corridors" and "riparian vegetation". Since the project takes place in the Coastal Zone, the LCP definition was used.

[5] Vegetation series nomenclature follows Sawyer and Keeler-Wolf (1995).

[6] Botanical nomenclature follows Hickman (1993).

bullata). Riparian Woodland, composed primarily of the Red alder series, occurs along Purisima Creek and is dominated by red alder (*Alnus rubra*), with occasional big-leaf maple, shining willow (*Salix lucida* ssp. *lasiandra*), creek dogwood (*Cornus sericea* ssp. *occidentalis*), red elderberry (*Sambucus racemosa*), thimbleberry (*Rubus parviflorus*), stinging nettle (*Urtica dioica*), and California blackberry. Red Alder Forest, composed of the Red alder series, is present south of Purisima Creek Trail. Red alder is the dominant species, with occasional big-leaf maple and an understory containing elements of both Redwood Forest and Riparian Woodland. Developed/Ruderal habitat includes roads, trails, parking areas, and other disturbed areas, and is composed of either bare ground or weedy, non-native species such as poison hemlock (*Conium maculatum*), English plantain (*Plantago lanceolata*), and curly dock (*Rumex crispus*).

3.2 Soils and Hydrology

Two soil types have been mapped on the study area (NRCS 2010): Butano shaly loam, very steep; and Santa Lucia loam, very steep, eroded. The Butano soil is usually found on mountain slopes and is well-drained, derived from siliceous shale, and is loam and clay loam textured in the upper 28 inches of soil profile. The Santa Lucia soil is usually found on mountain slopes and is well-drained, derived from shale, and is loam textured in the upper 24 inches of soil profile.

The principal hydrologic sources for the study area are direct precipitation, surface and sub-surface runoff from the surrounding watershed, and drainage through Purisima Creek. Purisima Creek is mapped as a USGS "blue line" stream, and drains generally westbound through the study area and eventually into the Pacific Ocean ~4 miles west of the study area (USGS 1991). The creek had 6 to 12 inches of flowing water at the time of the field visits, and has perennial hydrology.

4.0 RESULTS

4.1 Special-status Plants

Twenty-four special-status plant species are documented to occur in the study area region based on the background literature search discussed in Section 2.1. A list of these species, their status, and their typical habitats is presented in Appendix A. A search of the November 2, 2010 CNDDB GIS database found no documented occurrences[7] of special-status plant species on the study area. Two special-status plant species are documented within three miles of the study area (CDFG 2010): Santa Cruz manzanita (*Arctostaphylos andersonii*) (1.8-miles northeast) and Kings Mountain manzanita (*Arctostaphylos regismontana*) (1.8-miles northeast and 2.3-miles southeast).

No special-status plant species were observed on the study area during the field visits, but the visits occurred outside the typical blooming period of most plant species, and no focused surveys were conducted. Of the 24 special-status plants identified for the region during the background literature search, 23 are considered unlikely to inhabit the study area because it lacks suitable habitat components for the species (e.g., soil type, micro-habitat, plant community), and/or the species should have been identifiable during the field visits (e.g., shrubs, winter-blooming species), and was not observed. These species are considered absent[8] from the study area. The presence or absence of one

[7] The lack of documented occurrences does not necessarily mean that a species does not occur in an area, only that no occurrences have been reported.

[8] Since biological phenomena are complex and often poorly understood, this should be considered an "extremely low" potential for occurrence and not an absolute claim of absence. Even if species are not anticipated to occur, if any special-status plant or wildlife species were encountered during project construction, the project would be required to comply with the CCA, CEQA, and the state and federal Endangered Species Acts, as appropriate.

special-status plant species, Dudley's lousewort (*Pedicularis dudleyi*), could not be definitively determined because: (1) it might not have been identifiable in January, when the field work was conducted; (2) the study area supports some habitat components required by the species; and (3) there are documented occurrences of the species in the study area region. The species is discussed below.

Dudley's lousewort (*Pedicularis dudleyi*); Status: CNPS List 1B.2, State Rare

Dudley's lousewort is a perennial herb in the Scrophulariaceae family. It is listed as Rare by the State of California, and is on CNPS List 1B.2 (plants rare, threatened, or endangered in California and elsewhere/ fairly endangered in California). It typically occurs in maritime chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland, between 200 and 2,950 feet elevation, blooming between April and June (CNPS 2010). The nearest documented occurrence is ~13.5-miles southeast of the study area (CDFG 2010). Suitable habitat for Dudley's lousewort occurs on the study area in Redwood Forest. The field visits occurred outside the species recorded blooming period, and therefore a spring plant survey would be necessary to determine the presence or absence of Dudley's lousewort on the study area.

4.2 Special-status Wildlife

Fifteen special-status wildlife species were analyzed for their potential occurrence on the study area because they: (1) occur in habitats present in the general vicinity of the study area, and (2) have ranges that include western San Mateo County (Appendix A). A search of the November 2, 2010 CNDDB GIS database found no documented occurrence of special-status wildlife species on the study area. Two special-status wildlife species are documented within three miles of the study area: steelhead (*Oncorhynchus mykiss irideus*) (in Mills Creek, 1.8-miles north) and California red-legged frog (*Rana draytonii*) (2.4-miles southeast).

One special-status wildlife species, San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), was observed on the study area during the January 2011 field visits (Figure 2). An additional seven special-status wildlife species were considered to have a moderate potential for occurrence on the study area: California red-legged frog, olive-sided flycatcher (*Contopus cooperi*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus borealis*), fringed myotis (*Myotis thysanodes*) and long-legged myotis (*Myotis volans*). In addition, trees and shrubs on the study area provide nesting habitat for other bird species protected under the Migratory Bird Treaty Act (MBTA) and state Fish and Game Codes. These species are discussed below. The remaining special-status wildlife species analyzed are considered absent or to have a low potential to inhabit the study area, and it is therefore unlikely they would be adversely impacted by the proposed project (Appendix A). These species are not discussed further.

California Red-legged Frog (*Rana draytonii*), Federal Status: Threatened; State Status: Species of Special Concern

The California red-legged frog (CRLF) is a large (85-138 mm), nocturnal species that historically occupied much of central and southern California. The species requires still or slow-moving water during the breeding season, where it deposits large egg masses, usually attached to submerged or emergent vegetation. Breeding typically occurs between December and April, depending on annual environmental conditions and locality. Eggs require 6 to 12 days before hatching and metamorphosis occurs 3.5 to 7 months after hatching (Stebbins 2003). Following metamorphosis between July and September, post-metamorphic juveniles (metamorphs) generally do not travel far from aquatic habitats, although they will disperse in response to receding water (M. Allaback, pers. observ.).

Movements of metamorphs and adults generally begin with the first rains of the weather-year, in response to receding water or following the breeding season (Fellers and Kleeman 2007; Allaback, et al. 2010). Radio-telemetry data indicates that individuals generally engage in straight-line movements irrespective of riparian corridors and can move up to two miles (Bulger, et al. 2003; Fellers and Kleeman 2007). California red-legged frogs utilize a variety of water sources during the non-breeding season, and females are more likely than males to depart from perennial ponds shortly after depositing eggs (Fellers and Kleeman 2007). They may take refuge in small mammal burrows, leaf litter or other moist areas during periods of inactivity or whenever it is necessary to avoid desiccation (Rathbun, et al. 1993; Jennings and Hayes 1994). Occurrence of this frog has shown to be negatively correlated with presence of introduced bullfrogs (Moyle 1973; Hayes and Jennings 1986, 1988). Recent genetic studies indicate that the nominal subspecies *draytonii* and *aurora* represent separate lineages and are therefore distinct species that require taxonomic revision (Shaffer, et al. 2004).

One CRLF occurrence is documented within three miles of the study area (CDFG 2010): 2.4-miles southeast, along Tunitas Creek Road in the Purisima Creek watershed. There are no other documented CRLF occurrences within the watershed, but there are numerous other documented CRLF occurrences within 5-miles of the study area. No suitable breeding habitat is present on the study area for CRLF, but Purisima Creek and associated Riparian Woodland provides suitable summer habitat for foraging and sheltering. At least one potential breeding pond is located 0.7 miles to the southwest. Mitigation measures to address potential significant impacts to the species are included in Section 5.0.

Olive-sided Flycatcher (*Contopus cooperi*) Federal Status: Bird of Conservation Concern; State Status: Species of Special Concern

The olive-sided flycatcher ranges throughout California but is restricted primarily to the coastal and interior foothills and mountains. It inhabits woodland and forest habitats generally near edges and openings. It prefers coniferous trees but in the Bay Area region, the species also uses eucalyptus forest near the coast (Shuford 1993; Widdowson 2008). The species is quite vociferous and is often seen calling from the tops of prominent trees. It feeds on insects, especially bees and wasps, and builds a cup nest well away from the trunk of trees (Widdowson 2008). The species may depend on forest fires and other natural or man-made disturbances to create a habitat mosaic with edges and openings (Widdowson 2008).

The olive-sided flycatcher is considered to be a fairly common breeder in San Mateo County west of the crest of the Santa Cruz Mountains (Widdowson 2008). Although there are no nearby records of the species in the CNDDB, this may be due to a lack of survey effort or because observations of Species of Special Concern are often not reported. Although the study area provides potential nesting habitat, if no conifers are removed the species may be avoided, if it is present. Mitigation measures to address potential significant impacts to the species are included in Section 5.0

Saltmarsh Common Yellowthroat (*Geothlypis trichas sinuosa*), Federal Status: Bird of Conservation Concern; State Status: Species of Special Concern.

The saltmarsh (= San Francisco) common yellowthroat is a warbler that is restricted to the salt marshes of the San Francisco Bay area and coastal marshes and riparian systems from Marin County to northern Santa Cruz County. It inhabits salt, brackish and fresh water marshes and riparian corridors and nests in emergent vegetation on or near the ground or just above the water (Dunn and Garrett 1997). Tall grasses, tule patches and willow thickets provide typical breeding locations where open-cup nests are hidden (Gardali and Evens 2008). It prefers thick, continuous vegetative cover down to the water surface. It will sometimes nest in nearby upland areas adjacent to wetlands or

perennial streams. In the winter, it spreads out into the coastal marshes from San Francisco south to San Diego. The subspecies has declined as wetlands throughout its range have been drained and rivers channelized (Dunn and Garrett 1997). Currently, the known population is estimated to be roughly 1,000 to 2,000 individuals (Gardali and Evens 2008).

The nearest documented CNDDB occurrence of saltmarsh common yellowthroat is 4.5-miles southwest of the study area. Although portions of the study area provide potential habitat for the saltmarsh common yellowthroat, it is near an ecotone of non-habitat that begins with the Redwood Forest that extends from the study area east upstream into a narrow heavily forested canyon. Mitigation measures to address potential significant impacts to the species are included in Section 5.0.

Other Nesting Native Bird Species

Suitable nesting habitat for other, non-listed bird species protected under the MBTA occurs in trees and shrubs on the study area. The MBTA regulates or prohibits taking, killing, and possession of migratory bird species and their nests as listed in Title 50 Code of Federal Regulation (CFR) Section 10.13. Bird species and their nests are also protected under Sections 3515 and 3503 of the state Fish and Game Code. A potential raptor stick nest was observed at the top of a crowned redwood tree on the north side of Purisima Creek near the existing bridge (Figure 2). At least one passerine nest from 2010 was observed in the understory within the project site. Vegetation removal during the nesting season, or noise and other disturbance during construction, could adversely impact nesting bird species on the study area, should they be present, potentially resulting in nest destruction, abandonment, or failure. Mitigation measures to address potential significant impacts to bird species are included in Section 5.0.

Pallid Bat (*Antrozous pallidus*), Federal Status: None, State Status: Species of Special Concern, Western Bat Working Group: High Priority

The pallid bat inhabits a variety of arid habitats including grassland, scrub and woodlands (Hermanson and O'Shea 1983). It is a year-round resident in central California, where it is usually associated with oak woodland. Daytime roosts are generally in trees but also occur in rock outcrops and mines. Nocturnal roosts are often under bridges and in rock outcrops. Breeding takes place in the winter, and ovulation is delayed until environmental conditions are appropriate in the spring. One or two young are born in May or June. Maternal colonies generally number less than 100 individuals. Pallid bats feed on insects and arachnids, including Jerusalem crickets, scorpions and beetles, which are often taken on the ground. The species is very sensitive to disturbance of roost sites. Pallid bats are not known to migrate, and winter hibernaclea are often close to summer roosts.

The nearest documented CNDDB occurrence of pallid bat is 5.5-miles east of the study area. Appropriate daytime roosting habitat is present in trees on the study area, and the bridge over Purisima Creek may provide the appropriate structure for nocturnal roosts.

Western Red Bat (*Lasiurus blossevillii*), Federal Status: None, State Status: Species of Special Concern, Western Bat Working Group: High Priority

The western red bat is widely distributed in the western United States, Central America and South America. *Lasiurus blossevillii* formerly was included in *Lasiurus borealis*, but recent genetic work has demonstrated that the two represent distinct species (Morales and Bikham 1995; Baker, et al. 2003). The species roosts primarily in the foliage of trees and shrubs and is closely associated with riparian habitats (Shump and Shump 1982). It feeds primarily on insects, which are taken in flight or while foraging on the ground. Breeding occurs in late summer, while fertilization is delayed until the

spring (Shump and Shump 1982). It appears that red bats in California do not migrate out of the state, although there may be seasonal movements (Cryan 2003). Loss of riparian habitat has been implicated in the decline of this species.

There are no records in the CNDDB for western red bat within five miles of the study area. However, appropriate roosting habitat is present along Purisima Creek.

Fringed Myotis (*Myotis thysanodes*), Federal Status: None, State Status: None, Western Bat Working Group: High Priority

The fringed myotis is found throughout much of the western United States and Mexico from sea level up to 7,000 feet in elevation. It inhabits a variety of habitats including desert scrub, oak woodland and coniferous forest (O'Farrell and Studier 1980). Day roosts include rock crevices and trees, as well as mines and buildings. Birth of a single young occurs in May or June. Maternity roosts can be large, numbering up to 400 individuals (O'Farrell and Studier 1980). The species feeds primarily on beetles. It is known to migrate but such movements are poorly understood. Although widely distributed, it is uncommon to rare throughout its range. The species is highly sensitive to disturbance by humans.

There are no records in the CNDDB for fringed myotis within five miles of the study area. However, appropriate roosting habitat is present in the woodlands within the study area.

Long-legged Myotis (*Myotis volans*), Federal Status: None, State Status: None, Western Bat Working Group: High Priority

The long-legged myotis is found throughout much of California with the exception of the low desert regions (Warner and Czaplewski 1984; Hoffmeister 1986). It is primarily associated with coniferous forests, although it may be found in riparian and desert habitats as well (Warner and Czaplewski 1984). Day roosts are generally in hollow trees, rock crevices, mines and buildings. A single young is produced each year in June or July. Maternity roosts can be large, numbering in the hundreds. Long-legged myotis hibernate in California, and there are likely seasonal movements between summer and winter roosts. The species feeds primarily on moths, but will also eat beetles, flies and termites (Warner and Czaplewski 1984). Its population status is poorly understood.

There are no records in the CNDDB for long-legged myotis within five miles of the study area. However, appropriate roosting habitat is present in the woodlands within the study area.

San Francisco Dusky-footed Woodrat (*Neotoma fuscipes annectens*), Federal Status: None; State Status: Species of Special Concern.

The San Francisco dusky-footed woodrat occurs from San Francisco Bay south through the Santa Cruz Mountains to Elkhorn Slough and inland to the Diablo Range (Hall 1981). The species is most common in riparian, oak woodland and scrub habitats (Carraway and Verts 1991). It typically constructs houses, which are often referred to as nests or middens, out of sticks and other debris. They are constructed on the ground, in rocky outcrops or in trees and are often found in concentrations along riparian corridors. The species can also live in hollows in logs or trees and colonize man-made structures that provide appropriate protection from predators. Houses are often reused by successive generations and some can grow to be six feet or more in height, while others are well-hidden and easily overlooked. Houses are used for rearing young, protection from predators, resting, food storage, thermal protection and social interaction (Carraway and Verts 1991).

Five woodrat houses were observed on the edge of Riparian Woodland habitat, outside of the project site footprint as proposed (Figure 2). Mitigation measures to address potential significant impacts to the species are included in Section 5.0.

4.3 Riparian Corridor

Riparian Woodland meeting the LCP definition of Riparian Corridor was delineated along Purisima Creek on the study area (Figure 2). The Riparian Woodland is dominated by red alder, with occasional big-leaf maple, shining willow, creek dogwood, red elderberry, stinging nettle, and California blackberry. A disjunct stand of red alder, meeting the LCP Riparian Corridor definition, is located south of Purisima Creek trail, >50 feet from Purisima Creek (Figure 2). This stand of red alder has no obvious hydrologic or topographic connection to the creek (e.g., rooted at or below top of bank), and likely represents either an area that was previously part of a broader Riparian Woodland prior to construction of the logging road (now called the Purisima Creek trail), or represents an area of natural recruitment of red alder after road construction was completed. This area meets the LCP Riparian Corridor definition based on the presence of >50 percent cover of red alder, but due to the intervening disturbed habitat and distance from Purisima Creek, this area lacks riparian functions and values of the nearby Riparian Woodland adjacent to Purisima Creek, which provides ecosystem services such as: (1) creek shading and habitat buffering; (2) erosion control at or below top of bank; (3) direct biomass inputs to the creek; and (4) habitat structures (e.g., roots, snags, coarse woody debris) for stream dependent wildlife.

The proposed project would primarily impact Red Alder Forest and Developed/Ruderal habitats, along with smaller areas of Redwood Forest[9] related primarily to road widening. However, a portion of the project would also take place within the 50 foot riparian buffer zone (Figure 2). According to Section 7.11 (a) of the LCP: *"On both sides of riparian corridors, from the "limit of riparian vegetation" extend buffer zones 50 feet outward for perennial streams and 30 feet outward for intermittent streams."* Since Purisima Creek is a perennial stream, a 50 foot buffer would apply.

From an ecological point of view, mitigation measures, such as planting native riparian vegetation adjacent to the existing riparian boundary, particularly in Ruderal habitat along the southwestern boundary of the existing Riparian Corridor, could offset impacts to Red Alder Forest and riparian buffer zone encroachment and improve the ecological functions and values of the existing Riparian Corridor. Much of the existing riparian buffer zone in the vicinity of the proposed project is heavily disturbed, devoid of vegetation, and subject to frequent human use (existing trail, bathroom, and overflow parking area), and therefore provides generally low riparian functions and values. Riparian planting could improve the habitat value of this area by: (1) improving structural complexity and species diversity in the disturbed edges of the existing Riparian Corridor; (2) filling in gaps and expanding the acreage of Riparian Woodland with direct connectivity to the creek; and (3) screening the existing Riparian Corridor and woodrat nests from disturbance associated with the adjacent trail, overflow parking area, and bathroom facilities.

Though riparian planting could mitigate ecological impacts associated with the proposed project, the project would take place within the riparian buffer zone and an area that meets the LCP Riparian Corridor definition, and would not fall within the permitted uses for riparian corridors and buffer zones listed in the LCP.

Section 7.9 of the LCP identifies permitted uses in riparian corridors:

[9] Habitats in relation to the project site in Figure 2 should be used for general planning purposes only. For precise measurements, the project site would need to be staked on the ground and surveyed in relation to the riparian boundary.

a. Within corridors, permit only the following uses: (1) education and research, (2) consumptive uses provided for in the Fish and Game Code and Title 14 of the California Administrative Code, (3) fish and wildlife management activities, (4) trails and scenic overlooks on public land(s), and (5) necessary water supply projects.

b. When no feasible or practicable alternative exists, permit the following uses: (1) stream dependent aquaculture, provided that non-stream dependent facilities locate outside of the corridor, (2) flood control projects, including selective removal of riparian vegetation, where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, (3) bridges when supports are not in significant conflict with corridor resources, (4) pipelines, (5) repair or maintenance of roadways or road crossings, (6) logging operations which are limited to temporary skid trails, stream crossings, roads and landings in accordance with State and County timber harvesting regulations, and (7) agricultural uses, provided no existing riparian vegetation is removed, and no soil is allowed to enter stream channels.

Section 7.12 of the LCP identifies permitted uses in riparian buffer zones:

> Within buffer zones, permit only the following uses: (1) uses permitted in riparian corridors, (2) residential uses on existing legal building sites, set back 20 feet from the limit of riparian vegetation, only if no feasible alternative exists, and only if no other building site on the parcel exists, (3) in Planned Agricultural, Resource Management, and Timber Preserve Districts, residential structures or impervious surfaces only if no feasible alternative exists, (4) crop growing and grazing consistent with Policy 7.9, (5) timbering in "streamside corridors" as defined and controlled by State and County regulations for timber harvesting, and (6) no new residential parcels shall be created whose only building site is in the buffer area.

Due to topographic (steep slopes), hydrologic (Purisima Creek), and biotic (Riparian Corridor, woodrat nests) limitations, potential locations to expand the parking lot on the study area are limited. For the project to proceed, the CCC would need to determine whether the Red Alder Forest, though it meets the LCP Riparian Corridor definition, is considered a "Sensitive Habitat," as defined in Section 7.1 of the LCP, and whether the project, with the incorporation of mitigation measures, would be allowed to encroach into the riparian buffer zone.

5.0 POTENTIAL BIOLOGICAL IMPACTS AND PROPOSED MITIGATION MEASURES

The proposed project involves the expansion of a parking lot and widening of an existing access road for public access to the Preserve. The following measures are recommended to mitigate any potentially significant impacts to special-status biotic resources on the study area as a result of the proposed project.

Potential Significant Impact 1: Portions of the project will take place within Red Alder Forest habitat, which meets the LCP Riparian Corridor definition, as well as within the 50 foot riparian buffer zone, and would not fall within the permitted uses for riparian corridors and buffer zones.

Mitigation Measure 1: The CCC should be contacted to determine whether the Red Alder Forest, though it meets the LCP Riparian Corridor definition, is considered a Sensitive Habitat, as defined in Section 7.1 of the LCP, and whether the project benefits (e.g., increased public access to the Preserve and improved safety by reducing the number of vehicles parking and pedestrians walking along the

road), along with mitigation measures such as native riparian plantings, are sufficient to allow for buffer zone encroachment. A riparian planting plan should be prepared to mitigate impacts associated with the proposed project.

Potential Significant Impact 2: Portions of the study area support suitable habitat for Dudley's lousewort. If Dudley's lousewort is present on the study area, individuals could be adversely impacted during construction activities, including mortality of individuals by crushing or habitat destruction.

Mitigation Measure 2: A focused plant survey shall be conducted for Dudley's lousewort on the study area during the April-June blooming period. If the species is not observed during the focused survey, no additional mitigation measures for special-status plants are necessary. If observed, the population shall be mapped and a suitable buffer zone (based on species requirements, proximity to the work area, and other site specific factors) established, along with other protection measures, such as fencing installed around the population to protect it from project impacts. If the population can't be avoided by the proposed project, impacts to the population shall be quantified and the regulatory agencies contacted for guidance.

Potential Significant Impact 3: The study area does not support breeding habitat for CRLF. However, foraging, sheltering, and dispersal habitat for CRLF occurs along Purisima Creek and the associated Riparian Woodland. The proximity of the project site to the creek and Riparian Woodland could result in a CRLF occurring on the project site, potentially resulting in direct mortality during construction.

Mitigation Measure 3a: Within two weeks prior to the start of construction, a worker education program shall be presented at the project site by a qualified biologist. Associated written material will be distributed. It shall be the onsite foreman's responsibility to ensure that all construction personnel and subcontractors receive a copy of the education program. The education program shall include a description of the CRLF and its habitat, the general provisions of the Endangered Species Act, the necessity of adhering to the Act to avoid penalty, and measures implemented to avoid affecting CRLF specific to the project and the work boundaries of the project.

Mitigation Measure 3b: A qualified biologist shall monitor the initial removal of vegetation on the project site. Immediately prior to vegetation removal, the qualified biologist shall survey the work area for CRLF. If any CRLF are observed in the work area, work shall cease and the USFWS and CDFG contacted for guidance. After all vegetation and other debris that may provide cover for CRLF is removed, a qualified biologist shall inspect the work area daily prior to the start of construction. If no CRLF are observed, work may proceed without a qualified biologist present although a biological monitor shall be designated. If a CRLF is observed at anytime during the construction, work shall cease and CDFG and USFWS contacted for guidance.

Potential Significant Impact 4: Nesting habitat is present for olive-sided flycatcher, saltmarsh common yellowthroat, and other native birds in trees and shrubs on the project site and surrounding study area. Vegetation removal, as well as noise and other disturbance during construction, could adversely impact nesting bird species, if present, potentially resulting in nest destruction or abandonment.

Mitigation Measure 4: Vegetation removal shall be limited to the minimum necessary to conduct the project. If feasible, project construction shall take place outside of the breeding bird season (the breeding bird season is generally February 15 to August 15). If work must be conducted during the breeding season, a qualified biologist shall conduct a pre-construction breeding bird survey

throughout areas of suitable habitat within 300 feet of the project site within 30 days prior to the onset of any construction activity. If bird nests are observed, an appropriate buffer zone shall be established around all active nests to protect nesting adults and their young from construction disturbance. Buffer zones shall be determined by a qualified biologist in consultation with CDFG based on the site conditions and the species potentially impacted. Work within the buffer zone shall be postponed until all the young are fledged, as determined by a qualified biologist.

Potential Significant Impact 5: Five San Francisco dusky-footed woodrat houses were observed on the study area. The woodrat houses are located outside of the project site boundary, but mitigation measures are recommended due to the proximity of woodrat houses to the disturbance envelope.

Mitigation Measure 5: Within 30 days prior to project construction, a qualified biologist shall inspect the work area and adjacent areas (including woodpiles or other man-made structures that woodrats could potentially colonize) within 50 feet of the project disturbance envelope for woodrat houses. An exclusion zone shall be erected around the existing woodrat houses (located outside of the project disturbance envelope) using a temporary fence that does not inhibit the natural movements of wildlife (such as steel T-posts and a single strand of yellow rope or similar materials). If new woodrat houses are located that will be affected by construction and relocation is necessary, CCC and CDFG shall be contacted for guidance. Approval to relocate shall be acquired from the CCC and CDFG. To reduce impacts to young, relocation shall take place after July 1 and must be completed before the rainy season. Relocation may also happen during the month of March but only during a 3-day period when no rain forecast and only if night temperatures are above 40 degrees Fahrenheit.

Potential Significant Impact 6: Potential roosting habitat for pallid bat, western red bat, fringed myotis, and long-legged myotis occurs in mature trees and snags on the study area, and possibly under the bridge that spans Purisima Creek. Roost destruction, or work in close proximity to roost sites, could result in adverse impacts to special-status bat species.

Mitigation Measure 6: If mature trees or snags will be removed during the bat breeding season (April 1 through August 31), a qualified bat biologist shall inspect trees for potential roost sites. If no potential roost sites are found, no additional mitigation is necessary. If bat roosts are found, direct disturbance to the roost shall be avoided during the breeding season.

The conclusions of this biotic assessment reflect conditions observed at the time of the field visits and the biologist's interpretation of those conditions. Government regulatory agencies make the final determination regarding biological resource issues on the project site.

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Appendix A. Special-status species documented to occur in the study area region

List compiled from searches of the CNDDB (CDFG 2010), CNPS Online Inventory (CNPS 2010), and USFWS (2010) records for the Half Moon Bay, Montara Mountain, San Mateo, Woodside, La Honda, and San Gregorio 7.5' USGS quadrangles, the San Mateo County LCP, CDFG Special Animals List (2009), and other publications (Zeiner et al. 1988, 1990a). This list has not been reviewed by the regulatory agencies.

Species	Status	Typical Habitat	Potential for Occurrence on Study Area
PLANTS			
Allium peninsulare var. *franciscanum* Franciscan onion	List 1B.2	Cismontane woodland, valley and foothill grassland (clay, often on serpentine), dry hillsides, 100-300 m. Blooms May-June.	**Low.** No suitable habitat present on the study area.
Arctostaphylos andersonii Santa Cruz manzanita	List 1B.2	Broadleafed upland forest, chaparral, North Coast coniferous forest (openings, edges), 60-730 m. Blooms November-April.	**None.** No manzanita observed on the study area.
Arctostaphylos montaraensis Montara manzanita	List 1B.2	Chaparral, coastal scrub, 150 to 500 m. Blooms January-March.	**None.** No manzanita observed on the study area.
Arctostaphylos regismontana Kings Mountain manzanita	List 1B.2	Broadleafed upland forest, chaparral, North Coast coniferous forest, 305-730 m. Blooms January-April.	**None.** No manzanita observed on the study area.
Astragalus pycnostachyus var. *pycnostachyus* coastal marsh milk-vetch	List 1B.2	Coastal dunes (mesic), coastal scrub, marshes and swamps (coastal salt, streamsides), 0-30 m. Blooms April-October.	**Low.** No suitable wetland habitat present on the study area.
Cirsium andrewsii Franciscan thistle	List 1B.2	Broadleafed upland forest, coastal bluff scrub, coastal prairie (sometimes serpentinite seeps), 0-150 m. Blooms March-July.	**Low.** No suitable habitat present on the study area.
Collinsia multicolor San Francisco collinsia	List 1B.2	Closed-cone coniferous forest, coastal scrub (sometimes serpentinite), 30-250 m. Blooms March-May.	**Low.** No suitable plant communities present on the study area.
Dirca occidentalis western leatherwood	List 1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, North Coast coniferous forest, riparian forest and woodland. Usually on brushy slopes, mesic sites in mixed evergreen and foothill woodland communities, 30-550 m. Deciduous shrub, blooms January-April.	**None.** Suitable habitat present in Riparian Woodland, but field visits occurred during species blooming period and species wasn't observed.
Eriophyllum latilobum San Mateo wooly sunflower	FE, SE, List 1B.1	Cismontane woodland (serpentine, often on roadcuts), 45-150 m. Blooms May-June.	**None.** No serpentine habitat present on the study area. Species not observed.
Fritillaria liliacea	List 1B.2	Cismontane woodland, coastal prairie, coastal scrub,	**Low.** No suitable habitat present on the study area.

Species	Status	Typical Habitat	Potential for Occurrence on Study Area
fragrant fritillary		valley and foothill grassland (often serpentinite), 3-410 m. Blooms February-April.	
Horkelia cuneata ssp. *sericea* Kellogg's horkelia	List 1B.1	Closed-cone coniferous forest, chaparral, coastal dunes, old sand hills, coastal scrub (sandy or gravelly openings), 10-200 m. Blooms April-September.	**Low.** No suitable habitat present on the study area.
Lupinus eximius San Mateo tree lupine (=Davy's bush lupine)	List 3.2	Chaparral, coastal scrub, 90-550 m. Blooms April-July.	**None.** No suitable habitat present on the study area. Species not observed.
Malacothamnus aboriginum Indian Valley bush mallow	List 1B.2	Chaparral, cismontane woodland (rocky, granitic, often in burned areas), 150-1,700 m. Blooms April-October.	**None.** No suitable habitat present on the study area. Species should've been identifiable and was not observed.
Malacothamnus arcuatus arcuate bush mallow	List 1B.2	Chaparral, cismontane woodland, 15-355 m. Blooms April-September.	**None.** No suitable habitat present on the study area. Species should've been identifiable and was not observed.
Malacothamnus davidsonii Davidson's bush-mallow	List 1B.2	Chaparral, cismontane woodland, coastal scrub, riparian woodland, 185-855 m. Blooms June-January.	**None.** Out of elevational range. Species should've been identifiable and was not observed.
Malacothamnus hallii Hall's bush mallow	List 1B.2	Chaparral, coastal scrub, 10-760 m. Blooms May-September.	**None.** No suitable habitat present on the study area. Species should've been identifiable and was not observed.
Microseris paludosa marsh microseris	List 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland, 5-300 m. Blooms April-June.	**None.** No suitable habitat present on the study area.
Monolopia gracilens woodland woollythreads	List 1B.2	Broadleafed upland forest openings, chaparral openings, cismontane woodland, North Coast coniferous forest openings, valley and foothill grassland (serpentine), 100-1,200 m. Blooms March-July.	**Low.** Some habitat components present but study area lacks open areas and serpentine soils.
Pedicularis dudleyi Dudley's lousewort	List 1B.2, SR	Chaparral (maritime), cismontane woodland, North Coast coniferous forest, valley and foothill grassland, 60 to 900 m. Blooms April-June.	**Moderate.** Suitable habitat present in Redwood Forest.
Plagiobothrys chorisianus var. *chorisianus* Choris's popcorn-flower	List 1B.2	Chaparral, coastal prairie, coastal scrub (mesic), 15-100 m. Blooms March-June.	**None.** No suitable habitat present on the study area.
Polemonium carneum Oregon polemonium	List 2.2	Coastal prairie, coastal scrub, lower montane coniferous forest, moist to dry, open areas, 0-1,830 m. Blooms April-September.	**Low.** Some habitat components present but study area lacks open areas and CNDDB records date from early 1900's.

Species	Status	Typical Habitat	Potential for Occurrence on Study Area
Potentilla hickmanii Hickman's cinquefoil	FE, SE, List 1B.1	Coastal bluff scrub, closed-cone coniferous forest, meadows and seeps (vernally mesic), marshes and swamps (freshwater), 10-135 m. Blooms April-August.	**Low.** No suitable habitat present on the study area.
Silene verecunda ssp. *verecunda* San Francisco campion	List 1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland (sandy), 30-645 m. Blooms March-June (sometimes into August).	**Low.** No suitable habitat present on the study area.
Stebbinsoseris decipiens Santa Cruz microseris	List 1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland (open areas, sometimes serpentinite), 10-500 m. Blooms April-May.	**Low.** Some habitat components present but study area lacks open areas and serpentine soils.
WILDLIFE			
Invertebrates			
Danaus plexippus monarch butterfly	Winter roosts sensitive (CDFG)	Winter roost sites extend along the coast from northern Mendocino to Baja. Roosts in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	**Low.** Typical tree species used for roosting not present on the study area.
Fishes			
Oncorhynchus mykiss irideus steelhead – central California coast DPS	FT	From Russian River south to Soquel Creek and to, but not including, the Pajaro River. Also includes San Francisco and San Pablo Bay Basins.	**None.** Downstream barriers (30 foot waterfall at Pacific Ocean) prevent migratory fish passage.
Amphibians			
Rana draytonii California red-legged frog	FT, SSC	Breeds in semi-permanent and perennial water sources often with dense, shrubby or emergent riparian vegetation including stock ponds and marshes; uses a variety of wetland habitats including streams during the summer months.	**Moderate.** Suitable foraging and sheltering habitat present along Purisima Creek and adjacent Riparian Woodland.
Reptiles			
Emys marmorata western pond turtle	SSC	Inhabits permanent or nearly permanent bodies of water in many habitat types below 6000 ft. elevation. Typically nests in grassy, open habitat.	**Low.** No nesting habitat present, and narrow canyon does not provide quality aquatic habitat.
Thamnophis sirtalis tetrataenia San Francisco garter snake	FE, SE, FP	Vicinity of freshwater marshes, ponds, and slow moving streams in San Mateo and extreme northern Santa Cruz Counties. Prefers dense wetland cover that supports ranid frog prey and adjacent uplands with open scrub areas	**Low.** Some aquatic habitat components present, but dense forest cover, lack of significant wetland cover, and fast moving stream make presence unlikely.

Species	Status	Typical Habitat	Potential for Occurrence on Study Area
Birds			
Brachyramphus marmoratus marbled murrelet	FT, SE	Nests in coastal forests from Eureka to Oregon border and from Half Moon Bay to Santa Cruz. Nests in old growth redwood-dominated forests, often in Douglas-fir, up to six miles inland.	**Low.** No old growth redwood present on study area, and mature redwoods appear to lack suitable large limbs for nesting.
Elanus leucurus (nesting) white-tailed kite	FP	Open grassland, meadows, or marshes, for foraging, close to isolated, dense-topped trees for nesting and perching.	**Low.** Narrow canyon and lack of nearby foraging habitat make nesting unlikely on the study area.
Contopus cooperi olive-sided flycatcher	BCC, SSC	Nests primarily in coniferous forests with open canopy; nests in Eucalyptus forest along coast	**Moderate**. Potential nesting habitat in or near study area.
Dendroica petechia brewsteri(nesting) yellow warbler	SSC	Nests in riparian areas that typically support willows with one or more larger species such as cottonwoods, aspens, sycamores, and alders.	**Low.** Study area lacks typical vegetation cover for nesting.
Geothlypis trichas sinuosa saltmarsh common yellowthroat	BCC, SSC	Fresh and saltwater marshes. Requires thick, continuous cover down to water surface for foraging; nests in tall grasses, tule patches, willows and occasionally in scrub near riparian zones.	**Moderate.** Potential nesting habitat in or near study area.
Mammals			
Antrozous pallidus pallid bat	SSC, WBWG	Roosts in caves, trees and buildings; forages in variety of habitats.	**Moderate.** Suitable habitat present in mature trees with cavities.
Lasiurus borealis western red bat	SSC, WBWG	Roosts in foliage of trees and shrubs in riparian habitats.	**Moderate.** Suitable habitat present in Riparian Woodland.
Myotis thysanodes fringed myotis	WBWG	In a wide variety of habitats, optimal are pinyon-juniper, valley and foothill hardwood and hardwood conifer. Uses caves, mines, buildings, or crevices for maternity colonies and roosts.	**Moderate.** Suitable habitat present in mature trees with cavities.
Myotis volans long-legged myotis	WBWG	Roosts in trees, rock crevices, mines and buildings	**Moderate.** Suitable habitat present in mature trees with cavities.
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	SSC	Forest habitats of moderate canopy and moderate to dense understory. Also in chaparral habitats. Constructs houses of shredded grass, leaves, and other material.	**Present.** Five woodrat nests observed on study area in Riparian Woodland.

Species	Status	Typical Habitat	Potential for Occurrence on Study Area
Key to Status:			
BCC	Federal Bird of Conservation Concern		
FE	Federal Endangered		
FT	Federal Threatened		
SE	State Endangered		
ST	State Threatened		
SSC	California Department of Fish and Game Species of Special Concern		
FP	California Department of Fish and Game Fully Protected Species		
WBWG	Western Bat Working Group: High Priority Species		
List 1B	CNPS list of plants rare, threatened, or endangered in California and elsewhere		
List 2	CNPS list of plants rare, threatened, or endangered in California but more common elsewhere		
List 3	CNPS list of plants for which more information is needed; a review list		
.1/.2/.3	Seriously endangered in California/Fairly endangered in California/ Not very endangered in California		

Harkins Bridge Geotechnical Investigation Report

Prepared for:

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Open Space District
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Submitted by:

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July 2014

Harkins Bridge

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July 2014

TABLE OF CONTENTS

INTRODUCTION

This report presents result of the Geotechnical Investigation for the replacement bridge at Purisima Creek in the Purisima Creek Redwoods Open Space Preserve in San Mateo County, California. This investigation included review of geologic, soils, and seismic maps of the region and site vicinity, a subsurface exploration including the drilling, logging, and sampling of four boreholes completed by Cenozoic Exploration using a Simco 2400 SK-1 drilling rig and an auxiliary mobile limited access unit, laboratory soils testing, engineering analysis and report preparation.

REGIONAL SEISMICITY

The Project site lies in the tectonically active Coast Ranges Geomorphic Province of Northern California. The geologic and geomorphic structure of the northwest trending ridges and valleys in the region, including the Santa Cruz Mountains, Marin Headlands, the Hamilton-Diablo Range, and San Francisco Bay, are controlled by active tectonism along the boundary between the North American and Pacific Tectonic Plates, defined by the San Andreas Fault System. Regional faults have predominantly right-lateral strike-slip (horizontal) movement, with lesser dip-slip (vertical) components of displacement. Horizontal and vertical movement is distributed on the various fault strands within a fault zone. Throughout geologic time the fault strands experiencing active deformation change in response to regional shifts in stress and strain from plate motions.

The nearest known active fault is the San Andreas fault, located approximately 4 miles to the northeast. Other nearby active faults include the San Gregorio fault located approximately 7 miles to the southwest, the Seal Cove fault located approximately 8 miles to the northwest, the Hayward fault approximately 24 miles east-northeast and the Calaveras fault located approximately 26 miles to the east-northeast (CDMG 1994)[1]. A listing of active earthquake faults located in the project vicinity is presented in **Table 1,** on the following page.

Seismicity of the Project region has resulted in several major earthquakes during the historic period, including the 1868 Hayward Earthquake, the 1906 San Francisco Earthquake, and most recently, the 1989 Loma Prieta Earthquake. Given this history, it is likely that major earthquakes will occur in the region in the future.

1 California Division of Mines and Geology, 1994, Fault Activity Map of California and Adjacent Areas, CDMG Geologic Data Map No. 6.

Table 1. Active Earthquake Faults in Project Vicinity

Fault Name	Distance from Project Site (mi.)	Direction	Last Surface Rupture	Status	Maximum Characteristic Moment Magnitude[2]
San Andreas	4	NE	Historic	Active	7.9
San Gregorio	7	SW	Holocene	Active	6.9
Seal Cove	8	NW	Holocene	Active	6.7
Hayward	24	E/NE	Historic	Active	6.9
Calaveras	26	E/NE	Historic	Active	6.9

REGIONAL GEOLOGY

The regional geology of the area is characterized by northwest trending mountain ranges and valleys oriented sub-parallel to faults of the San Andreas Fault System. In the San Francisco Bay area west of the San Andreas fault, regional geology is dominated by the Salinian Block granitic basement and overlying sedimentary rocks of Mesozoic and Cenozoic age.

Bedrock outcrops in the hills surrounding the site consist of the Vaqueros Formation (lower Miocene and Oligocene), arkosic sandstones, mudstone and shale, the Mindego Basalt (Miocene and/or Oligocene), volcanic basalt and tuffs, and the Lambert Shale (Oligocene and lower Miocene), mudstone, siltstone and claystone with minor chert, sandstone, and dolomite. West of the site, the Purisima Formation (Pliocene and Upper Miocene), sandstone, siltstone and mudstone, is exposed in the hills and in road cuts. East of the site along the mountain ridge, the Whiskey Hill Formation (middle and lower Eocene), including arkosic sandstone, silty claystone, glauconitic sandstone, and tuffaceous siltstone is exposed[3].

SITE GEOLOGY

The geologic map of San Mateo County shows the site vicinity as underlain by bedrock of the Vaqueros Formation, the Mindego Basalt and the Lambert Shale. A portion of the map representing the project site and vicinity is presented as **Sheet 1.** In our Field Investigation, as described below, we encountered alluvial soils associated with the Purisima Creek valley and bedrock consisting of arkosic sandstone, likely of the Vaqueros Formation. Gravels within the alluvial soils included sandstone, siltstone, shale, basalt and volcanic tuff.

SOIL SURVEY AND SITE SOILS

According to the USDA Soil Survey of San Mateo County, California[4], the site is underlain by the Butano shaly loam. In boreholes completed at the site, alluvial soils included clayey sand

2 2007 Working Group on California Earthquake Probabilities (WGCEP). Uniform California Earthquake Rupture Forecast, Version 2. USGS Open File Report 2007-1437, CGS Special Report 20, 2008.
3 US Geological Survey, Geology of the Onshore Part of San Mateo County, California, Open-File Report 98-137
4 US Department of Agriculture, xxxx, Soil Survey of San Mateo County, California

with gravel and silty clay overlying sandstone bedrock at depths of approximately 9.5 to 11 feet BGS.

PRIMARY SEISMIC HAZARDS

Fault Rupture

Fault rupture is a seismic hazard that affects structures situated above an active fault. The hazard from fault rupture is the movement of the ground surface along a fault. Typically, this movement takes place during the short time of an earthquake, but can also occur slowly over many years in a process known as fault creep. As shown on the Earthquake Fault Zone (EFZ) map of the Woodside Quadrangle[5], the project site does not lie within an Alquist-Priolo Earthquake Fault Zone Boundary. The nearest Alquist-Priolo Earthquake Fault Zone Boundary to the site is for the San Andreas fault and is located approximately 5 miles northeast of the project site.

SECONDARY SEISMIC HAZARDS

Ground Shaking

Strong ground, or seismic, shaking is a major hazard in the San Francisco Bay Region. The severity of ground shaking at any location depends on several variables such as earthquake magnitude, epicenter distance, local bedrock geology, thickness and seismic response of soil and sediment materials, ground water conditions, and topographic relief.

The California Geological Survey has developed a Probabilistic Seismic Hazards Assessment Program where probabilities for estimated peak ground acceleration are given for any location within the State. The estimates of the peak ground acceleration at the project site are approximately 69% of the acceleration due to gravity, with a 10% chance of being exceeded in 50 years[6]. According to maps developed by the Association of Bay Area Governments (ABAG)[7], violent ground shaking (Modified Mercalli Intensity- MMI- Level IX) is possible in response to a large earthquake along the San Andreas fault. A major earthquake on the San Gregorio fault is expected to produce very strong ground shaking, MMI VIII on the site.

Seismically Induced Ground Failure

Seismically induced ground failure refers to a loss of ground strength and/or cohesion as a result of seismically induced ground shaking (generated by an earthquake). There are multiple types of ground failure hazards, including liquefaction, differential settlement, lurch cracking, lateral spreading and seismically induced landslides. Seismically induced ground failure could also result in landsliding on the adjacent steeply sloping areas resulting in landslide deposition in the

5 California Division of Mines and Geology, 2000, Digital Images of Alquist-Priolo Earthquake Fault Zone Map of the Richmond Quadrangle, California, 1982, 1:24,000.
6 California Geological Survey, 1996, Probabilistic Seismic Hazard Assessment for the State of California
7 Association of Bay Area Governments, 2007, Earthquake Ground Shaking Scenario Maps

creek valley. Large landslides could potentially cause changes to the drainage patterns within the creek.

SLOPE INSTABILITY AND LANDSLIDES

The project site is a creek valley located adjacent to moderately to steeply sloping areas. The slopes in the area vary from 30 to 60 percent. Creek banks vary from 30 to 90 percent in steepness, with local instabilities caused by erosional forces in the stream and by the falling of trees in wind storms. These banks are subject to erosional and scour forces during storm events. Bank stability could also be affected by earthquake induced ground shaking resulting in bank failures. Based on potential for bank instability along Purisima Creek, the abutments for the new bridge should be protected from scour and shallow bank instabilities. In addition, following removal of the existing Harkins Bridge, the disturbed stream banks should be protected to prevent scour and should be planted with appropriate native vegetation to provide long term stability and riparian habitat.

EXPANSIVE SOILS

Expansive soils are those that shrink and swell in response to changes in moisture content. Native soils on the site consist predominantly of clayey sand and sandy lean clay soils with a low to moderate expansion potential. The site is generally susceptible to low to moderate soil expansion due to soil moisture fluctuations. However, within a redwood forest environment moisture fluctuations seasonally are not as extreme as in open, non-coastal areas. Facility improvements at the site should be designed to resist the effects of soil heave and settlement in response to seasonal moisture fluctuations in underlying soils, in areas where moisture fluctuations are expected.

FIELD INVESTIGATION

Questa Engineering performed a subsurface investigation including the drilling, logging and sampling of four boreholes on May 21, 2014. Drilling was performed by Cenozoic Exploration of Aptos, California, using a Simco 2400 SK-1 drilling rig and an auxiliary mobile limited access unit powered with hydraulic hoses from the drilling rig. Hollow stem and solid stem continuous flight augers were used to drill the holes.

Two sampler types were employed, a California Modified Sampler (CA Mod.) with a 2.45-inch inside diameter (I.D.) and a Standard Penetration Test Sampler (SPT) with a 1.38-inch I.D. Blow counts were based on a 30-inch free fall with a 140-pound hammer driving the sampler into the ground. The blow count used to drive the SPT sampler one foot, also known as the N-value, is reported on the logs of boreholes. Blow counts from the California Modified Sampler were converted to the N-value by multiplying the number of blow counts taken to drive the bottom foot of the sampler by 0.67 (i.e., the ratio of the outside diameters of the SPT to the CA Mod. sampler). Boreholes were completed to depths of 13.5 to 16 feet BGS.

Locations of the boreholes are presented on **Figure 1.** The logs of boreholes are presented as **Figures 2** through **Figure 5.** Soils were logged in accordance with the Unified Soil Classification System (ASTM D 2487), which is summarized on **Figure 6**. Rocks were logged according to the Physical Properties Criteria for Description of Bedrock that is presented as **Figure 7**. Soil and rock colors were determined by use of a Munsell Soil Color Chart.

Borehole BH-1 (**Figure 2**) penetrated medium dense clayey sand with gravel from the ground surface to a depth of 7.25 feet below ground surface (BGS) and medium stiff silty clay to a depth of 9.5 feet BGS. Sandstone bedrock with moderate weathering was penetrated at 9.5 feet to the total depth of 14 feet BGS. Ground water was present at a depth of 11.0 feet BGS.

Borehole BH-2 (**Figure 3**) penetrated medium dense to dense clayey sand from the ground surface to a depth of 11.0 feet BGS. Sandstone was penetrated from 11.0 feet BGS to the total depth of the borehole at 13.5 feet BGS. Ground water was present at a depth of 11.0 feet BGS.

Borehole BH-3 (**Figure 4**) penetrated loose to medium dense clayey sand to a depth of 10.0 feet BGS and medium stiff sandy clay to a depth of 12 feet BGS. At 12 feet and continuing to the bottom of the borehole at 13.75 feet, moderately weathered sandstone was penetrated. Ground water was present at a depth of 10.0 feet BGS.

Borehole BH-4 (**Figure 5**) penetrated medium dense clayey sand from the ground surface to a depth of 7.5 feet BGS and medium dense clayey gravel to a depth of 12.5 feet BGS. From 12.5 feet BGS to the bottom of the borehole at 16.0 feet BGS, moderately weathered sandstone was penetrated. Ground water was present at a depth of 12.5 feet BGS.

The boreholes indicate that groundwater elevation is at or slightly above stream channel inverts. Groundwater apparently perches at the contact between surface soils and bedrock and suggests that Purisima Creek is a gaining creek; most of the water in the creek is generated by bank storage.

LABORATORY TESTING

Laboratory testing was performed on selected soil samples from the boreholes. Laboratory testing was performed in Questa's laboratory in general accordance with American Society for Testing and Materials (ASTM) standards for moisture content, dry density, particle size analysis, and liquid and plastic limits (including plasticity index). Triaxial shear strength testing, unconsolidated and undrained, was performed in accordance with ASTM standards by Soil Mechanics Laboratory of Oakland, California, with the testing reports included as **Appendix A**. Corrosion testing was performed by ETS of Petaluma, California. Corrosion testing results are included in **Appendix B**. A brief explanation of testing performed follows.

Moisture-Density

Moisture content and dry density testing were performed on selected soil samples to characterize the moisture content and dry density of material throughout the soil column. Testing was

performed in accordance with ASTM 2937. In this test, the dry density of the soil is determined by a mathematical relationship between moisture content and wet density of the soil sample. Results of moisture-density testing are summarized on the borehole logs (**Figures 2** through **5**).

Particle Size Analysis

Particle size analysis testing was performed in accordance with ASTM D 422. Samples collected at a depth of 1.5 feet BGS from each of the shallow hand auger holes, HA-5, HA-6, HA-7 and HA-8 were tested for grain size using both the dry sieve method and the hydrometer method, used to determine clay and silt fraction percentages. Results are presented on **Figures 8** and **9.**

Liquid Limit, Plastic Limit and Plasticity Index

Testing of liquid limit, plastic limit and plasticity index were performed in accordance with ASTM D 4318. Samples collected from depths of 1.5 feet BGS from HA-5, HA-6, HA-7 and HA-8 were tested by this method. Results are presented on **Figures 10.**

Strength Testing

Triaxial shear strength testing, unconsolidated, undrained (TXUU) was performed by Soil Mechanics Laboratory of Oakland, California. Results of TXUU testing are presented in **Appendix A**.

Corrosion Testing

Soil samples were obtained for corrosion analyses from borehole BH-2 at 9.0-10.5 feet BGS and from BH-4 at 9.5-11.0 feet BGS. Based on the results of the corrosion analyses, the site soils are considered not corrosive to concrete by Caltrans standards (Caltrans Corrosion Guidelines version 2.0). The chloride concentration is less than 500 mg/kg (195 and 27 mg/kg), and resistivity is greater than 1,000 Ohm-cm (1,390 Ohm-cm and 1,784 Ohm-cm), and pH was 8.12 and 7.22. Testing was also performed for sulfate concentration, redox, and percent moisture. The full laboratory test report by ETS is presented in **Appendix B**.

GEOTECHNICAL RECOMMENDATIONS

Site Preparation and Grading

Areas to be graded for road and bridge construction should be cleared and grubbed to a depth of 4 to 6 inches to remove vegetation and surface organic soils, or to the depth of subgrade soil preparation at the base of the structural section which includes aggregate base (AB) and trail or road surfacing. Subgrade soils should be scarified to a depth of six inches, moisture conditioned (wetted or dried) to a moisture content of 2 to 4 percent above the optimum, and recompacted to a minimum of 90 percent of the maximum dry density. A woven geotextile segregation fabric could be placed at the top of the compacted subgrade soils to provide subgrade stabilization and

segregation from the overlying aggregate base and surface treatment. The woven geotextile fabric should consist of Mirafi HP 370 or approved equivalent.

Bridge

Based on results of our preliminary geotechnical investigation, the soils at the proposed bridge abutment locations have poor supporting characteristics for the proposed bridge foundations. However, bridges can be founded on spread footings provided that the soils underlying the proposed bridge abutments are excavated to a minimum depth of 6 feet below ground surface and replaced with Controlled Low Strength Material (CLSM) also known as Controlled Density Fill (CDF), a low strength Portland cement, sand and gravel mix. The CLSM should have a minimum strength of 90 psi at 28 days.

Spread Footings

For spread footings founded on CLSM over native clayey sand soil, allowable bearing pressure of 2,000 pounds per square foot (psf) can be used for dead plus live loads, and can be increased by 33 percent for total loads, including wind or seismic forces. Resistance to lateral loads should be based on a passive pressure of 250 psf on the face of the footing in medium dense clayey sand soils. In addition, a friction coefficient of 0.35 can be used on the base of the footing on CLSM. If water is present in footings, it should be pumped out prior to placement of the concrete.

Drilled Piers

Alternatively, bridges can be founded on abutments supported on drilled piers penetrating the medium dense to dense clayey sand and clayey gravel soils and into the underlying sandstone bedrock a minimum of 5 feet. Drilled cast-in-place concrete piers should be a minimum of 18 inches in diameter and should be designed to support vertical and uplift loads based on a skin friction of 500 psf in clayey sand and clayey gravel and 800 psf in sandstone bedrock, neglecting the upper five feet of medium dense soils. The recommended skin friction is for dead plus long-term live loads and can be increased by 33 percent for total loads including wind or seismic forces. Resistance to lateral loads should be based on passive pressures using an equivalent fluid weight of 250 pcf over a width of two pier diameters on the portion of the piers extending into firm supporting soil and bedrock. End bearing strengths of 3,000 psf in the sandstone bedrock could be considered for dead and long term live loads and can be increased by 33 percent for total loads including wind or seismic forces, providing that the small-diameter pier holes are cleaned out to the bottom of the holes prior to pouring of the concrete.

The pier holes should be straight and free of loose soil and debris. Due to the presence of shallow ground water in the area adjacent to the creek, pier holes may require temporary casing during drilling and pouring of the concrete to prevent caving of the pier walls. The holes should be filled with concrete on the same days they are drilled. The concrete should be tremied into place and there should be no over-pouring of the concrete at the surface, especially adjacent to the creek.

The pier reinforcements should be placed with a minimum of 3 inches clearance from the bottom and sidewalls of the pier holes using dobees or other approved spacers. Concrete should be Type II/V, a corrosion resistant concrete.

Retaining Wall Design Parameters

Retaining walls at the site must be designed to resist lateral earth pressures plus additional lateral pressures that may be caused by surcharge loads such as seismic forces. Walls that are free to rotate should be designed for active lateral earth pressures. If walls are restrained by rigid elements to prevent rotation, then they should be designed for at-rest earth pressures. Retaining walls backfilled with granular soils should be designed to resist lateral earth pressures due to an equivalent fluid having unit weight as shown in **Table 2**.

Table 2. Retaining Wall Design Parameters

	Active Pressure pounds per cubic foot (pcf)	At-Rest Earth Pressure (pcf)
Above Design Groundwater Table Elevation	40	60
Below Design Groundwater Table Elevation	80	90

Retaining walls that are designed to be fully drained and include a backdrain can be designed for active pressures or at-rest earth pressure in accordance with the values given in **Table 2** for the above design groundwater condition. Retaining walls that are designed to be located below the design groundwater table or that do not include a backdrain should be designed to withstand the pressure of saturated soils as presented in **Table 2** for below design groundwater table elevation.

Unit weight (total) of the existing soils is approximately 120 pcf. Unit weight (total) of aggregate base granular backfill is approximately 135 pcf for recycled and 145 pcf for quarried material. The effective internal angle of friction of the clayey sand existing soils can be assumed to be 30 degrees and the aggregate base or gravel backfill 40 degrees for design purposes.

SEISMIC DESIGN CRITERIA

The project should be designed in conformance with current applicable standards for seismic stability as presented in the 2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design. The Seismic Design Criteria in accordance with the 2009 AASHTO Guide Specifications is summarized in **Table 3**.

Table 3. Seismic Design Criteria in accordance with the 2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design

Site Class	D
Soil Profile Name	Stiff Soil
Peak Ground Acceleration- PGA	0.924 g
A_s	0.924 g
S_s	2.213 g
S_1	0.850 g
S_{DS}	2.213 g
S_{D1}	1.275 g
F_{PGA}	1.0
F_A	1.0
F_V	1.5
Seismic Design Category	D

CONCLUSIONS

The project is feasible from a Geotechnical standpoint, provided that our recommendations are followed during design and construction of the project. Provided that the site is properly prepared and the structures and foundations are designed and constructed as recommended, we estimate that normal post-construction settlement for the bridge will be relatively small, less than 1.0 inches. Differential settlements from the west culvert abutment to the east culvert abutment could be as much as 0.75 inches.

CONSTRUCTION OBSERVATIONS AND TESTING

We should review the project plans and specifications for conformance with the intent of our recommendations. During construction we should observe and test all site preparation and grading to check the results of work by your contractor. This will allow us to observe that subsurface conditions are as anticipated and to make supplemental recommendations when needed. These services during construction should include:

X Site preparation and fill placement should be observed and tested.

X Subgrade for all fill and concrete should be tested and approved before placing fill or rock.

X The drilling of piers and excavation of footings should be observed on a continuous basis to confirm that firm supporting material is encountered and to develop/verify depth criteria in accordance with building code requirements.

X Cylinders of CLSM should be collected at the time of pouring and should be tested at 7 and 28 days.

X We should be present during concrete pouring to verify that the water is pumped and concrete is tremied into pier holes.

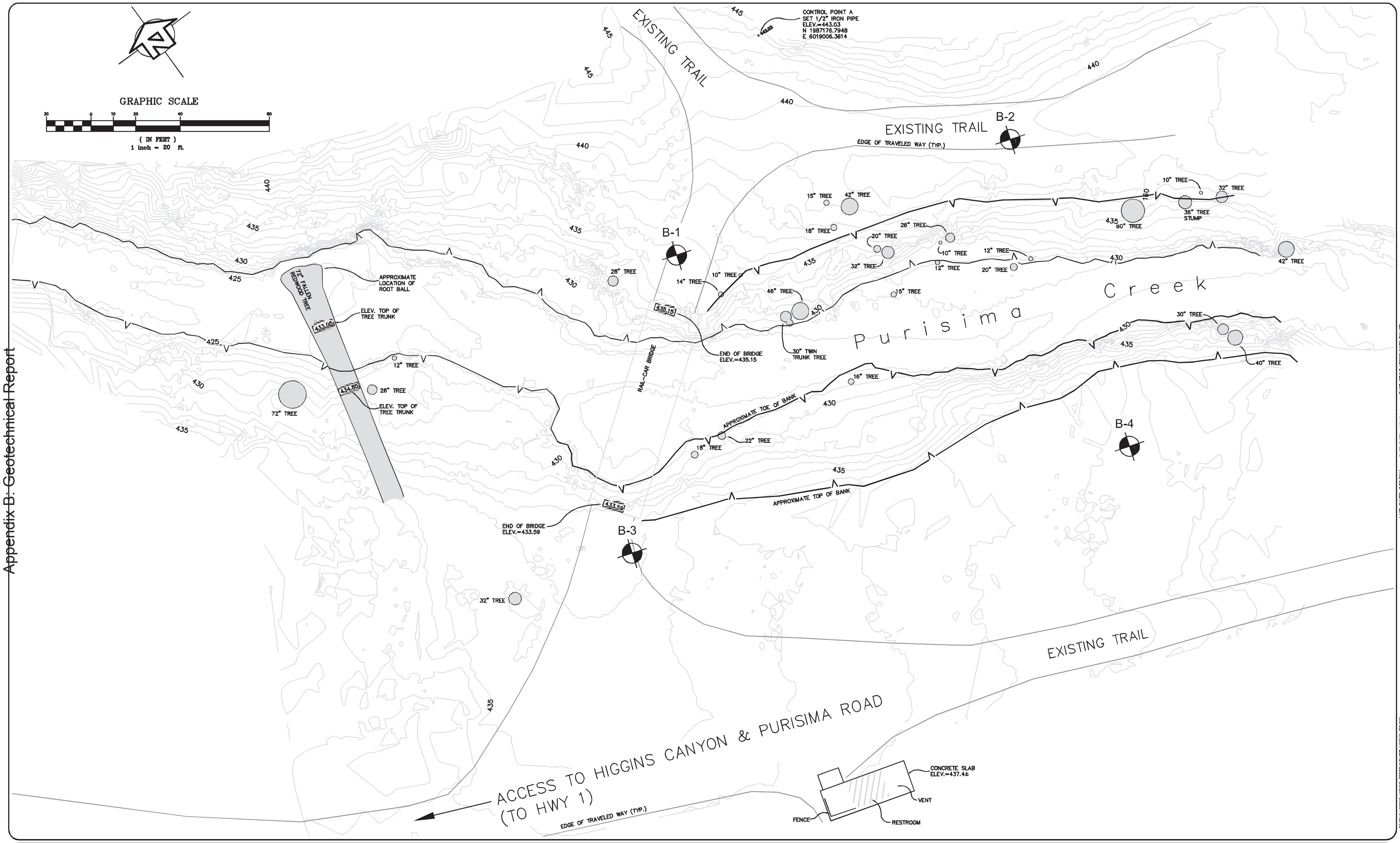
LIMITATIONS

This investigation was performed in accordance with present geotechnical and engineering geologic standards applicable to this project. In our opinion, the scope of services adequately supports the conclusions and recommendations presented. The findings are valid now, but should not be relied upon after two years without our review.

The recommendations of this report are based upon the assumption that the conditions do not deviate from those interpreted from the surface observations of this investigation and review of available subsurface information developed by others. If any variation or undesirable conditions are encountered during construction, or if the proposed construction differs from that planned at the present time, we should be notified so that supplemental recommendations can be given. The recommendations of this report are intended for the site described only, and must not be extended to adjacent areas.

This report is issued with the understanding that it is the responsibility of the owner to ensure that contractors and subcontractors carry out the recommendations presented.

FIGURES



HARKINS BRIDGE REPLACEMENT PLAN	BOREHOLE LOCATION MAP
SAN MATEO COUNTY	HALF MOON BAY, SAN MATEO COUNTY

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REGISTERED PROFESSIONAL ENGINEER No. 58695 EXPIRES 12-31-15 CIVIL STATE OF CALIFORNIA

Sht.	Rev.	Date:	By:	Description:	App'd

Design:	ST
Drawn:	CL
Checked:	ST
Appr'd:	ST

Size 11x17	Project 1400040
Scale:	AS NOTED
Date:	7-28-2014
Figure:	1

LAST SAVED: 7/28/2014 PLOT DATE: 7/28/2014 PLOT STYLE: HP650C 24X36 FULL.CTB

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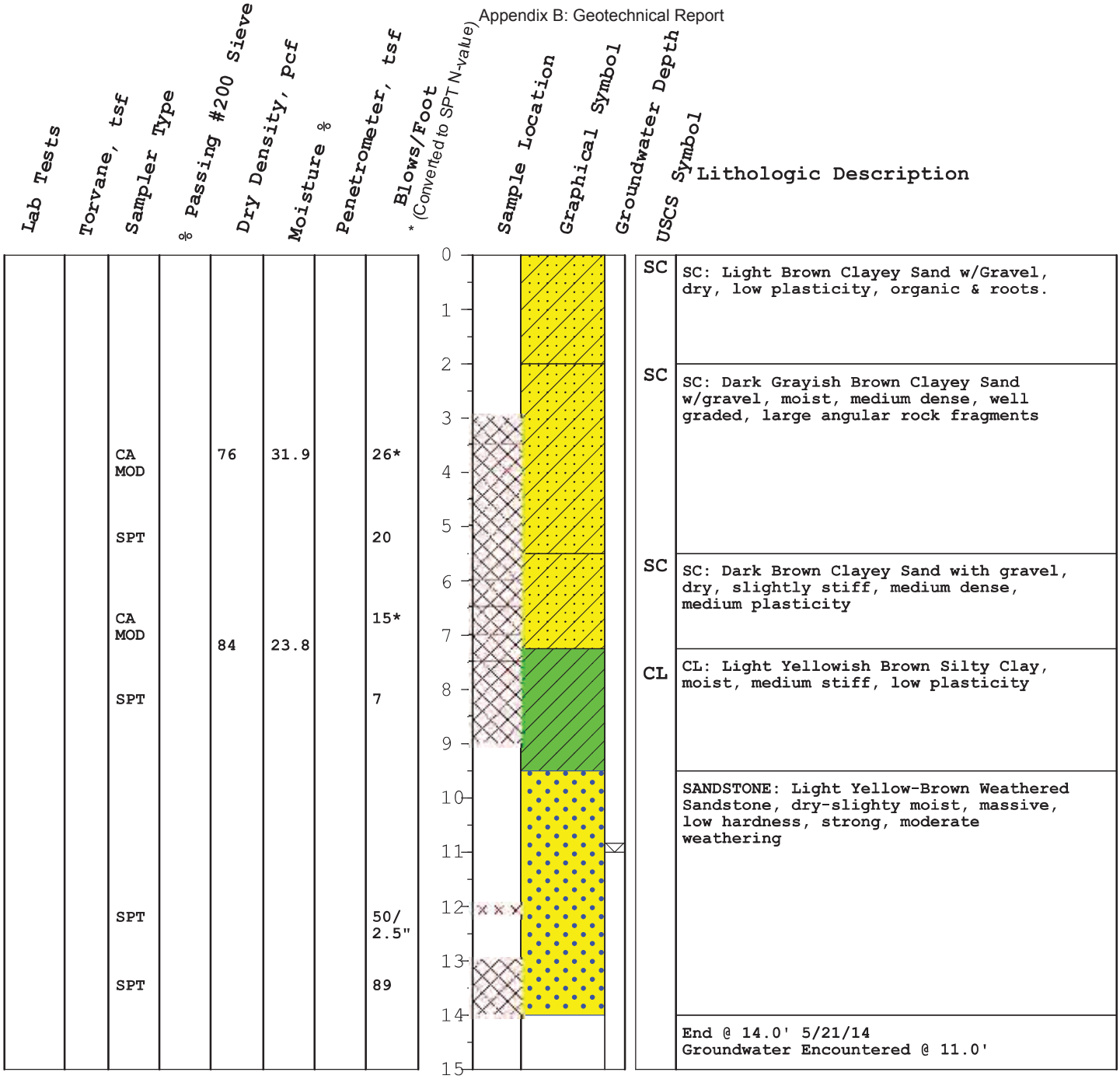
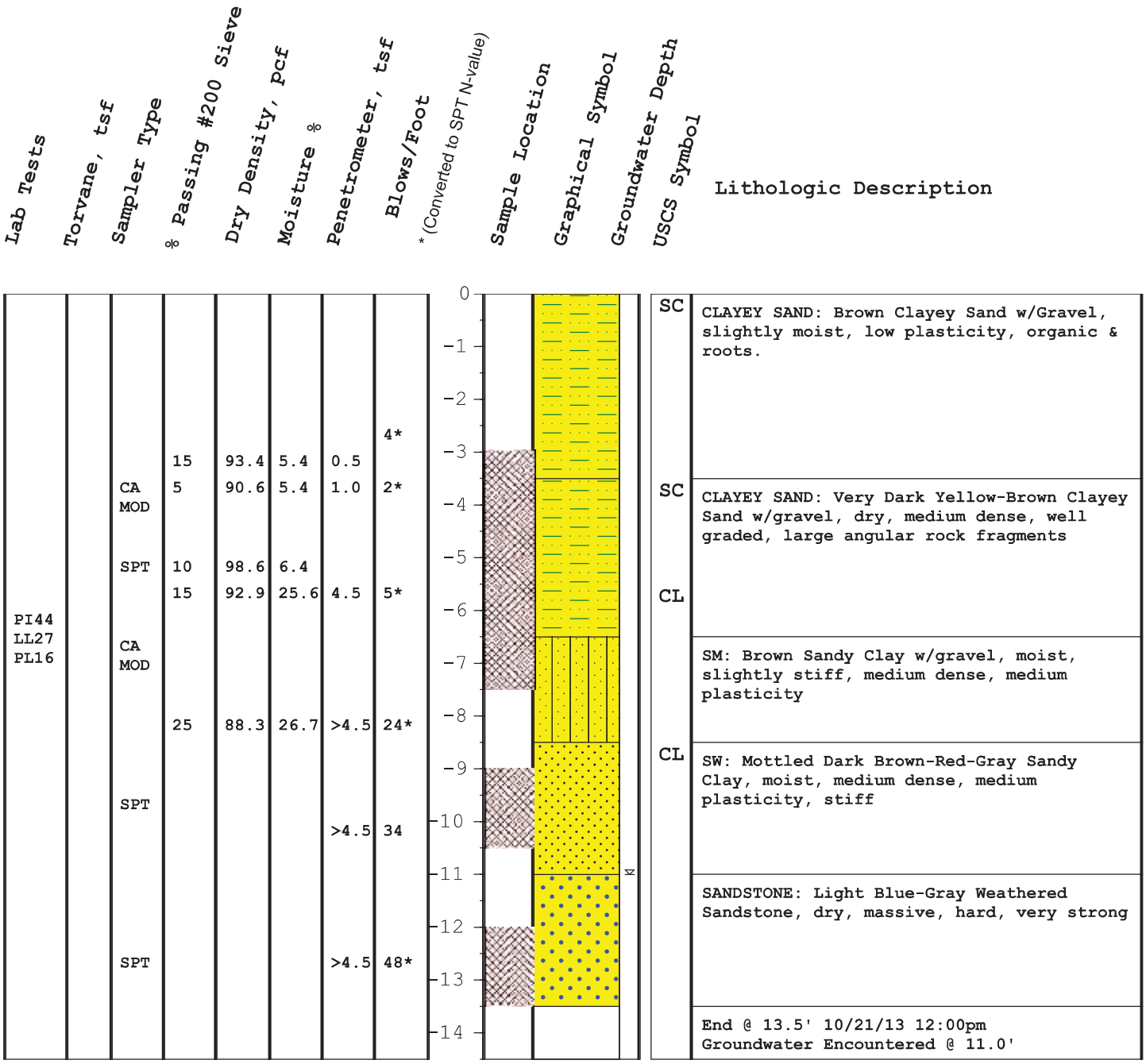
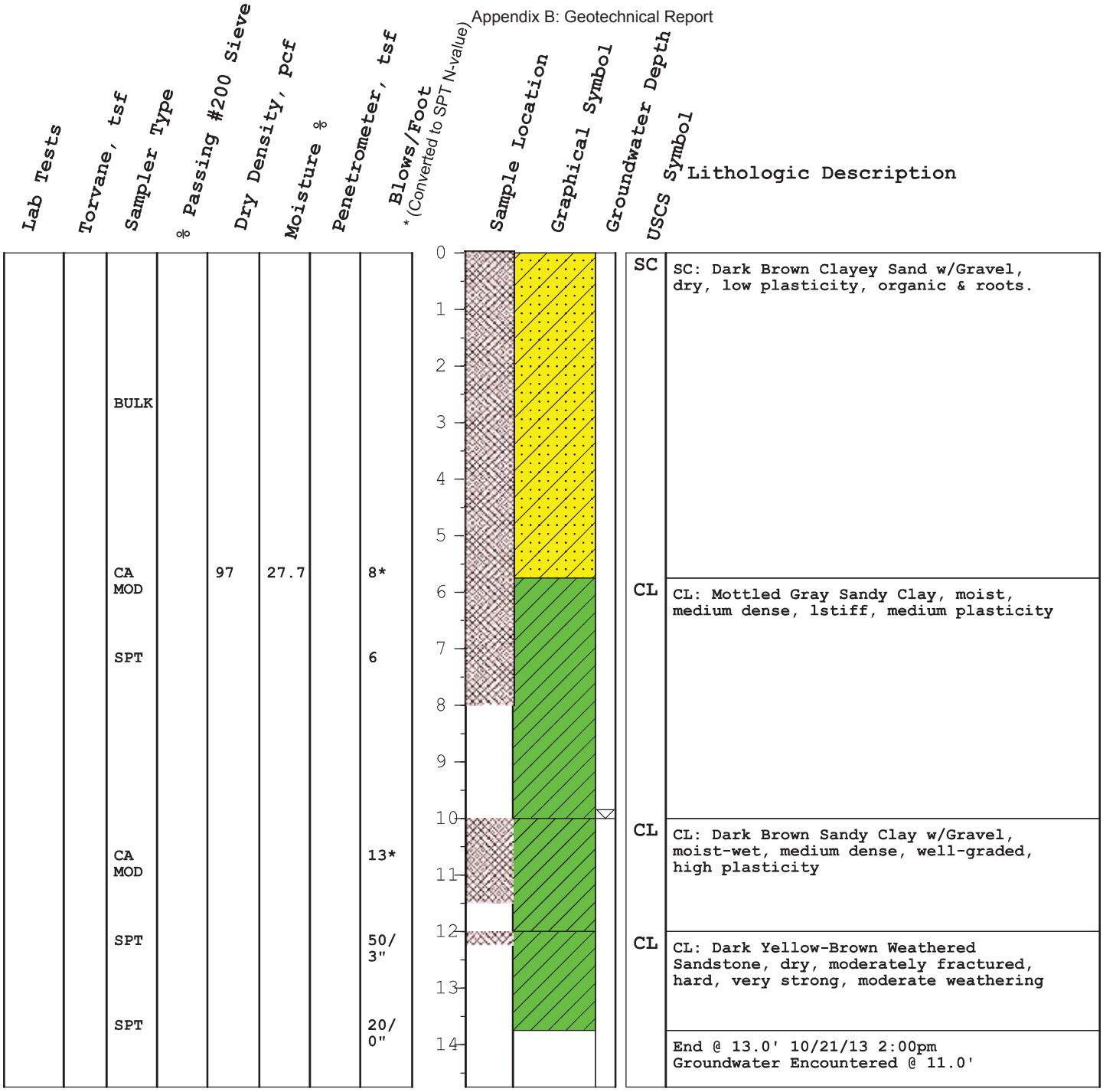


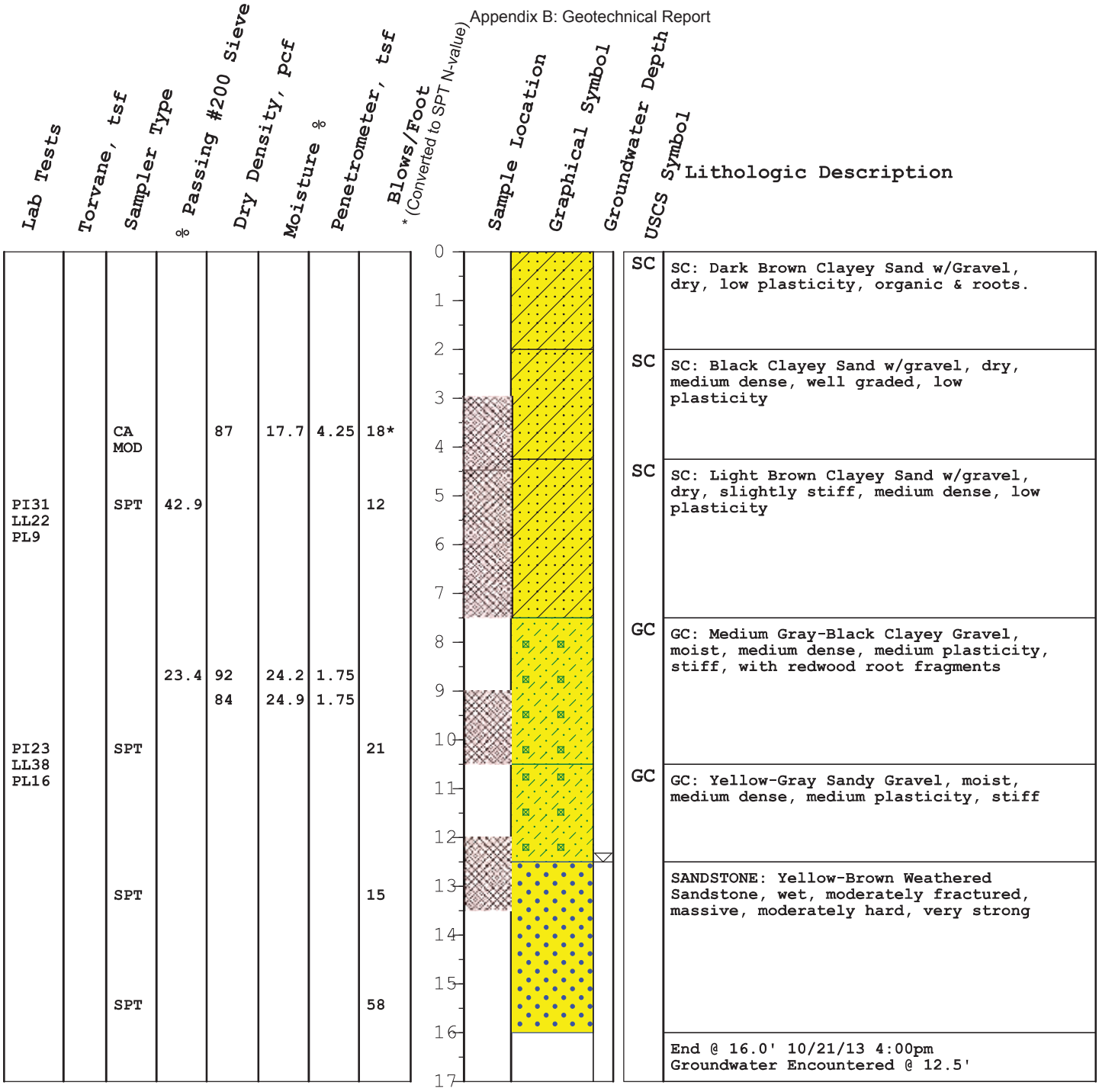
Questa Engineering Corporation 1220 Brickyard Cove Road, Suite 206 Point Richmond, CA 94807	**LOG OF BOREHOLE BH-1** Harkins Bridge Half Moon Bay, CA	Figure **2**



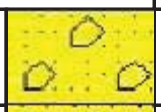
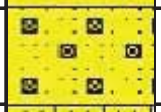
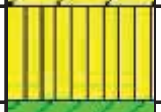
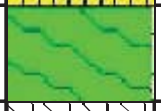
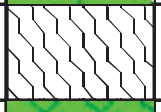
Questa Engineering Corporation 1220 Brickyard Cove Road, Suite 206 Point Richmond, CA 94807	**LOG OF BOREHOLE B-2** Harkins Bridge Half Moon Bay, CA	Figure **3**



Questa Engineering Corporation 1220 Brickyard Cove Road, Suite 206 Point Richmond, CA 94807	**LOG OF BOREHOLE B-3** Harkins Bridge Half Moon Bay, CA	Figure **4**



Questa Engineering Corporation 1220 Brickyard Cove Road, Suite 206 Point Richmond, CA 94807	**LOG OF BOREHOLE B-4** Harkins Bridge Half Moon Bay, CA	Figure **5**

MAJOR DIVISION					TYPICAL NAMES
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN #4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		Well graded Gravels, Gravel-Sand mixtures
			GP		Poorly graded Gravels, Gravel-Sand mixtures
		GRAVELS WITH OVER 12% FINES	GM		Silty Gravels, poorly graded, Gravel-Sand-Silt mixtures
			GC		Clayey Gravels, poorly graded Gravel-Sand-Clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS LARGER THAN #4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		Well graded Sands, Gravelly-Sands
			SP		Poorly graded Sands, Gravelly-Sands
		SANDS WITH OVER 12% FINES	SM		Silty Sands, poorly graded, Sand-Silt mixtures
			SC		Clayey Sands, poorly graded, Sand-Clay mixtures
FINE GRAINED SOILS MORE THAN HALF IS SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML		Inorganic Silts and very fine Sands, rock flour, Silty or Clayey fine Sands, or Clayey-Silts with slight plasticity
			CL		Inorganic Clays of low to medium plasticity, Gravelly Clays, Sandy Clays, Silty Clays, lean Clays
			OL		Organic Clays and Organic Silty Clays of low plasticity
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH		Inorganic Silts, micaceous or diatomaceous fine Sandy or Silty Soils,elastic Silts
			CH		Inorganic Clays of high plasticity, fat Clays
			OH		Organic Clays of medium to high plasticity, organic Silts
HIGHLY ORGANIC SOILS			Pt		Peat and other highly organic soils

BGS	Below Ground Surface	PSA	Particle Size Analysis
SPT	Standard Penetration Test Sampler (1.38“ inside diameter)	UC/TXUU	Unconfined Compression / Triaxial Shear Unconsolidated-Undrained
CAM	California Modified Sampler (S & H) (2.45“ inside diameter)	LL, PL, PI	Liquid Limit, Plastic Limit, Plasticity Index

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UNIFIED SOIL CLASSIFICATION SYSTEM AND KEY TO ABBREVIATIONS

FIGURE 6

PHYSICAL PROPERTIES CRITERIA FOR EVALUATING CONDITIONS OF BEDROCK

I. INDURATION - The process of hardening or consolidating of sediments or other rock aggregates through cementation, pressure, heat, or other cause.

U = unindurated P = poorly indurated M = moderately indurated W = well indurated

II. BEDDING

Splitting Property		Thickness (feet)	Stratification
massive	greater than 4.0	very thick bedded	
blocky		2.0 to 4.0	thick bedded
slabby		0.2 to 2.0	thin bedded
flaggy		0.05 to 0.2	very thin bedded
shaly or platy	0.01 to 0.05	laminated	
papery		less than 0.01	thinly laminated

III. FRACTURING

Intensity	Frequencies of Fractures (feet)
little fractured	greater than 4.0
occasionally fractured	1.0 to 4.0
moderately fractured	0.5 to 1.0
closely fractured	0.1 to 0.5
intensely fractured	0.05 to 0.1
crushed	less than 0.05

IV. HARDNESS

soft - Reserved for plastic material

low hardness - Can be gouged deeply or carved easily with a knife blade

moderately hard - Can be readily scratched by a knife blade; scratch leaves a heavy trace of dust and is readily visible after the powder has been blown away

hard - Can be scratched with difficulty; scratch produces little powder and is often faintly visible

very hard - Cannot be scratched with knife blade; leaves a metallic streak

V. STRENGTH

plastic - Very low strength, similar to soil

friable - Crumbles easily by rubbing with fingers

weak - An unfractured specimen will crumble under light hammer blows

moderately strong - Specimen will withstand a few heavy hammer blows before breaking

strong - Specimen will withstand a few heavy ringing hammer blows before breaking into large fragments

very strong - Specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments

VI. WEATHERING - The physical and chemical disintegration and decomposition or rocks and minerals by natural processes such as oxidation, reduction, hydration, solution, carbonation, and freezing and thawing.

deep - Moderate to complete mineral decomposition; extensive disintegration; deep and thorough discoloration; many fractures, all extensively coated or filled with oxides, carbonates and/or clay or silt

moderate - Slight change or partial decomposition of minerals; little disintegration; cementation is little to unaffected; moderate to occasionally intense discoloration; moderately coated fractures

little - No megascopic decomposition of minerals; little to no effect on normal cementation; slight and intermittent or localized discoloration; a few stains on fracture surfaces

fresh - Unaffected by weathering agents; no disintegration or discoloration; fractures usually less numerous than joints

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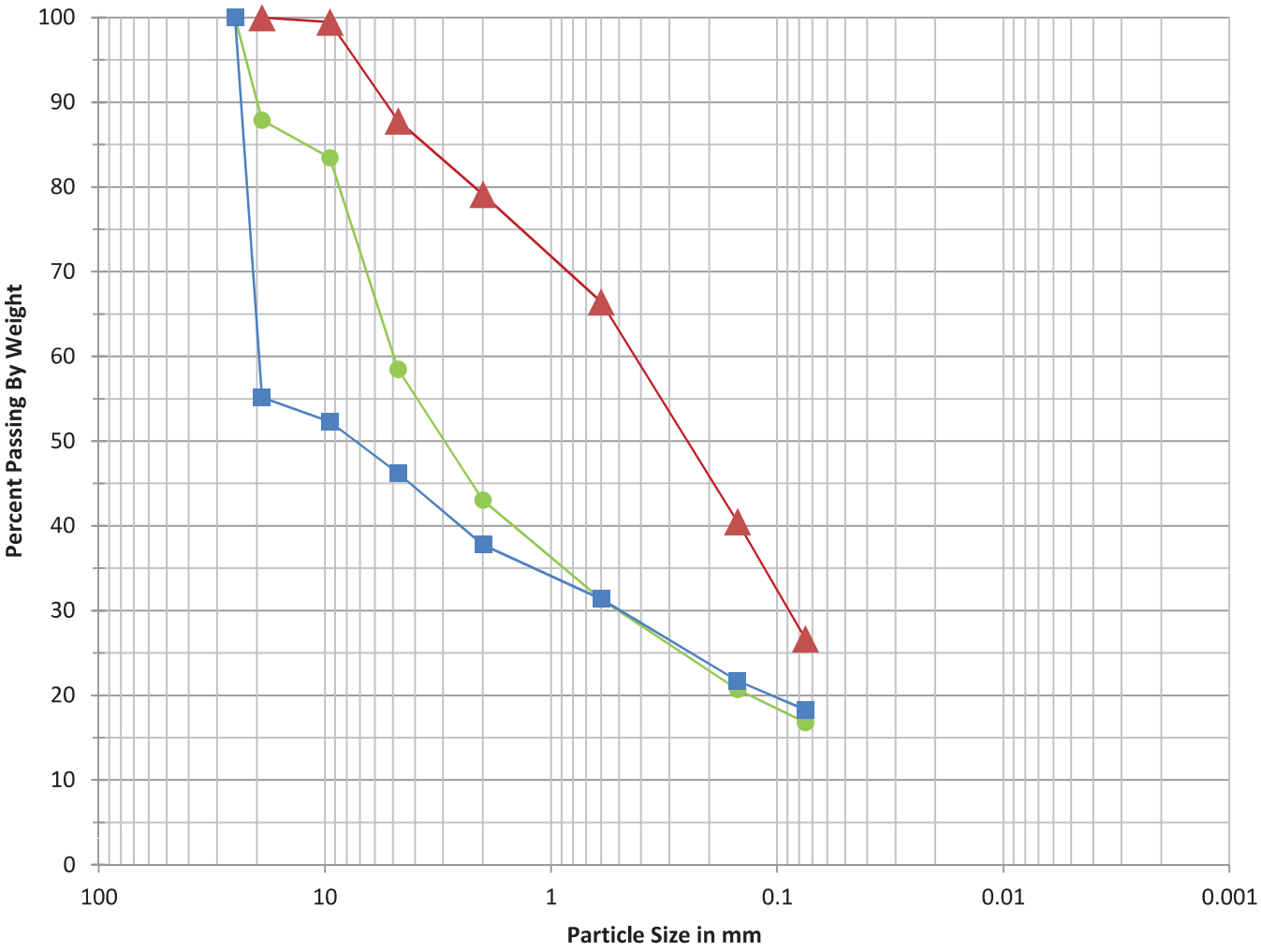
PHYSICAL PROPERTIES CRITERIA FOR EVALUATING CONDITIONS OF BEDROCK

FIGURE 7

Particle Size Analysis



Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		

Symbol	Source
●	B2 at 3'
▲	B2 at 6.5'
■	B-2 at 9-10.5'

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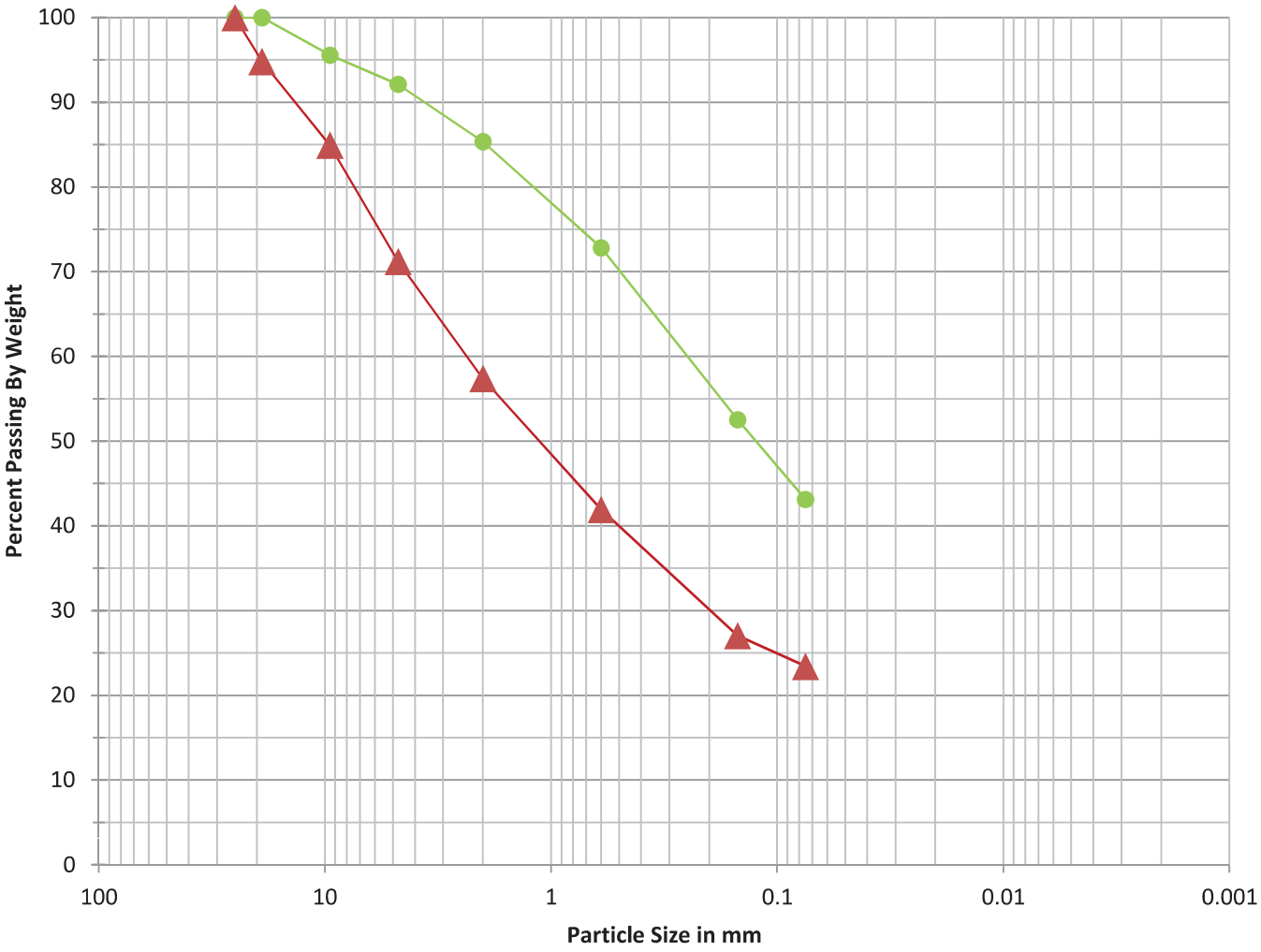
Particle Size Analysis

Harkins Bridge
San Mateo County

Figure

8

Particle Size Analysis



Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		

Symbol	Source
●	B4 at 4.5-6.0'
▲	B4 at 9.5-11.0'
■	

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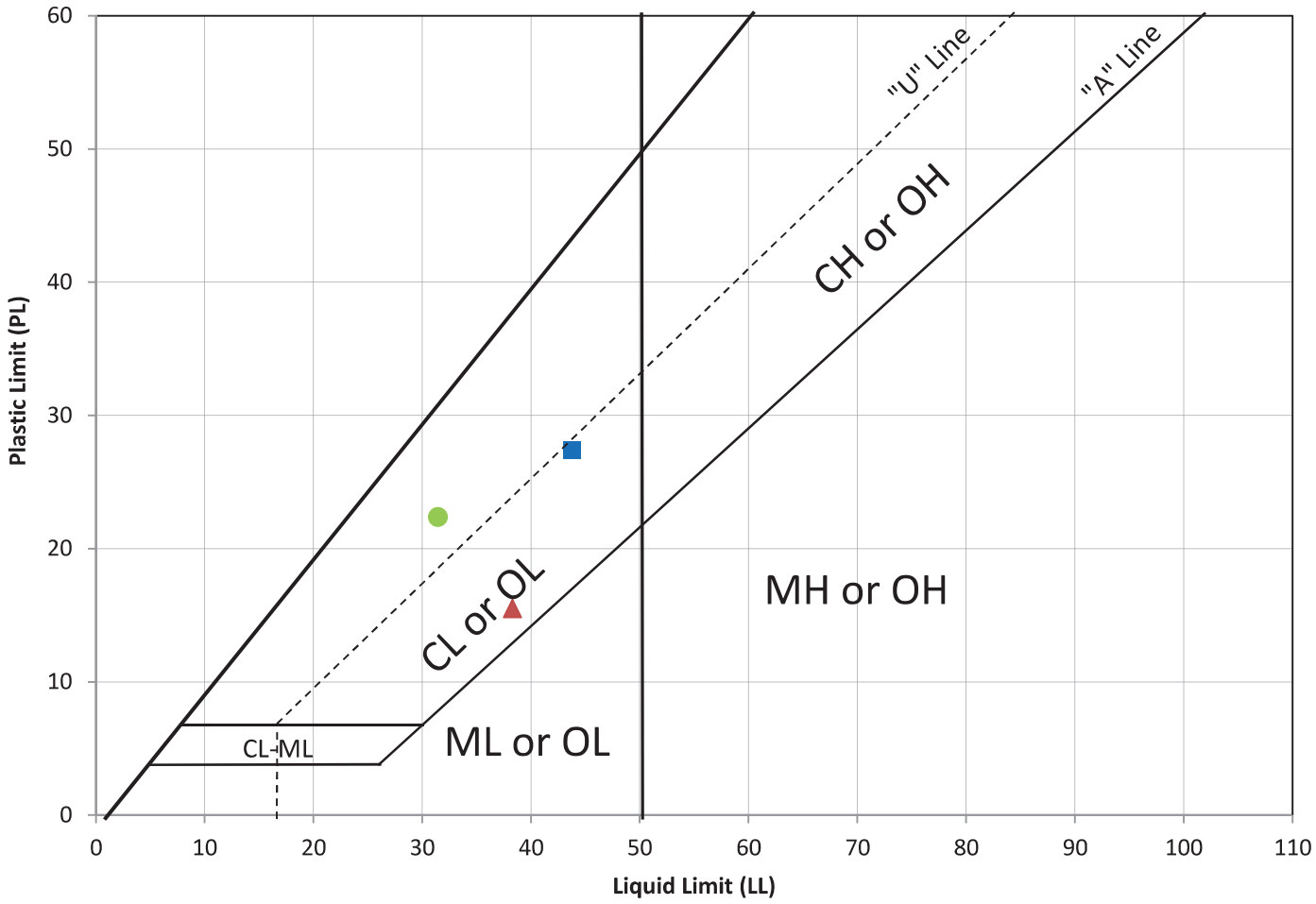
Particle Size Analysis

Harkins Bridge
San Mateo County

Figure

9

Atterberg Limits



Symbol	Classification & Source	Liquid Limit	Plastic Limit	Plasticity Index	% Passing #200 Sieve
●	B4 at 4.5-6.0'	31	22	9	42.9
▲	B4 at 9.5-11.0'	38	16	23	23.4
■	B2 at 6.5'	44	27	16	26.7

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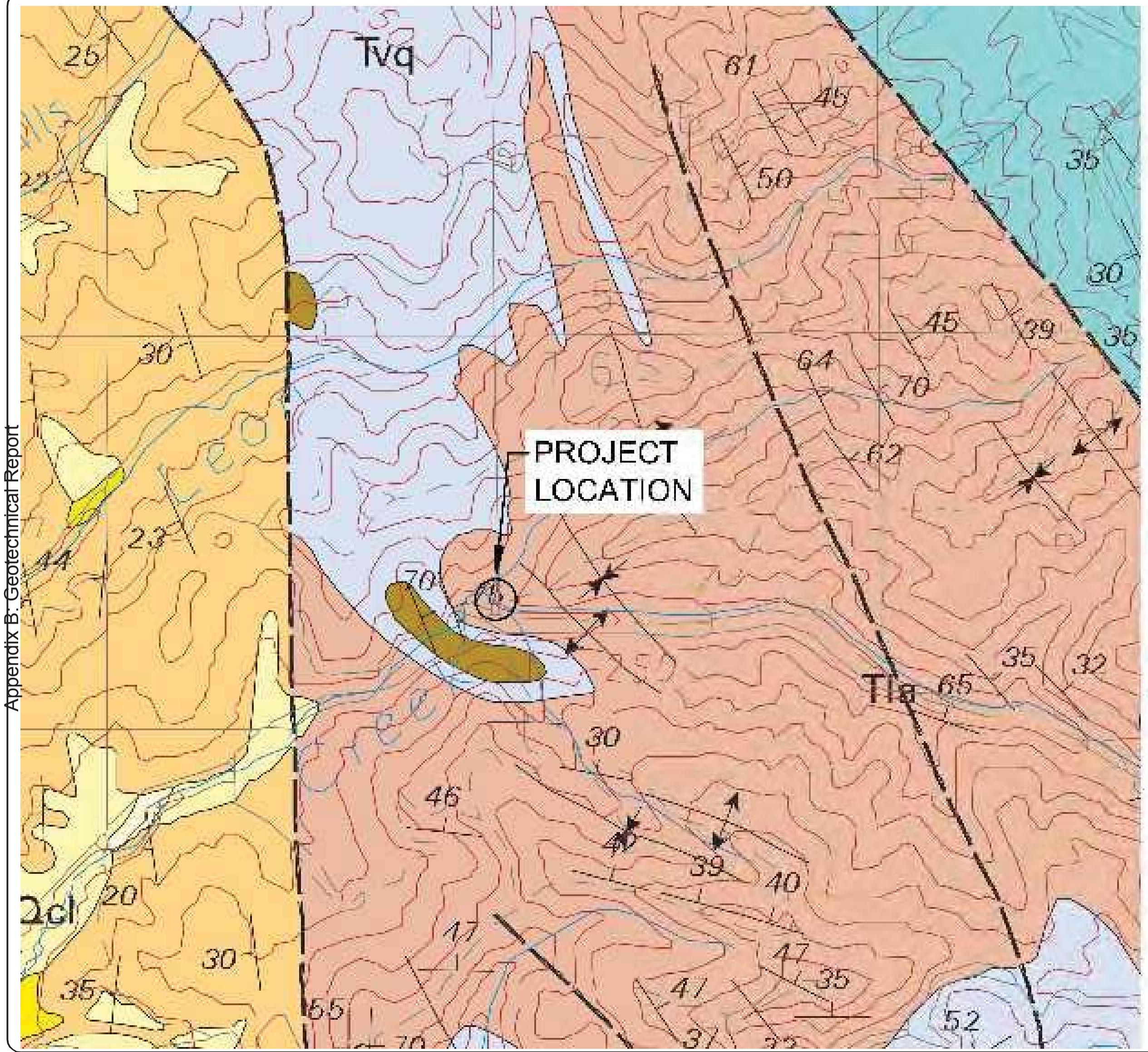
Atterberg Limits (ASTM D4318)

Harkins Bridge
San Mateo County

Figure

10

SHEETS



Qcl — **Colluvium (Holocene)**. Loose to firm, friable, unsorted sand, silt, clay, gravel, rock debris, and organic material in varying proportions

Qof — **Coarse-grained older alluvial fan and stream terrace deposits** (Pleistocene)—Poorly consolidated gravel, sand, and silt, coarser grained at heads of old fans and in narrow canyons

Tp — **Purisima Formation (Pliocene and upper Miocene)**—Predominantly gray and greenish-gray to buff fine-grained sandstone, siltstone, and mudstone, but also includes some porcelaneous shale and mudstone, chert, silty mudstone, and volcanic ash. West of Portola Valley, this unit consists of fine- to medium-grained silty sandstone. Locally divided into:

Tls — **Lambert Shale and San Lorenzo Formation, Undivided (lower Miocene, Oligocene, and middle and upper Eocene)**—Brown and dark-gray to gray, brown, and red mudstone, siltstone, and shale. Includes some beds of fine- to coarse-grained sandstone. Lambert Shale is generally more siliceous than San Lorenzo Formation, but the two units cannot be distinguished where out of stratigraphic sequence and without fossils

Tla — **Lambert Shale (Oligocene and lower Miocene)**—Dark-gray to pinkish brown, moderately well cemented mudstone, siltstone, and claystone. Chert crops out in a few places in upper part of section, and sandstone bodies up to 20 m thick, glauconitic sandstone beds, and microcrystalline dolomite are present in places. Lambert Shale is generally more siliceous than San Lorenzo Formation and less siliceous than the Monterey Shale. It resembles Santa Cruz Mudstone and parts of Purisima Formation. Lambert Shale is about 1400 m thick

Tmb — **Mindego Basalt and related volcanic rocks (Miocene and/or Oligocene)**—Basaltic volcanic rocks, both extrusive and intrusive. Extrusive rock is primarily dark gray to orange brown to greenish gray flow breccia, but includes lesser amounts of tuffs, pillow lavas, and flows. Extrusive rocks have a maximum thickness of 120 m. Intrusive rock is dark greenish gray to orange brown and medium to coarsely crystalline. It commonly weathers spheroidally, and crops out as roughly tabular bodies up to 180 m thick intruding older sedimentary rocks. Minor amounts of sandstone and mudstone are locally included

Tvq — **Vaqueros Sandstone (lower Miocene and Oligocene)**—Light-gray to buff, fine- to medium-grained, locally coarse-grained, arkosic sandstone interbedded with olive- and dark-gray to red and brown mudstone and shale. Sandstone beds are commonly 0.3 to 3 m thick and mudstone and shale beds are as much as 3 m thick. Vaqueros varies from a few meters to as much as 700 m in thickness

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HARKINS BRIDGE REPLACEMENT PLAN

SAN MATEO COUNTY

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REGISTERED PROFESSIONAL ENGINEER
No. 59695
EXPIRES 12-31-15
CIVIL
STATE OF CALIFORNIA

Sht.	Rev.	Date:	By:	Description:	App'd:

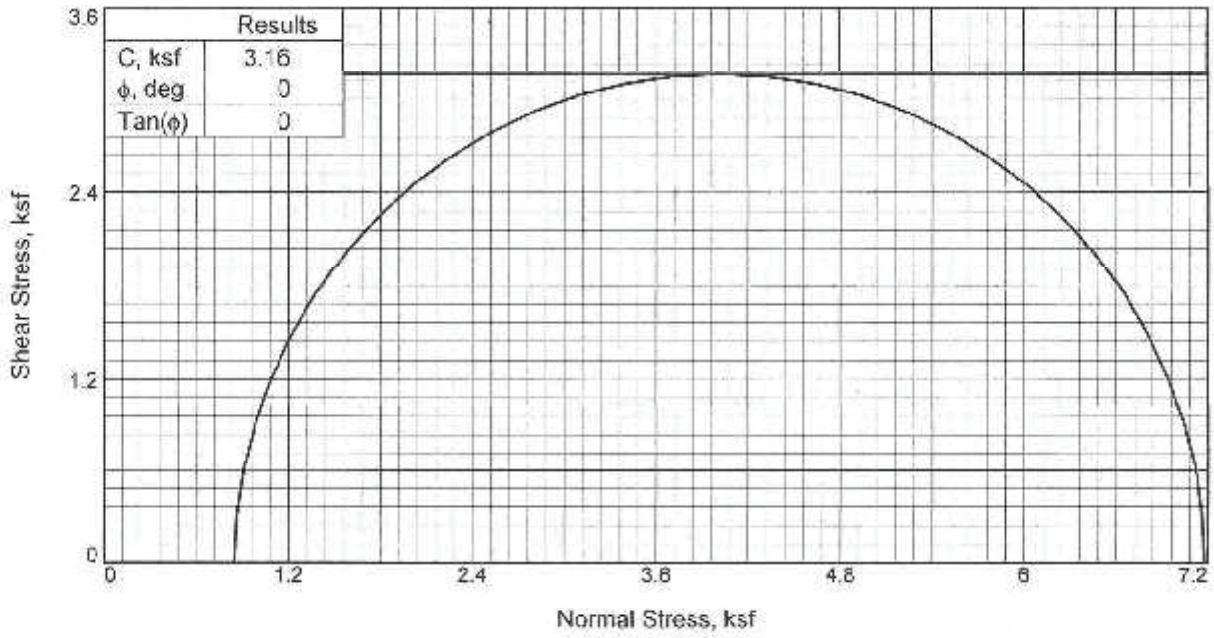
Design:	ST
Drawn:	CL
Checked:	ST
Appr'd:	ST

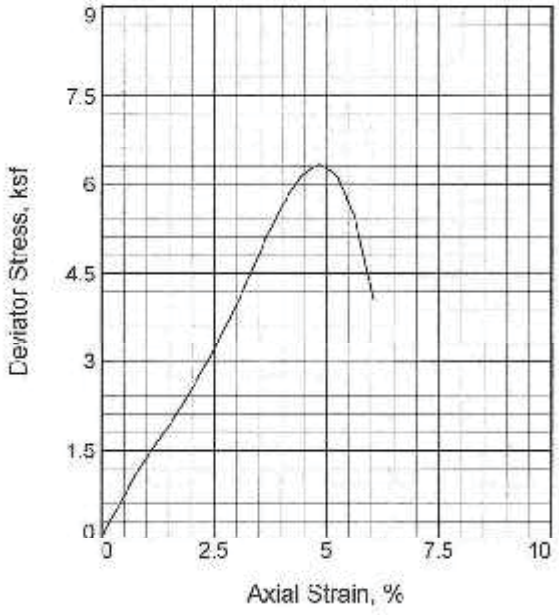
GEOLOGIC MAP

HALF MOON BAY, SAN MATEO COUNTY

Size 11x17	Project 1400040
Scale:	AS NOTED
Date:	7-28-2014
Sheet:	1

APPENDIX A





Sample No.		1
Initial	Water Content, %	18.8
	Dry Density, pcf	103.5
	Saturation, %	80.5
	Void Ratio	0.6293
	Diameter, in.	2.42
	Height, in.	4.96
At Test	Water Content, %	18.8
	Dry Density, pcf	103.5
	Saturation, %	80.5
	Void Ratio	0.6293
	Diameter, in.	2.42
	Height, in.	4.96
Strain rate, in./min.		0.08
Back Pressure, psi		0.00
Cell Pressure, psi		5.90
Fail. Stress, ksf		6.33
Ult. Stress, ksf		
σ_1 Failure, ksf		7.18
σ_3 Failure, ksf		0.85

Type of Test:
Unconsolidated Undrained

Sample Type: Mod.Cal.

Description: Very stiff,very dark reddish brown sandy CLAY(CL).Trace fine gravel inclusions.

Assumed Specific Gravity= 2.70

Remarks:

Client: Questa Engineering Corp.

Project: Harking Bridge

Location: B-2

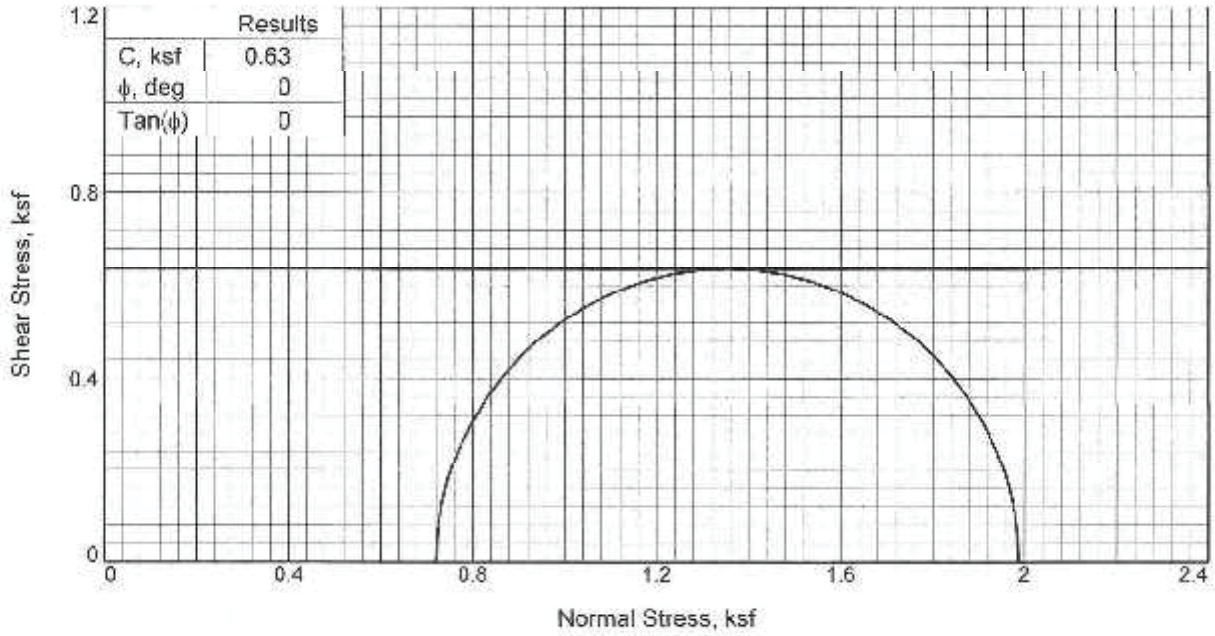
Depth: 7-7.5'

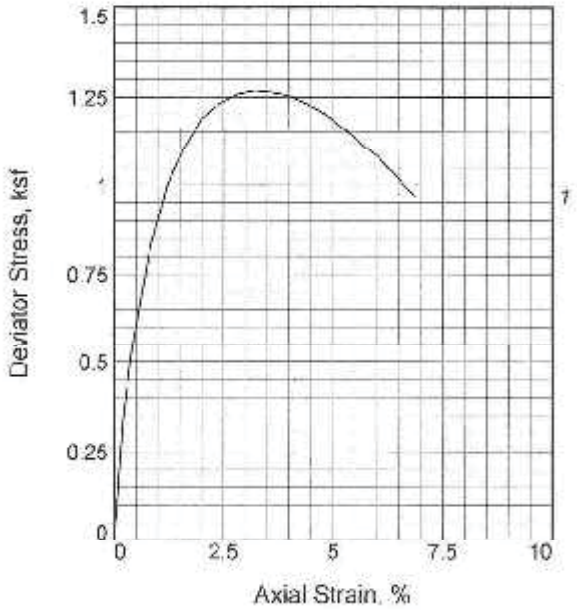
Proj. No.: 1400040 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
Soil Mechanics Lab
Oakland, California

Figure _____

Tested By: MA





Sample No.		1
Initial	Water Content, %	27.2
	Dry Density, pcf	94.8
	Saturation, %	94.2
	Void Ratio	0.7785
	Diameter, in.	2.42
	Height, in.	4.97
At Test	Water Content, %	27.2
	Dry Density, pcf	94.8
	Saturation, %	94.2
	Void Ratio	0.7785
	Diameter, in.	2.42
	Height, in.	4.97
Strain rate, in./min.		0.08
Back Pressure, psi		0.00
Cell Pressure, psi		5.00
Fail. Stress, ksf		1.27
Ult. Stress, ksf		
σ_1 Failure, ksf		1.99
σ_3 Failure, ksf		0.72

Type of Test:
Unconsolidated Undrained
Sample Type: Mod.Cal.
Description: Med. stiff,dark gray sandy CLAY(CL-CH).

Assumed Specific Gravity= 2.70
Remarks:

Figure _____

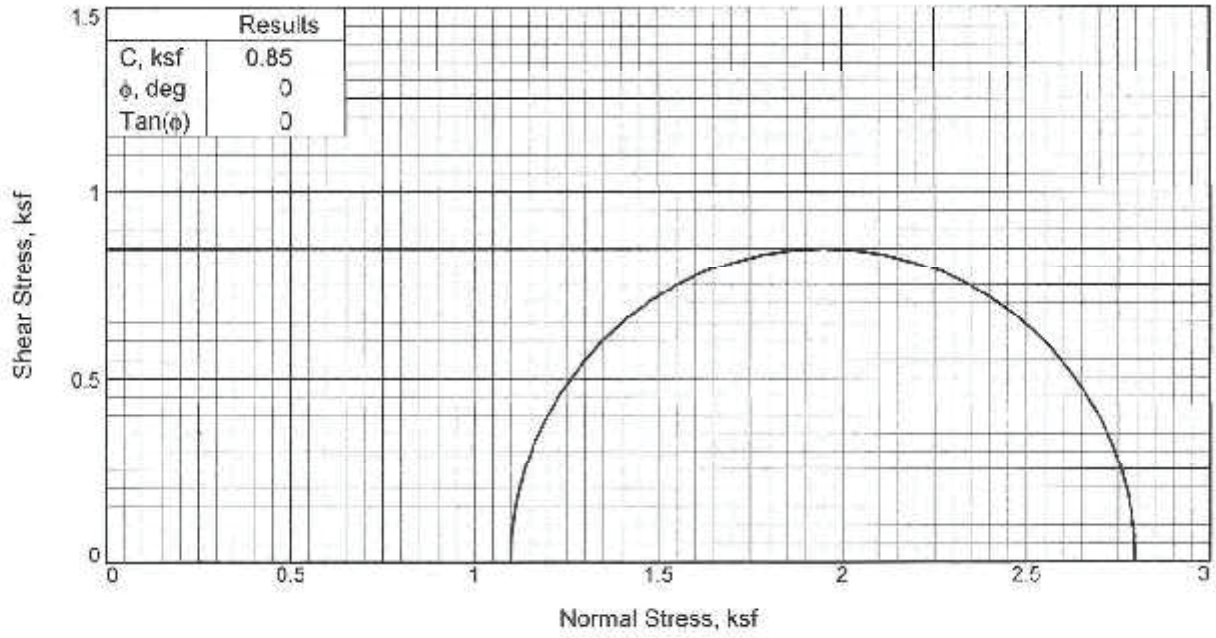
Client: Questa Engineering Corp.

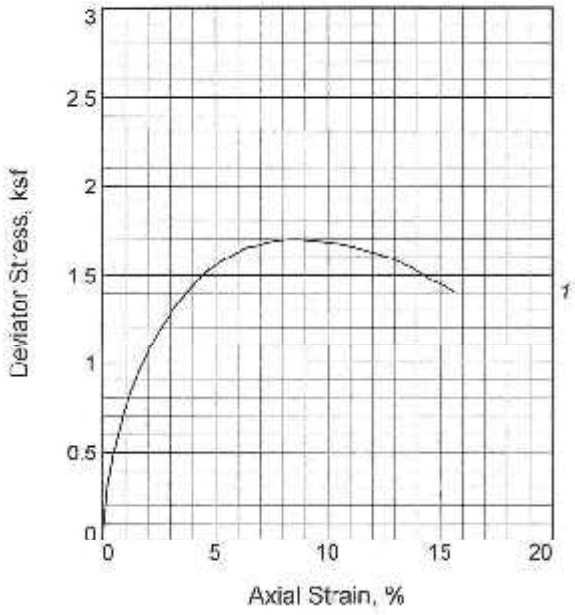
Project: Harking Bridge

Location: B-3
Depth: 6-6.5'
Proj. No.: 1400040 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
Soil Mechanics Lab
Oakland, California

Tested By: MA





Sample No.		1
Initial	Water Content, %	25.3
	Dry Density, pcf	96.0
	Saturation, %	90.3
	Void Ratio	0.7558
	Diameter, in.	2.42
	Height, in.	4.36
At Test	Water Content, %	28.0
	Dry Density, pcf	96.0
	Saturation, %	100.0
	Void Ratio	0.7558
	Diameter, in.	2.42
	Height, in.	4.36
Strain rate, in./min.		0.08
Back Pressure, psi		0.00
Cell Pressure, psi		7.63
Fail. Stress, ksf		1.70
Ult. Stress, ksf		
σ_1 Failure, ksf		2.80
σ_3 Failure, ksf		1.10

Type of Test:
Unconsolidated Undrained

Sample Type: Mod.Cal.

Description: Stiff,dark gray sandy CLAY(CL).

Assumed Specific Gravity= 2.70

Remarks:

Client: Questa Engineering Corp.

Project: Harking Bridge

Location: B-4

Depth: 9-9.5'

Proj. No.: 1400040 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
Soil Mechanics Lab
Oakland, California

Figure _____

Tested By: MA

APPENDIX B

E T S Environmental Technical Services

-Soil, Water & Air Testing & Monitoring
-Analytical Labs
-Technical Support

975 Transport Way, Suite 2
Petaluma, CA 94954
(707) 778-9605/FAX 778-9612
e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

COMPANY: Questa Engineering, 1220 Brickyard Cove Road, Suite 220, Point Richmond, CA
ATTN: Syd Temple & Chris Lyle
JOB: Harking Bridge
JOB #: 1400040

DATE RECEIVED: 6/16/2014
DATE of COMPLETION: 6/25/2014
ANALYST(S): D. Salinas, S. Santos
SUPERVISOR: D. Jacobson, LAB DIRECTOR, C.S. Conrad PhD

LAB SAMPLE NUMBER	SAMPLE ID	DESCRIPTION of SOIL and/or SEDIMENT	SOIL pH -log[H+]	NOMINAL RESISTIVITY ohm-cm	ELECTRICAL CONDUCTIVITY µmhos/cm	SULFATE SO4 ppm	CHLORIDE Cl ppm
05915-1	HB1/NC	B-2 @ 9.0-10.5'	8.12	1,390	[719]	246	195
05915-2	HB2/NC	B-4 @ 9.5-11.0'	7.22	1,784	[561]	87	27
Method	Detection	Limits -->	---	1	0.1	1	1

LAB SAMPLE NUMBER	SAMPLE ID	DESCRIPTION of SOIL and/or SEDIMENT	SALINITY ECe mmhos/cm	SOLUBLE SULFIDES (S=) ppm	SOLUBLE CYANIDES (CN=) ppm	REDOX mV	PERCENT MOISTURE %
05915-1	HB1/NC	B-2 @ 9.0-10.5'				+195.1	22.88
05915-2	HB2/NC	B-4 @ 9.5-11.0'				+269.9	18.38
Method	Detection	Limits --->	---	0.1	0.1	-400 -> +600	0.1

COMMENTS

Resistivities are at <1,500 & >1,500 ohm-cm, i.e., low & mediocre (assign 2-10 pts & 1-8 pts, depending on specs); soil reactions (i.e., pHs) are mildly alkaline which is good (assign Ø pts); sulfate is elevated in one (@ >200 ppm) and low enough in the other (@ <200 ppm) (assign Ø-1 & Ø pts, depending on specs); and chloride is mildly elevated in one (@ >100 ppm but <500 ppm, assign Ø-3 pts, depending on specs), and low in the other; soils are mildly (@ 200-400 mV, assign Ø-3.5 pts) to moderately (@ <200 mV, assign Ø-4 pts, depending on specs) reduced. The standard CalTrans times to perforation for these soils are as follows: for HB1 & 18 ga steel the time is >28 yrs, and for 12 ga it goes up to <63 yrs; and for HB2 the respective times are >31 yrs, and <70 yrs. For gray/ductile steels and cast iron the calculated average pitting rate (according to Uhlig) is @ ≈0.081 mm/yr for HB1 and 0.089 mm/yr for HB2, thus pitting to a 2 mm depth for HB1 is >24 yrs, and for HB2 is at ~22.5 yrs. Chloride is mildly elevated in HB1, thus this could be a mild issue for steel and rebar; and sulfate is mildly elevated in HB1 as well, thus this too could be a mildly adverse issue for concrete, cements, grouts and mortars. Also, both soil redoxes could be an issue for general construction materials. These soils would not benefit from alkaline or mild cement treatment in that both of their pHs are already alkaline enough. Metals longevity in these soils could be improved by upgrading the steel, in fact, often times structural strength considerations will require heavier gauge steel than used in the presented examples such that perf & pitting times can end up being safely beyond the specified life span. Other general alternatives include use of specialized engineering fill, or the use of bonded plastic coated steel, or plastic, fiberglass or concrete assets, etc. In general, standard concrete mixes should be fine in these soils based on these results. Total points for these soils would be as follows: HB1 @ 2-21.5 pts, depending on the actual specifications, and HB2 @ 1-11.5 pts, i.e., a huge range both cases meaning that any assessment of the utility or acceptability of these soils could be very much dependent on the exact specificatons. Last, both soils exhibited a moderate moisture content averaging right around 20-21%.

\\\NOTES: Methods are from following sources: extractions by Cal Trans protocols as per Cal Test 417 (SO4), 422 (Cl), and 532/643 (pH & resistivity); &/or by ASTM Vol. 4.08 & ASTM Vol. 11.01 (=EPA Methods of Chemical Analysis, or Standard Methods); pH - ASTM G 51; Spec. Cond. - ASTM D 1125; resistivity - ASTM G 57; redox - Pt probe/ISE; sulfate - extraction Title 22, detection ASTM D 516 (=EPA 375.4); chloride - extraction Title 22, detection ASTM D 512 (=EPA 325.3); sulfides - extraction by Title 22, and detection EPA 376.2 (=SMEWW 4500-S D); cyanides - extraction by Title 22, and detection by ASTM D 4374 (=EPA 335.2).

Technical Memorandum

Date: July 8, 2014

Subject: Harkins Bridge Relocation Study

To: Aaron Hebert
Midpeninsula Regional Open Space District

From: Sydney Temple P.E.
Questa Engineering Corporation

Summary

The Harkins Bridge is near the entrance of the Purisima Creek Redwoods Open Space Preserve (Preserve). The bridge not only links interior Preserve roads for patrol, fire, and other emergency response, it also provides a connection between two public roads (Purisima Creek Road and Highway 35/Skyline Boulevard). The bridge is old, deteriorated beyond repair, and requires replacement to continue to provide capacity for vehicular emergency response. This technical memorandum addresses the location of the existing and proposed new location for the replacement bridge.

Questa Engineering (Questa) performed engineering flood modeling which indicates that replacing the bridge at its current location is impractical and not as cost-effective as replacing it in a new, nearby location. A five-foot diameter redwood log recently fell into the creek immediately downstream of the bridge. This log blocks the majority of stream flow during 100-year storm events and therefore will cause flooding at the existing bridge location. If the bridge were to be raised above the flood zone, significant fill material would be required to raise the bridge approaches and overall bridge elevation. This will cause delays in permitting, increase the visibility of the bridge itself, and add significant cost. The downed redwood log is a welcome addition to stream complexity for aquatic habitat; also, removing it would not fully eliminate the need to import fill at the current bridge location. Fortunately, there is a better location to cross the creek about 60 feet upstream, outside of the influence of the redwood log. This new location reduces the need to import fill material to almost zero, allows for a shorter overall bridge span, and reduces construction costs. Some small alder trees (a quick growing, short-lived successional species) and annual riparian vegetation will need to be removed. The new location is the preferred alternative as it is more cost effective and minimizes potential environmental impacts.

LOCATION

The bridge is located approximately 100 yards east of the intersection of Higgins Canyon Road and Purisima Creek Road, on the Whittemore Gulch Trail, in the Purisima Creek Open Space Preserve.

Existing Bridge Use and Load Capacity

From the previous inspection report done in 2012: "The steel substructure, runners and transverse beams, are in extremely poor condition and are an immediate hazard to vehicle traffic. Some elements have rusted completely away and have fallen off. There is an elevated risk of a heavily loaded wheel penetrating through the deck due to these deficiencies. The girders appear in medium-poor condition with significant rust and degradation. They are of sufficient size, however, that they still have plenty of capacity to support even the heaviest highway trucks, HS20 loading. It is questionable whether or not abutments exist under the girder ends – none were observed. It is possible that the girders are placed directly on soil. Regardless, this system appears to be functioning adequately.

The load capacity of this bridge is limited by the poor condition of the substructure (steel runners and transverse beams.) Until these items are replaced or repaired, we suggest that the maximum load not exceed 6,000 lb. (passenger vehicle or light truck.)"

Bridge Size and Type

The current bridge serves as crossing for patrol, fire, and other emergency vehicles. These vehicles can be quite heavy, so the bridge will have to be able to carry those loads safely. This will entail the construction of structural concrete abutments, and maintaining adequate turning radius and grades leading to and from the bridge. The replacement must also comply with San Mateo County's building codes and regulations. Meeting these standards will drive the design of the height and wide of the replacement structure. Minimum amounts of the clearance will be required under large storm scenarios, such 50- and 100-year recurrent events. This will determine the bottom of the bridge elevation, which then sets road heights and approach designs.

Channel Conditions

The channel conditions on the site are now dominated by the presence of a large fallen redwood tree downstream of the bridge. This tree is in excess of 5 feet in diameter and has blocked the majority of the channel approximately 50-75 feet downstream of the bridge.

As can be seen in the adjacent photo, there is limited flow capacity underneath the tree ("freeboard") and on the right side which causes high flows to back up upstream. This will cause flooding of the adjacent areas and impact the bridge capacity at high flows.

The fallen tree is also causing sediment to accumulate upstream. Witness accounts estimate recent sediment aggradations of the bed on the order of 2 to 3 feet. It should be noted that falling woody debris and its subsequent geomorphic effects are a natural process of stabilization in this mountainous creek system.

In order to determine the effect of this tree trunk on the current bridge site we completed a site hydrologic and hydraulic review and analysis. This analysis utilized existing hydrologic information, 2014 topographic survey, and constructed new hydraulic models of the site. This analysis is discussed below.

Hydrology

The watershed hydrology was investigated in 1999 by Dames and Moore (Appendix A). The report stated that the watershed is approximately 2,460 acres or 3.58 square miles. The calculated magnitude of the 10-year and 100-year flow events, are 1,100 cubic feet per second (cfs) and 1,540 cfs, respectively. Using these numbers, we have also calculated 2 year flow at 800 cfs.

The hydraulic analysis consists of modeling the flow regime through the channel reach as characterized by surveyed cross-sections and the supplied topographic map. The field data were imported into HEC-RAS (Hydrologic Engineering Center River Analysis System version 4.1, 2010) hydraulic modeling software developed by the U.S. Army Corps of Engineers. This hydraulic model predicts flow velocity, water surface elevations, and water depths, among other hydraulic parameters.

The following methods were used:

- **1D Hydraulic Model**
  HEC-RAS is a one-dimensional hydraulic model capable of calculating water surface profiles for steady, gradually varied flow. The basic computational procedure is based on the solution of the one-dimensional energy equation. Energy losses are evaluated by friction (Manning's *n* coefficient) and contraction/expansion (coefficient multiplied by the change in velocity head). The model is therefore capable of evaluating backwater effects caused by channel constrictions such as undersized culverts. This hydraulic analysis was performed with the assumption that flow in Purisima Creek is uniform, steady, open-channel flow. A mixed regime steady flow analysis was computed, where flow can be either sub- or super-critical.

- **Cross-section Geometry**
  Cross sections were taken from the base topographic map that was surveyed in 2014.

- **Roughness**
  Roughness coefficients were assigned to left overbank, channel, and right overbank segments of each cross-section. Different roughness coefficient values reflect different surface "roughness" qualities. Generally, the channel was assigned a Manning's *n* of 0.050, and the overbanks 0.070.

- **Hydraulic Structures**
  The existing bridge was not modeled to due to the fact that it will be removed. Several scenarios were run to determine the impact of the downed redwood and to predict the water surface elevations at the proposed bridge site.
- **Steady Flow Analysis**
  The steady flow analysis requires the input of user-defined profiles specifying peak flow data and model boundary conditions. The analysis then determines the water surface elevations and other specific flow parameters within the reach. These parameters include depth, velocity, flooding top width and other parameters. This aids us in determining the the flow dynamics of the area and helps to determine the design conditions at the proposed bridge site.

In a modeled flow regime, boundary conditions are necessary at the upstream and downstream ends of the river system. This analysis used a "normal depth" boundary condition at the upstream and downstream boundaries of the project reach.

Existing Conditions

The modeling demonstrated that the flows are typically contained within the channel banks of the creek. The downed redwood tree, though letting small volumes of water in normal, low flows, will act as a significant constriction during high storm flows,. **Figure 1**. shows the existing topographic condition of the site as well as the modeled 10 and 100 year floodplain boundaries. We modeled the tree and its constriction like a culvert. The top of the tree was set as the elevation that water would flow over the top, acting like a weir. The opening beneath it was modeled as a wide, low arch culvert, and the small area between the rootwad and bank was modeled as open channel (**Figure 2**). The top elevation of the tree trunk is the controlling factor in determining the new floodplain. We ran several scenarios varying 100 cfs to 1500 cfs.

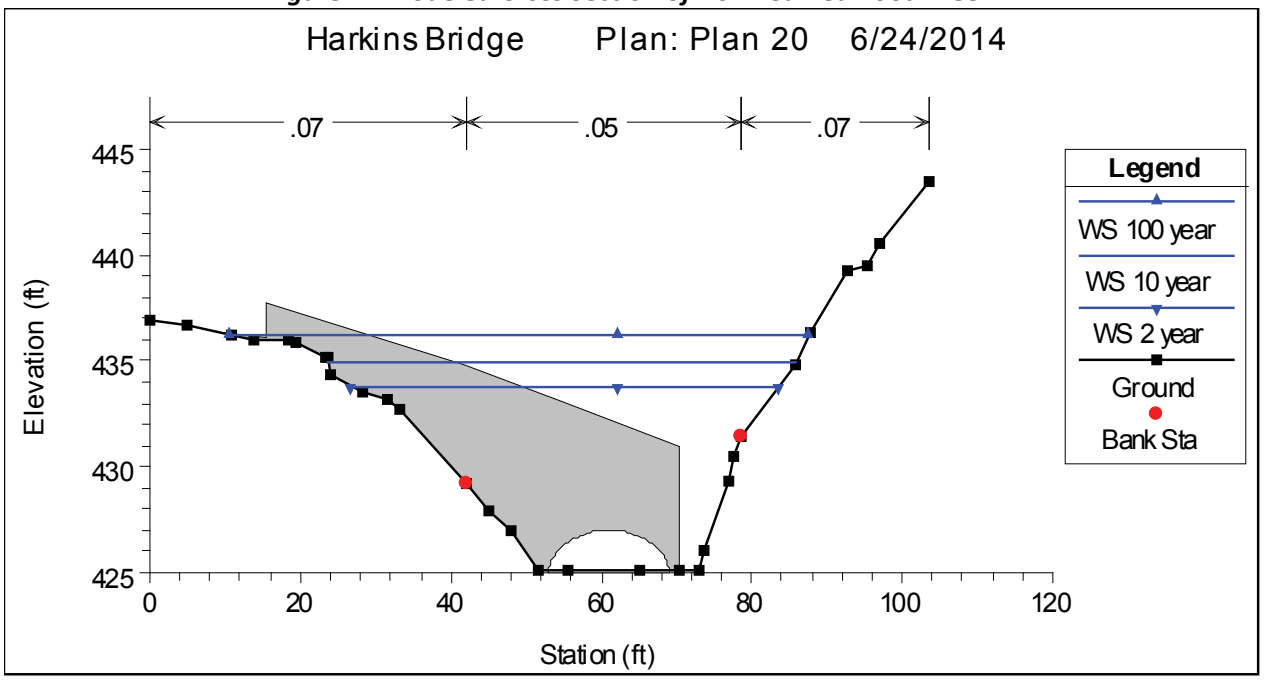
Figure 1 shows the existing floodplain with the log. The model shows the log causes significant flooding of the low areas to river left (looking downstream) of the bridge–exactly where the approach ramp would have to be located if the current bridge location is used.

Flows start to back up around 300 cfs and flood over the upstream banks and nearly to the top of the trunk under 2 year flow conditions (800 cfs). This back up of water is causing sediment to deposit upstream of the downed redwood and new instream terraces are beginning to form.

Flow is also being forced between the rootwad and right bank and some erosion is beginning. It is not expected that this erosion will develop into significant problems because bedrock is very close to the surface on the right bank. Erosion will continue but eventually the bedrock interface will be exposed

and erosion rates will reduce. The erosion is unlikely to cause any near future problems to the adjacent trail or other large trees nearby.

Figure 2. Modeled Cross Section of Downed Redwood Tree



*Note the X-axis scaled ~2:1 to the Y-Axis.

Problems with Current Bridge Location

The downed redwood tree presents some problems for the replacement of the bridge. The new bridge will need to comply with current freeboard and design regulations and since it will be used for emergency vehicles will need to be passable under major storm conditions. This will mean the bridge will need to be elevated one foot above the 100-year flood elevations. This is done for several reasons: first it provides that the bridge can be used during emergency events, it also provides a bit space beneath the bridge that can allow for floating debris to pass underneath, and three; it is generally the design standard for bridges that have a heavy vehicle load rating (H20). This elevation is currently around 436 feet. A bridge able to carry a fire truck load is going to be approximately three feet thick, so this puts the deck/roadway elevation at 439 feet. If the replacement bridge is installed at this height then it will be necessary to import fill material to raise the southern approach by 5 to 7 feet.
Adding this much fill to the area presents some significant drawbacks to building the new bridgein the same location as the old bridge. It adds significant expense to the project and increases the size and overall foot print of the project in a sensitive area. The additional fill required increases truck traffic and its associated environmental impacts. It prevents flow from reaching the floodplain and causes issues with local drainage at the site.

One solution would be to remove the down tree and restore flow into the channel. We modeled this scenario and it reduces the 100-water surface by 3 feet. Even if the tree is removed, the new bridge will still have to comply with freeboard requirements and will require fill placement. The redwood log

makes construction of a new bridge immediately upstream a significant challenge. It was because of these reasons that an alternate bridge location was sought.

Proposed New bridge location – The influence of the log decreases upstream of the current bridge location. Fortunately, the two road approaches parallel the creek going upstream. Thus, an upstream location out of the influence of the tree could provide an alternative bridge location, ideally over a narrow, incised channel. Such a location is found approximately 60 feet upstream of the present bridge, above the backwater influence of the fallen redwood where the channel is narrow and deep. The hydraulic model predicts that the 100-year water surface at this location to be approximately 437 feet, approximately 2 feet below the current top of bank. The top width of the flow is around 37 to 40 feet at this site. This location greatly reduces the need to place fill for the bridge approaches. At this location the bridge deck will only be about 1 foot above existing grade so only minor amounts of fill will be needed and the majority of this will likely come from onsite excavations. This location also reduces the bridge span needed. This will significantly reduce costs and the environmental impacts of the project.

Please see the attached **Sheets 1 to 5** that show the conceptual layout of the new bridge and the turning radius required on the northern bank. The new bridge would support wildland fire truck weights and have aH20/HS20 load rating. The impacts vegetation impacts are one tree (12" Alder) and some young alders (<4´dia.) that will need to be removed along the southern bank. Minor amounts of low growing annual native and exotic riparian vegetation will need to be removed for the new southern road alignment.

We believe this is a significantly better location for the replacement bridge and recommend the next stages of the design should focus on this bridge location.

Next Steps

Questa will complete its geotechnical investigation of the new bridge site and move forward with starting the general foundation and approach design. This analysis will be developed into a project design report that summarizes hydrologic, hydraulic, and geotechnical considerations in the design. We will also further develop the plan set to include the demolition of the existing bridge, the construction of a temporary crossing so construction vehicles can get to the north abutment. Once the new bridge is in place, the temporary crossing will be removed and the banks would be re-graded and replanted. Once 50% design has been developed then the CEQA process will be initiated. The project is likely going to need an Initial Study/ Mitigated Negative Declaration. The project lies within the Coastal Zone so a Coastal Development permit is required. This permit and structure design review will be administered by the County of San Mateo.

Once CEQA is completed then the project will need to be permitted by state and federal agencies. These will include a RWQCB 401, USCOE 404, and CDFW 1600. The temporary crossing (to construct the north abutments) will require a 404 permit from the Army Corps, but the new bridge is to be built above the ordinary high water mark. The USCOE will need to consult with the USFWS for any special status species in the area including the dusky-footed wood rat (known to occur in the area) and marbled murrelet (overhead flight corridor).

A 1600 permit from CDFW will be required for the demolition of the old bridge and construction of the new one. Consultation with CDFW will also be required for any flow diversion and temporary culvert placement in the channel.

HARKINS BRIDGE REPLACEMENT PLAN

SAN MATEO COUNTY
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaeng.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

No. 59695 — PROFESSIONAL ENGINEER — SIDNEY K. TEMPLETON — 12-31-15 EXPIRES — CIVIL — STATE OF CALIFORNIA

Sht	Rev:	Date:	By:	Description:	Appr'd:

Design: ST
Drawn: CL
Checked: ST
Appr'd: ST

PURISIMA CREEK
10 & 100 YEAR FLOODPLAINS

PURISIMA CREEK, SAN MATEO COUNTY

Size D | Project 1400040
Scale: AS NOTED
Date: 6-26-14
Sheet: 1 OF 1

H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

MARBLED MURRELET HABITAT ASSESSMENT AND MANAGEMENT RECOMMENDATIONS
Phase I – Preliminary Review and Recommendations

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

Prepared by

H. T. HARVEY & ASSOCIATES

Scott Terrill, Ph.D. Senior Ornithologist/Principal
Steve Rottenborn, Senior Wildlife Ecologist/Project Manager
Laird Henkel, M.S., Ornithologist
David L. Suddjian, B.A., Associate Ornithologist

Prepared for

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022-1404
Attn: Mr. Kirk Lenington, Resource Manager

30 March 2007

Project No. 2644-01

3150 Almaden Expressway, Suite 145 • San Jose, California 94118 • 408-448-9450

TABLE OF CONTENTS

FIGURES:

INTRODUCTION

The Midpeninsula Regional Open Space District (MROSD) owns and manages more than 50,000 acres of land in 25 open-space preserves in Santa Clara, San Mateo, and Santa Cruz counties. In keeping with the District's purpose, these lands are maintained primarily in a natural condition, and infrastructure is developed only to the extent necessary for low-intensity recreational uses. The Marbled Murrelet (*Brachyramphus marmoratus*), a seabird listed as federally-threatened under the Federal Endangered Species Act, may nest in coniferous forests on District lands. H. T. Harvey & Associates reviewed existing literature, data, and results of prior field surveys on District lands to determine potential habitat for the species, conducted ground-based observations within identified areas to refine appropriate habitat areas, and developed recommendations for future management actions, such as focused surveys to determine level of use, habitat enhancement, and predator control projects.

REVIEW OF EXISTING INFORMATION

Marbled Murrelets are small seabirds in the auk family (Alcidae). Unlike other seabirds, Marbled Murrelets nest in mature conifer forests, sometimes 50 km or more from the coast (Nelson 1997). Loss of old growth forest habitat has led to population declines throughout the species' range (Nelson 1997). In 1992, the Marbled Murrelet was listed by the United States Fish and Wildlife Service (USFWS; 1992) as threatened, and by the state of California as Endangered. Critical habitat for the species was designated in 1996, but was then rescinded as the result of a lawsuit. Critical habitat was re-proposed in 2006 (USFWS 2006). A final recovery plan was issued in 1997 (USFWS 1997), and a 5-year status review of the Marbled Murrelet in Washington, Oregon, and California was completed for the USFWS in 2004 (McShane et al. 2004).

Natural History. Marbled Murrelets spend the majority of their lives at sea, where they forage primarily on small fish. Throughout the winter, they remain at sea, and come ashore only to nest, from approximately April through September. They nest in coastal coniferous forests. They do not construct a nest, instead they lay a single egg directly on a horizontal branch of a large tree, usually in the top third of the tree (Nelson 1997). Nest trees must thus be of sufficient size and with sufficient structure to prevent the egg from rolling off the branch. Researchers have had difficulty finding nests high in old growth conifers, and the first known Marbled Murrelet nest in North America was not located until 1974, in Big Basin State Park (Binford et al. 1975).

Incubation of the single egg takes approximately one month. Incubation duties are shared by the male and female, each taking 24-hour shifts, changing at dawn (Nelson 1997). After the egg hatches, the chick is fed small fish carried to the nest at dawn, or occasionally at dusk or other times of the day, by both parents. After about one month of rearing at the nest, chicks fledge at dusk, apparently flying directly to the ocean (Nelson 1997).

Marbled Murrelets breed along the Pacific Coast of North America from Alaska south to the Santa Cruz Mountains. The Santa Cruz Mountains population is small (ca. 600 individuals; McShane et al. 2004) and isolated from the next significant population, in Humboldt County, by more than 400 km. Primary nesting areas in the Santa Cruz Mountains are in Big Basin Redwoods State Park, Butano State Park, and adjacent private property. By 1995, approximately 330,000 hectares of old-growth forest habitat remained in coast ranges of California (Perry 1995). Marbled Murrelets require large trees for nesting, and nesting sites are limited by adequate structure and diameter of branches. Nesting trees are generally greater than 1 m diameter, but nesting has been documented in many mature second-growth trees (Nelson 1997).

Demographic models indicate that the Marbled Murrelet population is declining as a result of low fecundity (Beissinger 1995, Peery et al. 2004, McShane et al. 2006). The range-wide population decline is presumably linked primarily to continuing loss of old growth forest habitat (Nelson 1997). In addition to direct loss of habitat, habitat fragmentation can potentially lead to increased nest predation (USFWS 1997). Few Marbled Murrelet nests have been found and monitored, but Corvids (ravens, crows, and jays) appear to be important predators of eggs and young (Nelson 1997, Nelson et al. 2006, Baker et al. 2006). Other threats include predation of

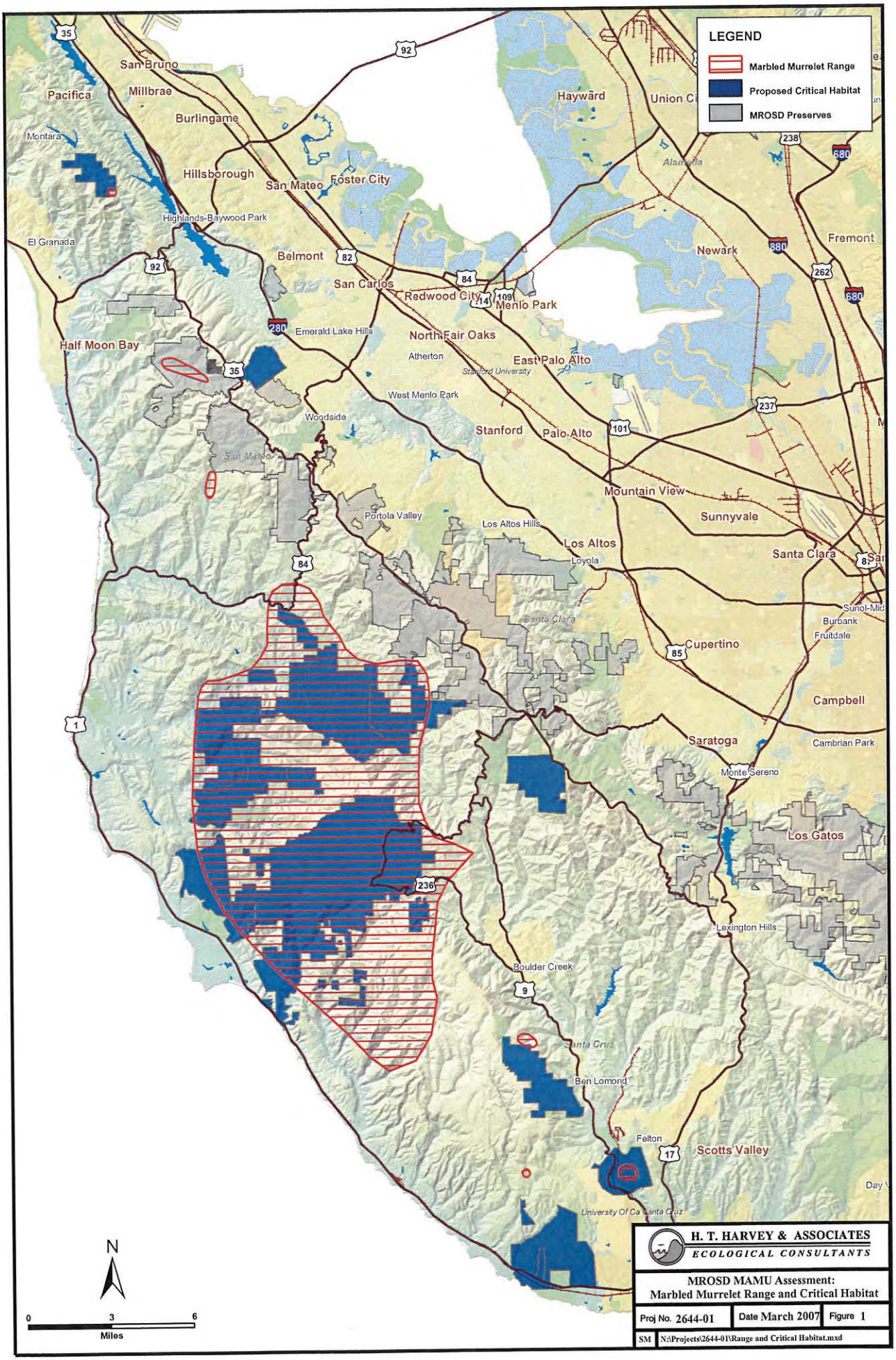
adults by Peregrine Falcons (*Falco peregrinus*); and such predation may be potentially exacerbated by habitat fragmentation, oil spills, and incidental mortality related to commercial or recreational fisheries (Nelson 1997). Populations may also be affected by interannual changes in the marine environment, including El Niño-related effects (McShane et al. 2004). Within USFWS Conservation Zone 6 for the species, which encompasses the Santa Cruz Mountains population, demographic modeling predicts that the species will be locally extinct (*i.e.*, less than 30 individuals present) by 2040 (McShane et al. 2004, Peery et al. 2006).

DISTRIBUTION IN THE SANTA CRUZ MOUNTAINS

Marbled Murrelets likely historically occurred in coniferous forests throughout west slope of the Santa Cruz Mountains. Much of this habitat was logged during the late 19th and early 20th centuries, and the range of the species is now much reduced. As previously noted, the first nest for the species was not found until 1974, and there was relatively little research on breeding distribution until the species was federally-listed in 1992. Since 1992, there have been numerous surveys conducted in potential habitat during the breeding season, and several radio-telemetry studies that have allowed for mapping of the species range in the Santa Cruz Mountains. Typical inland surveys follow a protocol developed by the Pacific Seabird Group (Evans Mack et al. 2003). This protocol calls for passive audio/visual surveys within suitable habitat during the breeding season, from 45 minutes before to 75 minutes after sunrise. To determine whether a site is occupied, this protocol recommends a minimum of 5 visits per year for 2 years. Radar has also proved useful for assessing habitat use by Marbled Murrelets (*e.g.*, Burger 2001), and radar may provide better, unbiased estimates of the actual number of murrelets flying into or out of a certain area (Bigger et al. 2006). Radio-telemetry has allowed researchers to find nests, greatly adding to the body of information on nesting habitat and distribution for the species (*e.g.*, Baker et al. 2006), but it is not a useful tool for assessing particular parcels of land.

Based on the best available information, the current approximate range of the Marbled Murrelet in the Santa Cruz Mountains is mapped in Figure 1. The core of the range includes the California State Parks near the Santa Cruz/San Mateo County border, including Big Basin, Butano, and Portola Redwoods State Parks. These parks contain much of the residual old growth coniferous forest left in the region. Other areas where the species has been recorded in recent history include isolated detections in the San Lorenzo Valley area, areas in or adjacent to Purisima Creek Redwoods OSP and El Corte Madera Creek OSP (discussed below), and one site near the headwaters of Pilarcitos Creek. In 2005, Avocet Research Associates (2005) recorded occupied behavior of Marbled Murrelets in Douglas-fir habitat on San Francisco PUC land along the upper reaches of Pilarcitos Creek. These records substantially expanded to the north the known range of the species in the Santa Cruz Mountains (Figure 1).

Critical Habitat, as recently re-proposed by the USFWS (2006), includes all the State Park units in the region with any potential habitat (Figure 1). No MROSD lands are proposed as Critical Habitat. McShane et al. (2004) estimated that there are 7,250 acres of suitable habitat for the Marbled Murrelet in the Santa Cruz Mountains (Conservation Zone 6).


LEGEND
Marbled Murrelet Range
Proposed Critical Habitat
MROSD Preserves
San Bruno
Pacifica
Millbrae
Burlingame
Montara
Hillsborough
San Mateo
Foster City
Highlands-Baywood Park
El Granada
Belmont
San Carlos
Redwood City
Menlo Park
Emerald Lake Hills
North Fair Oaks
Atherton
East Palo Alto
Stanford University
Half Moon Bay
West Menlo Park
Woodside
Stanford
Palo Alto
San Mateo
Mountain View
Sunnyvale
Portola Valley
Los Altos Hills
Los Altos
Loyola
Santa Clara
Cupertino
Campbell
Saratoga
Cambrian Park
Monte Sereno
Los Gatos
Lexington Hills
Boulder Creek
Santa Cruz
Ben Lomond
Felton
Scotts Valley
University Of Ca Santa Cruz
Hayward
Union Ci
Alameda
Newark
Fremont
Burbank
Fruitdale
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H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
MROSD MAMU Assessment:
Marbled Murrelet Range and Critical Habitat
Proj No. 2644-01
Date March 2007
Figure 1
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HABITAT ASSESSMENT

DESCRIPTION OF SUITABLE HABITAT

On a broad scale, suitable habitat includes coastal coniferous forests with suitable moisture to support mosses and lichens, which are used as a nesting substrate (Nelson et al. 2006). In the Santa Cruz Mountains, moist coniferous forest is generally limited to the west slope of the Santa Cruz Mountains. Although late-successional second-growth forests are used by the species if trees are large enough and have suitable structure, old-growth forest habitat is preferred (Nelson et al. 2006). Within the Santa Cruz Mountains, nests have been found in both coast redwood (*Sequoia sempervirens*) and Douglas-fir (*Pseudotsuga menziesii*). Of 17 known nests sites in the Santa Cruz Mountains (Baker et al. 2006), all nests were located within redwood stands, but within these stands, most nests were in individual Douglas-fir trees, which often have more potential nesting platforms.

Within suitable coniferous forests, habitat suitability depends both on the characteristics of individual nest trees and on the surrounding landscape. The recent Critical Habitat proposal (USFWS 2006) states that two primary constituents of Critical Habitat are necessary, as follows:

1) Forested stands containing large-sized trees, generally more than 32 inches (81 cm) in diameter with potential nesting platforms at sufficient height, generally greater than or equal to 33 feet (10 m) in height; and

2) The surrounding forested areas within 0.5 miles (0.8 km) of these stands with a canopy height of at least one-half the site-potential tree height.

Similarly, Nelson et al. (2006) reviewed the characteristics of suitable habitat, and reported that the most important component of suitable habitat at the tree-scale is the presence of large potential nesting platforms (limbs >10 cm in diameter) in coniferous trees. These platforms are typically found in large trees, although wind or lightning damage can create suitable platforms in smaller trees. Vertical and horizontal cover around nesting platforms is also important in preventing predators from finding nests. On a landscape-scale, the most important variable in determining suitability of potential habitat is the density of platforms and platform trees within stands of trees (Nelson et al. 2006). In addition, openings in the canopy adjacent to nest sites are important for allowing Marbled Murrelets access to these sites.

METHODS

We reviewed existing literature, data, and results of prior field surveys on District lands to assess what was already known regarding potential habitat for Marbled Murrelets within the District's boundaries. These sources included historic records of the species in or near District lands. In addition, Wildlife Biologist David Suddjian met with District rangers and other staff to discuss habitat areas that District staff thought might be suitable for the species.

We then used aerial imagery and other GIS-based data (*e.g.*, open space boundaries, District vegetation layers) to assess which portions of District lands contained coniferous forests with the

potential t support nesting Marbled Murrelets. This potential habitat analysis was limited to areas west of the summit of the Santa Cruz Mountains, and north of Highway 9, based on known range of the species (Figure 1).

Potential habitat was further refined based on ground-based observations of key habitat areas, and areas of old growth mapped by District staff and other researchers (*e.g.*, Steven Singer).

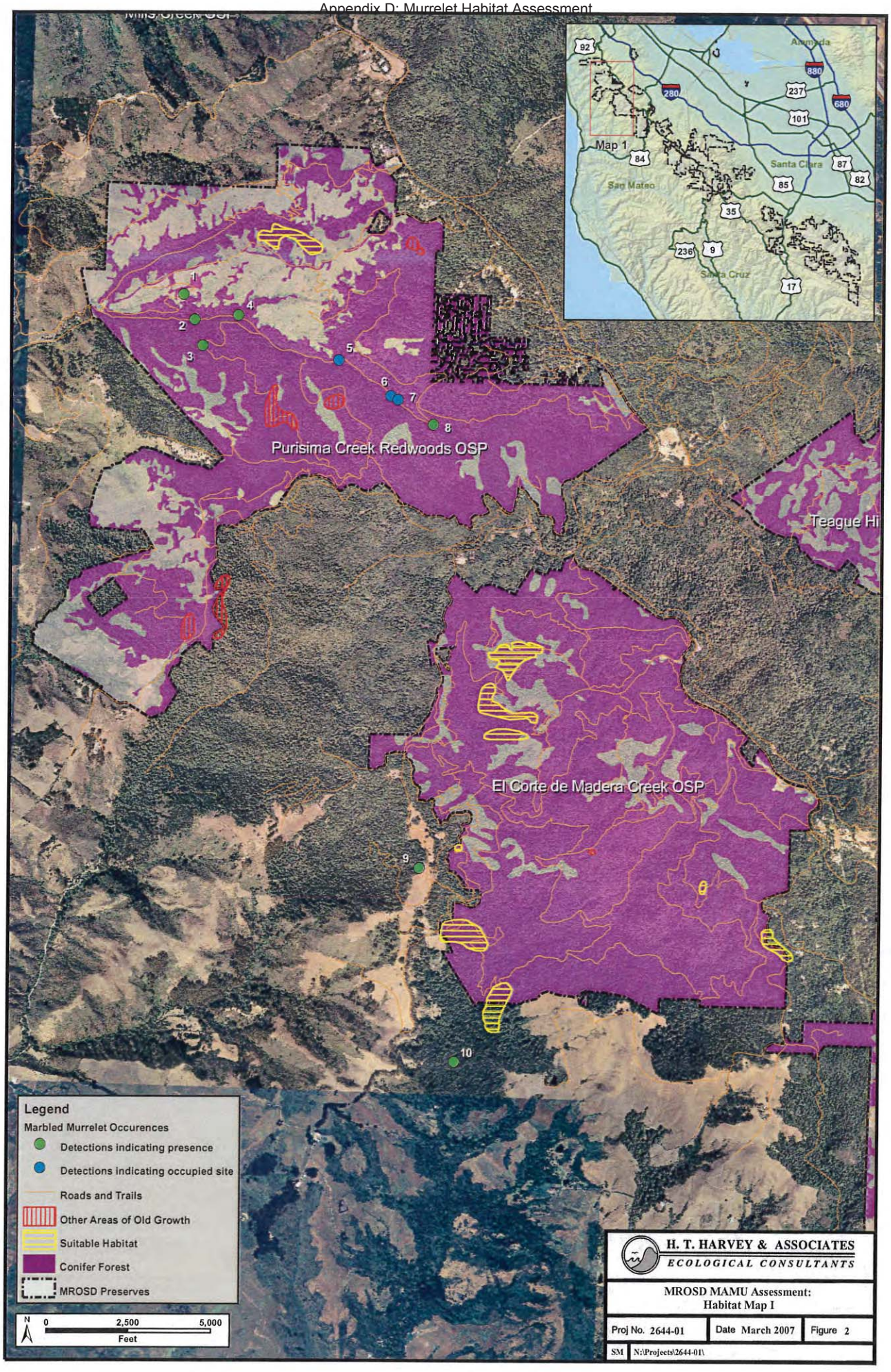
RESULTS

Potential habitat and known locations of Marbled Murrelet detections area mapped on Figure 2, 3, & 4. Potential habitat is divided into suitable habitat (viewed by David Suddjian for this study and determined to be suitable for Marbled Murrelets), and other areas of old growth, based on information from other sources. This other old growth habitat likely contains suitable habitat for Marbled Murrelets, but we were unable to conduct site visits to all potential habitat areas to verify this.

Mapped known locations of Marbled Murrelets are categorized as indicating presence or indicating occupied site. These categories are based on the survey results per the PSG protocol (Evans Mack et al. 2003). "Occupied" sites include sites where murrelets were seen flying below the top of the canopy (as well as sites with murrelets landing in trees, etc.). Presence-only (non-occupied) sites are characterized by above-canopy flights, presumably of birds commuting to a different location.

Locations are derived from surveys conducted primarily by Steven Singer (see Singer 2001). Surveys south and west of El Corte de Madera Creek OSP were reported in a letter dated December 9, 2005 from the California Department of Fish and Game to Edward Tunheim Forestry Consulting. In one case, a site is mapped as occupied not based on a protocol-level survey, but on the discovery of a fledgling Marbled Murrelet on the ground. This young bird was found in Purisima Creek Redwoods OSP on August 30, 2002. It was found along the Purisima Gulch Trail east of Soda Gulch, near where Singer had recorded occupied behavior during a previous survey. [David would have more info on locations. If we don't get more info, we should delete numbers off the map]

Based on this assessment, suitable habitat for Marbled Murrelets occurs within portions of Purisima Creek Redwoods OSP, of El Corte Madera Creek OSP, La Honda Creek OSP, and a small portion of Skyline Ridge OSP. In addition, old growth habitat that may be suitable for Marbled Murrelets occurs in Long Ridge OSP, and other potentially suitable habitat could occur in areas where we did not conduct on-the-ground surveys.



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ECOLOGICAL CONSULTANTS

MROSD MAMU Assessment:
Habitat Map I

Proj No. 2644-01	Date March 2007	Figure 2
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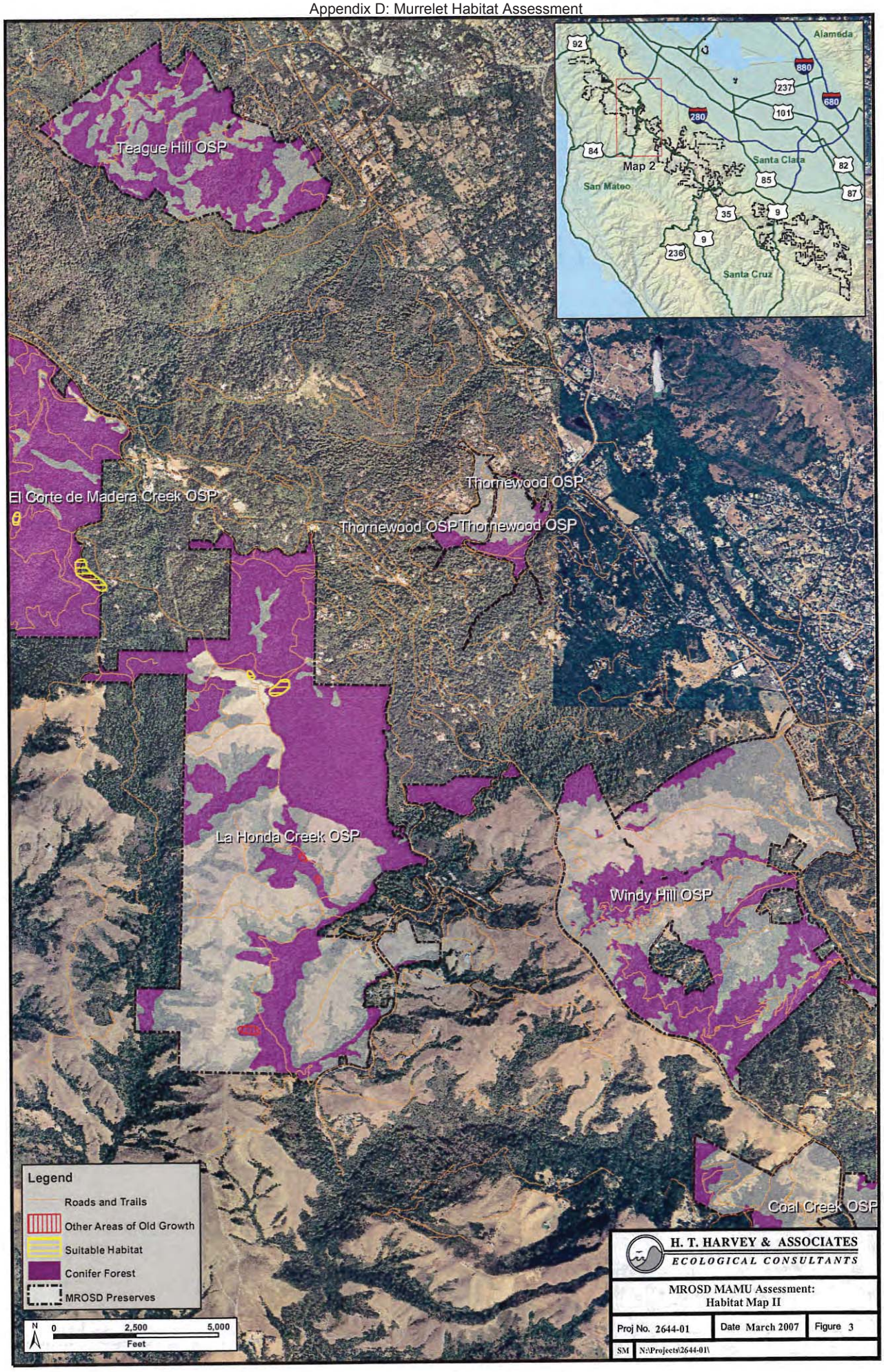
Teague Hill OSP
El Corte de Madera Creek OSP
Thornewood OSP
Thornewood OSP Thornewood OSP
La Honda Creek OSP
Windy Hill OSP
Coal Creek OSP
Map 2
Alameda
Santa Clara
San Mateo
Santa Cruz
92
880
237
680
101
280
84
82
85
87
35
9
236
Legend
Roads and Trails
Other Areas of Old Growth
Suitable Habitat
Conifer Forest
MROSD Preserves
N
0
2,500
5,000
Feet
H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
MROSD MAMU Assessment:
Habitat Map II
Proj No. 2644-01
Date March 2007
Figure 3
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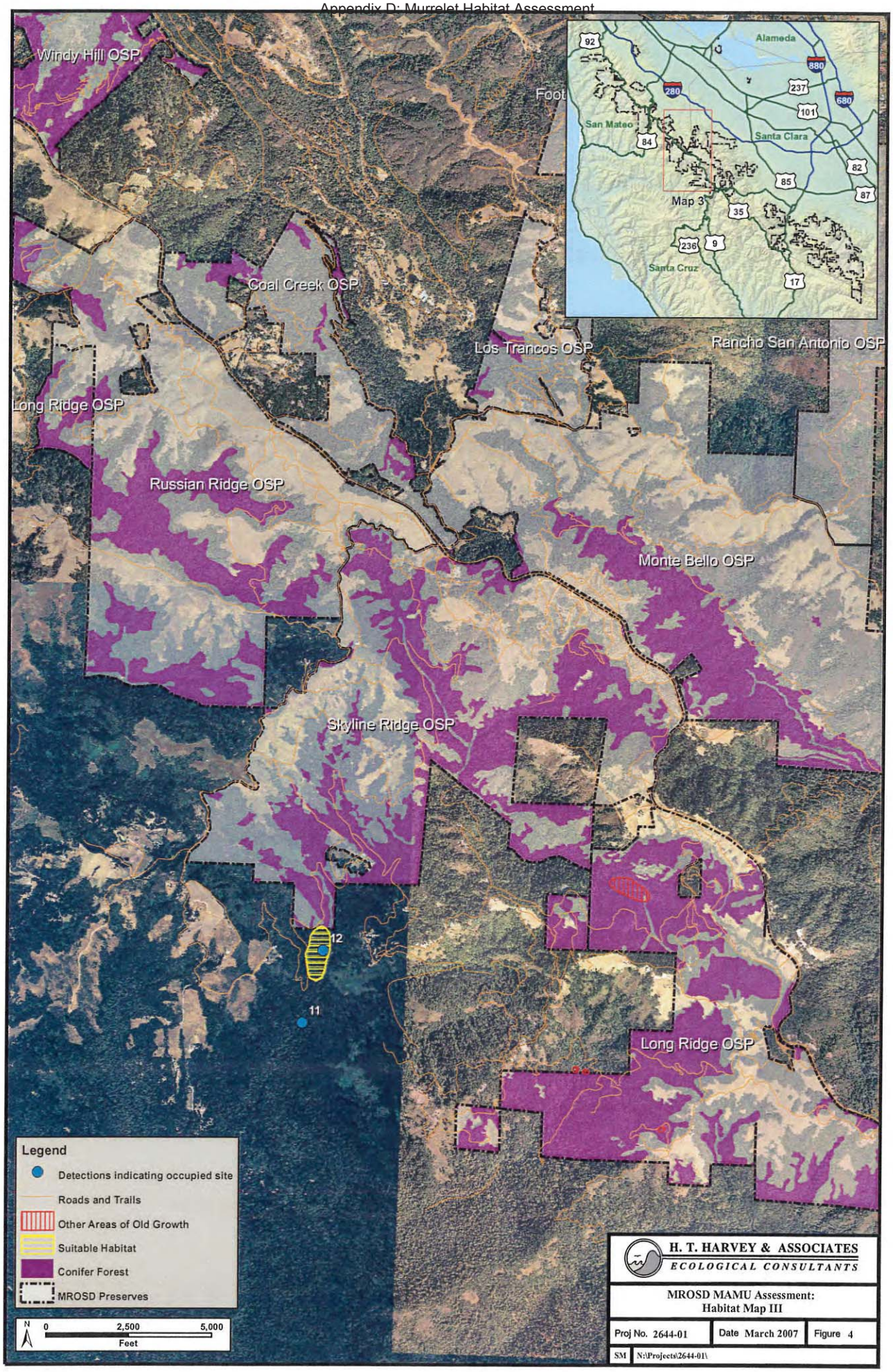
Windy Hill OSP
Foot
Coal Creek OSP
Los Trancos OSP
Rancho San Antonio OSP
Long Ridge OSP
Russian Ridge OSP
Monte Bello OSP
Skyline Ridge OSP
Long Ridge OSP
12
11
Alameda
San Mateo
Santa Clara
Santa Cruz
Map 3
92
880
280
237
680
101
84
82
85
87
35
236
9
17
Legend
Detections indicating occupied site
Roads and Trails
Other Areas of Old Growth
Suitable Habitat
Conifer Forest
MROSD Preserves
N
0
2,500
5,000
Feet
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MROSD MAMU Assessment:
Habitat Map III
Proj No. 2644-01
Date March 2007
Figure 4
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RECOMMENDATIONS

Here, we provide recommendations for potential management strategies to benefit the Marbled Murrelet on District Lands. In addition, although it is beyond the scope of this report to assess lands that the District may want to acquire, preservation of additional habitat that is not currently protected would be of the greatest benefit to the species.

BACKGROUND

Management of the Marbled Murrelet in most of California is overseen by the Northwest Forest Plan (Huff et al. 2006). This plan covers all Conservation Zones except Zone 6, in the Santa Cruz Mountains. Thus, management of the species in Zone 6 is overseen by the California Department of Fish and Game and the USFWS. The Recovery Plan for the Marbled Murrelet provides the following recommendations for key recovery actions.

1) Implement management plans for each Marbled Murrelet Conservation Zone
2) Delineate and protect areas of habitat within each Zone
3) Incorporate management recommendations for protected habitat areas
4) Initiate research necessary to guide recovery efforts
5) Establish a Regional West Coast Data Center for the Marbled Murrelet

The Recovery Plan also includes more detailed recovery actions. Of these, the following actions are relevant to management of the species on District Lands:

2.1 Protect terrestrial habitat essential for Marbled Murrelet recovery
3.1 Implement short-term actions to stabilize and increase population
3.1.1. Maintain/protect occupied nesting habitat and minimize loss of unoccupied but suitable nesting habitat
3.1.1.1 Maintain occupied nesting habitat
3.1.1.2 Maintain potential and suitable habitat in larger contiguous blocks while maintaining current north/south and east/west distribution of nesting habitat
3.1.1.3. Maintain and enhance buffer habitat surrounding occupied habitat
3.1.3. Minimize nest disturbance to increase reproductive success
3.2. Implement long-term actions to stop population decline and increase population growth
3.2.1. Increase the amount and quality of suitable nesting habitat.
3.2.1.1. Decrease fragmentation by increasing the size of suitable stands to provide a larger area of interior forest conditions
3.2.1.2. Protect "recruitment" nesting habitat to buffer and enlarge existing stands, reduce fragmentation, and provide replacement habitat for current suitable nesting habitat lost to disturbance events.
3.2.1.3. Use silvicultural techniques to increase speed of development of new habitat.
3.2.2. Improve distribution of nesting habitat
4.1. Monitor Marbled Murrelet populations and habitat
4.1.6. Survey potential breeding habitat to identify potential nesting areas

These actions fall into three basic categories: 1) protection of habitat, 2) enhancement of habitat and minimization of disturbance, and 3) monitoring of populations.

In addition, since the Recovery Plan was completed, more information from monitored nests has lead researchers to believe that many nests are depredated by corvids, particularly by Common Ravens (*Corvus brachyrhynchos*; Nelson 1997, McShane et al. 2004). Local raven populations have increased dramatically over the last several decades, and management of these predators has become a primary focus for conservation of Marbled Murrelets and other native wildlife (Liebezeit and George 2002, USFWS et al. 2004, Marzluff and Neatherlin 2006).

RECOMMENDATIONS

Consistent with the recommendations of the Recovery Plan discussed above, we recommend four broad categories of actions that would benefit the Marbled Murrelet on MROSD lands: 1) further habitat assessment, 2) protection of habitat, 3), enhancement of habitat, and 4) population monitoring, which are discussed below. It should be noted that funds from oil spill settlements may be available in the future to help with implementation of these actions. Past oil spill settlements, including the Apex Houston Spill and the Command Spill have funded habitat acquisition and other projects to benefit Marbled Murrelets in the Santa Cruz Mountains. Currently, the restoration plan for the S.S. Luckenbach and associated mystery oil spills (California Department of Fish and Game et al. 2006) includes plans for habitat acquisition and corvid management in the Santa Cruz Mountains. Specific projects within these categories have not yet been identified; the District could potentially benefit from both of these categories of restoration efforts, through cooperative planning with the Trustee Council for this restoration effort.

Further Habitat Assessment. We were not able to assess all potential habitat on MROSD lands for this analysis. Due to the difficulty in accessing much of the potential habitat, the District may want to consider low-level helicopter-based surveys of habitat. These surveys have been used successfully in British Columbia (Burger 2004). Due to the ease of viewing tree crowns, where suitable nesting platforms may occur, and the ease in moving quickly throughout a region, this technique may be a cost-effective way to conduct further surveys of MROSD lands.

Protection of Habitat. It is critical to the continued survival of the Marbled Murrelet that existing suitable nesting habitat be preserved. Potential habitat within MROSD lands is protected from habitat destruction (logging), a major benefit for the species. The MROSD may also wish to look into acquiring privately held land in the Santa Cruz Mountains that contains suitable habitat for the species but which is at risk of being destroyed. It is beyond the scope of this document to identify those lands. As noted above, oil spill restoration funds may be available to aid in purchasing new habitat.

Enhancement of Habitat. Habitat enhancement falls into three categories, discussed below.

Investigate Forest Management Strategies to Maximize Potential Habitat. Creation of new suitable habitat for Marbled Murrelets in most cases will take hundreds of years. However, a few management techniques may aid in providing this habitat eventually. Proper forestry practices (*e.g.*, selective thinning) to maximize growth would be beneficial. It may also be

possible to alter trees (*e.g.*, topping), to maximize growth of suitable nesting platforms. A professional forester should be consulted regarding potential methods to maximize future habitat for Marbled Murrelets.

Minimize Disturbance. Disturbance near an active Marbled Murrelet could lead to "take" (a violation of the Federal and California Endangered Species Acts) if the disturbance causes an adult to flush from the nest or affects behavior of adults feeding chicks. According to a review conducted by McShane et al. (2004), disturbance from vehicles and recreational use of trails is not likely to substantially affect the behavior of nesting Marbled Murrelets. However, louder or more unusual noises, such as noise associated with construction or timber harvesting, may lead to stronger behavioral responses. Estimated thresholds of disturbance for a variety of theoretical disturbances were reviewed by the USFWS in 2006 (USFWS 2006). This document contains the following general guidelines for thresholds of disturbance for Marbled Murrelets:

- Project-generated sound exceeding ambient nesting conditions by 20-25 decibels
- Project-generated sound, when added to existing ambient conditions, exceeding 90 decibels (equivalent to heavy construction machinery).
- Human activities occurring within a visual line-of-sight distance of 40 m or less from a nest.

To minimize disturbance near potential nests, activities that would exceed these thresholds during the nesting season (April 1 to September 31) should be avoided in any area mapped as potential Marbled Murrelet habitat, unless a series of protocol-level surveys first results in no detections of occupied behavior.

Control Corvids. Nest depredation by increasing corvid populations is likely a primary factor regulating the Santa Cruz Mountains Marbled Murrelet population. Although corvid populations may be increasing for a number of reasons, human refuse at open landfills and open garbage cans is providing abundant food for Common Ravens, fueling their population expansion. The Command Oil Spill Final Restoration Plan and Environmental Assessment (USFWS et al. 2004) and a summary of management recommendations (Liebezeit and George 2002) provide a number of possible management strategies for corvid control, ranging from public education regarding garbage to lethal control of corvids. We recommend that the MROSD ensure that all garbage cans on its lands are covered to remove any possible anthropogenic food source for ravens, and that MROSD rangers, maintenance staff, and resource staff receive educational training on the importance of minimizing corvid access to human refuse.

Population Monitoring. As the relatively recent increase in corvid populations has shown, adaptive management strategies are important for protecting natural resources over a long period of time. In order for adaptive management to be effective, resource managers must know the current and ongoing status of natural resources, and potential factors affecting those resources. We recommend initial monitoring at a number of locations on MROSD lands to determine if those areas are used by Marbled Murrelets, and follow-up ongoing annual monitoring at key sites. Locations of monitoring sites would depend on available budget and on whether the District is interested in the species status at a particular location, but ideally, monitoring should

include sites with known presence (Purisima Creek), to monitor long-term trends, as well as un-studied sites (*e.g.*, El Corte de Madera Creek OSP) to determine if the species is present.

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RE: Archaeological Review - Four Bridges in Midpeninsula Regional Open Space District Purisima Creek Redwoods Open Space Preserve, San Mateo County

Dear Mr. Temple,

This letter report provides the results of a records search conducted by the California Historical Resources Information System, Northwest Information Center (CHRIS/NWIC), Sonoma State University; a limited literature review of materials on file with BASIN; the results of a request to the Native American Heritage Commission (NAHC) for a review of the Sacred Lands Inventory, and a field inventory of four bridges and immediate surrounding area in order to determine if significant cultural resources are located in or adjacent to the proposed project.

PROJECT LOCATION AND DESCRIPTION

The proposed project is located within the Purisima Creek Redwoods Open Space Preserve managed by the Midpeninsula Regional Open Space District. It is located on the western slopes of the Santa Cruz Mountains west of Kings Mountain and State Highway 35, north of Tunitas Creek Road and east of the terminus of Higgins-Purisima Creek Road within the southern part of San Mateo County (USGS Woodside, CA 1997) [Figs. 1-3]. The 3360 acre preserve was established with a gift from the Save-the-Redwoods-League and generally represents second growth trees re-established after initial logging.

The proposed project plan to replace four foot bridges consisting of former railroad flat cars located over Purisima Creek and selected trees/vegetation along an approximately 1.75 mile segment of the Purisima Creek Trail. This trail, part of the Bay Area Ridge Trail, incorporates former logging roads as part of an extensive existing trail system. The four location include (Questa Engineering 2014; SF Bay Hiker 2014) [see Figs. 3-4]:

> ***Harkins Bridge***, the westernmost of the four bridges, permits access to the Whittemore Gulch Trail and the Harkins Ridge Trail on the north side of Purisima Creek. Walker Gulch is to the south. This location also includes a staging area south of the trail and west of the existing foot bridge (T 6S, R 5W, part SE¼ of Section 2 and unsectioned).

Purisima Bridge 1, east of the Harkins Bridge and the Borden Hatch Mill Trail allows access to the Grabtown Gulch Trail to the south (T6S R4W, part SW¼ of Section 6 and unsectioned).

Soda Gulch Bridge, is approximately mid-way between Purisima Bridge #1 and Purisima Bridge #2 and permits access to the Craig Britton Trail (formerly the Soda Gulch Trail) (T6S R4W, part SW ¼ of Section 6 and unsectioned).

Purisima Bridge 2, the easternmost of the four bridges, crosses over Purisima Creek (T6S R4W, part NE¼ of Section 7 and unsectioned).

RESEARCH SOURCES CONSULTED

A prehistoric and historic site record and literature search of the project and 0.25 mile buffer area around each of the four foot bridges was completed by the CHRIS/NWIC (File No. 14-CHRIS/NWIC File. No. 14-0161 by Hagel 8/15/2014) for Basin Research Associates.

The records search included consulting the *Historic Properties Directory for San Mateo County* (CAL/OHP 2012a) as well as other evaluations of properties reviewed by the State of California Office of Historic Preservation; the *Archaeological Determinations of Eligibility for San Mateo County* (CAL/OHP 2012b); and, the *California Inventory of Historic Resources* (CAL/OHP 1976). In addition, reference material from the Bancroft Library, University of California at Berkeley and Basin Research Associates was also consulted including list of *California Historical Resources* (CAL/OHP 2014), as well as the *California History Plan* (CAL/OHP 1973); *Five Views: An Ethnic Sites Survey for California* (CAL/OHP 1988); and, other lists and maps (see References Cited and Consulted).

The Native American Heritage Commission was contacted for a review of the Sacred Lands Files (Busby 2014a). Results were negative (Pilas-Treadway 2014). The nine Native American individuals/groups recommended by the NAHC as possibly aware of local information were contacted by letter with telephone/email follow-up (see Attachments).

No other agencies, departments or local historical societies were contacted regarding landmarks, potential historic sites or structures.

SUMMARY PREHISTORIC AND HISTORIC BACKGROUND

PREHISTORIC

The general study area, located in the uplands to the east of the coast would have provided a favorable environment during the prehistoric period with riparian and upland resources readily available. Ocean resources on the coast would have been accessible via trails to the west. Contact with San Francisco Bay to the east via the uplands and rugged hills is known as interior sites around the bay have evidence of coastal trade and resource use.

Native American occupation and use of the general area appears to extend over 5000-7000 years and may be longer. Prior to about 5000 to 7000 years ago, Native American occupation of the San Francisco Bay Area was intermittent and sparse. Evidence for early occupation along the bay was obscured by rising sea levels from about 15,000 to 7000 years ago, or was buried under sediments caused by bay marshland infilling along estuary margins from about 7000 years

onward (see Moratto 1984). Early occupants concentrated on hunting and gathering various plant foods and collecting shellfish. Archaeological information suggests an increase in the prehistoric population over time with an increasing focus on permanent settlements with large populations in later periods. This change from hunter-collectors to an increased sedentary lifestyle is due to more efficient resource procurement but with a focus on staple food exploitation, the increased ability to store food at village locations, and the development of increasing complex social and political systems including long-distance trade networks. The information obtained from archaeological studies in the general area has played a key role in refining both the local and regional interpretations of Native American history for central California. A general review of San Mateo County and Bay Area regional prehistory is presented in Moratto (1984), and Elsasser (1978, 1986).

ETHNOGRAPHIC

The project is within the *Ramaytush* subdivision of the *Costanoan* following Levy (1978) who places the *kotxen* group (La Purisima) at the mouth of Purisima Creek on the San Mateo Coast. Brown (1973-1974) and Milliken (1995, 2006) the identify the group as the *Cotegen* who appear to have occupied the ". . . entire Purisima Creek drainage, Lobitos Creek, and upper Tunitas Creek. Their main focus was located on Purisima Creek at *Shalaihme (Ssalaime)*[1] with a "second section" of the village in the mountains.

The Portola-Crespi party in 1769 and Fernando Javier Rivera and Father Francisco Palou in 1774 both noted a village at the mouth of Purisima Creek that appears to conform to the location of *Purisima* as it was known to the Spanish. A total of 42 *Cotegen* were baptized at Mission Dolores between 1782-1793 and another three at Mission Santa Clara between 1789-1791. The Mission Dolores padres referred to the village by 1786 as "the place of la Purma" (Purissima, the Most Pure, or Immaculate) and the creek as the *Arroyo de la Purissima* in 1787. A Christian burial took place at *Shalaihme* in 1787.

None of the known Native American villages or ranches associated with the missions or San Francisco Presidio were located in the vicinity of the project (Kroeber 1925:465, Fig. 42; Levy 1978:485, Fig. 1, #18 *kotxen* (*La Purisima*); Milliken 1983:79-80; Brown 1963; Brown 1973-1974 *[Cotehen* at Purisima Creek (*sic*)]; Brown 1975:74; Milliken 1983:85-86, 139, Map 4; Milliken 1995:229, Fig. 5, 242; Milliken 2006:27, Fig. 5).

Extensive ethnographic data for the San Francisco Bay Region are lacking, and the aboriginal lifeway apparently disappeared by approximately 1810 due to introduced diseases, a declining birthrate, the cataclysmic impact of the mission system and the later secularization of the missions by the Mexican government (Levy 1978:485, Fig. 1, #18; Elsasser 1986:Fig. 10; Milliken 1983:82, 1995:229, Map 5, 239).

HISPANIC PERIOD

After an initial period of exploration, the Spanish focused on the founding of presidios, missions,

1. State Historic Landmark No. 22 Portola Expedition Camp, 1769 ". . . camped on the south bank of Purisima Creek on October 27th. The Indian village on the north bank of the creek was named 'Las Pulgas'" (CAL/OHP 1992:219, #22).

and secular towns with the land held by the Crown (1769-1821). In contrast, later Mexican Period (1822-1848) policy stressed individual ownership of the land (Hart 1987).

None of the known Spanish expeditions appear to have passed through the vicinity of the project area (The first party to traverse the San Francisco Peninsula, Gaspar de Portola and Father Juan Crespi traveled up the coast and in fall 1769 traveled along the coast, probably just below the hills in the study area (see Richards 1973; Beck and Haase 1974:#17; Milliken 1995:33, Map 3; USNPS 1996).

The four bridges are located within the southern portion of *Rancho Canada de Verde y Arroyo de la Purisima* (e.g., USGS 1973). This grant was a provisional grant made on March 25, 1838 to Jose Maria Alviso who transferred the claim to his brother Jose Antonio Alviso in 1840. The rancho, located between Purisima and Tunitas creeks, was patented to the latter in 1864 for 8,905.58 acres (Hoover, et al. 1966:395) or alternatively 1865 (Hendry and Bowman 1940:1045).

No Hispanic Period adobe dwellings or other features appear to have been located in or adjacent the project (see Matthewson 1860; Hendry and Bowman 1940:Map of San Mateo). Reportedly an adobe built by Jose Antonio Alviso about 1845 was present on the north bank of Purisima Creek ". . . in the disputed section" (e.g., not within the grant as issued) (Hoover, et al. 1966:395).

AMERICAN PERIOD

In the mid-19th century, the majority of the rancho and pueblo lands and some of the ungranted land in California was subdivided as the result of population growth, the American takeover, and the confirmation of property titles. Growth can be attributed to the Gold Rush (1848), followed by the completion of the transcontinental railroad (1869) and local railroads. San Mateo County was created in 1856 from the southern part of San Francisco County and was later enlarged by annexing part of Santa Cruz County in 1868. Still later, the development of the refrigerator railroad car (ca. 1880s) used for the transport of agricultural produce to distant markets, had a major impact on the San Francisco Bay Region. Until about World War II, San Mateo County had a predominantly rural land-use pattern (Hoover, et al. 1966:389; Hart 1987). Later development has resulted in a pattern of urbanization interspersed with varying areas of rural and low-density land-use.

LIMITED MAP AND LITERATURE REVIEW

Richard Whittemore settled within what became known as Whittemore Gulch off of the north side of Purisima Creek about 1860 (Brown 1975:101).

The "Walker Place" dating to the 1870s was located at the foot of what became known as Walker Gulch, just east of the Higgins Road turnoff (Brown 1975:98). The "Walker" home site is shown on Neuman's 1909 *Official Map of San Mateo Co. California* on the south side of a road on the south side of Purisima Creek in the SW ¼ of Section 1 of T6S R5W – to the south and west of the proposed project.

Easton's 1868 *Official Map of the County of San Mateo, California shows* the north side of

Purisima Creek in T6S R5W, Section 2 as owned by B.G. Lathrop; Section 1 by N.C. Lane, and T6S R4W Section 6 by John Shults. The south side of the creek was within the former *Rancho Canada de Verde y Arroyo de la Purisima* owned - from west to east - by R.J. Lathrop (including a small portion of T6S R5W, Sections 1 and 2 of T6S R5W), J.G. Foster (including part of Section 1 of T6S R5W), and Borden & Hatch (Section 7 of T6S, R4W). At the time, the "Conley's Mill" (e.g., Stanger 1992 Location #1) is shown at the terminus of the road straddling Purisima Creek east from the coast up into the mountains within the far northwest corner of Borden & Hatch property.

Whitney's 1873 *Map of the Region Adjacent to the Bay of San Francisco* map shows a single "Saw Mill" along Purisima Creek, one of many former sawmills along the creek from about Whittemore Gulch and further east. This map also shows Purissima [*sic*] along the coast road [present-day Verde Road] on the north side of Purisima Creek. The Purisima townsite is located approximately 3.2 miles west of the project area near the San Mateo coast on the north side of Purisima Creek on Verde Road about four miles south of Half Moon Bay and approximately two miles north of present-day Lobitos on Lobitos Creek. The townsite is located above the gap near the old coast highway within the "Purissima Valley" below "Purissima Canyon" – terms in use since the 1870s. The canyon refers to the wooded area above the Higgins Road turnoff along Purisima Creek, including the proposed project (Brown 1975:74).

The importance of the Purisima Townsite to the region is underscored by its listing on a number of state and local lists (Jackson and Dietz 1970:52/S-3082; Brown 1975:73; Brabb 1982:#47; CAL/OHP 1973:164; CAL/OHP 1976:104, 263; CAL/OHP 1992:61, SPHI SMA-013; (SMaCo/ESA/PBD) 1999:H-51) The 1986 San Mateo General Plan listing states "*Purisima, established around 1853, was the first Anglo settlement in the Half Moon Bay area. In its heyday, it was a bustling stagecoach stop and shopping area with stores, hotel, school, saloon, dance hall, and harness and blacksmith shops, which served farmers and loggers in the surrounding area. By the turn of the century, the town was in decline with the growth of Half Moon Bay as the produce shipping center of the region. By the 1930's, Purisima was a ghost town. All that remains today are the ruins of the school and the cemetery*." (SMa/DEM 1986:5.28A, #16). The post office underscores the former importance and decline of Purissama [*sic*] (Purisima) – the post office was established in May 1868, discontinued in August 1869 and later re-established in August 1872 and discontinued in February 1901 when it was moved to Half Moon Bay (Patera 1991:173).

Cloud's 1877 *Official Map of the County of San Mateo California* shows Borden & Hatch as owners of most of the southern portion on the south side of Purisima Creek as well as Section 1 and possibly Section 2, T6S R5W on the north side of the creek. The exception, a small part of the SW ¼ of Section 6 of T6S R4W (including the north side of the creek), was held by S.P. Pharis. At the time, C.H. Lapham owned the SE ¼ of Section 6 T6S R4W (property did not include any of the four bridge locations).

The 1902 USGS Santa Cruz, Calif. topographic map scale prevents accurate placement of the cultural features mapped as present along Purisima Creek. The map appears to show two structures in the vicinity of the Harkins Bridge, an unimproved road along the south side of Purisima Creek proceeding to three buildings and a trail continuing east with small

structures at varying intervals further east along the creek. These structures are likely saw mills and other buildings/structures related to lumber operations (see Stranger 1992). In addition, the alignment of the Pharis tramway is mapped (e.g., Stanger 1963:59-60).

Neuman's 1909 *Official Map of San Mateo Co. California* labels Whittemore Gulch and shows the owners of property along Purisima Creek in the project area as Carrie A. Lock, C.W. Borden and A.S. Hatch (1/2 each), C.W. Borden/J.E. Hartley, and C.W. Borden. "Redwood Park", a subdivision is shown within Section 5 of T6S R4W, approximately one mile northeast of the easternmost footbridge, Purisima Bridge #2. The later included a post office from November 1940 until January 1942 when it was moved to Redwood City (Patera 1991:177).

Sawmills in the Redwoods: Logging on the San Francisco Peninsula 1849-1967 (Stanger 1992) reviews Purisima Creek in regard to historic lumber operations. The maps in the publication show eight separate sawmills along Purisima Creek as well as a former cable ridge tramway used to transport shingles.

None of the "logging" features identified by Stanger (1992) are located in or adjacent to the four foot bridges [see also Fig. 4]. The closest features are two sawmill locations, Nos. 1 and 8, both located on the south side of the creek just west of Walker Gulch and the proposed Harkins Bridge. Two other sawmill locations, Nos. 5 and 6, are located on the north side of the creek at Grabtown Gulch, east of the Purisima Bridge #1. Mill No. 4, the Pharis Mill (1870-1884) on the north side of the creek is located just east of Purisima Bridge #2. By the 1860s, three mills were producing shingles as well as lumber for the Spring Valley Water Company (1871). Various small mills were in production along the creek for over 50 years - dependent on demand for their output in tandem with the availability of trees for processing. These mills were owned by Borden & Hatch, the major landholders who purchased a water power mill originally built by Doolittle & Crumpecker (Sawmill #1) in 1854 who then sold it to D.W. Connely and then to Nathaniel C. Lane in 1860/1861. Lane was flooded out and subsequently sold the mill to Border & Hatch (Moore & DePue 1878:17, 107; Hynding 1982:140-141; Stanger 1992:52-60).

FIELD METHODS AND RESULTS

Mr. Christopher Canzonieri (M.A.), an archaeologist meeting the Standards of the Secretary of the Interior, completed a field inventory of the four foot bridges and immediate surrounding areas on August 15, 2014. The inventory consisted of a visual inspection of the bridges and areas adjacent to the bridges. Surface visibility was approximately 90-100% around the bridges although surrounding areas were characterized by dense vegetation and duff. In addition, Mr. Canzonieri attempted to locate various potential lumber mill sites shown on historic maps (see Stanger 1992) in the vicinity of the bridges [see also Fig. 4]

All of the bridges are repurposed railroad flat cars of varying lengths placed on informal earth or log abutments. The exposed portions of the four bridges varied in length from 26 to 59.5 feet long x 11-12 feet wide. All of the bridges have extensive corrosion and flaking paint present. Each has modern/recent wood decking with wood railings attached with carriage bolts.

Harkins Bridge: Bridge is located immediately north of the park entrance (GPS 10S 0555779 mE / 4143592 mN WGS84, elevation 551 feet absl). The bridge with decking is 47.5 feet long x 12 feet wide x 4 inches thick and is constructed from 12 foot long x 12 inch wide x 4 inch thick boards. The wood railings are attached with carriage bolts [see Figs. 5-7].

The exposed area of the former railroad flat car was inspected from below. The bridge is a repurposed railroad flat car with a redundant type main box (interior) girder, four angle stringers, floor beams, exterior girders and one center plate visible. In cross-section the rail car measures 47.5 feet long; with 22 feet associated with the major cross-section, eight (8) feet each associated with the transition region and +5 feet dedicated to the minor cross-section region. The railcar is approximately 8 feet wide. The flat car floor to the base of the main box girder measures 2.2 feet thick along the centerline and 12 inches thick along the minor cross-section region. There are 32 (16 per side) post holders located along the exterior girders. Each post holder measures 6.5 inches deep x 5 inches long x 4 inches wide. All visible rivets measured 1 1/4 inches.

The bridge has extensive rust and corrosion present and the loss of what appear to be two floor beams. No formal bridge abutments are present and the structure appears to have been placed on the creek banks. No indication of redwood or concrete was visible. The lowest part of this bridge is approximately four feet above the creek bed. The numerous marking along the exterior girders consist of: 10-75/RPKD BN-SD/10-21-75/…3. /I.D.T.J. 3-26-77/DSRGW SP 13002-B (in yellow)/RETIRED also in yellow CAPY 129000 | LBLMT 130400 | LTWT 54700 | 0…9-72 | 1-50-0. Based on the “SP” this was likely a former Southern Pacific Railroad car possibly retired in 1975/1977.

Purisima Bridge 1: Bridge is located approximately 1.15 miles east of the Harkins Bridge (GPS 10S 0557538 mE / 4143243 mN WGS84, elevation 641 feet absl). The bridge with decking measures 42 feet long x 11 feet wide x 4 inches thick. The decking is 11 foot long x 8 inch wide x 4 inch thick boards. The wood railings are attached with carriage bolts [see Figs. 8-10].

The exposed area of the former railroad flat car was inspected from below. The bridge is a repurposed railroad flat car with a redundant type main box (interior) girder, four angle stringers, floor beams, exterior girders and one center plate visible. In cross-section the rail car measures 42 feet long; with 20 feet associated with the major cross-section, 3.5 feet each associated with the transition region and +6 feet dedicated to the minor cross-section region. The railcar is approximately 8 feet wide. The flat car floor to the base of the main box girder measures 22 inches thick along the centerline and 12 inches thick along the minor cross-section region. There are 12 (6 per side) post holders located along the exterior girders. Each post holder measures 6.5 inches deep x 5 inches long x 4 inches wide. All visible rivets measured 1 1/4 inches.

The bridge has extensive rust and corrosion present. The west abutment is supported by large 12-inch diameter x +20-foot long redwood logs; the east side appears to be a earthen abutment; as no indication of redwood or concrete support was visible. The lowest part of this bridge is approximately four feet above the creek bed. The few marking along the

exterior girders consist of: TDT-4-2-75/ELKO WPRR | PT 10-21-73/ [W]PRR. Based on the "WPRR" the bridge was likely a former Western Pacific Railroad (alternatively, Western Pacific Railway) car possibly from the Elko Nevada division car possibly retired in 1973/1975.

***Soda Gulch Bridge**:* Bridge is located approximately 1.45 miles east of the Harkins Bridge (GPS 10S 0558004 mE / 4143204 mN WGS84, 722 feet absl). The bridge with decking is 60 feet long x 11 feet wide x 4 inches thick and is constructed from 11 foot long x 8 inch wide x 4 inch thick boards. The wood railings are attached with carriage bolts [see Figs. 11-14].

The exposed area of the former railroad flat car was inspected from below. This bridge spans a relatively deep gorge; access was difficult as the bridge is approximately +15 feet above the creek bed. The Soda Gulch Bridge is a repurposed railroad flat car with a non-redundant type main box (interior) girder, four stringers, floor beams, exterior girders and one center plate visible. In cross-section the rail car measures 60 feet long; with 30 feet associated with the major cross-section, 6 feet each associated with the transition region and +4 feet dedicated to the minor cross-section region. The railcar is approximately 8 feet wide. The flat car floor to the base of the main box girder measures 30 inches thick along the centerline and 22 inches thick along the minor cross-section region. There are 16 (8 per side) post holders located along the exterior girders. Each post holder measures 6.5 inches deep x 5 inches long x 4 inches wide. All visible rivets measured 1 1/4 inches.

The bridge has extensive rust and corrosion present. There is a redwood log with a braided cable visible on west abutment of the bridge; the east side appears to be an earthen abutment; as no indication of redwood or concrete was visible. Additionally, two 20-inch diameter redwood tree trunks (one on either side of the bridge) span Soda Gulch parallel to the bridge. The few marking along the exterior girders consist of: CAPY / 149000FMS / HIGH CAPY DRAFT GEAR 150900 | 69100 / SP509193 SAC-373 / [PLATE/C] DISMANTLER / SP-5-82 BLT/8-86 INSP/3-77/SP/ROS/SP COTS/4-78/CNW/HRN | LUB/72/4-76/COFFV/MP/COFFV | LDT/6-9-81/ATSF/AQ. Based on the "SP" this was likely a former Southern Pacific Railroad car possibly retired in 1977 or later (e.g., 1986).

Purisima Bridge 2: Bridge is located approximately 1.83 miles east of the Harkins Bridge (GPS 10S 0558502 mE / 4142831 mN WGS84, 846 feet absl). The bridge with decking is 26 feet long x 11 feet wide x 4 inches thick and is constructed from 11 foot long x 8 inch wide x 4 inch thick boards. The wood railings are attached with carriage bolts [see Figs. 15-17].

The exposed area of the former railroad flat car was inspected from below. The bridge is a repurposed railroad flat rail car with a redundant type main box (interior) girder, three stringers, floor beams and exterior girders visible. In cross-section the rail car measures 26 feet long; with 12 feet associated with the major cross-section, 6 feet each associated with the transition region and +4 feet dedicated to the minor cross-section region. The railcar is approximately 8 feet wide. The flat car floor to the base of the main box girder measures 28

inches thick along the centerline. There are no post holders located along the exterior girders. All visible rivets measured 1 1/4 inches.

The bridge has extensive rust and corrosion present. There is one 20-inch diameter redwood log extending out of the west abutment; the east side appears to be an earthen abutment; as no indication of redwood or concrete support was visible. The lowest part of this bridge is approximately four feet above the creek bed. The few marking along the exterior girders consist of: …-69/SP ..-68 / IDT 2/OAK DISMANTLE/1-6-78 5-31-68 / IDT 2/OAK DISMANTLE/3-15-75?. Based on the "SP" this was likely a former Southern Pacific Railroad car possibly retired in 1978.

***Other Finds**:* An attempt was made to locate possible historic saw mills associated with past logging activities along the creek in the vicinity of the bridges. A small area with a few historic artifacts was noted approximately 1.88 miles east of the Harkins Bridge (or 275 feet east of Purisima Bridge 2) along the north side of the trail within a densely wooded/vegetated area. Observed materials included a wheel rim, braided steel cable, several broken brick fragments (no markings) and a couple of pull-tab beer cans (no markings) [GPS 10S 0558582 mE / 4142804 mN WGS84, 868 feet abs] [see Fig. 18]. The Pharis Mill (1870-1884) was the closest known saw mill in the vicinity of this material (e.g., Stanger 1992:52, 60).

In summary, no surface indications of either significant prehistoric or historic cultural materials were observed.

FINDINGS

This letter report was prepared to identify potentially significant archaeological, Native American, or built environment resources listed or eligible for the National Register of Historic Places (NRHP) and/or California Register of Historical Resources (CRHR) within or adjacent to the proposed project.

RECORDS SEARCH RESULTS (CHRIS/NWIC File No. 14-0161)

Compliance Reports

Two (2) cultural resources compliance reports on file at the CHRIS/NWIC include the project and/or area adjacent. Both reports are negative for cultural resources in or adjacent to the project.

- *An Archaeological and Historical Reconnaissance of a Portion of the San Mateo County Coastside* (Jackson and Dietz 1970:52/S-3082), and;
- *Mid-Peninsula Regional Open Space District, Purisima Creek Trail and Bridge Project, FEMA-1203-DR-CA, DSR #27296* (Amaglio 2001/S-24470).

Recorded/Reported Sites within the Project

No prehistoric, combined prehistoric/historic or historic sites have been recorded or reported in or adjacent to the project.

Three historic era sites have been recorded within 0.25 miles of Purisima Bridge 1 near Grabtown Gulch. These resources were recorded as a result of new trail alignment and bridge replacement near the Purisima Creek Trail (e.g., Amaglio 2001/S-24470) and represent the remains of four corduroy logging roads.

- P-41-000510 (CA-SMA-362H), two intact segments of a corduroy logging road on the south bank of Purisima Creek (Hatoff and Dexter 2001/form);
- P-41-000511 (CA-SMA-363H), an intact remnant of a corduroy logging road on the west bank of Grabtown Gulch (Dexter and Hatoff 2001/form); and,
- P-41-000512 (CA-SMA-364H), a remnant of a logging road on the east bank of Grabtown Gulch (Dexter and Hatoff 2001/form).

NATIVE AMERICAN CONSULTATION

The Native American Heritage Commission (NAHC) was contacted for a review of the Sacred Lands Files (Busby 2014a). Results were negative (Pilas-Treadway 2014). The nine Native American individuals/groups recommended by the NAHC as possibly aware of local information were contacted by letter with telephone/email follow-up (see Attachments).

Five parties could not be contacted and detailed messages were left on answering devices. Four parties were contacted. One party recommended that there was no need to monitor ground disturbing construction as no resources were present and the bridge areas appeared to have a very low or no potential for Native American resources. Two parties recommended monitoring of ground disturbing construction. One Native American recommended implementing proper measures if Native American burials were exposed but had no other recommendations.

FIELD INVENTORY

The surface inventory found no surface indications of either significant prehistoric or historic cultural materials . The four bridges consist of portions of repurposed railroad flat car platforms. A review of the surviving identification marks suggests that they may have been released from railroad stock between 1973 to the early 1980s. All are in poor condition due to varying degrees of corrosion.

SUMMARY OF FINDINGS

- No archaeological resources have been recorded in or adjacent to any of the four project bridges.
- No known prehistoric, ethnographic or contemporary Native American resources, including villages, sacred places, traditional or contemporary use areas, have been identified in or adjacent to the project.

- No known or potential Hispanic or American era archaeological resources have been identified in or adjacent to any of the four project bridges.
- The surface inventory found no surface indications of either significant prehistoric or historic cultural materials.
- The four bridges consist of portions of repurposed railroad flat car platforms. A review of the surviving identification marks suggests that they may have been released from railroad stock between 1973 to the early 1980s. These structures lack integrity and do not appear to represent significant historic or archaeological resources. They are not eligible for the California Register of Historic Resources under any of the applicable eligibility criteria.
- No listed, determined or pending archaeological sites, significant local, state or federal historic properties, landmarks, etc. have been identified in or adjacent to any of the four project bridges.

RECOMMENDATIONS

It is recommended, based on the review of pertinent records, maps and other documents that the proposed project can proceed as planned in regard to known or potential prehistoric and historic archaeological resources as well as historic structures.

- Further recordation of the individual bridges is not recommended.
- No subsurface testing for buried archaeological resources appears warranted.
- Archaeological monitoring during bridge removal and installation and other construction activities is not recommended due to the very low potential for impacting cultural resources.
- If any potentially significant cultural materials[2] are exposed or discovered during either site preparation or subsurface construction activities within the project area, operations

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2. Significant prehistoric cultural resources may include:

a. Human bone - either isolated or intact burials.
b. Habitation (occupation or ceremonial structures as interpreted from rock rings/features, distinct ground depressions, differences in compaction (e.g., house floors).
c. Artifacts including chipped stone objects such as projectile points and bifaces; groundstone artifacts such as manos, metates, mortars, pestles, grinding stones, pitted hammerstones; and, shell and bone artifacts including ornaments and beads.
d. Various features and samples including hearths (fire-cracked rock; baked and vitrified clay), artifact caches, faunal and shellfish remains (which permit dietary reconstruction), distinctive changes in soil stratigraphy indicative of prehistoric activities.
e. Isolated artifacts

Historic cultural materials may include finds from the late 19th through early 20th centuries. Objects and features associated with the Historic Period can include.

a. Structural remains or portions of foundations (bricks, cobbles/boulders, stacked field stone, postholes, etc.).
b. Trash pits, privies, wells and associated artifacts.
c. Isolated artifacts or isolated clusters of manufactured artifacts (e.g., glass bottles, metal cans, manufactured wood items, etc.).
d. Human remains.

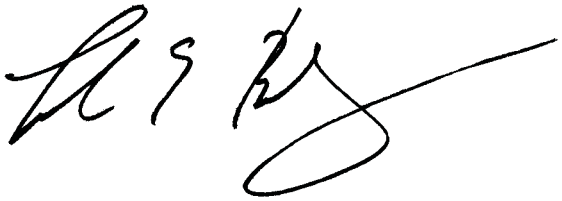
should stop within 25 feet of the find and a qualified professional archaeologist contacted for further review, evaluation and recommendations consistent with the California Environmental Quality Act and County of San Mateo requirements.

- State law shall be followed in the event of the exposure of Native American skeletal remains.

CLOSING REMARKS

Please don't hesitate to call to discuss our review of the project area.

Sincerely,
BASIN RESEARCH ASSOCIATES, INC.



Colin I. Busby, Ph.D., RPA
Principal

REFERENCES CITED AND CONSULTED

Amaglio, Sandro (Federal Emergency Management Agency)
2001 Letter Report to Dr. Knox Mellon, State Historic Preservation Officer, Office of Historic Preservation, Sacramento, CA. Subject: Mid-Peninsula Regional Open Space District, Purisima Creek Trail and Bridge Project, FEMA-1203-DR-CA, DSR #27296. MS on file, S-24470, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Beck, W.A. and Y.D. Haase
1974 Historical Atlas of California (Third printing). University of Oklahoma Press, Norman.

Brabb, E.E., F.A. Taylor and G.P. Miller
1982 Geologic, Scenic, and Historic Points of Interest in San Mateo County, California. Miscellaneous Investigations Series, Map I-1257-B. Scale 1:62,500. Department of the Interior, United States Geological Survey, n.p.

Bromfield, Davenport (County Surveyor)
1894 Official Map of the County of San Mateo, California. Schmidt Label & Lith. Co., San Francisco.

In addition, cultural materials including both artifacts and structures that can be attributed to Hispanic, Asian and other ethnic or racial groups are potentially significant. Such features or clusters of artifacts and samples include remains of structures, trash pits, and privies.

Brown, A.K.

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Busby, Colin I. (Basin Research Associates, San Leandro)

2014a Letter to Ms. Cynthia Gomez, Executive Secretary, Native American Heritage Commission (NAHC), Sacramento. Regarding: Request for Review of Sacred Lands Inventory, *Purisima Creek Four Bridges Project, San Mateo County*. Dated August 5, 2014.

2014b-j Letters to Jakki Kehl, Patterson; Linda G. Yamane, Seaside; Irene Zwierlein, Amah/Mutsun Tribal Band of Mission San Juan, Woodside; Michelle Zimmer, Amah/Mutsun Tribal Band of Mission San Juan Bautista, Woodside; Tony Cerda, Coastanoan Rumsen Carmel Tribe, Pomona; Ann Marie Sayers, Chairperson, Indian Canyon Mutsun Band of Costanoan, Hollister; Rosemary Cambra, Chairperson, Muwekma Ohlone Tribe of the SF Bay Area, Milpitas; Andrew Galvan, The Ohlone Indian Tribe, Fremont; and, Ramona Garibay, Representative, Trina Marine Ruano Family, Union City. Regarding: Request for Information , *Purisima Creek Four Bridges Project, San Mateo County*. Dated September 10, 2014.

California (State of), Department of Parks and Recreation, Office of Historic Preservation **(CAL/OHP)**

1973 The California History Plan. Volume One - Comprehensive Preservation Program. Volume Two - Inventory of Historic Features.

1976 California Inventory of Historic Resources.

1988 Five Views: An Ethnic Sites Survey for California.

1990 California Historical Landmarks.

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Abbreviations

n.d. no date v.d. various dates N.P. no publisher noted
n.p. no place of publisher noted

Note: The abbreviated phrase "CHRIS/NWIC, Sonoma State University, Rohnert Park" is used for material on file at the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert Park.

ATTACHMENTS

FIGURES

CORRESPONDENCE

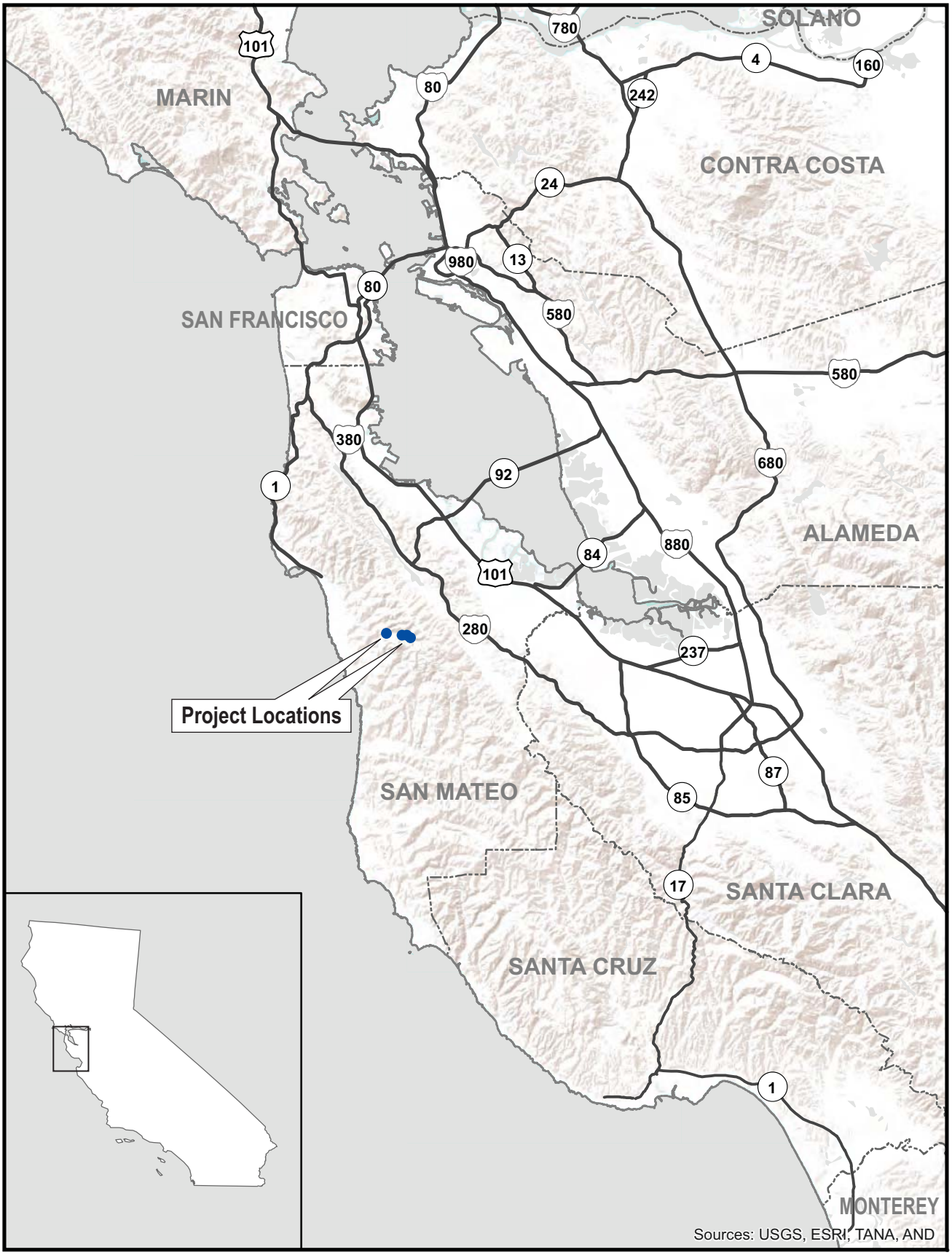

Figure 1: General Project Location

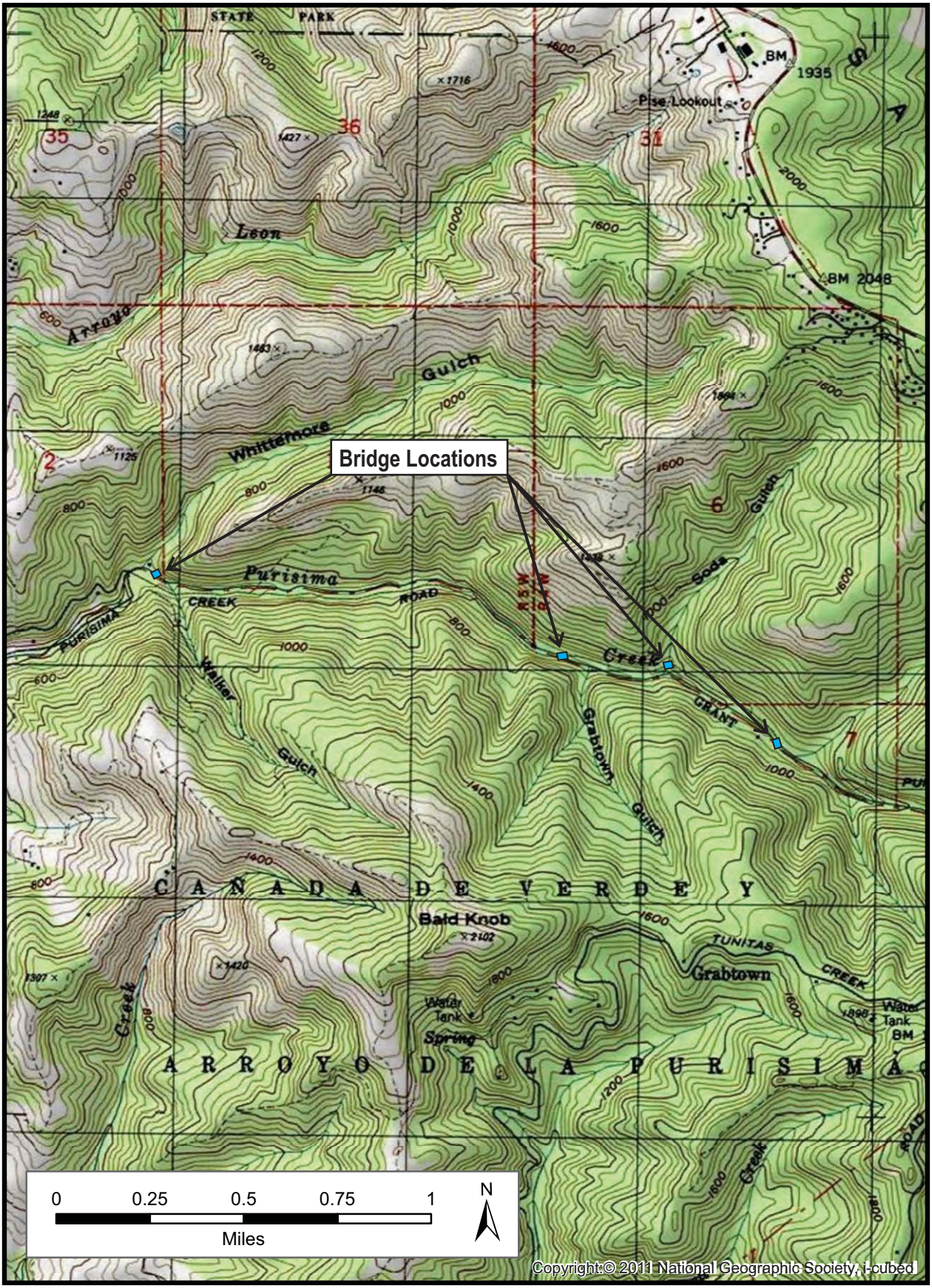

Figure 2: Project Locations (USGS Woodside, CA 1997)

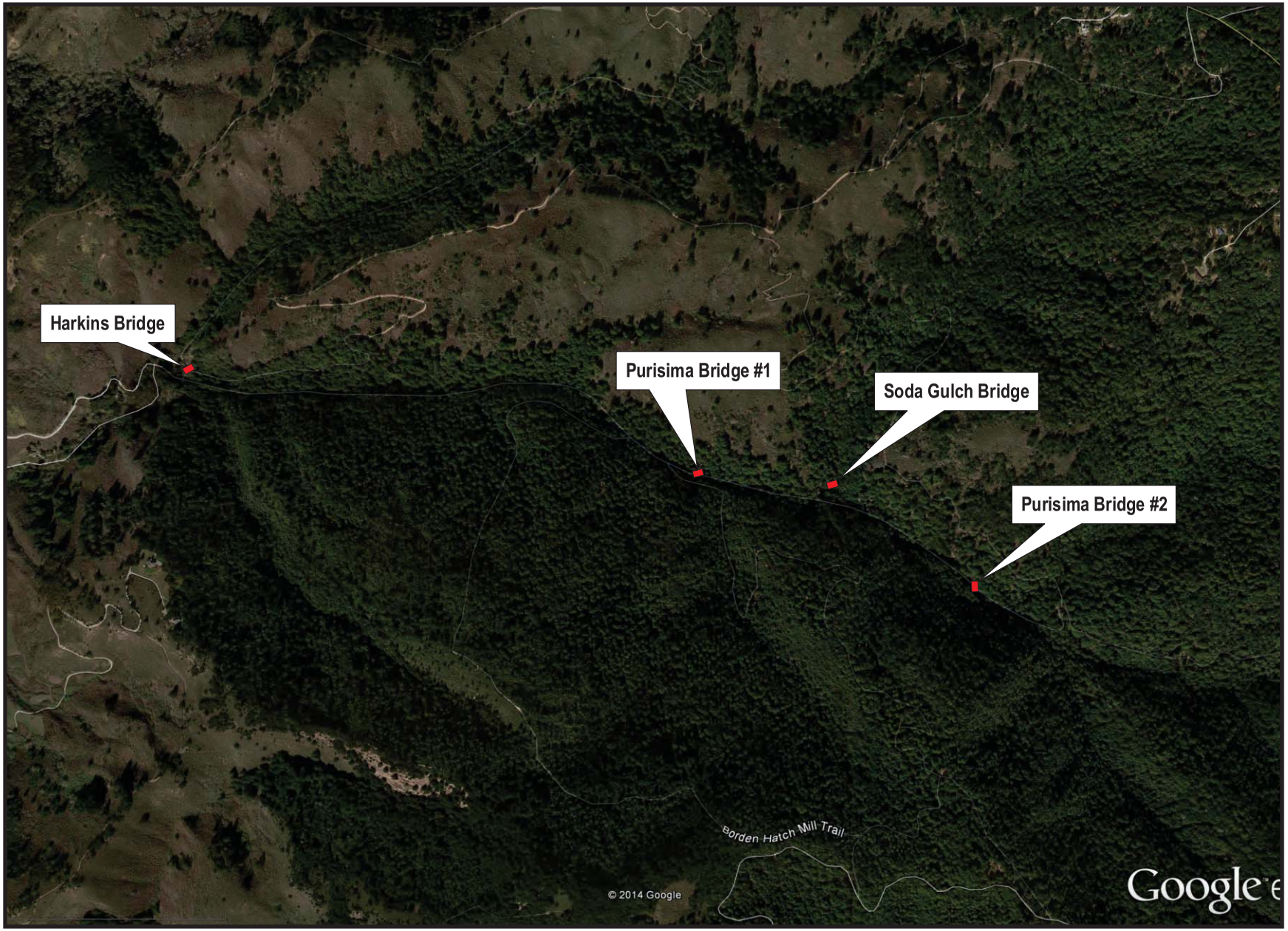

Figure 3: Aerial View of Project Area with Bridge Locations

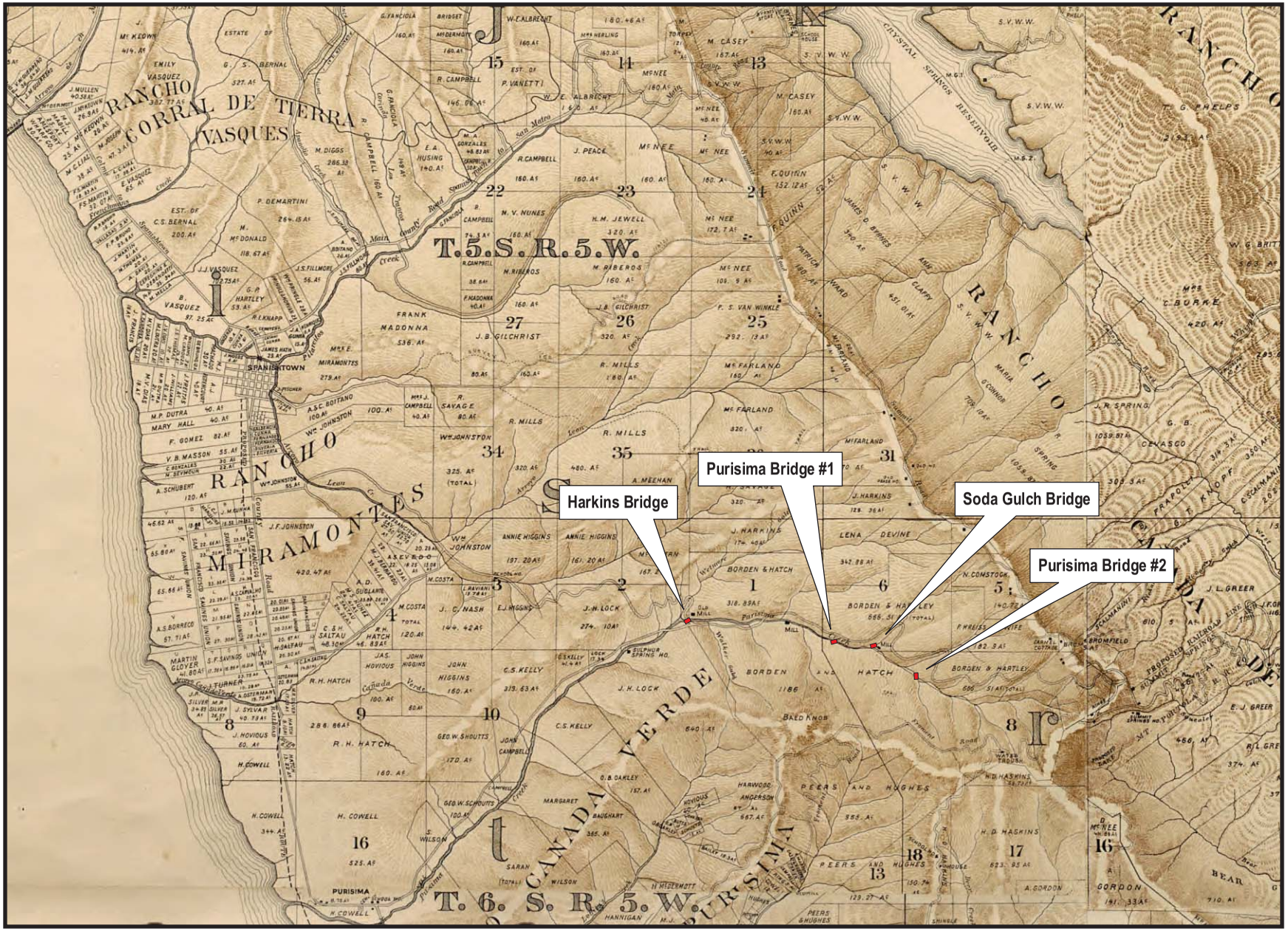

Figure 4: Project Area in 1894 with Bridge Locations (Bromfield 1894)

Figure 5: Harkins Bridge, view east

Figure 6: Harkins Bridge, redundant box girder and stringers

Figure 7: Harkins Bridge floor beams, exterior girder with markings (SP 13002-B)

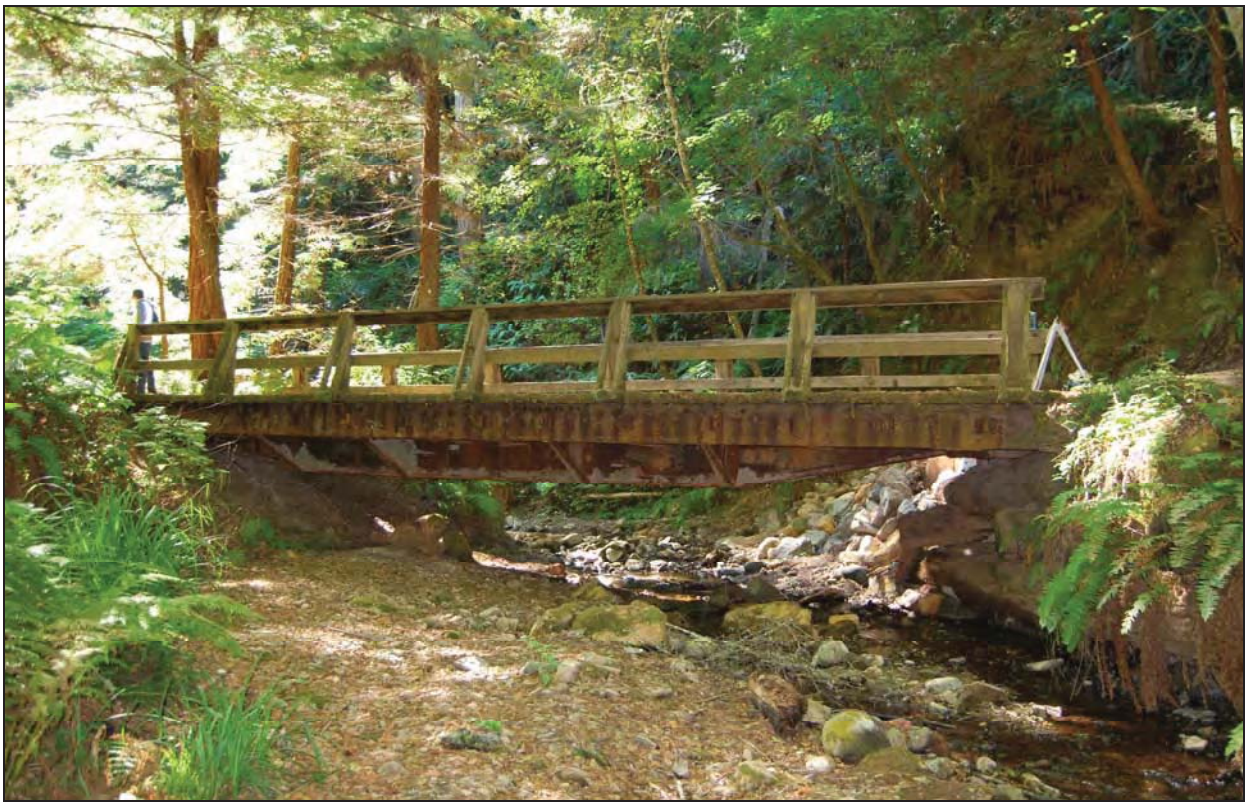

Figure 8: Purisima Bridge 1, view south

Figure 9: Purisima Bridge 1, view of redundant main box girder and stringers

Figure 10: Purisima Bridge 1, view west at redwood abutment

Figure 11: Soda Gulch Bridge, view north

Figure 12: Soda Gulch Bridge, view north and below

Figure 13: Soda Gulch Bridge, non-redundant main box girder with stringers, exterior girder and floor beams

Figure 14: Soda Gulch Bridge, exterior girder with markings (SP 509193)

Figure 15: Purisima Bridge 2, view south

Figure 16: Purisima Bridge 2, redundant main box girder and stringers

Figure 17: Purisima Bridge 2, view of exterior girders, stringers, and main box girder

Figure 18: View of small artifact concentration of wheel rim, braided steel cable and bricks (no-markings)

August 5, 2014

BASIN
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1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Ms. Cynthia Gomez
Executive Secretary
Native American Heritage Commission
1550 Harbor Boulevard
West Sacramento, CA 95691

RE: Request for Review of Sacred Lands Inventory –
Purisima Creek Four Bridges Project, San Mateo County

Dear Ms. Gomez,

Please let this letter stand as our request for the Native American Heritage Commission (NAHC) to conduct a review of the NAHC *Sacred Lands Inventory* to determine if any listed properties are present within or adjacent to the above proposed project area (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

Information from the NAHC *Sacred Lands Inventory* will be used to in a letter report to determine if significant archaeological resources may be affected by the proposed project.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

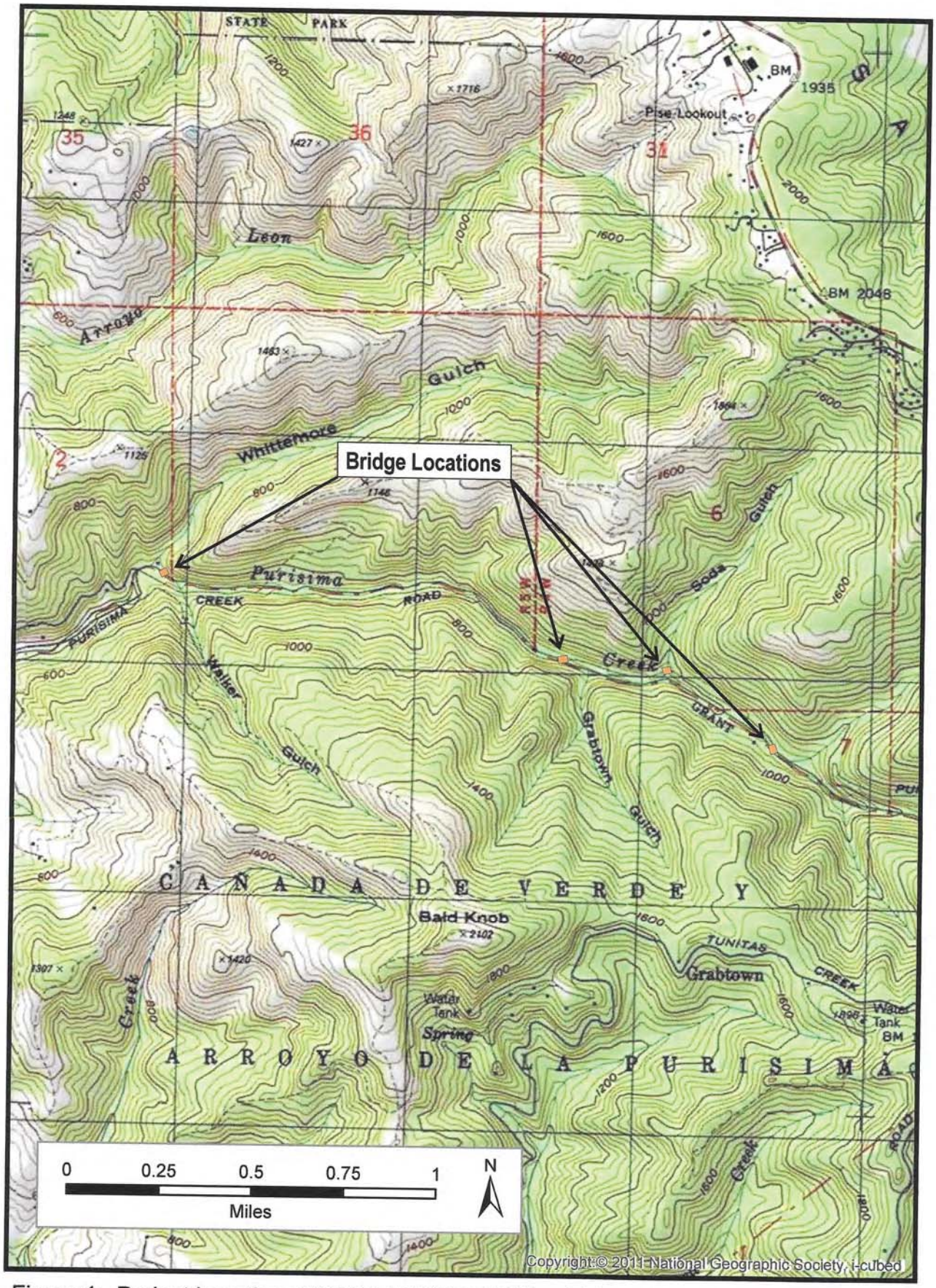

Figure 1: Project Locations T6S R4-5W (USGS Woodside, CA 1997)

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd.
West Sacramento, CA 95691
(916) 373-3710
Fax (916) 373-5471

Colin I. Busby, PhD
BASIN
1933 Davis St
Suite 210
San Leandro, CA 94577

September 2, 2014

By: Fax: 510-430-8443
2 Pages

Re: Purisima Creek Four Bridges project, San Mateo County

Dr. Busby,

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 373-3713.

Sincerely,

Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts
San Mateo County
September 2, 2014

Jakki Kehl
720 North 2nd Street
Patterson , CA 95363
(209) 892-1060
Ohlone/Costanoan

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister , CA 95024
ams@indiancanyon.org
(831) 637-4238
Ohlone/Costanoan

Linda G. Yamane
1585 Mira Mar Ave
Seaside , CA 93955
rumsien123@yahoo.com
(831) 394-5915
Ohlone/Costanaon

Muwekma Ohlone Indian Tribe of the SF Bay Area
Rosemary Cambra, Chairperson
P.O. Box 360791
Milpitas , CA 95036
muwekma@muwekma.org
(408) 205-9714
(510) 581-5194
Ohlone / Costanoan

Amah MutsunTribal Band of Mission San Juan
Irene Zwierlein, Chairperson
789 Canada Road
Woodside , CA 94062
amahmutsuntribal@gmail.com
(650) 400-4806 Cell
(650) 332-1526 Fax
Ohlone/Costanoan

The Ohlone Indian Tribe
Andrew Galvan
P.O. Box 3152
Fremont , CA 94539
chochenyo@AOL.com
(510) 882-0527 Cell
(510) 687-9393 Fax
Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Amah MutsunTribal Band of Mission San Juan Bautista
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Ohlone/Costanoan

Trina Marine Ruano Family
Ramona Garibay, Representative
30940 Watkins Street
Union City , CA 94587
soaprootmo@comcast.net
(510) 972-0645
Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Coastanoan Rumsen Carmel Tribe
Tony Cerda, Chairperson
240 E. 1st Street
Pomona , CA 91766
rumsen@aol.com
(909) 524-8041 Cell
(909) 629-6081
Ohlone/Costanoan

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Purisima Creek Four Bridges project, San Mateo County.

September 10, 2014

BASIN
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1933 DAVIS STREET
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SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Ms. Jakki Kehl
720 North Second Street
Patterson, CA 95363

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Jakki,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

Any information provided will be used to determine if significant archaeological resources may be affected by the proposed project.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

September 10, 2014

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VOICE (510) 430-8441
FAX (510) 430-8443

Ms. Linda G. Yamane
1585 Mira Mar Avenue
Seaside, CA 93955

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Linda,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

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Ms. Irenne Zwierlein, Chairperson
Amah/Mutsun Tribal Band of Mission San Juan Bautista
789 Canada Road
Woodside, CA 94062

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Irenne,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

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Ms. Michelle Zimmer
Amah/Mutsun Tribal Band of Mission San Juan Bautista
789 Canada Road
Woodside, CA 94062

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Michelle,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

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If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

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FAX (510) 430-8443

Mr. Tony Cerda
Coastanoan Rumsen Carmel Tribe
240 E. 1st Street
Pomona, CA 91766

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Tony,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

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September 10, 2014

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Ms. Ann Marie Sayers, Chairperson
Indian Canyon Mutsun Band of Costanoan
P.O. Box 28
Hollister, CA 95024

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Ann Marie ,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

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BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
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September 10, 2014

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Ms. Rosemary Cambra
Chairperson
Muwekma Ohlone Tribe of the SF Bay Area
P.O. Box 360791
Milpitas, CA 95036

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Rosemary,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

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If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
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September 10, 2014

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VOICE (510) 430-8441
FAX (510) 430-8443

Mr. Andrew Galvan
The Ohlone Indian Tribe
P.O. Box 3152
Fremont, CA 94539

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Andrew,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

Any information provided will be used to determine if significant archaeological resources may be affected by the proposed project.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

September 10, 2014

BASIN
RESEARCH
ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Ms. Ramona Garibay, Representative
Trina Marine Ruano Family
30940 Watkins Street
Union City, CA 94587

RE: Request for Information
Purisima Creek Four Bridges Project, San Mateo County

Dear Ramona,

The Native American Heritage Commission has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map).

The proposed project consist of the replacement of four foot bridges over Purisima Creek within approximately 1.75 mile along the Purisima Creek Trail within the Purisima Creek Redwoods Open Space Preserve. The trail is located west of Kings Mountain and Highway 35, north of Tunitas Creek Road and east of the terminus of Purisima Creek Road.

Any information provided will be used to determine if significant archaeological resources may be affected by the proposed project.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

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Principal

CIB/dg

Record of Native American Contacts
Proposed Purisima Creek Four Bridge Project, San Mateo County.

8/5/14 Letter to Ms. Cynthia Gomez, Executive Secretary, Native American Heritage Commission (NAHC), Sacramento. Regarding: Request for Review of Sacred Lands Inventory for project.

9/2/14 Letter response by Debbie Pilas-Treadway, NAHC

9/10/14 Letters sent to all parties recommended by NAHC

Letters to Jakki Kehl, Patterson; Linda G. Yamane, Seaside; Irenne Zwierlein, Chairperson, Amah Mutsun Tribal Band of Mission San Juan Bautista, Woodside; Michelle Zimmer Amah/Mutsun Tribal Band of Mission San Juan Bautista, Woodside; Tony Cerda, Chairperson, Coastanoan Rumsen Carmel Tribe, Pomona; Ann Marie Sayers, Chairperson, Indian Canyon Mutsun Band of Costanoan, Hollister; Rosemary Cambra, Chairperson, Muwekma Ohlone Indian Tribe of the SF Bay Area, Milpitas; Andrew Galvan, The Ohlone Indian Tribe, Mission San Jose; and Ramona Garibay, Representative, Trina Marine Ruano Family, Lathrop.

9/25/14 Telephone calls and/or emails made by Basin Research Associates (Christopher Canzonieri) in the late morning to non-responding parties.

Jakki Kehl – called at 10:56 AM and 11:15 AM, unable to leave a message – line busy.

Linda G. Yamane – called at 10:57 AM; left a detailed message on her answering machine.

Irenne Zwierlein – called at 10:59 AM recommends archaeological and Native American monitoring due to the presence of the creek**.**

Michelle Zimmer – Irenne Zwierlein, spoke on her daughter's behalf. Same recommendations apply – archaeological and Native American monitoring due to the presence of the creek.

Tony Cerda – called at 11:04 AM; no answer, unable to leave a message.

Ann Marie Sayers – called at 11:05 AM; based on Basin's survey results and the NAHC and CHRIS/NWIC documentation-Ms. Sayers does not recommend any monitoring.

Rosemary Cambra – called at 11:10 AM; unable to leave message.

Andrew Galvan – texted at 10:45 AM; per previously discussed conversation, Andy has no immediate concerns, but recommends that if something is encountered the proper measures should be implemented (i.e., contact County Coroner and Native American Heritage Commission if Native American remains are exposed and follow recommendations).

Ramona Garibay – called at 11:13 AM; left a detailed message on her answering machine.

County of San Mateo - Planning and Building Department

ATTACHMENT E

NOTICE OF DETERMINATION

To: California State Clearinghouse
Office of Planning and Research
P.O. Box 3044
Sacramento, 95812-3044

From: Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

FILED ENDORSED
IN THE OFFICE OF THE
COUNTY CLERK RECORDER OF
SAN MATEO COUNTY CALIF

MAR 12 2015

MARK CHURCH, County Clerk
By VERONICA MADRID
DEPUTY CLERK

San Mateo County Clerk
County of San Mateo
Redwood City, CA, 94063-1665

Subject: **Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.**

Harkins Bridge Replacement Project

Project Title
#2014102044

Aaron Hebert	650-691-1200
Lead Agency Contact Person	Area Code/Telephone/Extension

State Clearinghouse Number
(If submitted to Clearinghouse)

Project Location

Project Location: County: San Mateo City/Nearest Community: Half Moon Bay
Cross Streets: Higgins Canyon Road and Purisima Creek Road Zip Code: 94019
Longitude/Latitude (degrees, minutes and seconds): 37 ° 26 ′ 14.1 ″ N / 122 ° 22 ′ 9.84 ″ W Total Acres: .08
Assessor's Parcel No.: 067-320-220 Section: 1 Twp.: 6S Range: 5W Base:
Within 2 Miles: State Hwy #: 1 Waterways: Purisima Creek
Airports: Railways: Schools:

Project Description

The Project involves the removal and replacement of a deteriorated railroad car bridge crossing over Purisima Creek, which would entail demolition of an existing access road to the old bridge location, site restoration of the area of the old bridge location; construction of a temporary culvert crossing with associated water diversion plan; installation of a new bridge, construction of a new access roadway and trail to the proposed bridge, and temporary fencing along Purisima Creek Trail to exclude the public from construction activities.

The project goals and objectives are as follows:

- Remove the existing deteriorated bridge over Purisima Creek and restore the bridge approaches and bridge area to reduce soil erosion.
- Construct a new bridge and associated new access roadway approximately 100 feet upstream of the existing bridge that will improve public safety for the District with safe vehicular access for patrol, fire and other emergency vehicles.

This is to advise that the Midpeninsula Regional Open Space District (the Lead Agency) has approved the above described Project on 12/17/2014 (date) and has made the following determinations regarding the above described project:

1. The project [☐ will X will not] have a significant effect on the environment
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   X A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [X were ☐ were not] made a condition of the approval of the project.

4. A mitigation reporting or monitoring plan [X was ☐ was not] adopted for this project
5. A statement of Overriding Considerations [☐ was X was not] adopted for this project
6. Finding s [X were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration is available to the General Public at:

Midpeninsula Regional Open Space District administrative offices, 330 Distel Circle, Los Altos, CA 94022

Signature (Public Agency)

Project Manager
Title

Date received for filing and posting at OPR:

RESOLUTION NO. 14-39

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE MIDPENINSULA REGIONAL OPEN SPACE DISTRICT ADOPTING THE MITIGATED NEGATIVE DECLARATION, THE MITIGATION MONITORING PROGRAM, AND THE FINDINGS IN CONNECTION WITH THE PROPOSED HARKINS BRIDGE REPLACEMENT PROJECT (PURISIMA CREEK OPEN SPACE PRESERVE)

WHEREAS The Board of Directors of the Midpeninsula Regional Open Space District ("District") has reviewed the proposed Harkins Bridge Replacement Project and all associated actions ("the Project") and has reviewed the Mitigated Negative Declaration ("MND") analyzing the environmental effects of the Project;

NOW, THEREFORE, BE IT RESOLVED by the District Board of Directors that, based upon the Initial Study, Mitigated Negative Declaration, Mitigation Monitoring Program, all comments received, and all substantial evidence in light of the whole record presented, the Board of Directors find that:

1. Notice of the availability of the Initial Study and Mitigated Negative Declaration and all hearings on the MND were given as required by law and the actions were conducted pursuant to California Environmental Quality Act (CEQA) and the CEQA Guidelines.

2. All interested parties desiring to comment on the MND were given the opportunity to submit oral and written comments on the adequacy of the MND prior to this action by the Board of Directors.

3. Prior to approving the Project that is the subject of the MND, the Board has considered the MND, along with all comments received during the public review process.

4. The Board finds that, on the basis of the whole record before it, including the Initial Study and MND, that there is no substantial evidence that the Project will have a significant effect on the environment in that, although the proposed Project could have significant effects on the environment, there will not be a significant effect in this case since Mitigation Measures have been made a part of the Project to avoid such effects.

5. The Board adopts the MND and determines that the MND reflects the District's independent judgment and analysis

6. The Board adopts the attached Mitigation Monitoring and Reporting Program and will require it to be implemented as part of the Project.

7. The location and custodian of the documents or other material, which constitute the record of proceedings upon which this decision is based are located at the offices of the General Manager of the Midpeninsula Regional Open Space District, 330 Distel Circle, Los Altos, California 94022.

* *

PASSED AND ADOPTED by the Board of Directors of the Midpeninsula Regional Open Space District on December 17, 2014, at a special meeting thereof, by the following vote:

AYES: **CYR, HARRIS, HASSETT, KISHIMOTO, SIEMENS**
NOES: **NONE**
ABSTAIN: **NONE**
ABSENT: **HANKO, RIFFLE**

ATTEST:

Secretary
Board of Directors

APPROVED:

President
Board of Directors

APPROVED AS TO FORM:

General Counsel

I, the District Clerk of the Midpeninsula Regional Open Space District, hereby certify that the above is a true and correct copy of a resolution duly adopted by the Board of Directors of the Midpeninsula Regional Open Space District by the above vote at a meeting thereof duly held and called on the above day.

District Clerk