

Town of Moraga Bollinger Canyon Road Culvert Repair Project

Draft Initial Study / Mitigated Negative Declaration



Town of Moraga
Public Works/Engineering
Department
329 Rheem Blvd
Moraga, CA 94556

Prepared For:
Town of Moraga

Prepared By:
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501 Canal Blvd., Suite I
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Date:
May 3, 2016

NCE Project Number:
576.11.55

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1. BACKGROUND

- 1. Project Title:** Bollinger Canyon Road Culvert Repair Project
- 2. Lead Agency Name and Address:** Town of Moraga
329 Rheem Blvd.
Moraga, CA 94556
- 3. Contact Person & Phone Number:** Mr. Edric Kwan, PE
Public Works Director/Town Engineer
Town of Moraga, Public Works Department
(925) 888-7025
- 4. Project Location:** Near the intersection of Bollinger Canyon Road and Joseph Drive in the Town of Moraga
- 5. Project Sponsor's Name and Address:** Town of Moraga
329 Rheem Blvd.
Moraga, CA 94556
- 6. General Plan Designations:** Community Facilities
- 7. Zoning:** Residential/Institutional
- 8. Description of Project:** Proposed reconstruction and repair of two culverts along Bollinger Canyon Road.
- 9. Surrounding Land Uses and Setting:** Residential uses, Open space.
- 10. Other Agencies whose Approval Is Required:**
- US Army Corps of Engineers
 - San Francisco Regional Water Quality Control Board
 - California Department of Fish and Wildlife
 - U.S. Fish and Wildlife Service

2. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

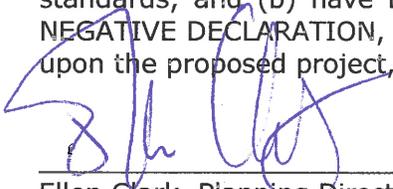
The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” as indicated by the environmental checklist (Section 6.0).

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

3. DETERMINATION

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.



Ellen Clark, Planning Director

MAY 3, 2016
Date

4. PROJECT SUMMARY

a. PROJECT LOCATION

The Town of Moraga proposes to repair and reconstruct two culverts within the town. These culverts are located in the Las Trampas Creek watershed along Bollinger Canyon Road, between Joseph Drive and St. Mary's Road (**Figure 1**). Steep bluffs abut Bollinger Canyon Road on the northeast side. The southeast side of the road has a narrow shoulder, then a steep slope that drops into a small canyon and Las Trampas Creek.

The two culverts collect overland flow from upland areas and the road surface, which eventually discharge into Las Trampas Creek. Pipe 1 originates at the southeast corner of the intersection of St. Mary's Road and Bollinger Canyon Road. Pipe 2 is on the southwest side of Bollinger Canyon Road just north of the intersection with Joseph Drive. Pipe 2 also conveys flows from an unnamed seasonal tributary.

The project would take place within the Town right of way and within Assessor's Parcel Number (APN) 258-150-006.

b. PROJECT BACKGROUND

The purpose of this project is to maintain existing storm drain conveyance and to stabilize an area adjacent to a storm drain outfall along Bollinger Canyon Road that has severely eroded. A section of Pipe 1 is in poor condition and would be replaced to maintain conveyance of storm water flows through the culvert. The pipe section will be replaced in-kind within the existing footprint of Bollinger Canyon Road. At the initial planning and design of the project, the extent of pipe and thus work limit for repair of Pipe 1 had not been determined. For this reason, areas near Pipe 1 were included in the biological resources assessment (**Appendix A**). Subsequent CCTV examination confirmed a section of pipe 1 underneath the roadway would be replaced and this work would not extend into, nor require dredge or fill, within the stream channel or riparian corridor. As a result, impacts associated with maintenance of this existing facility are not assessed further in this MND.

Pipe 2 conveys flow from an unnamed seasonal tributary and discharges to a seasonal wetland. There is significant erosion occurring at the outfall which requires slope stabilization. There is an approximately 10-foot vertical drop from the outfall to the bottom of the slope. Undercutting has occurred near the storm drain outfall and a gully has formed. Continued erosion threatens the stability of the roadway. This MND considers impacts associated with the work to be conducted at the outfall of Pipe 2.

c. PROJECT DESCRIPTION

The outfall and adjacent slope will be armored with rock riprap and slope protection to stabilize the eroded area (Photo 5.a and Photo 5.b). The stabilization solution requires fill of approximately 15 to 20 cubic yards to stabilize the slope and outfall. Not all of this fill would extend below the Ordinary High Water Mark (OHWM); the project footprint below the OHWM is approximately 175 square feet (**Figure 2**). Slope stabilization measures will include rock slope protection and construction of a retaining wall. The project will also require the removal of approximately two California bay trees (*Umbellularia californica*), two coast live oak trees (*Quercus agrifolia*), two bigleaf maple trees (*Acer macrophyllum*), and two red willows (*Salix laevigata*) along the slope adjacent to Pipe 2.

Construction is anticipated to begin in Summer of 2017 and be completed prior to September 30th, 2017. Construction equipment will be staged along wider areas of the shoulder along Bollinger Canyon and St. Mary's Road. One-way traffic control may be used during construction, which is expected to be for 30 days. Construction will occur from 8:00 am to 6:00 pm Monday through Friday. All work is anticipated to occur when surface water is not present in Las Trampas Creek and its tributaries.

Figure 1: Project Vicinity & Topographic Map

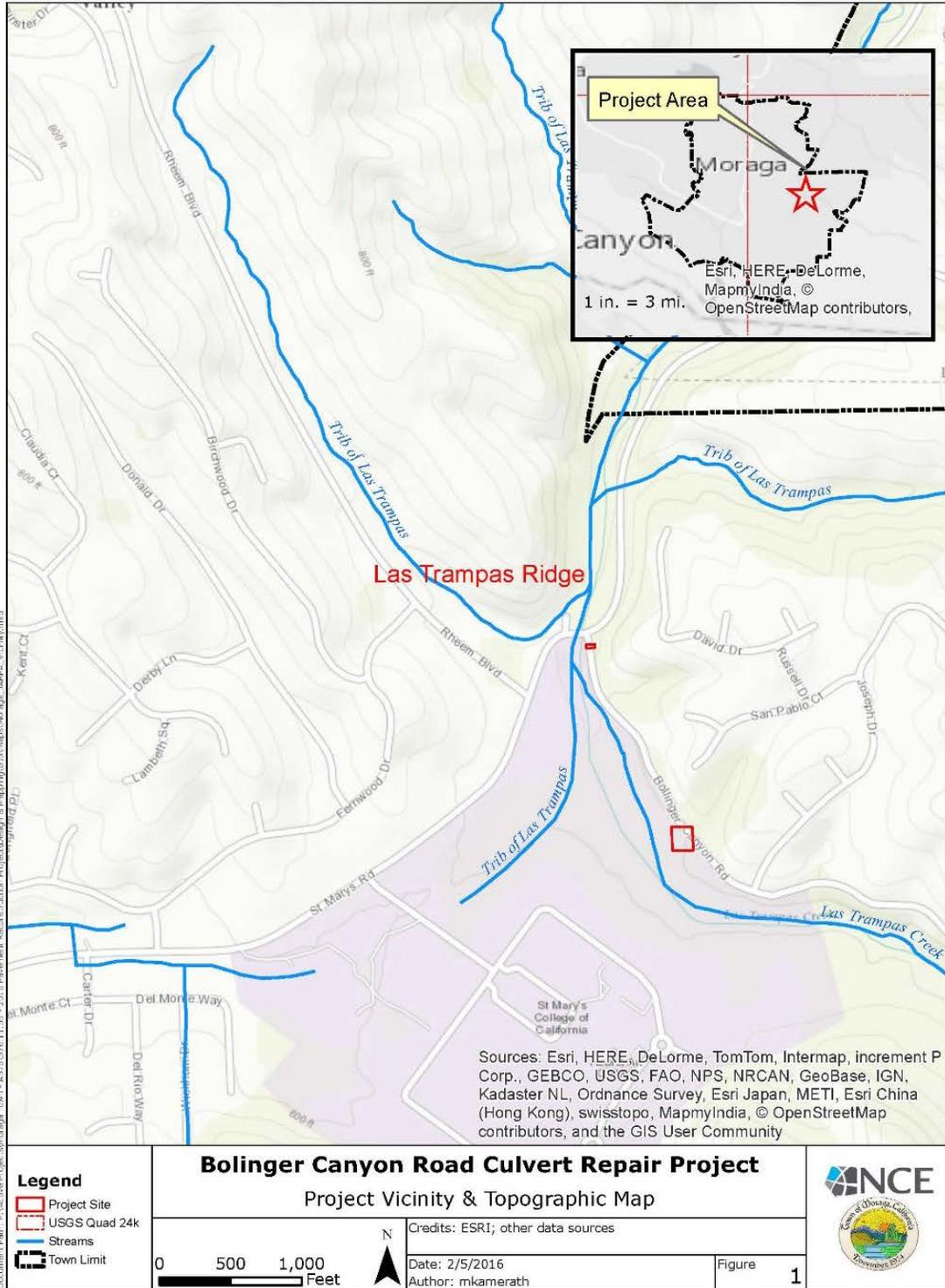
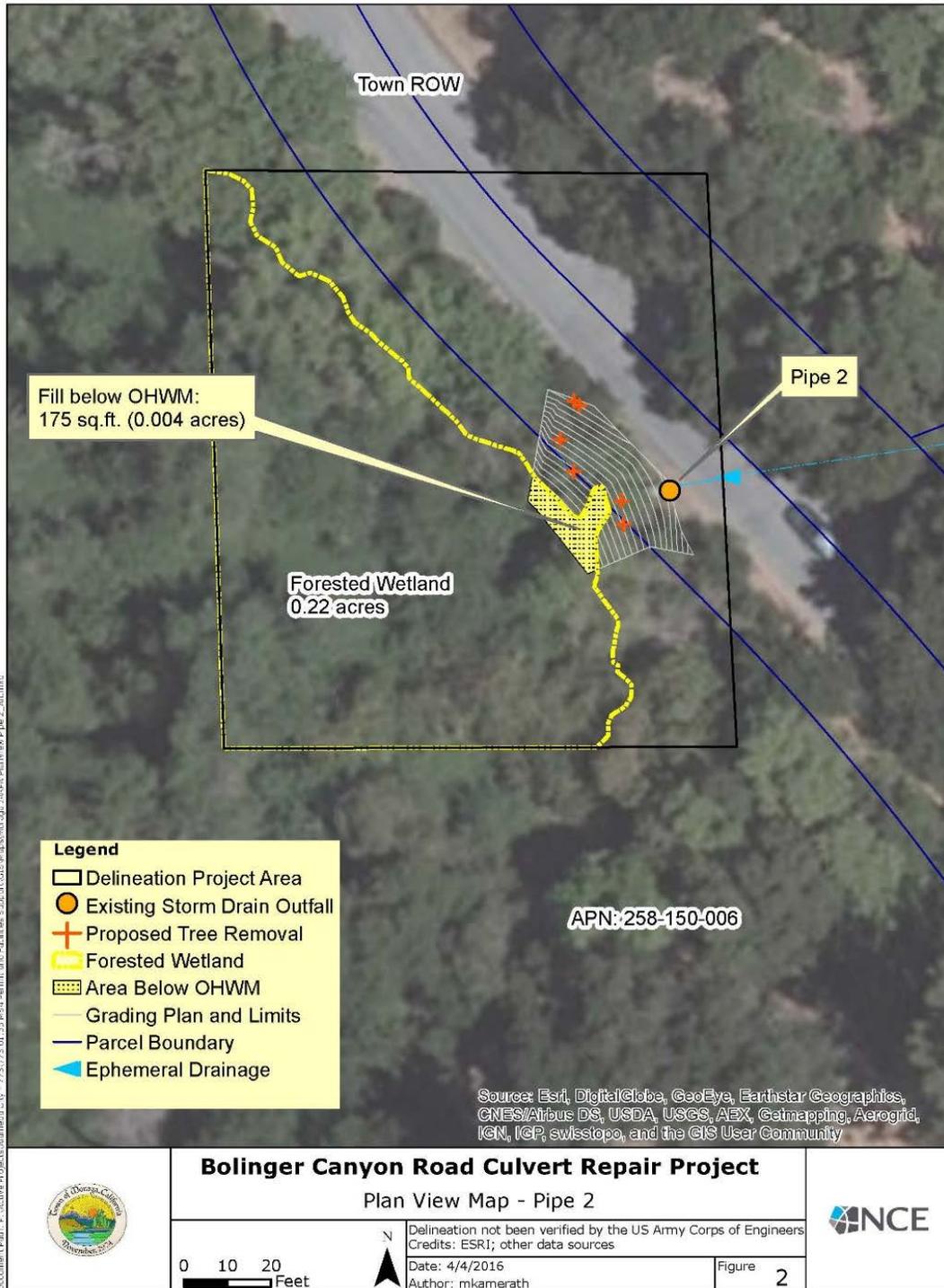


Figure 2. Plan View Map – Pipe 2



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5. SITE PHOTOGRAPHS

The following photographs were taken of the culvert and surrounding area on October 29, 2015.

a. **OUTFALL FROM BOLLINGER CANYON ROAD**



b. OUTFALL AND EROSION OF ADJACENT SLOPE



c. OHWM LOCATED AT THE TOE OF THE SLOPE NEAR THE OUTFALL



6. ENVIRONMENTAL CHECKLIST

The following Environmental Checklist describes the impacts of the proposed project, as detailed in the Project Description. Potential environmental impacts are described as follows:

Potentially Significant Impact: An environmental impact that could be significant and for which no feasible mitigation is known. If any potentially significant impacts are identified in this Checklist, an Environmental Impact Report (EIR) must be prepared.

Potentially Significant Unless Mitigated: An environmental impact that requires the incorporation of mitigation measures to reduce that impact to less-than-significant level.

Less- Than- Significant- Impact: An environmental impact may occur, however, the impact would not be considered significant based on CEQA environmental standards.

No Impact: No environmental impacts would result from implementation of the project.

INITIAL STUDY CHECKLIST

I. AESTHETICS – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?			X	
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a state scenic highway?				X
c. Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
d. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?				X

Item I-a through I-d.

Discussion. A substantial adverse effect to Aesthetics would result in the introduction of physical features that are not characteristic of the surrounding development, substantially change the natural landscape, or obstruct an identified public scenic vista.

Item I-a. Bollinger Canyon Road is a Town designated scenic corridor (Moraga Municipal Code Sections 8.132.020 and 8.132.040) and the project has been designed to comply with Town of Moraga development standards for projects within the Town designated scenic corridor, ensuring the project will have a less than significant impact.

Less than Significant Impact. The project has been designed in compliance with Town of Moraga development standards for projects within designated scenic corridors. This impact would be less than significant.

Item I-b. The nearest State designated scenic highway is State Route 24 or Interstate 680 located approximately 4-miles northeast of the proposed project site (Caltrans, 2011) and would not be visible from any State designated scenic highway.

No Impact. The proposed project is not located near any State designated scenic highways. There will be no impact.

Item I-c. As described in detail in the project description and in the Biological Resources Section, impacts include; tree removal along Bollinger Canyon Road, an additional section of guard rail installed at the edge of pavement near the outfall and a chain link fence behind the guard rail. The project proposes to remove approximately two California bay trees (*Umbellularia californica*), two coast live oak trees (*Quercus agrifolia*), two bigleaf maple trees

(*Acer macrophyllum*), and two red willows (*Salix laevigata*) along the slope adjacent to the outfall. Tree removal includes mitigation measures for replacement of existing canopy and landscaping as addressed in the Biological Resources Section. The metal beam guard rail will be approximately 50 ft. in length and 2.3 ft. tall, and will meet Caltrans standard specifications. Other metal beam guard rail currently exists in the project area along Bollinger Canyon Road. If walls or fencing 3 feet or higher would be installed, these improvements will be reviewed by the Design Review Board.

Less than Significant Impact. The project would be an extension of existing, similar development and would not result in substantial changes to the aesthetic character of the site and its surroundings with the incorporation of mitigation measures for tree removal, as described in the Biological Resources Section. This impact would be considered less than significant.

Item I-d. The project does not propose any new lighting. All fences, walls, and guard rails have been designed using matte finishes to blend into the surrounding landscape to avoid new sources of glare.

No Impact. There would be no impact resulting from the proposed project since no new sources of substantial light or glare, which would adversely affect day or nighttime views in the area have been proposed.

II. AGRICULTURAL AND FORESTRY RESOURCES – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Result in the loss of forest land or conversion of forest land to non-forest use?				X
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland (including livestock grazing) to non-agricultural use?				X

Item II-a through II-e.

Discussion. The project does not entail any land use changes and there will be no loss of agricultural resources since no farmland exists in the project area. The nature of the proposed culvert repair has no impact on land development and is proposed for drainage and stabilizing erosion only. There are no changes in zoning or conversion of land uses for the proposed project. There will be no impact on potential farmland development as a result of the culvert repair. Therefore, no mitigation measures are proposed for Agricultural and Forest Resources.

III. AIR QUALITY – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?			X	
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c. 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)?			X	
d. Expose sensitive receptors to substantial pollutant concentrations?		X		

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e. Create objectionable odors affecting a substantial number of people?				X

Item III-a.

Discussion. The Town of Moraga General Plan has general goals that promote Air Quality. The Town relies on Federal, State, and Regional regulations for the management of air quality during construction projects. Regionally, the project is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which is entrusted with regulating the stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma Counties.

CEQA thresholds of significance for air quality are found in **Table 1**, which shows the current significance thresholds including annual emissions for operational emissions and daily standards for short-term construction related emissions. Reactive Organic Gases, Nitrogen Oxides, and Particulate Matter (PM2.5) are limited to 54 lbs/day emission level during construction related projects. Particulate Matter (PM10) emissions from exhaust are to be limited to 82 lbs/day during construction related activities. Fugitive dust emissions from construction activities are in compliance if Best Management Practices (BMPs) are employed.

Figure 3 shows the California 8-hour ozone nonattainment areas, and Contra Costa County is mapped as “marginal”. Ozone levels are not regulated during construction activities and are not included in the threshold table.

Less than Significant Impact. The culvert repair project will not interfere with the implementation of the BAAQMD Regional Plan as the project will generate no additional emissions once installed and emissions during construction will be below the threshold of significance. During construction, BMPS for fugitive dust control are required to maintain emissions below the level of significance. No additional mitigation measures for air quality are proposed.

Item III-b.

Discussion. The California Air Resources Board (CARB) is part of the California EPA and is responsible for the coordination and administration of both the federal and state air pollution control programs in California. CARB sets the California Ambient Air Quality Standards (CAAQS), oversees the Toxic Air Contaminants Program (TACs), and the Hotspots Program. TACs were intended to reduce exposure to air toxins such as asbestos, benzene, and chloroform. The Hotspots Program was designed to report and notify the public of the types and quantities of air toxins routinely released in the air at specific locations. There are no TACs or designated Hotspots in the project area.

BAAQMD establishes permitting requirements for stationary sources; inspects emission sources; and enforces such measures when necessary. The BAAQMD has established significance thresholds to assess the regional and localized impacts of project related air pollutant emissions generated from construction equipment. **Table 1** presents the most current significance thresholds including annual emissions for operational emissions and daily

standards for short-term construction related emissions. A project with daily emission rates below these thresholds is considered to have a less than significant effect on air quality.

Table 1: Bay Area Air Quality Management District Thresholds of Significance

Adopted Air Quality CEQA Thresholds of Significance* - June 2, 2010		
Pollutant	Construction-Related	Operational-Related
Risk and Hazards – New Source (Cumulative Thresholds)	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) PM _{2.5} : > 0.8 µg/m ³ annual average (from all local sources) <u>Zone of Influence:</u> 1,000-foot radius from fence line of source or receptor
Risk and Hazards – New Receptor (Cumulative Thresholds) <i>Note: Threshold Effective Date May 1, 2011</i>	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) PM _{2.5} : > 0.8 µg/m ³ annual average (from all local sources) <u>Zone of Influence:</u> 1,000-foot radius from fence line of source or receptor
Accidental Release of Acutely Hazardous Air Pollutants	None	Storage or use of acutely hazardous materials locating near receptors or receptors locating near stored or used acutely hazardous materials considered significant
Odors	None	Complaint History—5 confirmed complaints per year averaged over three years
Plan-Level		
Criteria Air Pollutants and Precursors	None	1. Consistency with Current Air Quality Plan control measures 2. Projected VMT or vehicle trip increase is less than or equal to projected population increase
GHGs	None	Compliance with Qualified Greenhouse Gas Reduction Strategy (or similar criteria included in a General Plan) OR 6.6 MT CO ₂ e/ SP/yr (residents + employees)
Risks and Hazards	None	1. Overlay zones around existing and planned sources of TACs (including adopted Risk Reduction Plan areas) 2. Overlay zones of at least 500 feet (or Air District-approved modeled distance) from all freeways and high volume roadways
Odors	None	Identify locations of odor sources in general plan
Accidental Release of Acutely Hazardous Air Pollutants	None	None
Regional Plans (Transportation and Air Quality Plans)		
GHGs, Criteria Air Pollutants and Precursors, and Toxic Air Contaminants	None	No net increase in emissions

CO = carbon monoxide, CO₂e = carbon dioxide equivalent, GHGs = greenhouse gases, lb/day = pounds per day, MT = metric tons, NO_x = oxides of nitrogen, PM_{2.5} = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM₁₀ = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ppm = parts per million; ROG = reactive organic gases; SP = service population; tpy = tons per year, yr = year.

Less Than Significant Impact with Mitigation. Construction of the project will require the use of heavy equipment, which would create some level of temporary emissions. Air pollutants would be emitted by construction equipment and worker vehicles. Fugitive dust and particulate matter would be generated during demolition and grading of the project site.

Mitigation Measure III-b. In order to address particulate matter originating from dust emissions related to construction, the Town of Moraga will comply with all BAAQMD policies

and shall include in the grading plans the requirement that the Contractor, during the period of soil excavation: (1) water the active grading area at least one time per day or more as necessary to prevent visible dust plumes from leaving the project site and (2) water the excavated soil to prevent visible dust plumes when loading soil into trucks for export from the site. These measures must also be implemented during weekends and holidays, if construction is occurring.

As part of this project, a Storm Water Pollution Prevention Plan (SWPPP) will be required and prepared by the Contractor and approved by the Town prior to construction. The SWPPP will require dust mitigation measures and dust control BMPs which may include stabilization of unpaved areas subject to vehicular traffic, stabilization of storage piles and disturbed areas, dust suppression through watering of areas to be disturbed, cleaning of all construction vehicles leaving the site, mulching of bare soil areas, and suspension of grading and earth moving activities when wind speeds are high enough to result in dust emissions crossing the project boundary. These dust control measures help prevent transport of such materials off site, into any surface water, or into any drainage course.

Item III-c.

Discussion. Air quality is regulated by Federal, State, Regional, and Local standards. Per the Clean Air Act, the United States Environmental Protection Agency (USEPA) is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. There are seven criteria air pollutants: nitrogen dioxide (NO_x), ozone (O₃), particulate matter (including both PM₁₀ and PM_{2.5}), carbon monoxide (CO), sulfur dioxide (SO_x), and lead. The project area is located in a Federal and State designated non-attainment area for ozone (8 hour) and is in attainment for all other criteria air pollutants. **Figure 3** depicts the California 8-hour Ozone Nonattainment Areas Map (2008 standard).

Ozone is a secondary criteria pollutant, meaning that it is not directly emitted. The EPA reports that ozone is a gas that is formed when volatile organic compounds (VOCs) and nitrogen dioxide undergo photochemical reactions that occur in the presence of sunlight. Ground-level ozone is the primary constituent of smog and the associated health effects of smog. The primary source of VOC emissions is unburned hydrocarbons in motor vehicle exhaust.

Particulate matter typically occurs in the form of fugitive dust generated from vehicle exhaust, grading, demolition, and disturbed areas of soil. PM_{2.5} are fine dust particles that are less than 2.5 micrometers in size. PM₁₀ particles are referred to as coarse particles and are more visible to the naked eye. The project area is in attainment to the USEPA particulate matter standards.

Carbon Monoxide is a colorless, odorless gas, which in urban areas is associated with the incomplete combustion of fossil fuels in motor vehicles. High levels of CO are commonly found near freeways and major intersections; however, the project area is in attainment to the USEPA carbon monoxide standards.

Nitrogen Dioxide is a criteria air pollutant that is generated from the combustion of materials such as fossil fuels, wood, and coal. It is an irritant to the mucous membranes due to its ability to form nitric acid when combined with the water of the eyes, nose, and lungs. The project area is in attainment to the USEPA nitrogen dioxide levels.

Sulfur dioxide's major pollution source comes from the burning of fossil fuels at power generation plants. It is similar to Nitrogen Dioxide in how it reacts to the human body. The project area is in attainment to the USEPA sulfur dioxide levels.

Lead is a metal that can be found in very small quantities in the atmosphere. The major sources of lead pollution was historically exhaust from leaded-gasoline. Since the USEPA's adoption of lead in gasoline standards in 1978, there have been minimal ambient lead concentrations in the atmosphere. The project area is in attainment to the USEPA lead levels.

Less Than Significant Impact. Based on the short-term nature of the project, the construction process will not result in all other criteria air pollutants, including ozone and asbestos to exceed BAAQMD thresholds or State Standards. During construction, there will be an increase in emissions of ozone precursors. However, the increase is less than cumulatively considerable. BAAQMD Standards will be followed during repair of the existing culverts and therefore, the impact is less than significant.

Item III-d.

Discussion. According to the BAAQMD CEQA Guidelines, sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses. Examples include schools, hospitals and residential areas. The nearest receptor area to the project site is the residential community adjacent to the project area. A school is also located in the general vicinity.

Less Than Significant Impact with Mitigation Measures. Based on the short-term nature of the project, the installation of the culvert will not result in all other criteria air pollutants, including ozone and asbestos to exceed BAAQMD thresholds or State Standards. BAAQMD Standards will be followed during demolition of the existing culvert. However, due to the proximity of sensitive receptors, mitigation measures will be implemented.

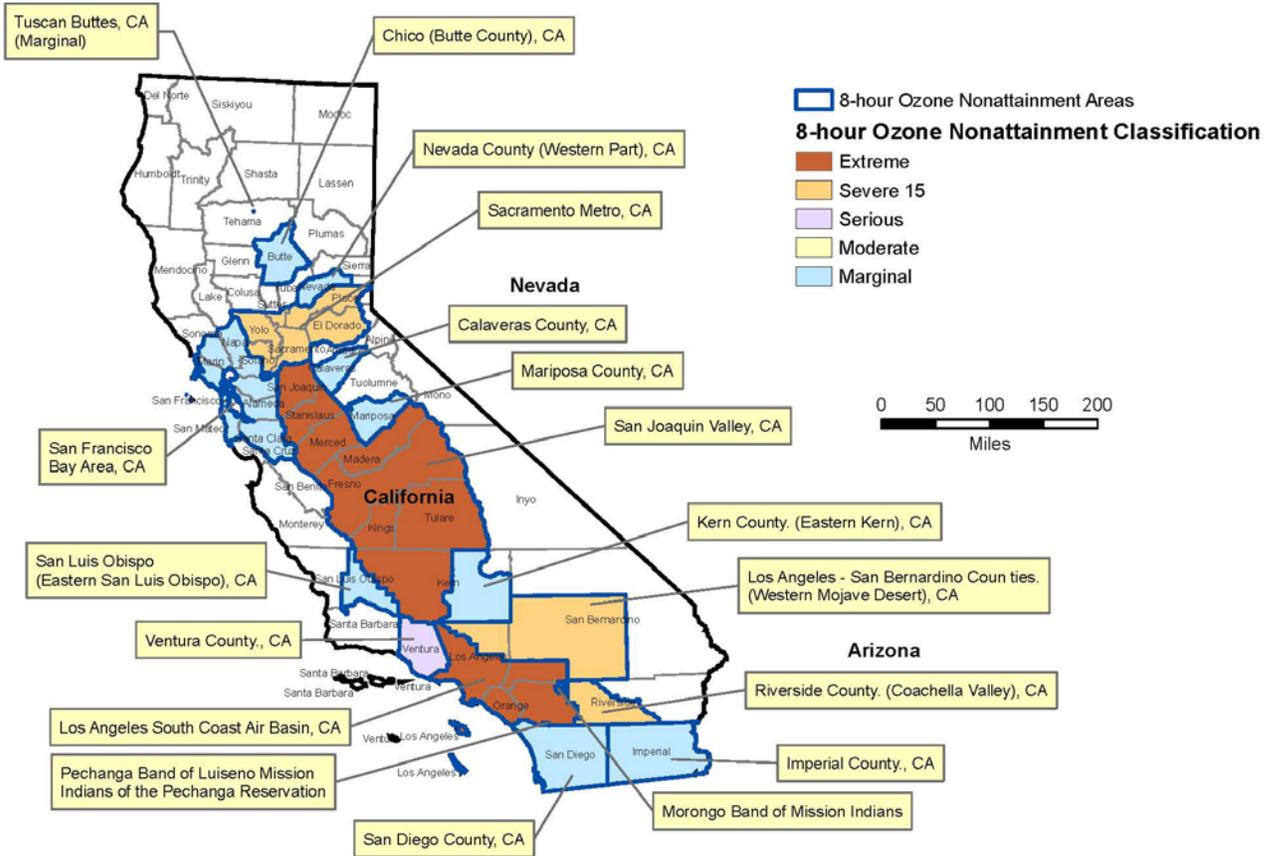
Mitigation Measure III-d. As a result of *Mitigation Measure III-b* stated above, there will be a less than significant impact on air quality in relation to sensitive receptors.

Item III-e.

Discussion. Objectionable odors are defined as nuisance odors that impact communities or businesses. The culvert repair and installation will not result in objectionable odors during and after construction.

No Impact. The culvert repair will not result in objectionable odors and therefore will have no impact. No mitigation measures are proposed.

Figure 3: California 8-hour Ozone Nonattainment Areas (2008 Standard) as of Oct. 1, 2015.



IV. BIOLOGICAL RESOURCES – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 & Wildlife or U.S. Fish & Wildlife Service?		X		
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations or by the California Department of Fish & Wildlife or U.S. Fish & Wildlife Service?		X		
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?		X		
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?		X		
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

Items IV-a, b.

Discussion. In October and November of 2015, a Biological Resource Assessment (BRA) was conducted by NCE biologists. The BRA focused on observing and recording plant and animal communities and habitats, delineating and mapping the OHWM, and observing the site for any listed Special Status Species (SSS). **Figure 4** illustrates habitat types mapped within the project area to support the BRA as well as direct areas of potential effect (APE) where work will occur or staging areas could be located. The BRA assessed the habitat in the project area and the vicinity. The BRA considered the flora and fauna to propose mitigation measures that would minimize impacts. The mitigation measures are appropriate for the number of trees potentially removed. A pre-construction survey will occur for all trees being removed and within a 250 ft. buffer of the project. All trees removed will be replanted at the appropriate mitigation ratio determined through the JARPA review. The results of the BRA indicate that mitigation measures are required to ensure a less than significant impact on Biological Resources. The BRA was utilized as a reference for the CEQA analysis and is included in **Appendix A** of this document (NCE, 2015a).

State and federal “endangered species” legislation has provided the California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as Threatened or Endangered under provisions of the state and federal Endangered Species Acts, Candidate species for such listing, state Species of Special Concern, and some plants listed as Endangered by the California Native Plant Society are collectively referred to as “species of special status.”

Permits could be required from both the CDFW and USFWS if activities associated with a proposed project will result in the “take” of a listed species. “Take” is defined by the state of California as “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill” (California Fish and Game Code, Section 86). “Take” is more broadly defined by the federal Endangered Species Act to include “harm” (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFW and the USFWS are Responsible Agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

Federally listed central coast steelhead trout (*Oncorhynchus mykiss*) occur downstream in Walnut Creek but are unlikely to occur in this reach of Las Trampas Creek because of a lack of fish passage and the seasonal nature of the creek. Federally listed California red-legged frog (*Rana draytonii*) may occur in the area.

Less Than Significant Impact with Mitigation. Not all species that occur in the vicinity of the project site occur within the boundaries of the project site. Of the 21 special status plant species that could occur in the project vicinity, only 10 species have the potential to occur on the site (NCE, 2015a). These are:

- Loma Prieta hoita (*Hoita strobilina*)
- Northern California black walnut (*Juglans hindsii*)
- Oregon meconella (*Meconella oregana*)
- Bent-flowered fiddleneck (*Amsinckia lunaris*)
- Big tarplant (*Blepharizonia plumose*)
- Round leaved filaree (*California macrophylla*)
- Western leatherwood (*Dirca occidentalis*)
- Diablo helianthella (*Helianthella castanea*)
- Mt. Diablo fairy-lantern (*Calochortus pulchellus*)

- Fragrant fritillary (*Fritillaria liliacea*)

The potential for these special status plant species to occur on site prior to construction activities is very low. However, pre-construction surveys are recommended. These surveys will focus on the area within and in the vicinity of proposed ground disturbing activities and should occur during the appropriate blooming season, such as the spring season prior to construction. The purpose of these surveys is to determine the presence or absence of the species on site prior to the time of construction.

If these special status plant species surveys result in a determination that the species are absent from areas impacted by construction activities, then there would be no impact to the species and mitigation would not be warranted. Should one or more populations of special status plant species be detected within the project footprint, then mitigation measures would be required to offset impacts to these plant populations. Generally, development should be avoided within 50 feet of any rare plant populations.

Of the 19 special status or sensitive animal species that occur, or once occurred, regionally, only 10 have any potential to occur at the site (NCE, 2015a). These are:

- Red-shouldered hawk (*Buteo lineatus*)
- Northern harrier (*Circus cyaneus*)
- Great horned owl (*Bubo virginianus*)
- Red-tailed hawk (*Buteo jamaicensis*)
- American kestrel (*Falco sparverius*)
- Alameda whipsnake (*Masticophis lateralis euryxanthus*)
- California red-legged frog (*Rana draytonii*)
- Hoary bat (*Lasiurus cinereus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- Obscure bumble bee (*Bombus caliginosus*)

These special status animal species may occur during foraging activities around the site. These species may either occur on the site incidental to home range and migratory movements, thus using the site infrequently, or may forage on the site year-round or during migration.

The limited area of disturbance as a result of the project will entail minimal loss of foraging, nesting, and/or roosting habitat that is abundantly available regionally. In addition, the construction will avoid removing most trees and shrubs, thereby protecting SSS habitat. Appropriate BMPs will be implemented into project construction in order to protect biological resources. Therefore, the loss of habitat for these species would be considered less than significant.

Although no stick nests were observed in trees on the site, a conclusive investigation of nesting birds was not conducted. Trees in the project vicinity may provide suitable nesting habitat for migratory birds, including tree-nesting raptors. If a migratory bird, regardless of its federal or state status, were to nest in trees near the site prior to or during proposed construction activities, such activities could result in the abandonment of active nests or direct mortality to these birds. Construction activities that adversely affect the nesting success of special-status or non-special-status migratory birds, including tree-nesting raptors, or result in mortality of individual birds constitute a violation of state and federal laws.

Direct impacts to SSS will be avoided through the use of pre-construction surveys. In addition, mitigation measures required by regulatory agencies for the protection of SSS and

their habitats will be implemented. Implementation of the following mitigation measures would mitigate impacts to migratory birds, other special status fish and wildlife species, and riparian areas to a less-than-significant level.

Mitigation Measures IV-a, b. The following measures shall be implemented into the project to avoid any potential adverse effects on any sensitive species or loss of riparian habitat:

1. To the extent practicable, the clearing of riparian areas will be minimized and avoided during project construction. After construction is complete, native willow cuttings from the vicinity will be replanted as determined in the JARPA permitting process.
2. Pre-construction surveys will be conducted to determine if special status plant species are present or absent and will focus on the area within and in the vicinity of proposed ground disturbing activities. Preconstruction activities should occur during the appropriate blooming season, such as spring prior to construction. If these special status plant species surveys result in a determination that species are absent from areas impacted by construction activities, then there would be no impact to the species and mitigation would not be warranted. If species are present then project work should be avoided within fifty feet of any rare plant populations.

If the project cannot be redesigned to avoid impacts to the identified species, then compensation measures should include development of a restoration plan for these species. At a minimum, the plan should contain the following elements: (a) location of restoration areas; (b) propagation and planting techniques to be employed for the restoration effort; (c) timetable for implementation; (d) monitoring plan and performance criteria; (e) adaptive management techniques; and (f) site maintenance plan. The plan must be approved by the Town prior to the start of project construction and should replace any special status plants lost during construction in the immediate vicinity of the identified population.

3. The project will require the removal of approximately two California bay trees (*Umbellularia californica*), two coast live oak trees (*Quercus agrifolia*), two big leaf maple trees (*Acer macrophyllum*), and two red willows (*Salix laevigata*) along the slope adjacent to the outfall. All other heritage trees, significant trees and other native trees, or oak woodlands shall be protected with construction fencing. After construction is complete, trees will be replanted in the immediate vicinity of the project at a 3:1 mitigation ratio, or a tree replacement ratio as determined by regulatory agencies and specified in environmental permits obtained through the Joint Aquatic Resources Permit Application (JARPA) if it results in a greater number of replacement trees. Removal of California bay trees will be done in a manner that avoids the spread of sudden oak death disease.
4. Invasive plants on the site shall be controlled and Best Management Practices (BMPs) shall be implemented to control the spread of sudden oak death disease.
5. As trees will be removed and other disturbances will occur during the breeding season (February 1 through August 31), a qualified biologist shall conduct a pre-disturbance survey for tree-nesting raptors and other migratory birds in all trees within the operation footprint and within 250 feet of the footprint no more than 10 days prior to the onset of ground disturbance. If nesting migratory birds are detected on the site during the survey, a suitable activity-free buffer should be established around all active nests. The precise dimension of the buffer (up to 250 ft.) would be determined at that time and may vary depending on location and species. Buffers should remain in place for the duration of the breeding season or until it has been confirmed by a qualified biologist that all chicks have

fledged and are independent of their parents. Pre-disturbance surveys during the non-breeding season are not necessary for migratory birds, as they are expected to abandon their roosts during construction activities.

Implementation of the above measures would mitigate impacts to migratory birds, including tree-nesting raptors, to a less-than-significant level.

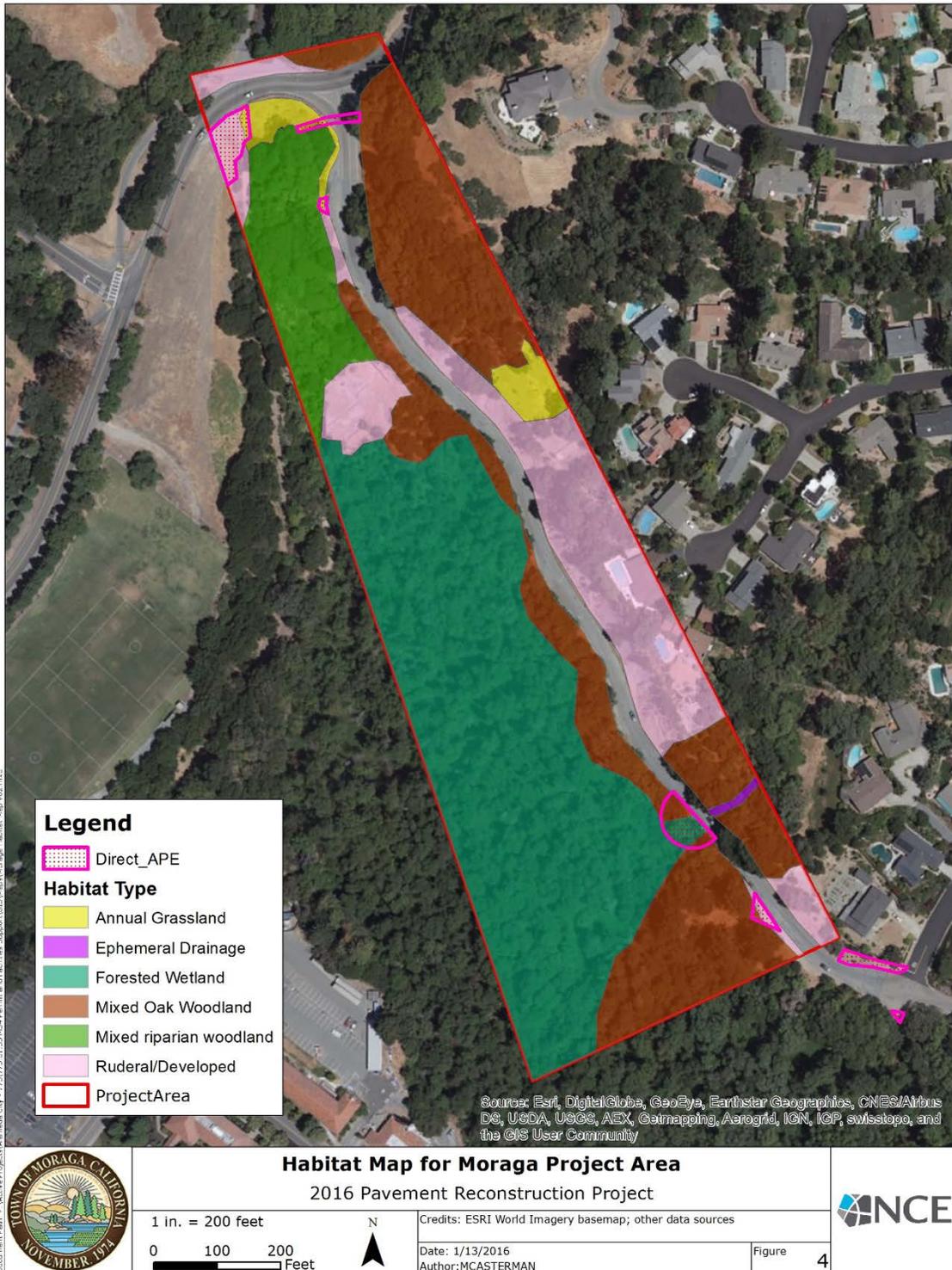
6. Prior to vegetation removal, pre-construction surveys should also be conducted for the presence of roosting bats, California red-legged frog, Alameda whipsnake, and any raptors to help avoid direct take of or impact to SSS. If any of these SSS are discovered within the project footprint during the pre-construction survey, avoidance of impacts to these protected species should be conducted in consultation with the CDFW or U.S. Fish and Wildlife Service (USFWS).
7. The reach of Las Trampas Creek and riparian corridor which are near the project site may provide non-breeding habitat for California red-legged frogs. All direct impacts to the riparian corridor and its buffer will be minimized by limiting vegetation removal within riparian areas, and protecting water quality. To the extent practicable, the clearing of riparian areas will be minimized and avoided during project construction.

Water quality of the adjacent riparian area and downstream waters will be protected by BMPs to prevent pollutants and sediment from mobilizing from the project area into the riparian corridor or surface waters. This includes the implementation of BMPs that will prevent spills or leaks from construction staging areas. Any additional measures required by the USFWS to protect CRLF will also be implemented.

8. Obscure bumble bees may use habitats in the vicinity. Ground disturbing activities during the time that the bees are hibernating may cause direct impacts to this species. Ground disturbing and construction activities should be limited to the time from May 1st to October 15th to minimize the potential to directly impact obscure bumble bees.
9. Training will be provided to construction crews on protected species, including California red-legged frogs, and Alameda whipsnake and will instruct crews on the necessary steps to take if these species are encountered.

These mitigation measures will allow avoidance of significant impacts to these species.

Figure 4: Habitat map for direct Areas of Potential Effect (APE), including construction equipment staging areas.



Item IV-c.

Discussion. The United States Army Corps of Engineers (USACE) regulates the filling or grading of all waters of the U.S. under the authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by the OHWM on opposing channel banks. All activities that involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the USACE.

Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the Regional Water Quality Control Board (RWQCB) issues a certification (Section 401) that the proposed activity will meet state water quality standards. The filling of isolated wetlands is regulated by the RWQCB. It is unlawful to fill isolated wetlands without filing a Notice of Intent with the RWQCB. The RWQCB is also responsible for enforcing National Pollution Discharge Elimination System (NPDES) permits, including the Construction General Permit.

The California Department of Fish and Wildlife (CDFW) has jurisdiction over the bed and bank of natural drainages according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that would disturb these drainages are regulated by the CDFW via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protect the habitat values of the drainage in question.

Less Than Significant Impact with Mitigation. Waters of the U.S. (WOUS) were mapped on the site by NCE. This delineation has not been verified by the USACE. There are 0.22 acres of forested wetland on the project site.

Approximately 175 square feet (less than 0.01 acres) of WOUS will be impacted by the project (**Figure 2**). The project entails the stabilization of the bank below the culvert outfall. Fill within WOUS will be minimized to the amount required to repair the culvert. Mitigation measures for wetlands will be consistent with mitigation required by the USACE, if any.

Mitigation Measure IV-c. Given a portion of the project will occur below the OHWM of a tributary to Las Trampas Creek, a CWA Section 401 certification, CWA 404 permit, and Fish and Game Code Section 1600 Streambed Alteration Agreement will be required. These permits will require mitigation measures for protecting water quality and minimizing impacts to wetlands and the riparian corridor. These mitigation measures are discussed in Hydrology and Water Quality (Section IX in this document). Pursuant to these regulatory requirements, the implementation of these mitigation measures will minimize impacts to WOUS below the level of significance.

Item IV-d.

Discussion. Substantially interfering with native wildlife movement or with their use of nursery sites could constitute a potentially significant impact. These impacts will be avoided both during and after construction with the mitigation measures found below.

Less Than Significant Impact with Mitigation. Special status bird species that may occur on or near the site will not be impeded in their movements by the proposed project. California red-legged frogs may use the downstream reach of Las Trampas Creek and its riparian corridor as non-breeding habitat. Substantial elevation change between the OHWM and the outfall, as well as lack of upstream habitat make this an unsuitable location for upstream fish migration and therefore impacts to fish movements are not anticipated as a result of this project. All direct impacts to the riparian corridor and its buffer will be minimized

per the mitigation measures detailed below. After construction is complete, there will be no impact to fish and wildlife movement.

Mitigation Measure IV-d. As a result of potential interference with the movement of fish and wildlife, the following mitigation measure is proposed to reduce the project to a Less Than Significant Impact. Construction will be completed while water is not flowing in the ephemeral drainage and fish and frogs are not expected to be present. Any impedance to the movement of wildlife during construction will be short term and in a very small area. After completing the project, fish and wildlife movements will be unimpeded.

Item IV-e.

Discussion. The project would repair existing infrastructure and does not change existing land use. Mitigation measures will ensure there are only limited and temporary impacts to natural resources and the project will be in compliance with the Moraga Municipal Code and the goals and policies of the Town of Moraga General Plan.

The project will require the removal of approximately two California bay trees (*Umbellularia californica*), two coast live oak trees (*Quercus agrifolia*), two bigleaf maple trees (*Acer macrophyllum*), and two red willows (*Salix laevigata*) along the slope adjacent to the outfall. In general, a 3:1 mitigation ratio is recommended for replacing native and riparian trees. A final replacement ratio, if it provides more replacement trees, will be determined by regulatory agencies and specified in environmental permits obtained through the Joint Aquatic Resources Permit Application (JARPA).

Less Than Significant Impact with Mitigation. As mentioned in *Item IV-a Discussion*, there is potential to affect unique plants and wildlife and native trees. However, with mitigation measures in place, the impacts will be less than significant.

Mitigation Measure IV-e. The final project design shall avoid and minimize direct impacts to native trees. Trees and shrubs will be protected prior to construction with construction fencing. Any loss of these resources will be permitted and compensated by replanting as set forth in Mitigation Measure IV-a, b(3) above.

To further protect rare plant populations in the project vicinity, BMPs will be employed during construction to minimize the introduction of invasive plant species. Implementation of *Mitigation Measures IV a-e* minimize the conflict with local ordinances and regulations protecting natural resources. Acquisition of environmental permits and implementation of all mitigation measures will minimize impacts below the level of significance. Additional details are found in the BRA (NCE 2015a) (**Appendix A**).

Item IV-f.

Discussion. There are no known Habitat Conservation Plans or Natural Community Conservation plans that apply to the area that includes the project location. No impacts are anticipated and no mitigation measures are proposed.

V. CULTURAL RESOURCES – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?			X	
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?		X		
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		
d. Disturb any human remains, including those interred outside of formal cemeteries?		X		

Discussion. A Cultural Resources Study for the project was conducted by NCE and is included in **Appendix B** of this document. The study includes an analysis of relevant laws that apply to cultural resources in the Area of Potential Effects (NCE, 2016).

National Historic Preservation Act:

The National Historic Preservation Act (NHPA) was enacted by Congress in 1966 to establish national policy for historic preservation in the United States. The NHPA establishes the role and responsibilities of the federal government in historic preservation. The NHPA directs agencies to identify and manage historic properties under their control; to undertake actions that will advance the Act’s provisions, and avoid actions contrary to its purposes; to consult with others while carrying out historic preservation activities; and to consider the effects of their actions on historic properties.

California Register of Historical Resources:

The California Register of Historical Resources (California Register) is a guide to cultural resources that must be considered when a government agency undertakes a discretionary action subject to CEQA. The California Register helps government agencies identify and evaluate California’s historical resources (California Office of Historic Preservation 2001b: 1), and indicates which properties are to be protected, to the extent prudent and feasible, from substantial adverse change (PRC §5024.1(a)). Any resource listed in, or eligible for listing in, the California Register is to be taken into consideration during the CEQA process.

Public Resources Code §5097.5:

California Public Resources Code §5097.5 prohibits excavation or removal of any “vertebrate paleontological site [...] or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having jurisdiction over such lands”. Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority or public corporation, or any agency thereof. Section 5097.5 states that any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

Item V-a

Less than Significant Impact. A records search was conducted at the Northwest Information Center (NWIC) and results indicate an absence of pre-historic or historic-period cultural resources within 500 feet of the project area. Native American consultation, initiated on November 30, 2015, also indicates a lack of cultural resources within the project area. The project area was visited by an archaeologist on December 17, 2015 and the Area of Direct Effect examined for the presence of cultural resources. As a result of the field examination, No historical resource as defined in Section 15064.5 were identified. For more detail, please refer to the attached *Cultural Resources Technical Memo, Moraga Culvert Replacement Project, and Contra Costa County, California* (**Appendix B**).

Items V-b and V-d.

Less than significant impact with mitigation. A records search was conducted at the Northwest Information Center (NWIC) and results indicate an absence of pre-historic or historic-period cultural resources within 500 feet of the project area. Native American consultation, initiated on November 30, 2015, also indicates a lack of cultural resources within the project area. The project area was visited by an archaeologist on December 17, 2015 and the Area of Direct Effect examined for the presence of cultural resources. As a result of the field examination, no cultural resources were identified. For more detail, please refer to the attached *Cultural Resources Technical Memo, Moraga Culvert Replacement Project, and Contra Costa County, California* (**Appendix B**).

While pre-historic or historic period cultural resources are not anticipated to be present in the project area based on the Cultural Resources Study and records search from NWIC, incidental discovery of cultural or paleontological resources which were not previously recorded or otherwise identified may occur during the project. Implementation of the following mitigation measures will minimize impacts below the level of significance.

Mitigation Measure V-b through V-d. Caltrans Standard Specifications Section 14-2 (Caltrans, 2015) for archaeological and paleontological resources shall be incorporated into the final specifications for the project and require the contractor implement the following protocols if an archaeological or paleontological resource is discovered during project construction:

1. Stop all work within a 60-foot radius of the discovery
2. Secure the area
3. Notify the Engineer
4. Do not remove archeological or paleontological resources or take them from the jobsite.
5. Do not resume work within the radius until authorized.

Town of Moraga Staff shall approve plans and specifications prior to construction.

Mitigation Measure V-d. As required by section 7050.5 of the California Health and Safety Code, that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner’s authority. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated cultural materials.

VI. GEOLOGY & SOILS – Would the project:

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

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

Items VI-a.i-iv.

Discussion. The slope adjacent to the outfall has significantly eroded. There is an approximately 10-foot vertical drop from the outfall to the bottom of the slope. Undercutting has occurred along the slope and a gully has formed. This project will stabilize this area to prevent further erosion and undercutting into the road. The project would repair existing pipes and areas near the outfall, thereby securing these areas so they are less susceptible to damage from seismic activity. The structures associated with the slope stabilization are designed in accordance with California Building Code (CBC) seismic standards. There is no proposed change to seismic conditions in the project area. There are no known hazards for fault rupture or seismicity at the site.

No Impact. There will be no impact to the Earthquake Fault Zone as referenced in Division of Mines and Geology Special Publication 42. Table 4 of Special Publication 42 identifies cities and counties affected per the Alquist-Priolo Earthquake Fault Zoning map and the Town of Moraga is not listed in this table. The current regulatory maps available on California Geologic Society’s website identify potentially active faults and did not identify an earthquake fault within the project area. Orinda formation bedrock is mapped at the site and bedrock outcrops have been observed above and below the road and no impacts related to liquefactions or landslides are anticipated.

Items VI-b.

Discussion. During the construction phase of the project, portions of the site will have exposed soil areas that during rain or high wind events could cause minor erosion. With the implementation of the proposed mitigation measures, the proposed project will have a less than significant impact on geology and soils.

Less Than Significant Impact with Mitigation. During construction of the slope stabilization and culvert replacement there will be significant disruptions of the soil on site. As a result, there will be a temporary change in topography. Erosion and water quality impacts related to the project will be addressed by a SWPPP. Construction activity which disturbs an acre or more of land area is subject to the NPDES Construction General Permit (CGP) (2012-0006-DWQ). This project will be required to obtain coverage under the CGP. To obtain coverage, the Contractor will prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) to the State Water Resources Control Board (SWRCB) prior to the start of construction. The SWPPP will be in accordance with requirements specified in the CGP and will be in effect until a notice of termination (NOT) is filed for the project. Implementation of the SWPPP will minimize impacts below the level of significance.

Mitigation Measure VI -b.

As part of the SWPPP, the contractor will be required to implement BMPs for erosion and sediment control, non-stormwater controls, and good housekeeping. The type, quantity, and location of BMPs will be specified in the SWPPP but examples are provided below. Erosion and sediment control BMPs may include silt fencing, construction limit fencing, and stabilized construction access areas. Linear sediment controls such as fiber rolls must be installed along the toe of the slope, face of the slope, and at exposed grade breaks to comply with sheet flow lengths specified in Table 1, Attachment D of the CGP (Order No. 2012-006-DWQ).

Non-stormwater and good housekeeping BMPs will require stockpiles to be covered when not actively in use, equipment inspection to prevent leaks, and gravel or other suitable material placed to stabilize construction access areas.

The SWPPP will require dust mitigation measures and dust control BMPs which may include stabilization of unpaved areas subject to vehicular traffic, stabilization of storage piles and disturbed areas, dust suppression through watering of areas to be disturbed, cleaning of all construction vehicles leaving the site, mulching of bare soil areas, and suspension of grading and earth moving activities when wind speeds are high enough to result in dust emissions crossing the project boundary. These dust control measures help prevent transport of such materials off site, into any surface water, or into any drainage course.

The SWPPP will include a Dewatering Contingency Plan to outline steps required if groundwater is intercepted. Although groundwater is not expected to be encountered during construction, if groundwater is encountered and the excavated area requires dewatering to complete the work, the Dewatering Plan shall be implemented.

In addition to the above measures, rain event action plans (REAP) will be prepared prior to any qualifying rain event to specify measures required to secure the site and control sediment from mobilizing and erosion occurring within or near the project area. The measures can include covering active stockpile areas, installing temporary erosion control blankets over active working areas, and conducting inspections to correct BMPs as needed.

The CGP specifies stabilization criteria which must be met in order to file a NOT. These stabilization criteria are identified in the CGP, Order No. 2012-0006-DWQ, Section II.D.3. The SWPPP will specify stabilization measures for areas disturbed as a result of the project.

Implementation of the SWPPP and meeting CGP requirements provides mitigation for potential erosion during and as a result of the project which reduces the project impact to less than significant.

Items VI -c, d, e.

Discussion. The project area for the proposed culvert repair is not located on unstable soil nor is it anticipated to become unstable as a result of the project, nor is on expansive soil, and no septic tanks or waste water disposal systems are proposed as a part of this project. Mitigation measures are not necessary.

VII. GREENHOUSE GAS EMISSIONS – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				X

Item VII-a.

Discussion. Projects that contribute to the increase of GHG emissions are associated with global climate change. Estimated GHG emissions attributed to projects are primarily associated with increases of carbon dioxide (CO₂) from mobile sources during construction activities.

The Bay Area Air Quality Management District (BAAQMD) offers guidance for addressing the GHG emissions associated with individual development projects and standards for GHG emissions are documented in the *Adopted Air Quality CEQA Thresholds of Significance*. However, BAAQMD does not have an adopted Threshold of Significance for construction-related GHG emissions. The District has also prepared an emission inventory of pollutants contributing to climate change, or greenhouse gases (GHG). The Greenhouse Gas Source Inventory estimates direct and indirect emissions from sources within the District’s jurisdiction for the following gases: carbon dioxide, methane, nitrous oxides, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Due to the nature of the proposed project, significant impacts associated with generation of greenhouse gas (GHG) emissions are not anticipated with the proposed mitigation measures.

Less Than Significant Impact with Mitigation. Greenhouse Gas emissions will temporarily increase during construction practices and the use of heavy machinery. The BAAQMD regulates construction practices involving air quality measures, but does not have a standard for construction related greenhouse emissions. Regardless, the project proponent proposes mitigation measures to reduce emission levels during construction.

Mitigation Measure VII-a. Use of heavy machinery will be minimized to the fullest extent possible during the construction process. Vehicles will be turned off when not in use rather than remaining in an idling state. Heavy haul trips will be augmented to reduce emissions and increase fuel efficiency.

Item VII-b.

Discussion. In June 2005, former Governor Schwarzenegger established California’s GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals for the State of California: GHG emissions should be reduced to 2000 levels by

2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2050. The Air Resources Board is responsible for the implementation of AB 32 Scoping Plan, which identifies action items that work to reach the GHG emissions reductions goals.

No Impact. The proposed culvert repair is not a land use based project and would not conflict with the State goal of reducing GHG emissions and would not conflict with the AB 32 Scoping Plan or the action measures. Construction of the culvert repair would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing greenhouse gas emissions.

VIII. HAZARDS & HAZARDOUS MATERIALS – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?)				X
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing in the project area?				X

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
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?				X

Items VIII-a, b.

Discussion. The Environmental Protection Agency (EPA, Federal and State) determines whether a chemical, either in its liquid, gas, or solid form could be a hazardous material. This determination is based on its potential to pose a hazard to human health, safety, or the environment. A material may also be considered hazardous if it is listed on any Federal, State, or Local Hazardous Materials List; and may be considered hazardous based on its concentration or quantity. Transport of hazardous materials is regulated by the EPA and by the Department of Transportation (DOT) under Title 49.

Less Than Significant Impact. The culvert repair project will not utilize hazardous materials on site. The construction vehicles which are operated on diesel fuel will be maintained regularly to ensure that diesel fuel does not leak onto the project site or into Las Trampas Creek. Bollinger Way will remain intact and operational until the culvert is installed. There are no risks of health hazards to the surrounding community or the environment, therefore no mitigation is proposed.

Item VIII-c.

Discussion. The proposed project is located within one quarter mile of a residential community. Hazardous materials will not be utilized on site and the project area will be barricaded to prevent access to pedestrians and children. Therefore, there is no impact or mitigation proposed.

Item VIII-d.

Discussion. The proposed project is not located on a site included on a list of hazardous material sites per Government Code Section 65962.5. No impact is proposed and no mitigation measures are proposed.

Items VIII-e, f.

Discussion. The proposed project is not located within an airport land use plan or within two miles of a public or private airstrip. Thus, no impacts result from the proposed culvert repair and no mitigation measures are necessary.

Item VIII-g.

Discussion. The proposed project will not impair implementation of an emergency response or evacuation plan as it is a culvert repair project. During construction, one lane of Bollinger Way will be temporarily closed to traffic and emergency access will be allowed through one

lane of Bollinger Way. This road will remain open during construction for local residents and emergency vehicles. Once construction of the culvert replacement is complete, the proposed project will not result in inadequate emergency access or access to nearby uses. Because there is no impact, mitigation measures are not required.

Item VIII-h.

Discussion. The culvert repair project is located in a predominately urban area with minimal risk to wildfires. The project will not increase wildfire risk and therefore has no impact or required mitigation measures.

IX. HYDROLOGY AND WATER QUALITY – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Violate any water quality standards?		X		
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 local groundwater supplies (i.e. 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)?				X
c.) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X
d.) 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 flooding on- or off-site?				X
e.) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional				X

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
sources of polluted runoff?				
f.) Otherwise substantially degrade water quality?				X
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 or other flood hazard delineation map?				X
h.) Place within a 100-year flood hazard area improvements which would impede or redirect flood flows?				X
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?				X
j.) Inundation by seiche, tsunami, or mudflow?				X

Item IX-a.

Discussion. During construction there may be an increased potential for runoff into the Creek due to temporary exposure to unstable soils, which could violate USACE and RWQCB standards. These temporary impacts will be mitigated through the implementation of REAPS and sediment and erosion control BMPs detailed in the SWPPP.

Less Than Significant Impact with Mitigation. During grading and construction of the culvert repair project, the potential exists for runoff to enter Las Trampas Creek. There is also a potential risk for water quality contamination during construction due to the close proximity of the construction equipment to the wetland and channel and the potential for leaks of oil or diesel fuel. To ensure there is no contamination of the wetland and creek, the Contractor will be required to monitor construction equipment daily and to maintain the equipment as necessary to prevent and minimize leaks or spills as identified by Mitigation measure IX-a. Implementation of the SWPPP and meeting CGP requirements provides mitigation for potential erosion during and as a result of the project which reduces the project impact to less than significant.

Mitigation Measure IX-a. According to standards set forth by USACE and RWQCB, temporary BMP's including catch basins and erosion control fencing will be installed to ensure that the potential for construction site runoff is minimized to a less than significant impact. All fill proposed for the culvert repair project will comply with standards set forth by the USACE and is proposed for structural stability purposes only.

The project will be in compliance with all USACE and RWQCB regulations and therefore has a less than significant impact on water quality during and after construction with the proposed mitigation measures.

As discussed in Section VI of this document, the Town of Moraga's contractor will be required to comply with the CGP and to implement a SWPPP in order to prevent and control erosion and mobilization of sediment in stormwater runoff from the construction site to nearby receiving waters.

In addition to the measures described in Section VI of this document, the SWPPP will also include a plan for dealing with accidental spills and must include the requirement for spill prevention kits to be available on site to contain any accidental spills. A spill contingency plan will minimize the potential for and effects from spills of hazardous, toxic or petroleum substances from construction materials and equipment on-site during construction.

Item IX-b.

Discussion. The proposed project will have no impact on groundwater supplies and will not interfere with groundwater recharge rates as the nature of the project is to stabilize erosion around the outfall of a culvert, and to in-kind replace a section of a culvert. Because there will be no impact to groundwater, no mitigation measures are proposed.

Items IX-c,d,e,f.

Discussion. Construction will occur during summer months when no water is flowing through the culvert, and no surface water will flow from the site to Las Trampas Creek. The culvert conveys overland flow and ephemeral drainage areas. The project will stabilize the slope area at the outfall pipe will be replaced in-kind. This project will not increase hydraulic capacity through the culvert. Construction and post-construction BMPs will comply with USACE, RWQCB, and DFG regulations. There will be no permanent or long term change to the drainage pattern of Las Trampas Creek as a result of the culvert repair and stabilization and therefore poses no significant impact. No mitigation measures are proposed.

Item IX-g.

Discussion. No housing is proposed as a part of this project. Also, the proposed culvert stabilization does not change the location of the 100-year floodplain boundary. Therefore, there is no impact to the Flood Hazard Boundary of Flood Insurance Rate Maps. No mitigation is proposed.

Item IX-h.

Discussion. The capacity of the culvert will equal the capacity of the original culvert. Because there are no impacts to flood flows, no mitigation measures are proposed.

Item IX-i.

Discussion. These improvements will not affect any levees or dams. No mitigation measures are proposed.

Item IX-j.

Discussion. Due to the location of the proposed Project, there will be no additional risk of inundation by seiche, tsunami, or mudflow as a part of this project. No mitigation measures are proposed.

X. LAND USE & PLANNING – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Physically divide an established community?				X
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?				X
c.) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Item X-a.

Discussion. The physical division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a mean of access (such as a local road or bridge) that would impair mobility within an existing community, or between a community and outlying areas.

No Impact. This project will not physically divide the already established community.

Item X-b.

Discussion. The Town of Moraga General Plan land use designation for the project site is Residential and Public Facilities. Surrounding land uses include residential, open space, and recreation lands.

No Impact. The proposed Bollinger Way culvert repair will not alter the land use of the area. The culvert repair is a public project that serves the community as a whole. The implementation of the proposed project would not result in conflict with any applicable land use or conservation plans.

Item X-c.

Discussion. No habitat conservation plan (HCP) or national community conservation plans (NCCP) are in operation in the project area.

No Impact. Since no HCPs or NCCPs are currently operating in the project area, the proposed Project site is not subject to and would not conflict with an adopted HCPs or NCCP.

XI. MINERAL RESOURCES – Would the project result in:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) The loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b.) The loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				X

Items XI-a, b.

Discussion. No known mineral resources or recovery sites are located in or near the project area. Therefore, the proposed project will have no impact on mineral resources.

No Impact. There would be no impact as the project site is not located in a mineral resource recovery site.

XII. NOISE – Would the project result in:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?			X	
b.) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			X	
c.) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d.) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
e.) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
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?				X

Item XII-a.

Discussion. Construction related activities will generate a short term increase of existing ambient noise levels. Sensitive noise receptors in the area include individuals who live in the surrounding residential neighborhoods. According to Chapter 7.12 of the Town of Moraga Municipal Code, construction equipment noise is not allowed within 500 feet of a residential zone between the hours of 5 pm and 8 am the next day. This noise generation would be required to comply with the City’s noise ordinance limiting construction between the hours of 8 am and 5 pm.

Less Than Significant Impact The project may result in a temporary or periodic exposure to or generation of noise levels in excess of standards established in the local General Plan, Community Plan, or Noise Ordinance, but it will be temporary and is allowable under local ordinances. Therefore, the project will have a less than significant impact on noise.

Item XII-b.

Discussion. Vibration is described in terms of frequency and amplitude. Unlike sound, there is no standard way of measuring and reporting amplitude. Construction activities will result in temporary and intermittent vibration impacts to the surrounding area. Construction vibration is generally associated with pile driving and rock blasting. Occasionally, large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity. The project will generate ground borne vibration from pile drivers, soil compaction, jack hammers, and demolition-related activities.

Less Than Significant Impact. Construction activities will result in intermittent exposure of ground borne vibration to the surrounding areas. However, this impact would be temporary and would not occur within 500 feet of a residential zone between the hours of 5 pm and 8

am the next day under the Town Noise Control Ordinance. Therefore, impacts in this regard are considered less than significant and no mitigation measures are proposed.

Item XII-c.

Discussion. There will not be a permanent increase in noise levels. No mitigation measures are required.

Item XII-d.

Discussion. Refer to *Item XII-c Discussion*.

Less Than Significant Impact As stated above in XII-a, The project may result in a temporary or periodic exposure to or generation of noise levels in excess of standards established in the local General Plan, Community Plan, or Noise Ordinance, but it will be temporary and is allowable under local ordinances. Therefore, the project will have a less than significant impact on noise

Item XII-e, f.

Discussion. The project area is not located in an airport land use plan or within the vicinity of a private airstrip. Therefore, there is no impact and no mitigation proposed.

XIII. POPULATION & HOUSING – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Induce substantial population growth in an area, either directly (i.e. by proposing new homes and businesses) or indirectly (i.e. through extension of roads or other infrastructure)?				X
b.) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c.) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Items XIII-a, b, c.

Discussion. The proposed project includes no residential component and therefore no impact on housing and population would occur.

No Impact. There will be no change to the availability of housing or population growth, as a result of this project to replace an existing culvert. No mitigation measures are required.

XIV. PUBLIC SERVICES – Would the project result in:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Substantial adverse physical impacts associated with the provision of new or physically altered governmental services and/or 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?				X
Fire Protection?				X
Police Protection?				X
Schools?				X
Parks?				X
Other Public Facilities?				X

Item XIV- a.

Discussion. The proposed culvert replacement will repair the culverts. There are no changes proposed that will require additional maintenance or public services. No additional public services will be required as a result of the culvert replacement. No mitigation measures are required.

XV. RECREATION – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b.) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

Items XV-a,b.

Discussion. The proposed culvert replacement will have no impact on existing recreation facilities or use of those facilities. No mitigation measures are required.

XVI. TRANSPORTATION & TRAFFIC – Would the project result in:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transits and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b.) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			X	
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?				X
d.) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e.) Result in inadequate emergency access?			X	
f.) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X

Items XVI-a, b.

Discussion. The Town of Moraga has regulatory authority of roads and traffic in the project vicinity. During construction, one lane of Bollinger Canyon Road will be temporarily closed to traffic. This will be a temporary inconvenience to local residents.

Less Than Significant Impact. The proposed project will not change any traffic element nor increase vehicle trips except during construction as a result of construction vehicles mobilizing to and from the project site. Once construction is complete, the proposed project will not result in a permanent increase in traffic which may be substantial in relation to the existing and/or planned future year traffic load and capacity of the roadway system; therefore, the project will have a less than significant impact on transportation and traffic.

Item XVI-c.

Discussion. The culvert repair project will not result in a change in air traffic patterns. No impacts or mitigation measures are proposed.

Item XVI-d.

Discussion. The culvert repair project will not result in any new dangerous design features and therefore no mitigation measures necessary.

Item XVI-e.

Discussion. Please refer to *Item XVI-a Discussion*.

Less Than Significant Impact. During construction, emergency access will be allowed through one lane of Bollinger Way. This road will remain open during construction for local residents and emergency vehicles. Once construction of the culvert replacement is complete, the proposed project will not result in inadequate emergency access or access to nearby uses; therefore, the project will have a less than significant impact on transportation and traffic.

Item XVI-f.

Discussion. Please refer to *XVI-a Discussion* above.

Less Than Significant Impact. The proposed project may cause a short term impact to vehicular traffic during construction and lane closure. Traffic control plans will be implemented by the contractor. Signs, cones, and minimum taper lengths will be established which will alert users of the road work ahead and will guide traffic through the construction area. This section of Bollinger Canyon Road is not within a designated bike route and there are not pedestrian facilities. Once construction is complete, the proposed project will not result in permanent hazards or barriers for vehicular traffic, pedestrians or bicyclists; therefore, the project will have a less than significant impact on transportation and traffic.

XVII. UTILITIES & SERVICE SYSTEMS – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b.) Require or result in the construction of new water or wastewater delivery, collection or treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?				X
d.) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e.) Result in a determination by wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f.) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g.) Comply with federal, state, and local statues and regulations related to solid waste?				X

Items XVII-a, b, c.

Discussion. This project does not affect wastewater treatment facility effluent. The proposed culvert replacement project will require no new stormwater facilities or wastewater treatment facilities. Construction will not generate substantial solid waste that would require sewer service or landfill accommodations. The proposed design will utilize BMPs for stormwater treatment and to prevent erosion into Las Trampas Creek. No changes are proposed for the existing utilities. As a result of the SWPPP and the fact that no new facilities are proposed, there is no impact to stormwater facilities and no mitigation measures proposed.

Item XVII-d.

Discussion. The culvert replacement project does not require additional water supplies or entitlements. No impact to water supply is proposed and no mitigation measures are required.

Item XVII-e.

Discussion. The culvert replacement project does not require additional wastewater treatment facilities as it is an in-situ replacement of an existing culvert. No mitigation measures are proposed.

Item XVII-f.

Discussion. The culvert replacement project will not produce excess waste and will not require additional landfill facilities. No mitigation measures are proposed.

Item XVII-g.

Discussion. The culvert replacement project will be compliant with all applicable federal, state, and regional solid waste regulations. No mitigation measures are proposed.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?		X		
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, or the effects of probable future projects.)			X	
c.) Does the project have environmental effects, which will cause substantial				X

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
adverse effects on human beings, either directly or indirectly?				

Item XVIII-a.

Discussion. As revealed by the previous discussions for each environmental category, the proposed project could degrade the quality of the environment; however, implementation of Mitigation Measures III-b,d, IV-a-e, VI-b, VII-a, IX-a, and XII-a,d would ensure that potential impacts related to air quality, biological resources, geology and soils, greenhouse gas emissions, hydrology and water quality, and noise, respectively, would be reduced to less-than-significant levels. No long-term significant impacts are associated with the project.

Item XVIII-b.

Discussion. The impacts of the proposed culvert replacement project would generally be individually limited and not cumulatively considerable. Most impacts would result from construction-period activities, and would be temporary. All environmental impacts as a result of implementation of the project would be reduced to less-than-significant levels through implementation of the mitigation measures recommended in this document.

Item XVIII-c.

Discussion. Based on the analysis of all the above questions, it has been determined that the project would not result in environmental effects that would cause substantial direct or indirect adverse effects on human beings.

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Appendix A

BIOLOGICAL RESOURCES ASSESSMENT

Preliminary Biological Resource Assessment

Moraga Culvert Replacement Bollinger Way



Moraga, Contra Costa County,
California

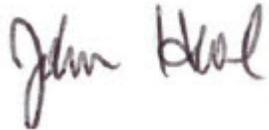
Prepared For:
Town of Moraga

Prepared By:
NCE

Date:
November 20, 2015

NCE Project Number:
576.11.55

John Heal
Senior Scientist

A handwritten signature in black ink that reads "John Heal".

Mack Casterman
Staff Scientist

A handwritten signature in black ink that reads "Mack Casterman".

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1.0 INTRODUCTION

This Preliminary Biological Resource Assessment was prepared for the site of the Bollinger Way Culvert Repair (Project). This report describes the biological resources found in the area and the potential for impacts to those biological resources that must be considered under the California Environmental Quality Act (CEQA). The report concludes with an analysis of those potential impacts and how they may be reduced to less than significant with appropriate mitigation measures.

The objectives of this report are to:

- Summarize all site-specific information related to existing biological resources;
- Draw reasonable conclusions about the biological resources that could occur onsite based on habitat suitability, historical occurrences, and the proximity of the site to a species' known range;
- Identify and discuss the potential impacts to biological resources from the Project likely to occur on and near the site within the context of CEQA; and
- Identify avoidance and mitigation measures that would reduce potential impacts and that are generally consistent with recommendations of the resource agencies for affected biological resources.

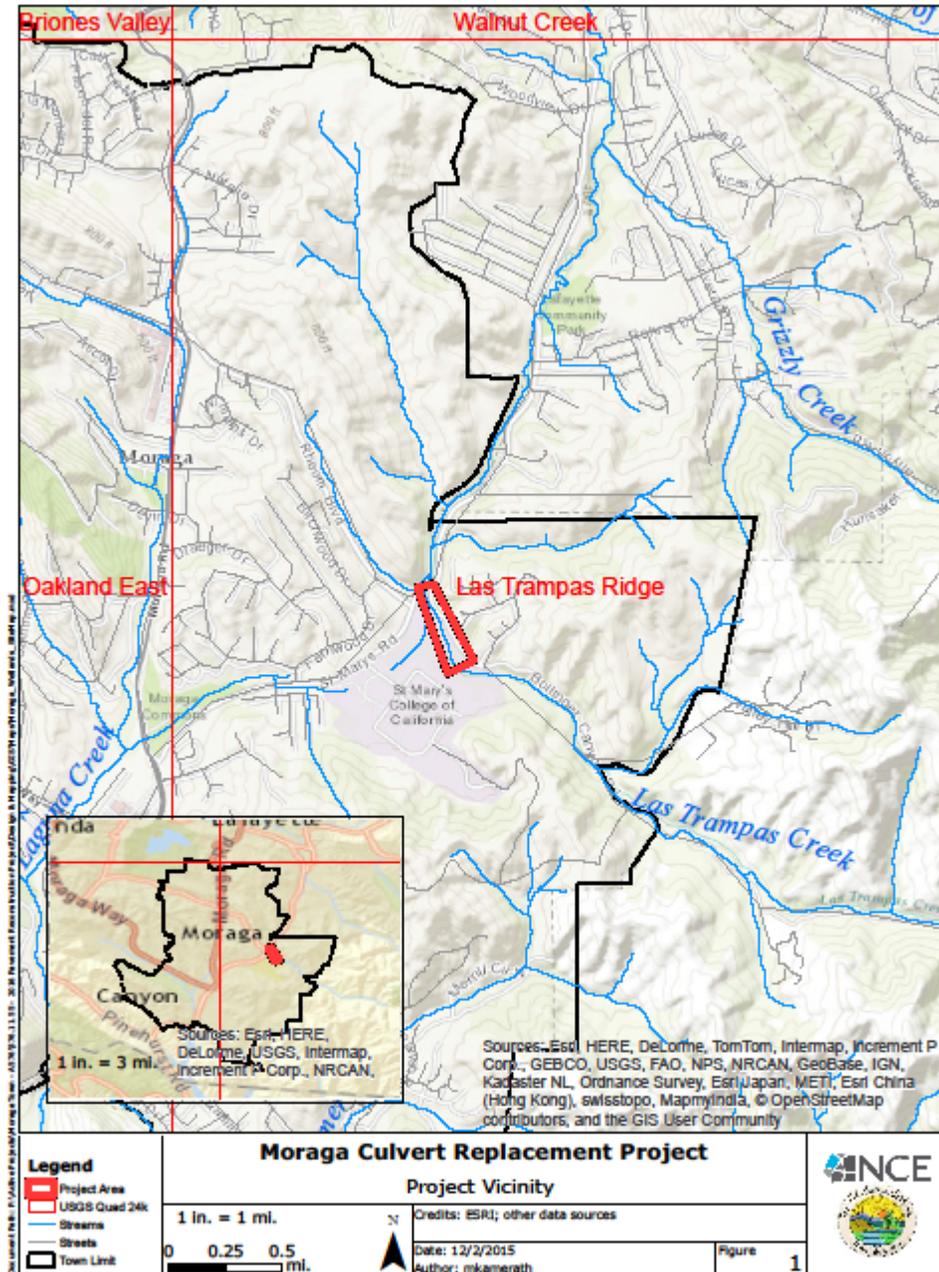
1.1 PROJECT SITE

The project area is located in Section 17, Township 1 South, Range 2 West of the Mt. Diablo Meridian in Contra Costa County, California. The project area covers less than 1 acre and is the location of two culverts under Bollinger Canyon Road (**Figure 1**). The project area is located in the Town of Moraga (**Figure 1**).

Land use in the project area is comprised mainly areas of open space within and residential development around the project area (**Figure 1**). Land use includes both developed and undeveloped residential areas, paved roads, and ditches.

Federally listed central coast steelhead trout (*Oncorhynchus mykiss*) occur downstream in Walnut Creek but are unlikely to occur in this reach of Las Trampas Creek because of a lack of fish passage and the seasonal nature of the creek. Federally listed California Red-legged frog (*Rana draytonii*) may occur in the area.

Figure 1. Project Site and Vicinity



1.2 PROJECT DESCRIPTION

The Town of Moraga proposes to repair and reconstruct two culverts within the town, and construction is anticipated to occur during dry weather in 2016. These culverts are located along Bollinger Canyon Road, between Joseph Drive and St. Mary's Road. Steep bluffs abut Bollinger Canyon Road on the northeast side. The southeast side of the road has a narrow shoulder, then a steep slope that drops into a small canyon and Las Trampas Creek.

The two culverts collect overland flow from upland areas and the road surface, and eventually discharge into Las Trampas Creek. A section of one of the storm drain pipes is anticipated to be replaced in-kind, and the outfall and slope of the other storm drain pipe will be stabilized to prevent further erosion.

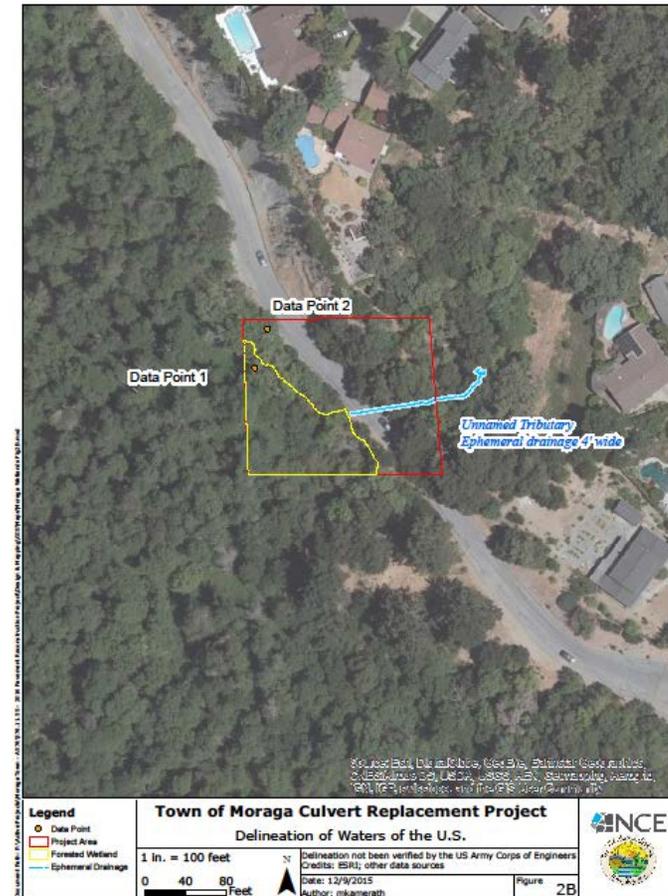
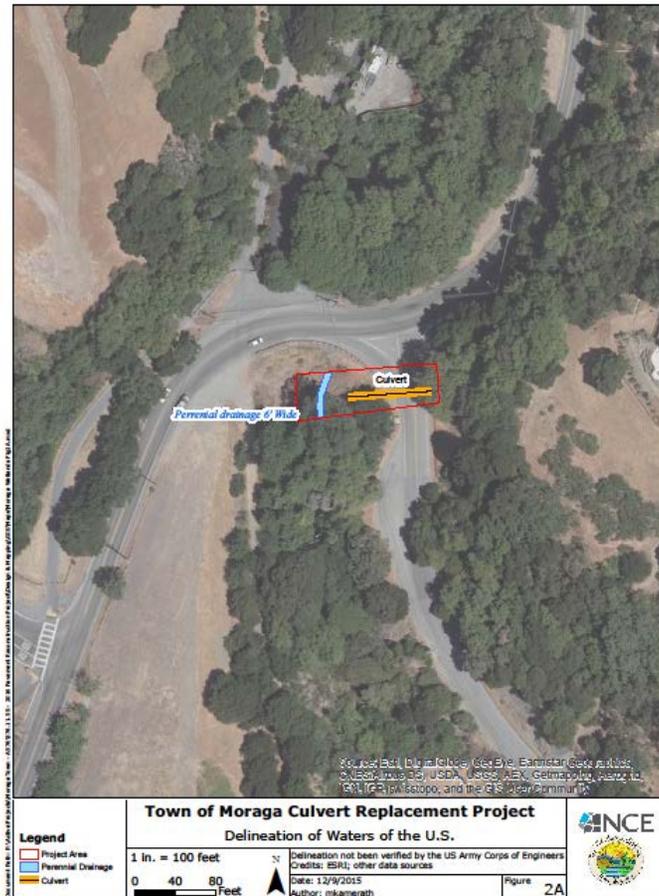
Pipe 1 originates at the southeast corner of the intersection of St. Mary's Road and Bollinger Canyon Road. The pipe collects overland flow routed to the pipe from a vegetated roadside shoulder along the northeast side of Bollinger Canyon Road and overland flows from St. Mary's Road.

Pipe 2 is on the southwest side of Bollinger Canyon Road just north of the intersection with Joseph Drive. Pipe 2 also conveys flows from an unnamed seasonal tributary and discharges to a seasonal wetland. There is significant erosion occurring at the pipe outfall which requires slope stabilization. There is an approximately 10-foot vertical drop from the outfall to the bottom of the slope. Significant erosion of the slope has occurred at the storm drain outlet and downstream of the discharge point. Undercutting has occurred near the storm drain pipe and a gully has formed. Continued erosion threatens the stability of the roadway.

The upstream section of Pipe 1 is 30-inch Corrugated Metal Pipe (CMP) proposed to be removed and replaced in kind. At the outfall, the pipe is a 30-inch High Density Polyethylene (HDPE) pipe in good condition and would remain in place. Below the outfall, flows currently discharge to a riprap apron with an approximately 25-foot flow path down to the creek. No dredge or fill would be required within the stream corridor, and the HDPE section of the pipe would remain in place. Depending on results from the cleaning of debris and completed CCTV video to be conducted by the Town's 2015 pavement reconstruction contractor, the CMP portion of the pipe is anticipated to be replaced and any erosion control features established would be placed outside of the stream channel.

The stabilization solution for Pipe 2 requires fill of approximately 20 cubic yards to stabilize the slope and culvert outfall. The project will also require the removal of approximately three California bay trees (*Umbellularia californica*) along the slope adjacent to Pipe 2. All work is anticipated to occur when surface water is not present.

Figures 2A and 2B. Waters of the U.S.



2.0 METHODS

The purpose of this Preliminary Biological Resource Assessment is to describe the biological resources found in the area and the potential for impacts to those biological resources that must be considered under CEQA. Research was conducted on biological resources known to occur in the area and a site visit included both a reconnaissance level survey and a survey and mapping of the ephemeral drainage and waters of the U.S. (WOUS) found on the site. The delineation of WOUS report is found under separate cover (NCE, 2015).

Site specific references and background information reviewed include:

- *California Natural Diversity Database (CNDDDB)*. 2015. California Department of Fish and Game, Sacramento, CA. Accessed online.
- California Native Plant Society. 2015. *Inventory of Rare and Endangered Vascular Plants of California*. Accessed online.
- Natural Resource Conservation Service. United States Department of Agriculture. *Web Soil Survey*. Accessed online.
- U.S. Army Corps of Engineers. 1987. *Corps of Engineers Wetlands Delineation Manual*. Department of the Army.
- U.S. Army Corps of Engineers. 2008. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. Engineer Research and Development Center.
- EPA and U.S. Army Corps of Engineers. 2007. "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*". Environmental Protection Agency and U.S. Army Corps of Engineers. Washington, D.C.
- Town of Moraga General Plan
- U.S.G.S. *Las Trampas Ridge, California, 7.5 minute quadrangle*.
- U.S. Fish and Wildlife Service. 2015. *Federally Endangered and Threatened Species that Occur in or may be Affected by Projects in the Las Trampas Ridge U.S.G.S. 7 ½ Minute Quad*. Accessed online.

The site was visited on October 27th, 2015 by John Heal and Mack Casterman of NCE. A reconnaissance level survey was conducted, plant communities and habitats were observed and recorded, and the edges of the Ordinary High Water Mark (OHWM) and riparian area were delineated and subsequently mapped. Transects were traversed on foot and the site was photographed. Focused surveys for special status species of flora and fauna were not conducted.

3.0 RESULTS

3.1 SOILS AND TOPOGRAPHY

3.1.1 Soils

According to the Natural Resources Conservation Service, soils found in the immediate vicinity of the project site are **Conejo clay loam**, 0% to 2% slopes, **cut and fill-Los Osos complex**, 9% to 30% slopes, and **Los Osos clay loam**, 15% to 30% slopes (NRCS 2011). A summary of this soil unit is found in **Table 1** below. The three soil types are characterized as being well-drained; however, the cut and fill land-Los Osos complex and the Los Osos clay loam are described as having a very low to moderately high saturated hydraulic conductivity (Ksat, 0.00 to 0.20 in/hr).

Table 1. Soils Occurring on the Via Verdi Restoration Project

Soil Series/Soil	Map Symbol	Parent Material	Drainage Class	% of Project Boundary
Conejo clay loam, 0% to 2% slopes	CeA	Alluvium derived from sedimentary rock	well drained	41.1%
Cut and fill land-Los Osos complex, 9% to 30% slopes	CnE	Residuum weathered from sandstone and shale	well drained	17.0%
Los Osos clay loam, 15% to 30% slopes	LhE	Residuum weathered from sandstone and shale	well drained	41.9%

Source: NRCS 2011

3.1.2 Topography

Topography in the vicinity of the site ranges from rolling to steep. Elevations of the project site range from approximately 80 feet to 200 feet (25 meters to 60 meters) above mean sea level.

3.1.3 Climate

The climate in Contra Costa County (CCC) varies depending on the location and topography. Western CCC experiences cool summers and mild winters due to its proximity to San Francisco and San Pablo Bays. On the other hand, eastern CCC, which includes portions of the San Joaquin Valley, has hot and dry summers with cool winters. Elevation and proximity to the sea have a direct effect on the average annual precipitation across the County. Antioch, which is located near sea level, receives 13.34 inches, while the north gate at Mt. Diablo (elevation 344 feet) receives 22.77 inches and Richmond in western CCC receives 22.28 inches. While most precipitation falls in the form of rain across the County, higher elevation areas including Mt. Diablo and its surrounding foothills will receive snow during the winter months (NRCS 1977).

3.2 HABITATS

3.2.1 Project Region

The lands surrounding the site are influenced by climate, topography, soils, and aspect. Habitats in this area include mixed riparian woodland, mixed hardwood forest, coastal prairie, northern coastal scrub, chaparral, agricultural lands, urban lands, and annual grassland. Other habitats in the region include wetlands, ponds, riparian scrub, and streams.

3.2.2 Project Site and Vicinity

Five general habitat types were identified on the project site (**Figure 3**). These are California annual grassland, perennial drainages, forested wetlands, broadleaf deciduous riparian woodland, and mixed broadleaf woodland.

Plant species found in California annual grassland include wild oat (*Avena fatua*), Canada thistle (*Cirsium arvense*), black mustard (*Brassica nigra*), English plantain (*Plantago lanceolata*), vetch (*Vicia* sp.), ripgut brome (*Bromus diandrus*) and coyote brush (*Baccharis pilularis*). Perennial drainages were unvegetated.

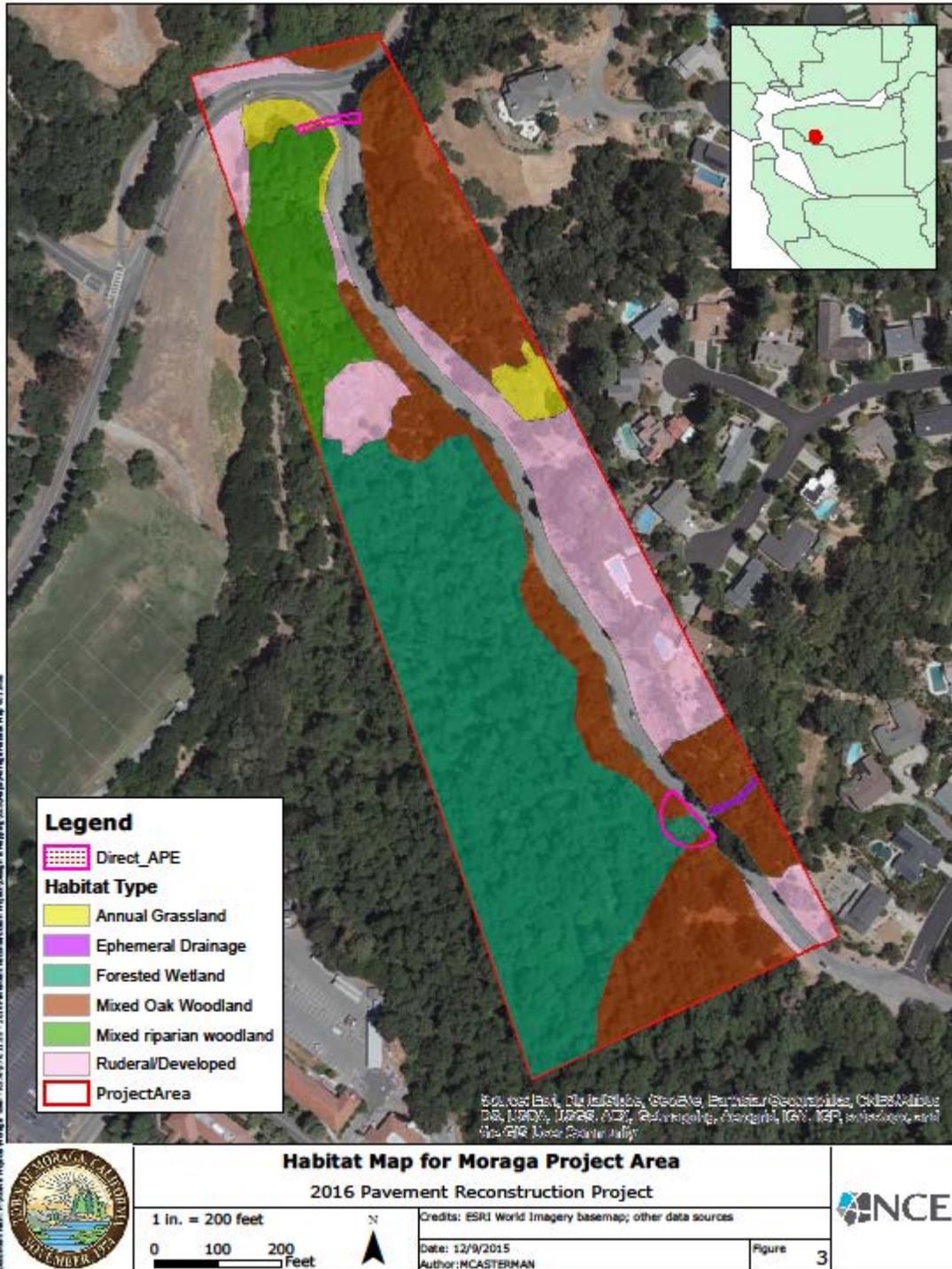
Plant species found in forested wetlands were red willow (*Salix laevigata*), white alder (*Alnus rhombifolia*), big-leaf maple (*Acer macrophylla*), and giant horsetail (*Equisetum telematia*).

Plant species found in broadleaf deciduous riparian woodland includes California bay (*Umbellularia californica*), white oak (*Quercus alba*), poison oak (*Toxicodendron diversilobum*), big-leaf maple, yellow willow (*Salix lutea*), northern California walnut (*Juglans hindsii*), and white alder. Plant species found in mixed broadleaf woodland includes Monterey pine (*Pinus radiata*), interior live oak (*Quercus wislizeni*), California bay and wild oats.

The habitats within and surrounding the project site support a varied assemblage of wildlife, which may move up and down the riparian corridor along Las Trampas Creek from time to time. Overhanging riparian vegetation protects pools up to 3 feet deep in the mainstem area near Pipe #1. Stream conditions downstream include well- developed riparian cover and a shallow, gravelly stream bed. These areas may provide habitat for California red-legged frog (*Rana draytonii*), a federally threatened species and California Species of Special Concern. Central California Coast Steelhead (*Oncorhynchus mykiss*), a federally threatened species, may occur further downstream in Walnut Creek. However, no special status species fish or herptiles were identified on site during field visits in October, 2015.

These habitats also provide habitat for a number of resident and migratory birds. These and other birds may nest, forage, or winter in habitats on or adjacent to the site. The riparian and upland vegetation in the vicinity provides foraging habitat and cover for several mammal species. These include western gray squirrel (*Sciurus griseus*), coyote (*Canis latrans*), and mule deer (*Odocoileus hemionus*).

Figure 3. Habitat Map



3.3 SPECIAL STATUS SPECIES

A wide variety of taxa native to the state of California have low populations, limited distributions, or are otherwise vulnerable to extinction or extirpation with the state. Although they may include Ecologically Significant Units and sub-species as well as species, these taxa are collectively referred to as “special status species.”

These flora and fauna may be considered “rare” and are vulnerable to extirpation as the state’s human population grows, the habitats these species occupy are converted to agricultural and urban land uses, and they are subject to other impacts, such as climate change, pollution, or wildfires. State and federal laws have provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with the responsibility for conserving and protecting the diversity of plant and animal species native to the state. Because of the diversity of habitats within the state, a relatively large number of native plants and animals have been formally designated as “threatened” or “endangered” under state and federal endangered species legislation. Others have been designated as candidates for such listing. Still others have been designated as “species of special concern” by the CDFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered (CNPS 2010). Additionally, conservation groups such as the American Fisheries Society, the World Conservation Union, and the Xerces Society have developed lists and categorized species that are of particular concern with regard to conservation.

A number of special status plants and animals have the potential to occur in the site’s vicinity. These species and the likelihood of their occurrence in the study area are listed in **Table 2**, found below. Sources of information for this table included *California’s Wildlife, Volumes I, II, and III* (Zeiner et. al 1988), *California Natural Diversity Database* (CDFG 2011), *California Wildlife Habitat Relationships* (CDFG 2008a), *A California Cooperative Anadromous Fish and Habitat Data Program* (CalFish 2011), and *The California Native Plant Society’s Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2010). This information was used to evaluate the potential for special status plant and animal species to occur on the site. It is important to note that the California Natural Diversity Database is a volunteer database of historical occurrences; therefore, it may not contain all known or gray literature records.

A search of the CNDDDB using the Rarefind 3.1.1 software was conducted for the *Las Trampas Ridge* quadrangle. A list of federally protected species was generated for this quadrangle by the USFWS and retrieved by NCE. All species listed in the CNPS’s *Inventory of Rare and Endangered Plants* (CNPS, 2010) for Contra Costa County *Las Trampas Ridge* quadrangle were reviewed for their potential to occur on the site. The results are presented in **Table 2**.

Table 2. List of Special Status Species that May Occur in the Project Vicinity

Species	Status	Habitat	Occurrence in the Study Area*
Plant Species			
Santa Cruz tarplant (<i>Holocarpha macradenia</i>)	FT, CE, CNPS 1B.1	Coastal prairie, coastal scrub, and valley and foothill grassland. Light, sandy soil or sandy clay; often with nonnatives, 10 - 220 meters. Blooms June - October.	Unlikely. Species distribution limited to specific areas. Potential habitat does not exist on site.
Loma Prieta hoita (<i>Hoita strobilina</i>)	CNPS 1B.1	Usually serpentinite, mesic habitats including chaparral, cismontane woodland, and riparian woodland. 30 - 860 meters. Blooms May - October.	Possible. Suitable habitat for this species may occur on site.
Pallid manzanita (<i>Arctostaphylos pallida</i>)	FT, CE, CNPS 1B.1	Found in siliceous shale, sandy or gravelly soils. Habitats include broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub. 185 - 465 meters. Blooms December - March.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Northern California black walnut (<i>Juglans hindsii</i>)	1B.1	Deep alluvial soil associated with a creek or stream, 0-440 m.	Possible. Suitable habitat for this species may occur on site.
Contra Costa goldfields (<i>Lasthenia conjugens</i>)	FE, 1B.1	Vernal pools, swales, low depressions, in open grassy areas, 1-470 m.	Unlikely. Species distribution limited to specific areas. Potential habitat does not exist on site.
Oregon meconella (<i>Meconella oregana</i>)	1B.1	Coastal prairie, coastal scrub. Open, moist places, shaded canyons under 1000 m.	Possible. Suitable habitat for this species may occur on site.
Woodland woollythreads (<i>Monolopia gracilens</i>)	FE	Grassy sites, in openings; sandy to rocky soils. Often seen on serpentine after burns but may have only weak affinity to serpentine. 100-1200 m.	Unlikely. Species distribution limited to specific areas. Potential habitat does not exist on site.

Species	Status	Habitat	Occurrence in the Study Area*
San Francisco popcornflower (<i>Plagiobothrys diffusus</i>)	CE, 1B.1	Historically from grassy slopes with marine influence. 60-485m.	Unlikely. Species distribution limited to specific areas. Potential habitat does not exist on site.
Marin knotweed (<i>Polygonum marinense</i>)	3.1	Coastal salt marshes and brackish marshes. 0-10 m.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Most beautiful jewelflower (<i>Streptanthus albidus</i> ssp. <i>peramoenus</i>)	1B.2	Serpentine outcrops, on ridges and slopes. 95-1000 m.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Oval-leaved viburnum (<i>Viburnum ellipticum</i>)	2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. 215-1400 m.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Bent-flowered fiddleneck (<i>Amsinckia lunaris</i>)	1B.2	Cismontane woodland, valley and foothill grassland. 50- 500 meters.	Possible. Suitable habitat for this species may occur on site.
Big tarplant (<i>Blepharizonia plumose</i>)	1B.1	Valley and foothill grassland. Dry hills & plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas. 30-505 m.	Possible. Suitable habitat for this species may occur on site.
Round-leaved filaree (<i>California macrophylla</i>)	1B.2	Cismontane woodland, valley and foothill grassland. Clay soils, 15-1200 m.	Possible. Suitable habitat for this species may occur on site.
Presidio clarkia (<i>Clarkia franciscana</i>)	FE, CE, 1B.1	Coastal scrub, valley and foothill grassland. Serpentine outcrops in grassland or scrub, 25-335 m.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Western leatherwood (<i>Dirca occidentalis</i>)	1B.2	On brushy slopes, mesic sites; mostly in mixed evergreen & foothill woodland communities, 25-425 m.	Possible. Suitable habitat for this species may occur on site.

Species	Status	Habitat	Occurrence in the Study Area*
Tiburon buckwheat (<i>Eriogonum luteolum</i> var. <i>caninum</i>)	1B.2	Chaparral, valley and foothill grassland, cismontane woodland, coastal prairie. Serpentine soils; sandy to gravelly sites, 0-700 m.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Diablo helianthella (<i>Helianthella castanea</i>)	1B.2	Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade, 25-1150m.	Possible. Suitable habitat for this species may occur on site.
Mt. Diablo fairy-lantern (<i>Calochortus pulchellus</i>)	1B.2	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland. On wooded and brushy slopes, 30-915 m.	Possible. Suitable habitat for this species may occur on site.
Fragrant fritillary (<i>Fritillaria liliacea</i>)	1B.2	Coastal scrub, valley and foothill grassland, coastal prairie, cismontane woodland. Often on serpentine; various soils reported though usually clay, in grassland, 3-400 m.	Possible. Suitable habitat for this species may occur on site.
Slender-leaved pondweed (<i>Stuckenia filiformis</i> ssp. <i>Alpine</i>)	2B.2	Marshes and swamps. Shallow, clear water of lakes and drainage channels. 300-2150 m.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Avian Species			
Golden eagle (<i>Aquila chrysaetos</i>)	WL, FP	Rolling foothills, mountain areas, sage-juniper flats, & desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Unlikely. Species distribution limited to specific areas. Potential habitat does not exist on site.
Alameda song sparrow (<i>Melospiza melodia pusillula</i>)	CSC	Resident of salt marshes bordering south arm of San Francisco Bay.	Absent. Does not occur on the site. Potential habitat does not exist on site.

Species	Status	Habitat	Occurrence in the Study Area *
Red-shouldered hawk (<i>Buteo lineatus</i>)	U	Deciduous and mixed forests, open country. Nests in large trees.	Possible. Red-shouldered hawk may occur incidentally on the site if they forage over adjacent areas. They are unlikely to nest on the site.
Northern harrier (<i>Circus cyaneus</i>)	U	Open grasslands, marshes, and riparian woodlands. Nests in open field or meadow.	Possible. Northern harrier may occur incidentally on the site if they forage over adjacent areas. Suitable nesting habitat is absent from the site.
Great horned owl (<i>Bubo virginianus</i>)	U	Occurs in a wide range of habitats. May nest in trees or on cliffs.	Possible. Great horned owls may occur incidentally on the site if they forage over adjacent areas. They are unlikely to nest on the site.
Red-tailed hawk (<i>Buteo jamaicensis</i>)	U	Deciduous and mixed forests, open country. Nests in large trees.	Possible. Red-tailed hawks may occur incidentally on the site if they forage over adjacent areas. They are unlikely to nest on the site.
American kestrel (<i>Falco sparverius</i>)	U	Occurs in a wide range of habitats. Nests in cavities in trees or on cliffs.	Possible. Kestrels may occur incidentally on the site if they forage over adjacent areas. They are unlikely to nest on the site.
Mammal Species			
Pallid Bat (<i>Antrozous pallidus</i>)	CSC	Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Hoary Bat (<i>Lasiurus cinereus</i>)	LC	Prefers open habitats or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding.	Possible. Hoary bats may occur incidentally on the site if they forage over adjacent areas. They are unlikely to roost on the site.
Townsend's Big-eared Bat (<i>Corynorhinus townsendii</i>)	CA Candidate Threatened CSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls & ceilings.	Possible. Townsend's Big-eared bats may occur incidentally on the site if they forage over adjacent areas. They are unlikely to roost on the site.

Species	Status	Habitat	Occurrence in the Study Area*
Berkeley Kangaroo Rat (<i>Dipodomys heermanni berkeleyensis</i>)	WL	Open grassy hilltops & open spaces in chaparral & blue oak/digger pine woodlands. Needs fine, deep, well-drained soil for burrowing.	Absent. Does not occur on the site. Potential habitat does not exist on site.
American Badger (<i>Taxidea taxus</i>)	LC, CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Herptile Species			
Alameda whipsnake (<i>Masticophis lateralis euryxanthus</i>)	FT, CT	Common in scrublands broken by scattered grassy patches, rocky hillsides, gullies, canyons, or stream courses.	Possible. The Alameda whipsnake may occur incidentally on the site. They may use the grassland habitat adjacent to the site to forage; however, no breeding habitat is present on site.
California red-legged frog (<i>Rana draytonii</i>)	FT, CSC, IUCN VU	A pond frog that inhabits humid forests, woodlands, grasslands, and streamsides; however, frequents otherwise permanent sources of water. Breeds January-April and can be found in damp woods during non-breeding periods.	Possible. California red-legged frog may occur incidentally on the site. Potential habitat does exist on site.

Species	Status	Habitat	Occurrence in the Study Area *
Foothill yellow-legged frog (<i>Rana boylei</i>)	SSC, NT	Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats. Typically found in or near perennial streams. Need at least some cobble-sized substrate for egg-laying.	Absent. Does not occur on the site. Potential habitat does not exist on site.
California tiger salamander (<i>Ambystoma californiense</i>)	FT, CSC, VU	Need underground refuges, especially ground squirrel burrows, & vernal pools or other seasonal water sources for breeding.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Fish Species			
Central California Coast Steelhead (<i>Oncorhynchus mykiss</i>)	FT, AFS TH	Require cool freshwater for spawning and rearing sites. Adult runs occur during the winter, while the amount of time spent in fresh versus salt water varies considerably. Typically steelhead enter the streams and rivers between late December-April, while spawning occurs in late spring.	Absent. Does not occur on the site. Potential habitat does not exist on site.
Invertebrate Species			
Obscure bumble bee (<i>Bombus caliginosus</i>)	IUCN VU	Coastal California. Food plant genera include <i>Baccharis</i> , <i>Cirsium</i> , <i>Lupinus</i> , <i>Lotus</i> , <i>Grindelia</i> and <i>Phacelia</i> .	Possible. This species may be underground during the colder part of the year.
Bay checkerspot butterfly (<i>Euphydryas editha bayensis</i>)	FT, XERCES CI	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay.	Absent. Species distribution limited to specific areas. Potential habitat does not exist on site.

Species	Status	Habitat	Occurrence in the Study Area*
Habitat			
Wetlands			Present. Wetlands were identified in the vicinity of the project site (Figure 2A and 2B).
Native trees			Present. Numerous native tree species were observed within and adjacent to the project site including <i>Quercus</i> spp. and <i>Salix</i> spp.
Heritage trees			Possibly. Heritage trees may exist on site.
Oak woodland			Possibly. Oak woodlands are present nearby.
Native grassland			Absent. No native grassland is present on or in the vicinity of the project site.
Serpentine Bunchgrass		Serpentine soils	Absent. No other unique habitats were located on site.
Serpentine soils			Absent. No other unique habitats were located on site.
Northern Maritime Chaparral			Absent. No other unique habitats were located on site.

Sources: CDFG 2008a, CDFG 2008b, USFWS 2011, NOAA 2011, CalFish 2011, and CNPS 2010.

***Explanation of Occurrence Designations and Status Codes**

Present: Species observed on the sites at time of field surveys or during recent past.

Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.

Possible: Species not observed on the sites, but it could occur there from time to time.

Unlikely: Species not observed on the sites, and would not be expected to occur there except, perhaps, as a transient.

Absent: Species not observed on the sites, and precluded from occurring there because habitat requirements not met.

STATUS CODES

Federally Endangered	FE
Federally Threatened	FT
Federally Endangered (Proposed)	FPE
Federal Candidate	FC
San Mateo County Unique	U
California Endangered	CE
California Threatened	CT
California Rare	CR
California Protected	CP

California Species of Special Concern	CSC
California Watch List	WL
California Fully Protected	FP
USFWS Birds of Conservation Concern	BCC
California Native Plant Society Listing	CNPS
Plants Presumed Extinct in California	1A
Plants Rare, Threatened, or Endangered in California and elsewhere	1B
Plants Rare, Threatened, or Endangered in California, but more common elsewhere	2
Plants about which we need more information – a review list	3
Plants of limited distribution – a watch list	4
American Fisheries Society	AFS
Endangered	EN
Threatened	TH
Vulnerable	VU
The World Conservation Union	IUCN
Conservation Dependent	CD
Critically Endangered	CE
Data Deficient	DD
Endangered	EN
Least Concern	LC
Near Threatened	NT
Vulnerable	VU
Xerces Society: Red List	Xerces
Possibly Extinct	PE
Critically Imperiled	CI
Imperiled	IM
Vulnerable	VU
Data Deficient	DD

3.4 JURISDICTIONAL WATERS

Jurisdictional waters are defined by the laws that protect them, including the federal Clean Water Act (CWA) and the California Fish and Game Code, Sections 1601 through 1603 (Section 1600). The CWA regulates waters of the U.S., which typically includes rivers, creeks, and drainages that have a defined bed and bank and which, at the very least, carry ephemeral flows. Waters of the U.S. may also include lakes, ponds, reservoirs, and wetlands, if these waters have a significant nexus with a Traditional Navigable Water.

Creeks, rivers, lakes, and their associated riparian areas may be subject to regulation by the CDFG under Section 1600, and the California Regional Water Quality Control Board (RWQCB) may take jurisdiction over all waters of the state. Waters of the state are defined as all surface and groundwater within the state of California. Las Trampas Creek is a water of the U.S. and is located near the site of the two culverts to be repaired. A wetland associated with Las Trampas Creek is located at the outfall of Pipe #3 (NCE, 2015).

4.0 POTENTIAL IMPACTS AND MITIGATION MEASURES

4.1 LOCAL ORDINANCES AND REGULATIONS

Local ordinances and regulations of importance include the Town of Moraga General Plan (Town of Moraga, 2002). This plan discusses trees and general habitat areas that should be protected. These include goals and policies for the protection and conservation of open space, wildlife areas, trees, and creeks. The Bollinger Way culvert repair project will require a tree removal permit if trees are removed.

The project will require compliance with CEQA and the Town of Moraga will serve as the lead agency. As such, the Town will conduct an environmental review, which will include a review of all studies conducted in compliance with CEQA, and the creation and adoption of appropriate mitigation measures. The applicant will be required to conform with any element of the Town's 2002 General Plan which protects sensitive natural resources (e.g., wildlife habitats, open space, etc.) (Town of Moraga 2002).

In general, the project is a repair of existing infrastructure and does not change existing land use. Mitigation measures will ensure there are only limited and temporary impacts to natural resources and the project will be in compliance with the goals and policies of the Town of Moraga General Plan.

4.2 RELEVANT FEDERAL AND STATE LAWS

4.2.1 California Environmental Quality Act

The project will require compliance with CEQA and the Town of Moraga will serve as the lead agency. The Town will conduct an environmental review, which will include a review of all studies conducted in compliance with CEQA, and the creation and adoption of appropriate mitigation measures.

4.2.2 Threatened and Endangered Species

State and federal "endangered species" legislation has provided the CDFW and the USFWS with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal endangered species acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as "species of special status."

Permits may be required from both the CDFW and USFWS if activities associated with a proposed project will result in the "take" of a listed species. "Take" is defined by the state of California as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (California Fish and Game Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFW and the USFWS are responding agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

4.2.3 Migratory Birds

State and federal laws also protect most birds. The Federal Migratory Bird Treaty Act (16 U.S.C., sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

4.2.4 Birds of Prey

Birds of prey are also protected in California under provisions of the State Fish and Game Code, Section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the order *Falconiformes* or *Strigiformes* (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFW.

4.2.5 Wetlands and Other Jurisdictional Waters

Natural drainage channels and adjacent wetlands may be considered "Waters of the United States" (hereafter referred to as "jurisdictional waters") subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE). The extent of jurisdiction has been defined in the Code of Federal Regulations but has also been subject to interpretation of the federal courts. Jurisdictional waters generally include:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce;
- All impoundments of waters otherwise defined as waters of the United States under the definition;
- Tributaries of waters identified in paragraphs (a)(1)-(4) (i.e. the bulleted items above).

As recently determined by the United States Supreme Court in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (the SWANCC decision), channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. However, the U.S. Supreme Court decisions *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers* (referred together as the Rapanos decision) impose a "significant nexus" test for federal jurisdiction over wetlands. In June 2007, the USACE and Environmental Protection Agency (EPA) established guidelines for applying the significant nexus standard. This standard includes 1) a case-by-case analysis of the flow characteristics and functions of the tributary or wetland to determine if they significantly affect the chemical, physical, and biological integrity of downstream navigable waters and 2) consideration of hydrologic and ecologic factors (EPA and USACE 2007).

The USACE regulates the filling or grading of such waters under the authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by “ordinary high water marks” on opposing channel banks. Wetlands are habitats with soils that are intermittently or permanently saturated, or inundated. The resulting anaerobic conditions select for plant species known as hydrophytes that show a high degree of fidelity to such soils. Wetlands are identified by the presence of hydrophytic vegetation, hydric soils (soils saturated intermittently or permanently by water), and wetland hydrology according to methodologies outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987).

All activities that involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the USACE (Wetland Training Institute, Inc. 1991). Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the RWQCB issues a certification (or waiver of such certification) that the proposed activity will meet state water quality standards. The filling of isolated wetlands, over which the USACE has disclaimed jurisdiction under the SWANCC decision, is regulated by the RWQCB. It is unlawful to fill isolated wetlands without filing a Notice of Intent with the RWQCB. The RWQCB is also responsible for enforcing National Pollution Discharge Elimination System (NPDES) permits, including the Construction General Permit. All projects requiring federal money must also comply with Executive Order 11990 (Protection of Wetlands).

The California Department of Fish and Wildlife has jurisdiction over the bed and bank of natural drainages according to provisions of Section 1601 and 1602 of the California Fish and Game Code (2008b). Activities that would disturb these drainages are regulated by the CDFW via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protect the habitat values of the drainage in question.

5.0 PROJECT SPECIFIC IMPACTS AND MITIGATION MEASURES

The proposed project will include the construction and repair of the two culverts and stabilization of the bank below the outfall of Pipe #2. This work will require grading, excavation, and limited vegetation removal.

Important natural resources on site are the riparian area, flora and fauna within the riparian woodland, and the water quality of Las Trampas Creek. The construction and repair activities associated with the Project have the potential to impact these natural resources, either directly or indirectly. Potential impacts include the possibility of crushing protected flora and fauna, degrading their habitats, preventing the successful breeding of wildlife, or degrading water quality in downstream water bodies. The applicant proposes to avoid and minimize the potential for these impacts by implementing specific mitigation measures.

5.1 IMPACTS TO RIPARIAN AREAS

A riparian corridor extends through the project site and is associated with Las Trampas Creek, a perennial stream for much of its length. The riparian corridor in the vicinity of the Project site is relatively intact riparian forest, shown as broadleaf deciduous riparian woodland on **Figure 3**. Approximately 200 square feet of riparian wetland will be directly impacted downstream of Pipe #2.

Mitigation. To the extent practicable, the direct impacts to these riparian areas will be minimized and avoided. After construction is complete, these impacts will be rectified by replanting native willow cuttings from the vicinity.

5.2 IMPACTS TO HABITATS FOR RARE AND ENDANGERED AND OTHER SPECIAL STATUS SPECIES

5.2.1 Flora

Of the 21 special status plant species that could occur in the project vicinity, only 10 species have the potential to occur (**Table 2**). These are the Loma Prieta hoita, northern California black walnut, Oregon meconella, bent-flowered fiddleneck, big tarplant, round leaved filaree, western leatherwood, Diablo helianthella, Mt. Diablo fairy-lantern, and the fragrant fritillary.

The potential for these special status plant species to occur on site prior to construction activities is very low. However, pre-construction surveys are recommended. These surveys will focus on the area within and in the vicinity of proposed ground disturbing activities and should occur during the appropriate blooming season, such as spring of 2016. The purpose of these surveys is to determine the presence or absence of the species on site prior to the time of construction.

If these special status plant species surveys result in a determination that the species are absent from areas impacted by construction activities, then there would be no impact to the species and mitigation would not be warranted.

Mitigation. Should one or more populations of special status plant species be detected within the project footprint, then mitigation measures would be required to offset impacts to these plant populations. Generally, development should be avoided within fifty feet of any rare plant populations.

If the project cannot be redesigned to avoid impacts to the identified species, then compensation measures should include development of a restoration plan for these species. At a minimum, the plan should contain the following elements: 1) location of restoration areas, 2) propagation and planting techniques to be employed for the restoration effort, 3) timetable for implementation, 4) monitoring plan and performance criteria, 5) adaptive management techniques, and 6) site maintenance plan.

The plan would need to be approved by the lead agency prior to the start of project construction and, because disturbances and impacts to the site will be permanent, should occur in the immediate vicinity of the identified population(s). The objective of this mitigation measure would be to replace the special status plants lost during construction activities. This and any other compensation for anticipated impacts should be consistent with local policies and ordinances, and any other federal or state regulations protecting these plant communities.

Avoidance and minimization of direct impact to heritage trees, significant trees, and other native trees, heritage trees or oak woodlands will be included during final project design. These trees and shrubs will be protected prior to construction with construction fencing and any loss of these resources will be compensated by replanting after construction is complete. Removal of California bay trees, if required, will be done in a manner that avoids the spread of sudden oak death disease.

To further protect rare plant populations in the project vicinity, invasive plants on the site should be controlled and Best Management Practices (BMPs) to control the spread of invasive plants should be implemented. Implementation of the above measures is expected to reduce project impacts to a less-than-significant level to any special status plant species that may occur on the site.

5.2.2 Fauna

Of the 19 special status or sensitive animal species that occur, or once occurred, regionally, only 10 have any potential to occur at the site (**Table 2**). These are:

- Red-shouldered hawk
- Northern harrier
- Great horned owl
- Red-tailed hawk
- American kestrel
- Alameda whipsnake
- California red-legged frog
- Hoary bat
- Townsend's big-eared bat
- Obscure bumble bee

These special status animal species may occur during foraging activities around the site. These species may either occur on the site incidental to home range and migratory movements, thus using the site infrequently, or may forage on the site year-round or during migration.

The construction will include the avoidance of removing most trees and shrubs, while protecting special status species habitat. Project buildout will entail minimal loss of foraging, nesting, and/or roosting habitat that is abundantly available regionally.

Appropriate BMPs will be employed in order to protect these resources. Therefore, the loss of habitat for these species would be considered less than significant.

Although no stick nests were observed in trees on the site, a conclusive investigation of nesting birds was not conducted. Trees in the project vicinity may provide suitable nesting habitat for migratory birds, including tree-nesting raptors. If a migratory bird, regardless of its federal or state status, were to nest in trees near the site prior to or during proposed construction activities, such activities could result in the abandonment of active nests or direct mortality to these birds. Construction activities that adversely affect the nesting success of special-status or non-special-status migratory birds, including tree-nesting raptors, or result in mortality of individual birds constitute a violation of state and federal laws (see **Section 4.2**).

Mitigation. If trees need to be removed, their removal should occur during the non-breeding season (September 1 through January 31). If it is not possible to avoid tree removal or other disturbances during the breeding season (February 1 through August 31), a qualified biologist should conduct a pre-disturbance survey for tree-nesting raptors and other migratory birds in all trees within the operation footprint and within 250 feet of the footprint no more than 10 days prior to the onset of ground disturbance. If nesting migratory birds are detected on the site during the survey, a suitable activity-free buffer should be established around all active nests. The precise dimension of the buffer (up to 250 ft.) would be determined at that time and may vary depending on location and species. Buffers should remain in place for the duration of the breeding season or until it has been confirmed by a qualified biologist that all chicks have fledged and are independent of their parents. Pre-disturbance surveys during the non-breeding season are not necessary for migratory birds, as they are expected to abandon their roosts during construction activities. Implementation of the above measures would mitigate impacts to migratory birds, including tree-nesting raptors, to a less-than-significant level.

Prior to vegetation removal, pre-construction surveys should also be conducted for the presence of roosting bats, California red-legged frog, Alameda whipsnake, and any raptors. If any of these special status species are discovered within the project footprint during the pre-construction survey, avoidance of impacts to these protected species should be conducted in consultation with the CDFW. The USFWS should also be consulted on any federally listed species.

California red-legged frogs may use this reach of Las Trampas Creek and its riparian corridor as non-breeding habitat. All direct impacts to the riparian corridor and its buffer will be minimized. Water quality will be maintained and improved by using BMPs for surface water management.

Obscure bumble bees may use habitats in the vicinity. Ground disturbing activities during the time that the bees are hibernating may cause direct impacts to this species. Ground disturbing and construction activities should be limited to the time from May 1st to October 15th to minimize the potential to directly impact obscure bumble bees.

In addition, training will be provided to construction crews on protected species, including California red-legged frogs, and Alameda whipsnake. These mitigation measures will allow avoidance of significant impacts to these species.

Temporary/Construction BMPs or Erosion & Sediment Controls. The project will have to comply with the new CA NPDES Construction General Permit (CGP). There will be a number of Temporary and Permanent BMPs which will be required as part of the Stormwater Pollution

Prevention Plan (SWPPP) and or final design in order to comply with the permit. The 2012-0006-DWQ CGP includes requirements for Post Construction BMPs and the permanent BMP or Post Construction BMP element will be included in the final design. The development of the SWPPP and application for coverage under the Construction General Permit (GCP) will occur after project design is complete.

Waters of the U.S. The project entails the repair and replacement of existing culverts and stabilization of the bank below Pipe #2. Fill within waters of the U.S. (WOUS) will be minimized to the amount required to stabilize the bank. No additional loss of WOUS is anticipated.

6.0 CONCLUSION

The Bollinger Canyon Road culvert repair project requires construction in wetlands associated with Las Trampas Creek and its associated riparian area. Several special status species have the potential to use these and other adjacent habitats, and the potential exists to adversely affect these species and their habitats. However, the project has been designed to avoid sensitive species with timing and pre-construction surveys, implement BMPs for avoiding impacts to water quality, and to restore areas where vegetation is unavoidably removed. These mitigation measures will allow this essential public infrastructure to be re-constructed and stabilized, while avoiding significant impacts to the natural resources of the site.

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Appendix B

CULTURAL RESOURCES TECHNICAL MEMO

January 13, 2016

NCE Project: 576.11.55

Edric Kwan
Public Works Director/Town Engineer
Town of Moraga
Public Works Department
329 Rheem Blvd
Moraga, CA 94556

Re: Cultural Resources Technical Memo, Moraga Culvert Replacement Project, Contra Costa County, California

Mr. Kwan

PROJECT DESCRIPTION

The Town of Moraga (Town), Contra Costa County, California proposes to repair and reconstruct two culverts. The legal location of the project area is within Section 17, T.1S., R.2W., on the USGS Las Trampas Ridge 7.5 minute quadrangle map (**Figure 1**). The culverts are located in the Las Trampas creek watershed along Bollinger Canyon Road, between Joseph Drive and St. Mary's Road (**Figure 2**). Steep bluffs abut Bollinger Canyon Road on the northeast side. The southeast side of the road has a narrow shoulder, then a steep slope that drops into a small canyon and Las Trampas Creek. The two culverts collect overland flow from upland areas and the road surface, which eventually discharge into Las Trampas Creek.

Pipe 1 is anticipated to be replaced in-kind and the outfall and slope of Pipe 2 will be stabilized to prevent further erosion. In addition to the culverts, several staging areas are located along previously disturbed road shoulders within the project area for temporary equipment storage and vehicle parking (see **Figure 2**).

Pipe 1 originates at the southeast corner of the intersection of St. Mary's Road and Bollinger Canyon Road. The pipe collects overland flow routed to the pipe from a vegetated roadside shoulder along the northeast side of Bollinger Canyon Road and overland flows from St. Mary's Road. The upstream section of the pipe is a 30-inch Corrugated Metal Pipe (CMP) which may be removed and replaced, depending on results from cleaning debris and video surveillance. At the outfall, the pipe is a 30-inch High Density Polyethylene (HDPE) pipe in good condition and would remain in place. Below the outfall, flows currently discharge to a riprap apron with an approximately 25-foot flow path down to the creek. No dredge or fill would be required within the stream corridor, and the HDPE section of the pipe would remain in place, and any erosion control features established would be placed outside of the stream channel.

Pipe 2 is located on the southwest side of Bollinger Canyon Road just north of the intersection with Joseph Drive. This pipe conveys flows from an unnamed seasonal tributary. There is significant erosion occurring at the pipe outfall which requires slope stabilization. There is an approximate 10-foot vertical drop from the outfall to the bottom of the slope. Significant erosion of the slope has occurred at the storm drain outlet and downstream of the discharge point. Undercutting has occurred near the storm drain pipe and a gully has formed. Continued erosion threatens the stability of the roadway.

NCE was retained by the Town to prepare technical reports in support of acquiring the environmental approvals and associated permitting required by the California Environmental Quality Act (CEQA) for the Moraga Culvert Replacement Project. The cultural resources portion of this project was conducted by Mr. Jeremy Hall (RPA), NCE Project Scientist, a cultural resource specialist with ten years of experience in California. A records search was conducted at the Northwest Information Center (NWIC) and Native American consultation was initiated through the Native American Heritage Commission (NAHC). The project area was visited on December 17, 2015. Results of the archives search, Native American consultation, and field examination are presented below.

DEFINITION OF UNDERTAKING

The Moraga Culvert Replacement Project, as described above, constitutes the proposed undertaking. This project requires compliance with Public Resource Code (PRC) Section 21083.2 of the California Environmental Quality Act (CEQA). In addition, since the project will involve discharge or fill into potential Waters of the United States (WOUS), a permit and certification must be obtained to comply with Section 404 and 401 of the Federal Clean Water Act, respectively. Therefore, a WOUS delineation was performed by NCE and submitted to the U.S. Army Corps of Engineers (USACE), San Francisco District for review. Given the project is subject to federal permit requirements, compliance with Section 106 of the National Historic Preservation Act (NHPA) is also required.

This report describes an archaeological field examination of approximately 0.36 acres conducted by NCE as an initial step in the state and federal compliance process. All work was designed to comply with current state, federal (USACE), and professional standards. Those standards state that the goals of an intensive archaeological inventory (maximum 15 m transect interval) are to:

- Establish an Area of Potential Effect (APE);
- Identify prehistoric and historic period archaeological resources in the study area;
- Evaluate identified resources as to their eligibility for listing in the California Register of Historic Places (CRHR) and the National Register of Historic Places (NRHP);
- Provide management recommendations for those properties considered eligible to the CRHP and the NRHP

AREA OF POTENTIAL EFFECT

The APE, otherwise referred to in this memo as the Area of Direct Effect (ADE), includes a narrowly defined area around Pipe 1 (because it will be replaced in-kind), an approximate 50 foot buffer surrounding the Pipe 2 outfall on the west side of Bollinger Canyon Road, and six potential staging areas all located along previously disturbed road shoulders. Not all of these staging areas are anticipated to be used for the project, but all were examined to enable flexibility during construction. The total ADE inspected as part of this cultural resources investigation was 0.36 acres.

Given the scale and scope of this project, coupled with the lack of historic properties identified in the vicinity of the project area, indirect effects such as audio and visual impacts to such resources were not considered.

RESULTS OF THE RECORDS SEARCH

An archival search request was submitted to the NWIC using a 500 foot search buffer around the project area (**Attachment 2**). Emphasis was placed on determining which portions of the

overall archival study area have been inventoried previously, and on the location of previously recorded archaeological sites. The results of the records search are summarized below.

A number of previous archaeological inventories have been conducted within or immediately adjacent to the proposed project area. Summary information regarding those inventories is presented in **Table 1**.

Table 1. Previous Inventories within 500 Feet of the Project Area.

NWIC				
Rpt	Authors	Year	Title	Publisher
S-000595	Ronald F. King	1974	A Report on the Status of Generally Available Data Regarding Archaeological, Ethnographic, and Historical Resources Within a Five Mile Wide Corridor Through Portions of Colusa, Yolo, Solano, and Contra Costa Counties, California	n/a
S-000848	David A. Fredrickson	1977	A Summary of Knowledge of the Central and Northern California Coastal Zone and Offshore Areas, Vol. III, Socioeconomic Conditions, Chapter 7: Historical & Archaeological Resources	The Anthropology Laboratory, Sonoma State College; Winzler & Kelly Consulting Engineers
S-001316	Cindy Desgrandchamp	1978	Archaeological Survey Report, Rescinded Route 04-CC-77, Excess Parcels, 24524-07-01, 24524-08-01, 24524-16-01, 19575-01-01, 24524-10-01, 24524-17-01, 24524-18-01, 19560-03-01, 24524-11-01, 24524-13-01, in Moraga, Contra Costa County, California	Caltrans
S-001978	Anthony V. Aiello	1960	The Islands of Contra Costa	n/a
S-002458	Suzanne Marie Ramiller, Neil Ramiller, Roger Werner, and Suzanne Stewart	1981	Overview of Prehistoric Archaeology for the Northwest Region, California Archaeological Sites Survey: Del Norte, Humboldt, Mendocino, Lake, Sonoma, Napa, Marin, Contra Costa, Alameda	Northwest Regional Office, California Archaeological Sites Survey; Anthropological Studies Center, Sonoma State University
S-009462	Teresa Ann Miller	1977	Identification and Recording of Prehistoric Petroglyphs in Marin and Related Bay Area Counties	San Francisco State University
S-009583	David W. Mayfield	1978	Ecology of the Pre-Spanish San Francisco Bay Area	San Francisco State University
S-013417		1990	Archaeological Survey Report, Rheem Creek Project, Town of Moraga, Contra Costa County, California	William Self Associates
S-016660	Jeffrey B. Fentress	1992	Prehistoric Rock Art of Alameda and Contra Costa Counties, California	California State University, Hayward
S-017835	Judy Myers Suhey	1975	Biological Distance of Prehistoric Central California Populations Derived from Non-Metric Traits of the Cranium	University of California, Riverside
S-018217	Glenn Gmoser	1996	Cultural Resource Evaluations for the Caltrans District 04 Phase 2 Seismic Retrofit Program, Status Report: April 1996	Caltrans
S-020395	Donna L. Gillette	1998	PCNs of the Coast Ranges of California: Religious Expression or the Result of Quarrying?	California State University, Hayward
S-026732	Sue-Ann Schroder and Thomas M. Origer	2003	A Cultural Resources Survey for the Rancho Laguna Project, Contra Costa County, California	Tom Origer & Associates
S-032596	Randall Milliken, Jerome King, and Patricia Mikkelsen	2006	The Central California Ethnographic Community Distribution Model, Version 2.0, with Special Attention to the San Francisco Bay Area, Cultural Resources Inventory of Caltrans District 4 Rural Conventional Highways	Consulting in the Past; Far Western Anthropological Research Group, Inc.

Table 1. Previous Inventories within 500 Feet of the Project Area.

NWIC				
Rpt	Authors	Year	Title	Publisher
S-033600	Jack Meyer and Jeff Rosenthal	2007	Geoarchaeological Overview of the Nine Bay Area Counties in Caltrans District 4	Far Western Anthropological Research Group, Inc.

Based on an examination of survey coverage maps associated with these inventories, only one previous inventory (S-001316) intersects the project area. This report, entitled *Archaeological Survey Report, Rescinded Route 04-CC-77, Excess Parcels, 24524-07-01, 24524-08-01, 24524-16-01, 19575-01-01, 24524-10-01, 24524-17-01, 24524-18-01, 19560-03-01, 24524-11-01, 24524-13-01, in Moraga, Contra Costa County, California*, was conducted by Caltrans in 1978. Based on information provided by the Information Center, no cultural resources were identified as a result of this inventory. However, this could be the result of missing data within the Information Center’s database. Many of the reports listed in Table 1 are regional in nature and contain little information about the immediate project area. Over half the reports are more than 30 years old, many dating to the 1960s and 1970s. Given the limited relevance and age of the existing archival data, NCE approached the ADE as if it had not been examined previously.

Several inventories identified within the 500 foot archival research buffer did identify cultural resources. However, none are located within or adjacent to the current project area.

NATIVE AMERICAN CONSULTATION

On November 30, 2015 a letter was sent to the Native American Heritage Commission (NAHC) requesting information pertaining to the presence of known Native American sensitive areas or cultural resources within or immediately adjacent to the project area. A response was received December 14, 2015 indicating that the sacred lands file search did not reveal the presence of Native American cultural resources within or immediately adjacent to the project area. The NAHC requested that additional Native American cultural resource representatives be contacted. Contact information for three individuals was provided and NCE sent letters to each contact on December 15, 2015. Follow-up emails were sent December 31, 2015. All correspondence related to Native American consultation for this project is located in **Attachment 3**.

Mr. Andrew Galvan of the Ohlone Indian Tribe responded on December 31, 2015. He inquired about the status of a records search and pedestrian survey within the project area. He was informed that both the records search and survey resulted in the identification no cultural resources in the project area. In addition, Mr. Galvan requested a copy of the final cultural resources technical memo and associated documentation for the project. It is NCE policy not to disseminate sensitive material directly to interested parties outside our contractual client and the lead agency for CEQA and/or Section 106 of the NRHP (if applicable). Therefore, NCE recommends that the CEQA lead agency (Town of Moraga in this case) note the request by Mr. Galvan and provide the requested information.

As of January 15, 2016, no other responses have received from Native American representatives. Should responses be received following submittal of this letter report, those responses will be forwarded to the Town of Moraga with guidance regarding compliance to such inquiries.

INVENTORIED AREAS AND FIELD METHODS

Mr. Hall visited the project area on December 17, 2015. The objective of the field examination was to locate, describe, and evaluate cultural resources present within or adjacent to the ADE (see **Figure 2**). Fieldwork was performed in accordance with accepted federal and State of California standards. Given their small size, individual project elements were examined by walking their boundaries followed by a few zig-zag transects through their center. This approach exceeds the 15-meter transect spacing typically held as the industry standard.

Proposed staging areas were mapped and culvert replacement areas verified using a mapping-grade Trimble Geo7x GPS receiver. Several photographs were taken at each culvert replacement area and proposed staging area. Inventory area photos and an associated photo log are included within **Attachment 4** of this technical memo.

The vast majority of the ADE is located in previously disturbed ground along road shoulders. Special attention was paid to the ADE associated with Pipe 2 which contains the only undisturbed ground examined. Surface visibility varied somewhat across the areas examined. All of the staging areas are located along road shoulders and ground visibility was 100%. The existing pipe in the Pipe 1 area is exposed along the downhill side (west) and ground visibility was good (90-100%). In the Pipe 2 outlet area, ground visibility was lower (<50%) due to thick vegetation along the drainage channel. Even in this area, however, access and ground visibility were sufficient to allow for the identification of any cultural resources present.

FINDINGS

No cultural resources were identified within the ADE defined for the proposed undertaking.

DETERMINATION OF EFFECT

Based on results of the records search and field examination, it is recommended that significant cultural resources are not present within the APE associated with the proposed undertaking. Thus, project-related activities associated with the proposed Moraga Culvert Replacement Project will not impact properties listed on or eligible to the NRHP, nor will it impact historic resources that meet criteria outlined in Section 5024.1 of the California PRC. It is recommended that *"no historic properties will be affected"*, as that phrase is viewed within the context of compliance with Advisory Council on Historic Preservation regulations (36 CFR part 800).

Although considered improbable, it is possible that prehistoric burials might be inadvertently discovered during construction (none were apparent based on archival research, Native American consultation, or an examination of the ground surface). Should human remains be encountered while engaged in construction activities, work must cease in the immediate area and the proper local authorities alerted including the local Sheriff's Office and the County Coroner. If the remains are determined to be of Native American origin, the California Office of Historic Preservation (OHP) must be contacted. The OHP will contact the appropriate tribal representatives and consult on disposition of the remains and any associated artifacts.



Should you require additional information, or if you would like to discuss recommendations listed herein, please contact me at 775-588-2505.

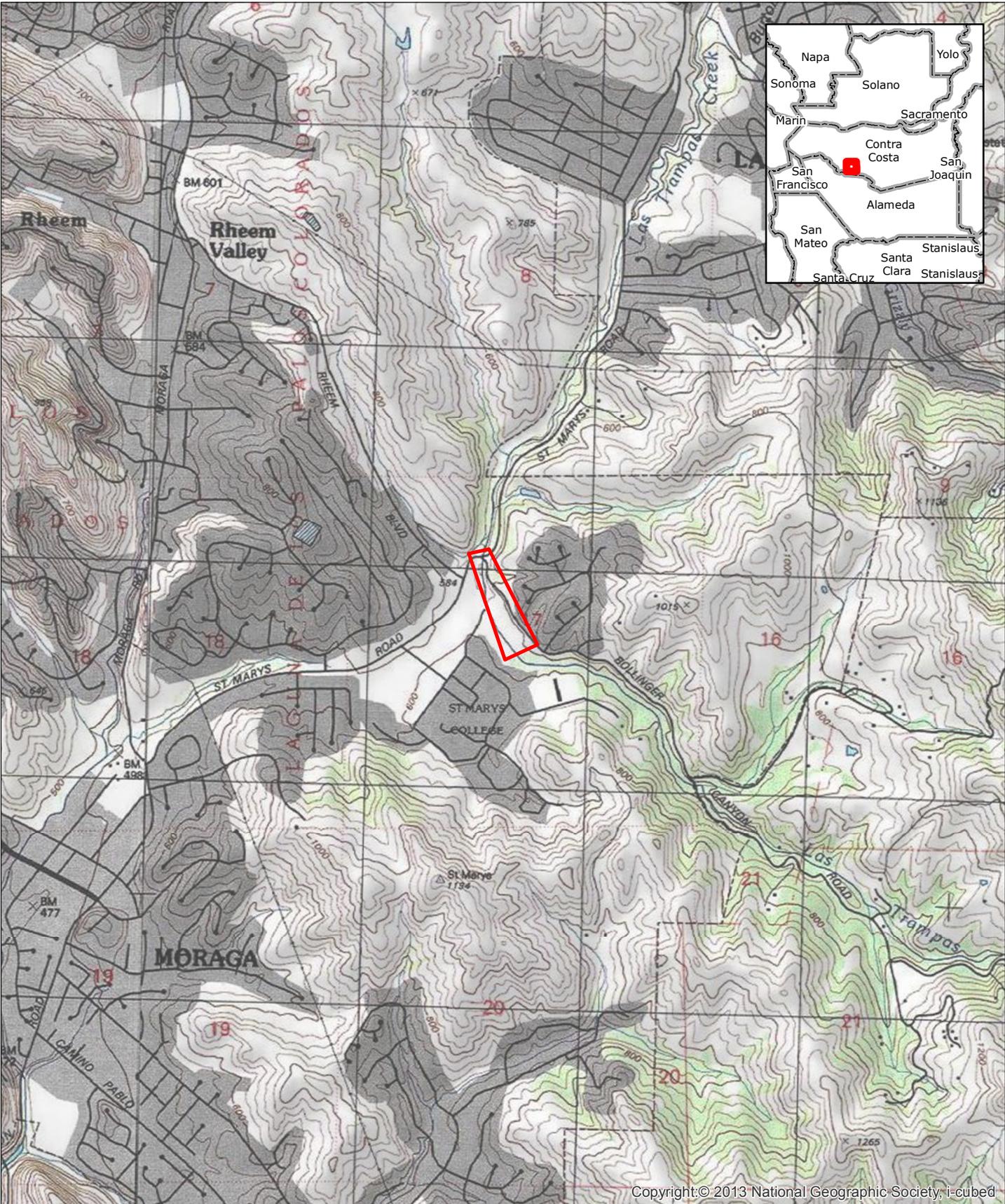
Sincerely,

Jeremy Hall
Project Scientist
NCE
P.O. Box 1760
Zephyr Cove, NV 89448

- cc. Ellen Clark
Planning Director, Town of Moraga
- cc. Laurie Sucgang
Senior Civil Engineer, Town of Moraga

ATTACHMENT 1

Figures



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Moraga Culvert Replacement Project

Project Area Overview Map



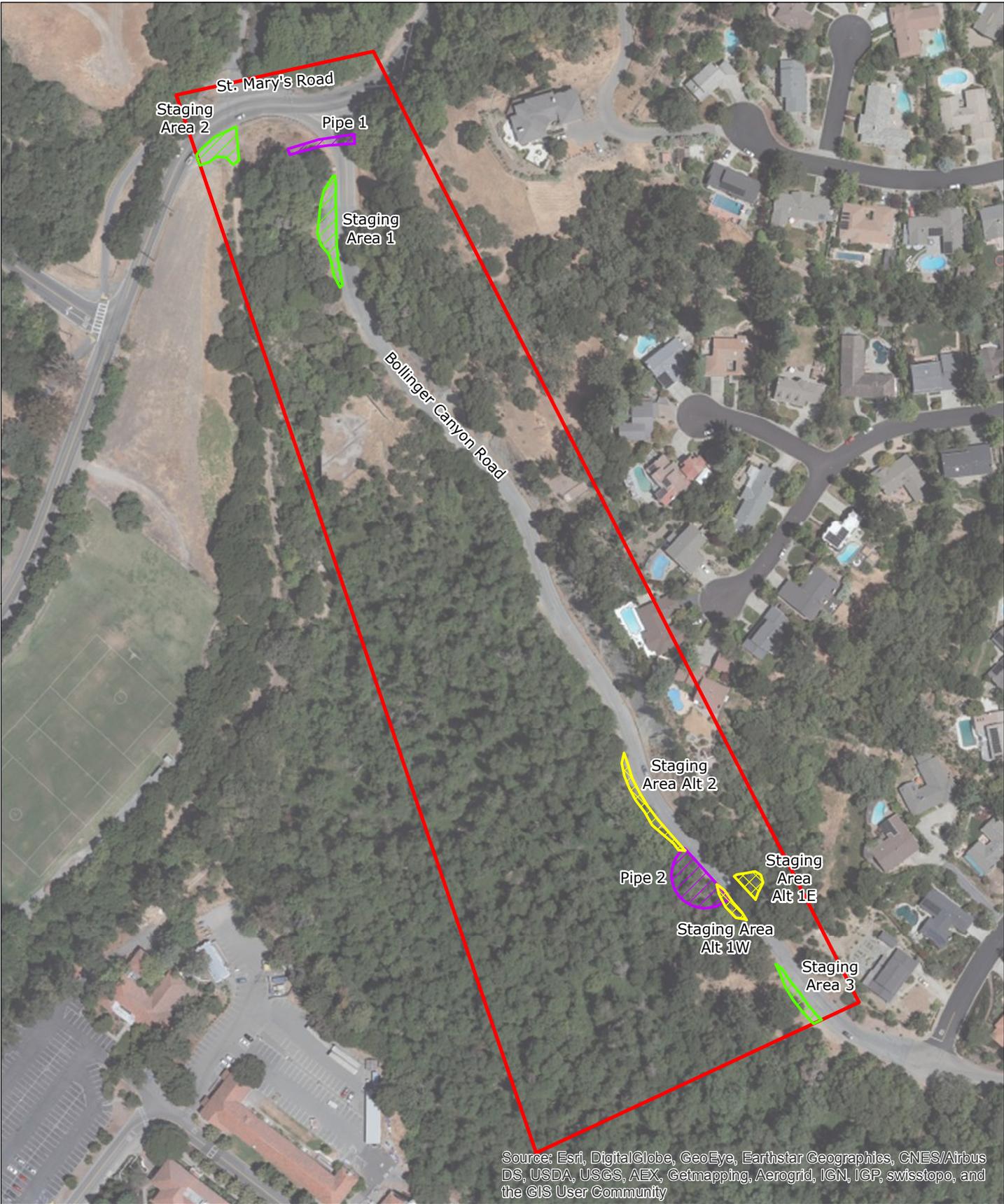
Legend
 Project Area

1:24,000
 0 1,000 2,000
 ft.



Credits: ESRI World Imagery basemap
 Date: 12/18/2015
 Author: jhall

Figure 1



Legend
Project Area
Direct APE
Culvert
Staging Area
Alternative Staging Area

Moraga Culvert Replacement	
Area of Potential Effect Map	
1 in. = 200 ft.	N
0 100 200 ft.	Credits: ESRI World Imagery basemap
	Date: 12/18/2015
	Author: jhall
Figure	2

ATTACHMENT 2

NWIC Records Search Results

CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM



ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE

HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO

SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
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12/2/2015

NWIC File No.: 15-0806

Jeremy Hall
NCE
P.O. Box 1760
Zephyr Cove, NV 89448

re: Moraga Culvert Replacement Project

The Northwest Information Center received your record search request for the project area referenced above, located on the Las Trampas Ridge USGS 7.5' quad. The following reflects the results of the records search for the project area and a 500 foot radius:

Resources within project area:	None
Resources within 500 foot radius:	None
Reports within project area:	S-1316.
Reports within 500 foot radius:	S-26732 & 13417.
Other Reports within records search radius:	S-595, 848, 1978, 9462, 9583, 16660, 17835, 18217, 20395, 32596, & 33600. These reports are classified as Other Reports; reports with little or no field work or missing maps. The electronic maps do not depict study areas for these reports, however a list of these reports has been provided. In addition, you have not been charged any fees associated with these studies.

Resource Database Printout (list): enclosed not requested nothing listed

Resource Database Printout (details): enclosed not requested nothing listed

Resource Digital Database Records: enclosed not requested nothing listed

Report Database Printout (list): enclosed not requested nothing listed

Report Database Printout (details): enclosed not requested nothing listed

Report Digital Database Records: enclosed not requested nothing listed

Resource Record Copies: enclosed not requested nothing listed

Report Copies: enclosed not requested nothing listed

- OHP Historic Properties Directory:** enclosed not requested nothing listed
- Archaeological Determinations of Eligibility:** enclosed not requested nothing listed
- CA Inventory of Historic Resources (1976):** enclosed not requested nothing listed
- Caltrans Bridge Survey:** enclosed not requested nothing listed
- Ethnographic Information:** enclosed not requested nothing listed
- Historical Literature:** enclosed not requested nothing listed
- Historical Maps:** enclosed not requested nothing listed
- Local Inventories:** enclosed not requested nothing listed
- GLO and/or Rancho Plat Maps:** enclosed not requested nothing listed
- Shipwreck Inventory:** enclosed not requested nothing listed

*Notes:

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Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

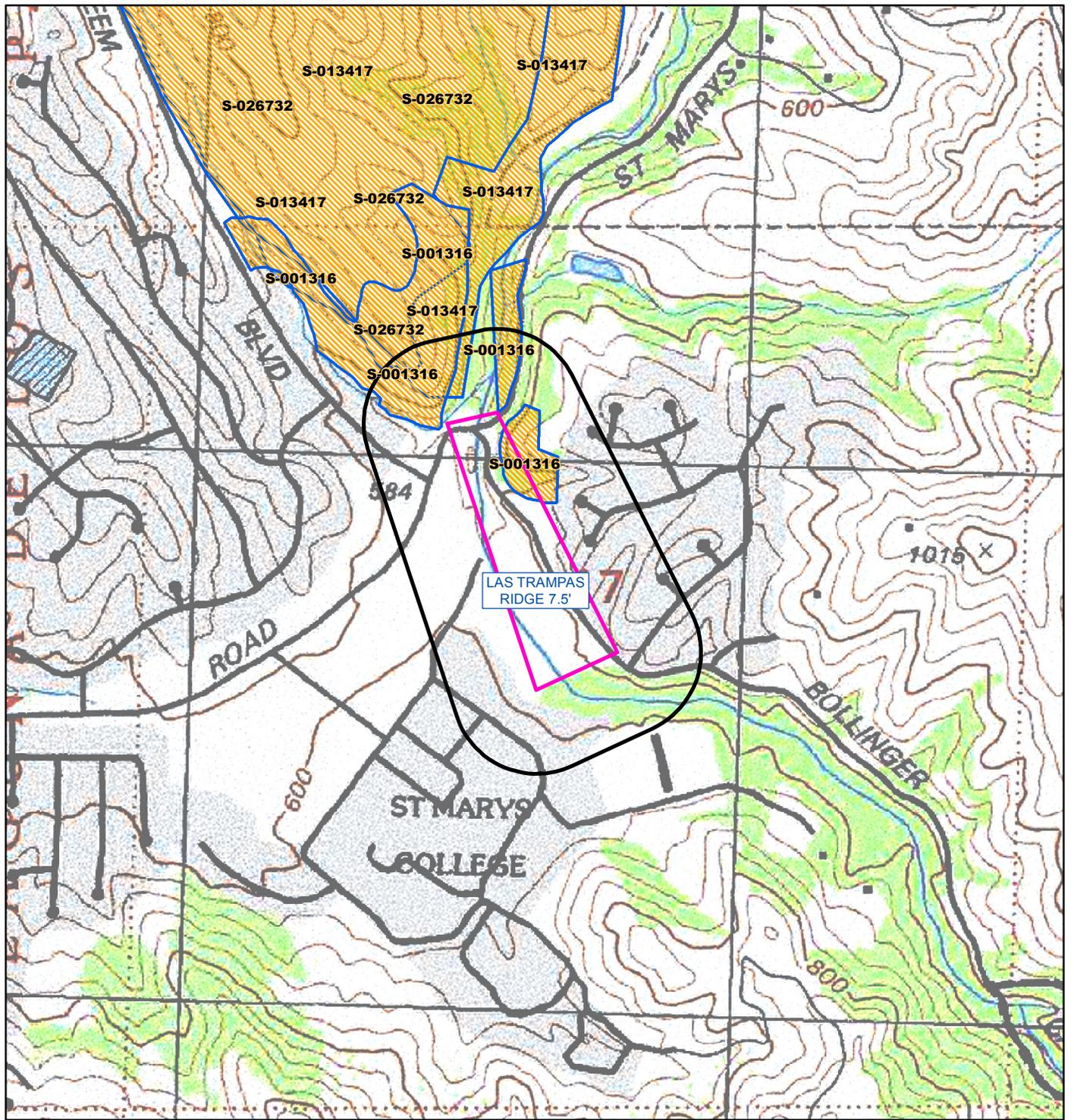
Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Lisa C. Hagel
Researcher

Moraga Culvert Replacement Project

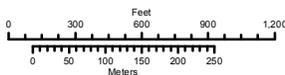


Northwest Information Center

File #15-0806, 2 December 2015, L. Hagel

May depict confidential cultural resource locations.

Do not distribute.



Report Detail: S-000595

Identifiers

Report No.: S-000595

Other IDs:

Cross-refs:

Citation information

Author(s): Ronald F. King

Year: 1974 (Dec)

Title: A Report on the Status of Generally Available Data Regarding Archaeological, Ethnographic, and Historical Resources Within a Five Mile Wide Corridor Through Portions of Colusa, Yolo, Solano, and Contra Costa Counties, California

Affiliation:

No. pages: 9

No. maps: 0

Attributes: Literature search

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Not-mappable report. There are no maps showing the location of the project in this report.

Associated resources

Primary No.	Trinomial	Name
P-07-000091	CA-CCO-000149	isolate
P-48-000009	CA-SOL-000001	Petersen 1
P-48-000010	CA-SOL-000002	Peterson 2
P-48-000011	CA-SOL-000003	Petersen 3
P-48-000012	CA-SOL-000004	Petersen, Schmeiser
P-48-000013	CA-SOL-000005	Petersen 5
P-48-000018	CA-SOL-000010	SW-10
P-48-000020	CA-SOL-000012	Campbell Site
P-57-000130	CA-YOL-000161	PGE-16
P-57-000131	CA-YOL-000162	PGE-17

No. resources: 10

Has informals: No

Location information

County(ies): Colusa, Contra Costa, Solano, Yolo

USGS quad(s): Antioch North, Dozier, Esparto, Wildwood School, Winters, Woodward Island

Address:

PLSS:

Database record metadata

Date	User
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Entered: 4/7/2005 nwic-main

Last modified: 9/10/2015 hagell

IC actions:	Date	User	Action taken
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4/7/2005 jay Appended records from NWICmain bibliographic database.

Record status: Verified

Report Detail: S-000848

Identifiers

Report No.: S-000848

Other IDs: Type

Name

Submitter

Contract AA550-CT6-52

Cross-refs:

Citation information

Author(s): David A. Fredrickson

Year: 1977

Title: A Summary of Knowledge of the Central and Northern California Coastal Zone and Offshore Areas, Vol. III, Socioeconomic Conditions, Chapter 7: Historical & Archaeological Resources

Affiliation: The Anthropology Laboratory, Sonoma State College; Winzler & Kelly Consulting Engineers

No. pages: 223

No. maps: 0

Attributes: Management/planning, Other research

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Santa Barbara, San Luis Obispo, and Ventura counties are also within the study area. 9880 prehistoric and historic resources were identified in the 17 counties when the report was written in 1977. There were no location maps in the report.

Associated resources

No. resources: 0

Has informals: Yes

Location information

County(ies): Alameda, Contra Costa, Del Norte, Humboldt, Marin, Mendocino, Monterey, Napa, Other, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma

USGS quad(s): ~All quads - Alameda Co., ~All quads - Contra Costa Co., ~All quads - Del Norte Co., ~All quads - Humboldt Co., ~All quads - Marin Co., ~All quads - Mendocino Co., ~All quads - Monterey Co., ~All quads - Napa Co., ~All quads - San Francisco Co., ~All quads - San Mateo Co., ~All quads - Santa Clara Co., ~All quads - Santa Cruz Co., ~All quads - Solano Co., ~All quads - Sonoma Co.

Address:

PLSS:

Database record metadata

Date User

Entered: 4/7/2005 nwic-main

Last modified: 10/20/201 rinerg

IC actions: Date User Action taken

4/7/2005 jay Appended records from NWICmain bibliographic database.

Record status: Verified

Report Detail: S-001316

Identifiers

Report No.: S-001316

Other IDs:

Cross-refs:

Citation information

Author(s): Cindy Desgrandchamp

Year: 1978 (Jun)

Title: Archaeological Survey Report, Rescinded Route 04-CC-77, Excess Parcels, 24524-07-01, 24524-08-01, 24524-16-01, 19575-01-01, 24524-10-01, 24524-17-01, 24524-18-01, 19560-03-01, 24524-11-01, 24524-13-01, in Moraga, Contra Costa County, California

Affiliation: Caltrans

No. pages: 7

No. maps: 0

Attributes: Archaeological, Field study

Inventory size: c 146 ac

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Contra Costa

USGS quad(s): Las Trampas Ridge, Oakland East

Address:

PLSS:

Database record metadata

Date *User*

Entered: 4/7/2005 nwic-main

Last modified: 11/30/201 mikulikc

IC actions: *Date* *User* *Action taken*

4/7/2005 jay Appended records from NWICmain bibliographic database.

Record status: Verified

Report Detail: S-001978

Identifiers

Report No.: S-001978

Other IDs:

Cross-refs:

Citation information

Author(s): Anthony V. Aiello

Year: 1960 (Jan)

Title: The Islands of Contra Costa

Affiliation:

No. pages: 12

No. maps: 0

Attributes: Other research

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Contra Costa

USGS quad(s): Antioch North, Antioch South, Benicia, Bouldin Island, Brentwood, Briones Valley, Byron Hot Springs, Clayton, Clifton Court Forebay, Diablo, Dublin, Hayward, Honker Bay, Jersey Island, Las Trampas Ridge, Livermore, Mare Island, Oakland East, Petaluma Point, Richmond, San Quentin, Tassajara, Vine Hill, Walnut Creek, Woodward Island

Address:

PLSS:

Database record metadata

Date *User*

Entered: 4/7/2005 nwic-main

Last modified: 9/17/2015 mikulikc

IC actions: Date *User* *Action taken*

4/7/2005 jay Appended records from NWICmain bibliographic database.

9/17/2015 mikulikc corrected quads in location tab

9/17/2015 mikulikc database incomplete: no affiliation submitted

Record status: Verified

Report Detail: S-002458

Identifiers

Report No.: S-002458

Other IDs:

Cross-refs:

Citation information

Author(s): Suzanne Marie Ramiller, Neil Ramiller, Roger Werner, and Suzanne Stewart

Year: 1981 (Jan)

Title: Overview of Prehistoric Archaeology for the Northwest Region, California Archaeological Sites Survey: Del Norte, Humboldt, Mendocino, Lake, Sonoma, Napa, Marin, Contra Costa, Alameda

Affiliation: Northwest Regional Office, California Archaeological Sites Survey; Anthropological Studies Center, Sonoma State University

No. pages: 420

No. maps:

Attributes: Archaeological, Other research

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Not-mappable report.

Associated resources

Primary No.	Trinomial	Name
P-01-000080	CA-ALA-000060	Castro Valley
P-01-000084	CA-ALA-000307	West Berkeley Shell Mound
P-01-000086	CA-ALA-000309	Emeryville Shellmound
P-01-000104	CA-ALA-000328	Nelson's 328
P-01-000119	CA-ALA-000389	Site #1
P-01-000124	CA-ALA-000394	Pleasanton Meadows Site
P-01-000125	CA-ALA-000396	Noble's Rest Stop
P-01-000126	CA-ALA-000398	ICR-WR-4
P-01-000127	CA-ALA-000399	ICR-WR-5
P-01-000137	CA-ALA-000410	ICR-WR-16
P-01-000139	CA-ALA-000413	Santa Rita Village
P-01-002053	CA-ALA-000300	
P-01-002104	CA-ALA-000397	ICR-WR-3
P-07-000047	CA-CCO-000030	
P-07-000079	CA-CCO-000137	Monument
P-07-000080	CA-CCO-000138	Hotchkiss Mound
P-07-000081	CA-CCO-000139/H	Simone Mound
P-07-000092	CA-CCO-000150	Veale Tract #1
P-07-000093	CA-CCO-000151	
P-07-000105	CA-CCO-000222/H	Keller Ranch House Complex
P-07-000131	CA-CCO-000250	Nelson Survey Map #250a
P-07-000146	CA-CCO-000267	Nelson No. 267
P-07-000147	CA-CCO-000268	Voided, see P-07-000462
P-07-000148	CA-CCO-000269	Nelson No. 269
P-07-000149	CA-CCO-000270	Nelson No. 270
P-07-000150	CA-CCO-000271	Nelson No. 271
P-07-000168	CA-CCO-000290	Nelson No. 290
P-07-000173	CA-CCO-000295	Nelson No. 295
P-07-000175	CA-CCO-000298	Nelson's No. 298, Stege
P-07-000177	CA-CCO-000300	Nelson's Survey 300
P-07-000185	CA-CCO-000308	Stone Valley Site
P-07-000186	CA-CCO-000309	The Rossmoor Site
P-07-000190	CA-CCO-000352	Diablo Road Site
P-07-000323	CA-CCO-000553/H	Alvarado Park, Wildcat Regional
P-07-000440	CA-CCO-000259	Barker's Rodeo

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P-07-000447	CA-CCO-000389	492-1-A
P-07-000448	CA-CCO-000390	492-2-A
P-07-000449	CA-CCO-000391	492-3-B
P-07-000462	CA-CCO-000655	Nelson's 268B
P-07-000470	CA-CCO-000372	[none]
P-07-000474	CA-CCO-000392	492-4-B
P-07-000476	CA-CCO-000698	Nelson No. 259
P-07-000481	CA-CCO-000356	
P-07-000674	CA-CCO-000311	
P-07-000710	CA-CCO-000349	Void, see P-07-000323
P-07-000724	CA-CCO-000377	SL-1
P-07-004621		#1 Claeys Ranch
P-08-000015	CA-DNO-000011/H	Ta'gia n te (OHP)
P-08-000018	CA-DNO-000014/H	Clnya'tLtcI (Waterman 1925)
P-08-000021	CA-DNO-000017/H	MesLteLn
P-08-000090	CA-DNO-000088	Cemetry of Meslteltun
P-12-000125	CA-HUM-000067/H	Loud 67
P-12-000175	CA-HUM-000118	Patrick's Point #4
P-12-000186	CA-HUM-000129/H	Tsa'hpekW
P-12-000194	CA-HUM-000169	Tsurai
P-12-000199	CA-HUM-000174	Cone Rock, Sea Gull Rock
P-12-000202	CA-HUM-000177	MM-1
P-12-000207	CA-HUM-000182	Shelter Cove, X-1
P-12-000209	CA-HUM-000184	Etter Mound, X-3
P-12-000210	CA-HUM-000185	X-4
P-12-000211	CA-HUM-000186	X-5
P-12-000263	CA-HUM-000245	Stormy Saddle Site
P-12-000264	CA-HUM-000246	Pine Ridge Site
P-12-000266	CA-HUM-000248	Humboldt Gully Site
P-12-000336	CA-HUM-000323	Nooning Creek
P-12-000442	CA-HUM-000435	Mud Springs Site
P-12-000445	CA-HUM-000439	RNP-S-4
P-12-000458	CA-HUM-000452	RNP-S-22
P-17-000006	CA-LAK-000261	Fredrickson "A"
P-17-000026	CA-LAK-000510	5A
P-17-000035	CA-LAK-000753	14A
P-17-000072	CA-LAK-000036	Borax Lake Site
P-17-000114	CA-LAK-000089	Rattlesnake Island
P-17-000177	CA-LAK-000153	LAK 307
P-17-000286	CA-LAK-000267	Mauldin 196
P-17-000287	CA-LAK-000268	CA-LAK-785
P-17-000289	CA-LAK-000271	[none]
P-17-000290	CA-LAK-000272	CA-LAK-272/Full Circle Field 2
P-17-000307	CA-LAK-000291	Mauldin 221
P-17-000320	CA-LAK-000305	Sam Alley Site
P-17-000392	CA-LAK-000380	The Mostin Site
P-17-000407	CA-LAK-000395	GR-11
P-17-000437	CA-LAK-000425	LAK-S270
P-17-000446	CA-LAK-000435	Diwi'lem
P-17-000470	CA-LAK-000471	27A
P-17-000531	CA-LAK-000585	2A
P-17-000535	CA-LAK-000589	A161
P-17-000546	CA-LAK-000605	G-99
P-17-000550	CA-LAK-000609/H	G-103
P-17-000551	CA-LAK-000610	G-104
P-17-000554	CA-LAK-000613/H	Ford Flat Site
P-17-000572	CA-LAK-000643	Pirate's Buried Site
P-17-000610	CA-LAK-000711	PBL9
P-17-000639	CA-LAK-000741	[none]

Report Detail: S-002458

P-17-000640	CA-LAK-000742	[none]
P-17-000673	CA-LAK-000785	Voided: see P-17-000287
P-17-000787	CA-LAK-000944	Middle Creek CCC Camp
P-21-000017	CA-MRN-000266	PB 266
P-21-000034	CA-MRN-000001	Nelson No. 1
P-21-000039	CA-MRN-000008	
P-21-000051	CA-MRN-000020	Nelson No. 20
P-21-000053	CA-MRN-000022	Nelson No. 22
P-21-000057	CA-MRN-000026	Nelson No. 26
P-21-000058	CA-MRN-000027	Nelson No. 27
P-21-000106	CA-MRN-000076	Nelson No. 76
P-21-000143	CA-MRN-000115	Nelson No. 115
P-21-000163	CA-MRN-000138/H	Nelson No. 138
P-21-000177	CA-MRN-000152	Nelson No. 152
P-21-000217	CA-MRN-000192	Nelson No. 192
P-21-000221	CA-MRN-000196	Nelson No. 196
P-21-000235	CA-MRN-000216/H	DNG-1
P-21-000242	CA-MRN-000232/H	PB 232 b
P-21-000245	CA-MRN-000235/H	Beardsley's 301
P-21-000252	CA-MRN-000242/H	PB No. 242 - Cauley
P-21-000262	CA-MRN-000275	PB 275
P-21-000283	CA-MRN-000298/H	DNG-2
P-21-000290	CA-MRN-000307/H	Probably 232 C
P-21-000291	CA-MRN-000308	
P-21-000295	CA-MRN-000315	Nelson No. 86C
P-21-000332	CA-MRN-000357/H	Bayonet Midden
P-21-000335	CA-MRN-000362	
P-21-000342	CA-MRN-000370	S.A. VIII
P-21-000346	CA-MRN-000374	
P-21-000347	CA-MRN-000375	The Palo Marin Site
P-21-000368	CA-MRN-000402	
P-21-000369	CA-MRN-000403	
P-21-000370	CA-MRN-000404	
P-21-000651	CA-MRN-000358	S.A. II (San Antonio II)
P-21-000653	CA-MRN-000391	
P-21-002539	CA-MRN-000682	S.A. VII (Northwestern Archaeol.
P-23-000143	CA-MEN-000069	69
P-23-000387	CA-MEN-000320	Voided; See P-23-000590
P-23-000450	CA-MEN-000455	"Digger Post"
P-23-000475	CA-MEN-000483/H	may be Pomo Village- Kroeber
P-23-000478	CA-MEN-000486	
P-23-000492	CA-MEN-000500	
P-23-000534	CA-MEN-000583	
P-23-000535	CA-MEN-000584	
P-23-000536	CA-MEN-000585	
P-23-000537	CA-MEN-000586	
P-23-000539	CA-MEN-000588	
P-23-000590	CA-MEN-000643	Eel River Work Center
P-23-000786	CA-MEN-000851	
P-23-000789	CA-MEN-000854	Upper Twin Rocks
P-23-000790	CA-MEN-000855	Milling Stone Basin
P-23-000791	CA-MEN-000856	Wagon Trail
P-23-000792	CA-MEN-000857/H	White Hawk Top
P-23-000793	CA-MEN-000858	White Hawk Yoostabe
P-23-000796	CA-MEN-000861	Long Doe Petroglyph/Field Desi
P-23-000835	CA-MEN-000900	Upper Coffee Mill Flat
P-23-001034	CA-MEN-001111	Spring Site
P-23-001060	CA-MEN-001154	NEIYI
P-23-001063	CA-MEN-001157	S-6435

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P-23-001520	CA-MEN-001633	Oikat
P-23-002898	CA-MEN-000405	Fenenga 1
P-23-002915	CA-MEN-000482	MEN-482
P-23-002936	CA-MEN-000546	Possibly Barrett's (1908, p. 140)
P-23-002945	CA-MEN-000555	[none]
P-28-000015	CA-NAP-000001	#1; Goddard; Oakville
P-28-000027	CA-NAP-000014	Las Trancas
P-28-000028	CA-NAP-000015/H	#15, Suscol Mound #5
P-28-000029	CA-NAP-000016	#16
P-28-000032	CA-NAP-000021	ACRS-PV-1
P-28-000045	CA-NAP-000039	#39
P-28-000061	CA-NAP-000057	Peripoli
P-28-000063	CA-NAP-000060	UCMA Napa 60-50
P-28-000066	CA-NAP-000063	
P-28-000077	CA-NAP-000074	#4
P-28-000088	CA-NAP-000089	#23
P-28-000092	CA-NAP-000093	Possibly Kroeber's "Topai"
P-28-000093	CA-NAP-000094	# 28
P-28-000097	CA-NAP-000098	#32
P-28-000123	CA-NAP-000129	B-53-GG
P-28-000125	CA-NAP-000131	Genoa Site
P-28-000150	CA-NAP-000158	B-59-Z
P-28-000199	CA-NAP-000234	Roy Pridmore #3
P-28-000209	CA-NAP-000247	ACRS-BD-6
P-28-000218	CA-NAP-000261	D.T.Davis #49; UCAS-B 277
P-28-000222	CA-NAP-000270	CA-NAP-270
P-28-000310	CA-NAP-000410	Querried Quarry Site
P-28-000311	CA-NAP-000411/H	[none]
P-28-000329	CA-NAP-000432	TR-23
P-28-000330	CA-NAP-000433	T-41 (UCD Files)
P-28-000362	CA-NAP-000468	Mudflat Site (2)
P-28-000418	CA-NAP-000535	Tom's Mounds
P-28-000419	CA-NAP-000536	[none]
P-28-000420	CA-NAP-000537	[none]
P-28-000421	CA-NAP-000538	[none]
P-28-000422	CA-NAP-000539	Klaffke's Mound
P-28-000428	CA-NAP-000545	I
P-28-000828	CA-NAP-000032	#32; Kolb; Rutherford; Pistorias
P-28-000912	CA-NAP-000311	
P-49-000073	CA-SON-000004/H	Carrillo Adobe
P-49-000079	CA-SON-000020	Lithic Scatter
P-49-000112	CA-SON-000084	Santa Rosa Creek site
P-49-000135	CA-SON-000159	Stony Glenn Lane
P-49-000194	CA-SON-000222	Nelson No. 222
P-49-000228	CA-SON-000256	P-30
P-49-000264	CA-SON-000292	The Ranch Site
P-49-000265	CA-SON-000293	Probably Kelly's Site "Tiwut-Huy
P-49-000271	CA-SON-000299	"Kili"
P-49-000291	CA-SON-000320/H	"Loken-Huye" (Kelly)
P-49-000292	CA-SON-000321/H	Peter's 321
P-49-000295	CA-SON-000324	Peter's 324
P-49-000318	CA-SON-000347	Gleason Beach 1
P-49-000329	CA-SON-000358	VOIDED - see P-49-000087
P-49-000330	CA-SON-000359	Hidden Valley Ranch
P-49-000340	CA-SON-000369	Atcacinateawalli
P-49-000342	CA-SON-000371	Foster's Ranch
P-49-000360	CA-SON-000389	Carriger Creek site
P-49-000362	CA-SON-000391	S.A.1
P-49-000363	CA-SON-000392	KING #5

Report Detail: S-002458

P-49-000369	CA-SON-000400	S.A. VII (Northwestern Archaeol.
P-49-000371	CA-SON-000402	TC-1
P-49-000423	CA-SON-000455/H	Gables Site
P-49-000424	CA-SON-000456	
P-49-000434	CA-SON-000466	
P-49-000483	CA-SON-000518	SDA-30
P-49-000512	CA-SON-000547	H-51
P-49-000521	CA-SON-000556	H-41
P-49-000548	CA-SON-000583	SRI-3001
P-49-000620	CA-SON-000670/H	SDA-1
P-49-000653	CA-SON-000710	SDA-61
P-49-000671	CA-SON-000729	SDA-104
P-49-000682	CA-SON-000740	G.E. - 8
P-49-000683	CA-SON-000741/H	G.E. - 9
P-49-000730	CA-SON-000789	Geysers Forty-Four
P-49-000731	CA-SON-000790	Geysers Forty-Five
P-49-000732	CA-SON-000791	Geysers Forty-Six
P-49-000733	CA-SON-000792	Geysers Forty-Seven
P-49-000846	CA-SON-000906	Miller's Garden Site
P-49-000860	CA-SON-000920	[none]
P-49-000887	CA-SON-000948	
P-49-000913	CA-SON-000976	
P-49-000914	CA-SON-000977	
P-49-000915	CA-SON-000978	
P-49-000916	CA-SON-000979	
P-49-000917	CA-SON-000980	
P-49-000959	CA-SON-001025	Redwood Thompson Site
P-49-000970	CA-SON-001036	Soledad
P-49-000976	CA-SON-001042	
P-49-000978	CA-SON-001044	Walnut Orchard Site
P-49-000981	CA-SON-001047	Rosehip Site
P-49-000982	CA-SON-001048	Laguna Grande
P-49-000983	CA-SON-001049	Willow Marsh Site
P-49-000990	CA-SON-001058	
P-49-000992	CA-SON-001060	Madrone Knoll
P-49-001081	CA-SON-001154	Site No. 1
P-49-001082	CA-SON-001155	Site No. 2
P-49-001083	CA-SON-001156	Site No. 3
P-49-001084	CA-SON-001157	Site No. 4
P-49-001085	CA-SON-001158	Site No. 5
P-49-001086	CA-SON-001159/H	Site No. 6
P-49-001087	CA-SON-001160	Site No. 7
P-49-001109	CA-SON-001182	Doberman Terrace
P-49-001121	CA-SON-001195	Covert Lane Site

No. resources: 256

Has informals: No

Location information

County(ies): Alameda, Contra Costa, Del Norte, Humboldt, Lake, Marin, Mendocino, Napa, Sonoma

USGS quad(s): ~All quads - Alameda Co., ~All quads - Contra Costa Co., ~All quads - Del Norte Co., ~All quads - Humboldt Co., ~All quads - Lake Co., ~All quads - Marin Co., ~All quads - Mendocino Co., ~All quads - Napa Co., ~All quads - Sonoma Co.

Address:

PLSS:

Report Detail: S-002458

Database record metadata

	<i>Date</i>	<i>User</i>	
<i>Entered:</i>	4/7/2005	nwic-main	
<i>Last modified:</i>	11/10/201	hagell	
<i>IC actions:</i>	<i>Date</i>	<i>User</i>	<i>Action taken</i>
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
<i>Record status:</i>	Verified		

Report Detail: S-009462

Identifiers

Report No.: S-009462

Other IDs:

Cross-refs:

Citation information

Author(s): Teresa Ann Miller

Year: 1977 (Jun)

Title: Identification and Recording of Prehistoric Petroglyphs in Marin and Related Bay Area Counties

Affiliation: San Francisco State University

No. pages: 98

No. maps: 12

Attributes: Archaeological, Thesis/dissertation

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Associated resources

Primary No.	Trinomial	Name
P-07-000323	CA-CCO-000553/H	Alvarado Park, Wildcat Regional
P-21-000087	CA-MRN-000057	Nelson No. 57
P-21-000376	CA-MRN-000414	DEER ISLAND AREA #1
P-21-000378	CA-MRN-000416	DEER ISLAND AREA #3
P-21-000379	CA-MRN-000417	DEER ISLAND AREA #4
P-21-000380	CA-MRN-000418	DEER ISLAND AREA #5
P-21-000381	CA-MRN-000419	DEER ISLAND AREA #6
P-21-000382	CA-MRN-000420	17 NOVATO
P-21-000383	CA-MRN-000421	NOVATO #18
P-21-000384	CA-MRN-000422	NOVATO #19
P-21-000386	CA-MRN-000425	TIBURON 3 FIELD #3
P-21-000387	CA-MRN-000426	TIBURON #4 FIELD #4
P-21-000388	CA-MRN-000427	TIBURON #5 FIELD #5
P-21-000389	CA-MRN-000428	TIBURON 6
P-21-000390	CA-MRN-000429	TIBURON 7 FIELD #7
P-21-000391	CA-MRN-000430	TIBURON #8 FIELD #8
P-21-000392	CA-MRN-000431	TIBURON #9
P-21-000393	CA-MRN-000432	TIBURON 12
P-21-000394	CA-MRN-000433	TIBURON 13 FIELD #13
P-21-000395	CA-MRN-000434	TIBURON 14 AND 15 FIELD #'
P-21-000396	CA-MRN-000435	TIBURON #16 FIELD #16
P-21-000397	CA-MRN-000436	TIBURON 17 FIELD #17
P-21-000398	CA-MRN-000437	TIBURON 18
P-21-000399	CA-MRN-000438	TIBURON 19 FIELD #19
P-21-000400	CA-MRN-000439	TIBURON 20A
P-21-000401	CA-MRN-000440	TIBURON 21 FIELD #21
P-21-000402	CA-MRN-000442	Tiburon 1
P-21-000546	CA-MRN-000424	Tiburon 2
P-23-000789	CA-MEN-000854	Upper Twin Rocks
P-23-000790	CA-MEN-000855	Milling Stone Basin
P-49-000629	CA-SON-000682	Steward's 9 PT.
P-49-000785	CA-SON-000844	PETALUMA #1
P-49-000787	CA-SON-000846	PETALUMA #3

No. resources: 33

Has informals: Yes

Report Detail: S-009462

Location information

County(ies): Alameda, Contra Costa, Lake, Marin, Mendocino, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma

USGS quad(s): ~All quads - Alameda Co., ~All quads - Contra Costa Co., ~All quads - Lake Co., ~All quads - Marin Co., ~All quads - Mendocino Co., ~All quads - Napa Co., ~All quads - San Francisco Co., ~All quads - San Mateo Co., ~All quads - Santa Clara Co., ~All quads - Santa Cruz Co., ~All quads - Solano Co., ~All quads - Sonoma Co.

Address:

PLSS:

Database record metadata

Date User

Entered: 4/7/2005 nwic-main

Last modified: 9/10/2015 simsa

IC actions: Date User Action taken

4/7/2005 jay Appended records from NWICmain bibliographic database.

10/5/2010 muchb updated county list as per thesis content

7/2/2015 rinerg marked Verified

Record status: Verified

Report Detail: S-009583

Identifiers

Report No.: S-009583

Other IDs:

Cross-refs:

Citation information

Author(s): David W. Mayfield

Year: 1978 (Dec)

Title: Ecology of the Pre-Spanish San Francisco Bay Area

Affiliation: San Francisco State University

No. pages: 170

No. maps: 8

Attributes: Other research, Thesis/dissertation

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Masters Thesis. A study of the ecological setting of part of the San Francisco Bay Area as it existed prior to Spanish colonization. Not-mappable report.

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara, Santa Cruz

USGS quad(s): Altamont, Antioch North, Antioch South, Benicia, Big Basin, Brentwood, Briones Valley, Byron Hot Springs, Calaveras Reservoir, Castle Rock Ridge, Clayton, Cupertino, Diablo, Dublin, Franklin Point, Half Moon Bay, Hayward, Honker Bay, Hunters Point, Jersey Island, La Costa Valley, La Honda, Las Trampas Ridge, Lick Observatory, Livermore, Los Gatos, Mare Island, Mendenhall Springs, Milpitas, Mindego Hill, Montara Mtn, Morgan Hill, Mount Day, Mountain View, Newark, Niles, Oakland East, Oakland West, Palo Alto, Pigeon Point, Point Bonita, Redwood Point, Richmond, San Francisco North, San Francisco South, San Gregorio, San Jose East, San Jose West, San Leandro, San Mateo, San Quentin, Santa Teresa Hills, Tassajara, Vine Hill, Walnut Creek, Woodside

Address:

PLSS:

Database record metadata

Date User

Entered: 4/7/2005 nwic-main

Last modified: 7/16/2015 rinerg

IC actions: Date User

4/7/2005 jay

7/16/2015 rinerg

Action taken

Appended records from NWICmain bibliographic database.

set Collections=No; set Status=Verified

Record status: Verified

Report Detail: S-013417

Identifiers

Report No.: S-013417

Other IDs:

Cross-refs:

Citation information

Author(s):

Year: 1990 (Dec)

Title: Archaeological Survey Report, Rheem Creek Project, Town of Moraga, Contra Costa County, California

Affiliation: William Self Associates

No. pages: 18

No. maps: 2

Attributes: Archaeological, Field study

Inventory size: c 300 ac

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Contra Costa

USGS quad(s): Las Trampas Ridge

Address:

PLSS:

Database record metadata

Date User

Entered: 4/7/2005 nwic-main

Last modified: 12/2/2015 hagell

IC actions: Date User Action taken

4/7/2005 jay Appended records from NWICmain bibliographic database.

11/30/201 mikulikc database incomplete: no author submitted

Record status: Verified

Report Detail: S-016660

Identifiers

Report No.: S-016660

Other IDs:

Cross-refs:

Citation information

Author(s): Jeffrey B. Fentress

Year: 1992 (Jul)

Title: Prehistoric Rock Art of Alameda and Contra Costa Counties, California

Affiliation: California State University, Hayward

No. pages: 187

No. maps:

Attributes: Other research, Thesis/dissertation

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Masters Thesis. Not-mappable report.

Associated resources

Primary No.	Trinomial	Name
P-01-000035	CA-ALA-000014	Mortar Rock Park
P-01-000039	CA-ALA-000019/H	
P-01-000071	CA-ALA-000051	Vargas Road Petroglyph
P-01-000080	CA-ALA-000060	Castro Valley
P-01-000128	CA-ALA-000400	ICR-WR-6
P-01-000137	CA-ALA-000410	ICR-WR-16
P-01-000138	CA-ALA-000412	DOT-04-92-1
P-01-000144	CA-ALA-000418	
P-01-000195	CA-ALA-000477/H	Drove Right To It Site
P-01-000198	CA-ALA-000480	Site 1
P-01-000199	CA-ALA-000481/H	HBR-1 & 2
P-01-002112	CA-ALA-000505	
P-07-000029	CA-CCO-000009	Los Vaqueros #24 (LV-24)
P-07-000094	CA-CCO-000152	
P-07-000189	CA-CCO-000320	
P-07-000193	CA-CCO-000375/H	CA-CCO-375
P-07-000212	CA-CCO-000417	Locus 11: C1
P-07-000216	CA-CCO-000428	
P-07-000219	CA-CCO-000434/H	Vasco Caves
P-07-000230	CA-CCO-000450/H	Los Vaqueros #16, 21, 22 (LV-1
P-07-000242	CA-CCO-000462	Los Vaqueros #31 (LV-31)
P-07-000255	CA-CCO-000482	YBL-1
P-07-000260	CA-CCO-000487	YBL-6
P-07-000271	CA-CCO-000500	Site 1
P-07-000301	CA-CCO-000530	Fossil Ridge #1
P-07-000302	CA-CCO-000531	Fossil Ridge 2
P-07-000323	CA-CCO-000553/H	Alvarado Park, Wildcat Regional
P-07-000344	CA-CCO-000577	AR Site 2
P-07-000345	CA-CCO-000578	Peter Banks Rock
P-07-000346	CA-CCO-000579	Amos Site
P-07-000347	CA-CCO-000580	Amos Rock
P-07-000348	CA-CCO-000581	Star Rock/Stair Rock
P-07-000356	CA-CCO-000590	Old Stump Site
P-07-000362	CA-CCO-000597	Kellogg Unit #4 (K-4)
P-07-000374	CA-CCO-000609	Site 1 (Keller Landfill)
P-07-000725	CA-CCO-000382	Rock City #1

Report Detail: S-016660

P-07-000726	CA-CCO-000383	Rock City #2
P-07-000727	CA-CCO-000384	Rock City #3
P-07-000730	CA-CCO-000395	Rock City #4
P-07-000734	CA-CCO-000416	MD-2
P-07-000736	CA-CCO-000424	[none]
P-07-000738	CA-CCO-000429	Artist Point
P-07-000739	CA-CCO-000430	Shotstar

No. resources: 43

Has informals: No

Location information

County(ies): Alameda, Contra Costa

USGS quad(s): ~All quads - Alameda Co., ~All quads - Contra Costa Co.

Address:

PLSS:

Database record metadata

Date *User*

Entered: 4/7/2005 nwic-main

Last modified: 9/18/2015 grahams

IC actions: *Date* *User* *Action taken*

4/7/2005 jay Appended records from NWICmain bibliographic database.

10/2/2009 muchb updated county information

9/18/2015 rinerg fill out the lists of counties and quads based on map coverage

Record status: Verified

Report Detail: S-017835

Identifiers

Report No.: S-017835

Other IDs:

Cross-refs:

Citation information

Author(s): Judy Myers Suchey

Year: 1975 (Dec)

Title: Biological Distance of Prehistoric Central California Populations Derived from Non-Metric Traits of the Cranium

Affiliation: University of California, Riverside

No. pages: 186

No. maps: 13

Attributes: Thesis/dissertation

Inventory size:

Disclosure: Not for publication

Collections: Yes

General notes

PhD dissertation. Burials from Santa Cruz Island and Sacramento, San Joaquin, & Los Angeles counties were also examined. The GIS contains report polygons from the paper maps.

Associated resources

Primary No.	Trinomial	Name
P-01-000086	CA-ALA-000309	Emeryville Shellmound
P-01-000104	CA-ALA-000328	Nelson's 328
P-01-000105	CA-ALA-000329	Nelsons 329
P-06-000025	CA-COL-000001	S-1 Miller
P-07-000080	CA-CCO-000138	Hotchkiss Mound
P-07-000081	CA-CCO-000139/H	Simone Mound
P-07-000083	CA-CCO-000141	C-141
P-07-000087	CA-CCO-000145	Byron Tract
P-21-000017	CA-MRN-000266	PB 266
P-21-000193	CA-MRN-000168	Nelson No. 168
P-21-000242	CA-MRN-000232/H	PB 232 b
P-21-000252	CA-MRN-000242/H	PB No. 242 - Cauley
P-48-000010	CA-SOL-000002	Peterson 2
P-57-000145	CA-YOL-000013	Mustang Site

No. resources: 14

Has informals: No

Location information

County(ies): Alameda, Colusa, Contra Costa, Marin, Napa, Other, Solano, Sonoma, Yolo

USGS quad(s): ~All quads - Alameda Co., ~All quads - Colusa Co., ~All quads - Contra Costa Co., ~All quads - Marin Co., ~All quads - Napa Co., ~All quads - Solano Co., ~All quads - Sonoma Co., ~All quads - Yolo Co.

Address:

PLSS:

Database record metadata

Date User

Entered: 4/7/2005 nwic-main

Last modified: 10/15/201 riner

IC actions: Date User Action taken

4/7/2005 jay Appended records from NWICmain bibliographic database.

10/15/201 riner add county: Sonoma, Napa; this Thesis has GIS mapped components in both 'Other reports' and 'Reports (polygons)' layers.

Record status: Verified

Report Detail: S-018217

Identifiers

Report No.: S-018217

Other IDs:

Cross-refs:

Citation information

Author(s): Glenn Gmoser

Year: 1996 (Apr)

Title: Cultural Resource Evaluations for the Caltrans District 04 Phase 2 Seismic Retrofit Program, Status Report: April 1996

Affiliation: Caltrans

No. pages: 12

No. maps: 0

Attributes: Other research

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Status report of the evaluation of bridge structures. There were no location maps in the report.

Associated resources

Primary No.	Trinomial	Name
P-01-000014	CA-ALA-000483	Site 2
P-01-000023	CA-ALA-000002/H	Ohlones Cemetery
P-01-000227	CA-ALA-000548/H	Vallejo Mill
P-07-000108	CA-CCO-000225	Anaclario Site
P-07-000119	CA-CCO-000237	Loud's 422
P-38-000002	CA-SFR-000002	Shellmound No. 439
P-38-000004	CA-SFR-000004/H	Yerba Buena Island
P-41-000273	CA-SMA-000321	Hamilton #2
P-43-000106	CA-SCL-000092/H	Sargent Ranch
P-43-000297	CA-SCL-000289	GP-1
P-43-000624	CA-SCL-000677	The 237/880 Site
P-43-001078	CA-SCL-000699/H	Dollhouse Site
P-44-000010	CA-SCR-000002/H	Aptos Creek
P-44-000201	CA-SCR-000199H	Cactus Gardens
P-44-000300	CA-SCR-000313	Granite Ck. Rd./Highway 17 Inte
P-49-000195	CA-SON-000223	Nelson No. 223

No. resources: 16

Has informals: No

Location information

County(ies): Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Sonoma

USGS quad(s): ~All quads - Alameda Co., ~All quads - Contra Costa Co., ~All quads - Marin Co., ~All quads - Napa Co., ~All quads - San Francisco Co., ~All quads - San Mateo Co., ~All quads - Santa Clara Co., ~All quads - Santa Cruz Co., ~All quads - Sonoma Co.

Address:

PLSS:

Database record metadata

Date User

Entered: 4/7/2005 nwic-main

Last modified: 7/14/2015 rinerg

IC actions: Date User Action taken

4/7/2005 jay Appended records from NWICmain bibliographic database.

10/13/201 hagell edited database

7/14/2015 rinerg set status=Verified

Report Detail: S-018217

Record status: Verified

Report Detail: S-020395

Identifiers

Report No.: S-020395

Other IDs:

Cross-refs:

Citation information

Author(s): Donna L. Gillette

Year: 1998 (May)

Title: PCNs of the Coast Ranges of California: Religious Expression or the Result of Quarrying?

Affiliation: California State University, Hayward

No. pages: 148

No. maps: 4

Attributes: Archaeological, Thesis/dissertation

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Masters Thesis. Recorded sites in Santa Barbara County and in Oregon were also included in the report.

Associated resources

<i>Primary No.</i>	<i>Trinomial</i>	<i>Name</i>
P-07-000094	CA-CCO-000152	
P-07-000323	CA-CCO-000553/H	Alvarado Park, Wildcat Regional
P-12-000050	CA-HUM-000983	Squaw Rock
P-17-000071	CA-LAK-000034	Bachelor Valley No. 4
P-17-001315	CA-LAK-001577	LAKEPORT PCN BOULDER
P-21-000087	CA-MRN-000057	Nelson No. 57
P-21-000376	CA-MRN-000414	DEER ISLAND AREA #1
P-21-000378	CA-MRN-000416	DEER ISLAND AREA #3
P-21-000379	CA-MRN-000417	DEER ISLAND AREA #4
P-21-000381	CA-MRN-000419	DEER ISLAND AREA #6
P-21-000382	CA-MRN-000420	17 NOVATO
P-21-000383	CA-MRN-000421	NOVATO #18
P-21-000384	CA-MRN-000422	NOVATO #19
P-21-000386	CA-MRN-000425	TIBURON 3 FIELD #3
P-21-000387	CA-MRN-000426	TIBURON #4 FIELD #4
P-21-000388	CA-MRN-000427	TIBURON #5 FIELD #5
P-21-000389	CA-MRN-000428	TIBURON 6
P-21-000390	CA-MRN-000429	TIBURON 7 FIELD #7
P-21-000391	CA-MRN-000430	TIBURON #8 FIELD #8
P-21-000392	CA-MRN-000431	TIBURON #9
P-21-000393	CA-MRN-000432	TIBURON 12
P-21-000394	CA-MRN-000433	TIBURON 13 FIELD #13
P-21-000395	CA-MRN-000434	TIBURON 14 AND 15 FIELD #'
P-21-000396	CA-MRN-000435	TIBURON #16 FIELD #16
P-21-000397	CA-MRN-000436	TIBURON 17 FIELD #17
P-21-000398	CA-MRN-000437	TIBURON 18
P-21-000399	CA-MRN-000438	TIBURON 19 FIELD #19
P-21-000400	CA-MRN-000439	TIBURON 20A
P-21-000401	CA-MRN-000440	TIBURON 21 FIELD #21
P-21-000402	CA-MRN-000442	Tiburon 1
P-21-000419	CA-MRN-000465	WHIT'S ROCK
P-21-000433	CA-MRN-000481	ARS 78-72-ROCK 1
P-21-000546	CA-MRN-000424	Tiburon 2
P-21-000620	CA-MRN-000636	PETROGLYPH SITE SOUTH O
P-21-000621	CA-MRN-000637	PETROGLYPH SITE ON SMAL
P-21-000624	CA-MRN-000640	Petroglyph site near Taylor Road

Report Detail: S-020395

P-21-000661	CA-MRN-000452	Pat's Rock
P-23-000434	CA-MEN-000433	Bell Springs Petroglyph Rock
P-23-000809	CA-MEN-000874	KNIGHT'S VALLEY 2
P-23-000810	CA-MEN-000875	KNIGHT'S VALLEY 1
P-23-001698	CA-MEN-001912	SPYROCK ROAD PETROGLYP
P-23-001725	CA-MEN-001941	GENESIS #4,5,6,7,8
P-23-001792	CA-MEN-002020	POTTER VALLEY PETROGLYP
P-23-001798	CA-MEN-002028	GENESIS #9
P-23-001799	CA-MEN-002029	GENESIS #10
P-23-001803	CA-MEN-002034	GENESIS #16
P-23-001804	CA-MEN-002035	Infinity #1
P-23-001930	CA-MEN-002200	NWIC Restricted File
P-23-001942	CA-MEN-002213	Huntly Peak Petroglyphs
P-23-001950	CA-MEN-002221	Hidden Hill Petroglyph
P-23-001963	CA-MEN-002235	WATERSHED DOWN PETROG
P-35-000013	CA-SBN-000012	
P-43-000067	CA-SCL-000048	RANCHO PASO DEL VERDE O
P-43-000080	CA-SCL-000063	SFSU-SCL-6
P-43-000287	CA-SCL-000279	
P-43-000289	CA-SCL-000281	ARS 77-97-3
P-43-000504	CA-SCL-000503	COE-29
P-49-000046	CA-SON-000929	JAN'S ROCK
P-49-000240	CA-SON-000268	not mappable: Steward's 8 PT.
P-49-000533	CA-SON-000568	Midden site
P-49-000550	CA-SON-000585	Yorty Cupule Rock
P-49-000629	CA-SON-000682	Steward's 9 PT.
P-49-000785	CA-SON-000844	PETALUMA #1
P-49-000787	CA-SON-000846	PETALUMA #3
P-49-000868	CA-SON-000928	MIKE WHITSON ROCK I
P-49-000960	CA-SON-001026	NANA'S ROCKS
P-49-000975	CA-SON-001041	LEE'S ROCK
P-49-001004	CA-SON-001075	Kellies Rock
P-49-001087	CA-SON-001160	Site No. 7
P-49-001239	CA-SON-001319	KATHLEEN'S ROCK
P-49-002121	CA-SON-001383	

No. resources: 71

Has informals: Yes

Location information

County(ies): Alameda, Contra Costa, Humboldt, Lake, Marin, Mendocino, Other, San Benito, Santa Clara, Sonoma

USGS quad(s): ~All quads - Alameda Co., ~All quads - Contra Costa Co., ~All quads - Humboldt Co., ~All quads - Lake Co., ~All quads - Marin Co., ~All quads - Mendocino Co., ~All quads - San Benito Co., ~All quads - Santa Clara Co., ~All quads - Sonoma Co.

Address:

PLSS:

Database record metadata

Date User

Entered: 4/7/2005 nwic-main

Last modified: 9/10/2015 simsa

IC actions: Date User Action taken

4/7/2005 jay Appended records from NWICmain bibliographic database.

Record status: Verified

Report Detail: S-026732

Identifiers

Report No.: S-026732

Other IDs:

Cross-refs:

Citation information

Author(s): Sue-Ann Schroder and Thomas M. Origer

Year: 2003 (Feb)

Title: A Cultural Resources Survey for the Rancho Laguna Project, Contra Costa County, California

Affiliation: Tom Origer & Associates

No. pages: 19

No. maps: 4

Attributes: Archaeological, Field study

Inventory size: c 200 ac

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Contra Costa

USGS quad(s): Las Trampas Ridge

Address:

PLSS:

Database record metadata

Date *User*

Entered: 4/7/2005 nwic-main

Last modified: 12/2/2015 hagell

IC actions: *Date* *User* *Action taken*

4/7/2005 jay Appended records from NWICmain bibliographic database.

Record status: Verified

Report Detail: S-032596

Identifiers

Report No.: S-032596

Other IDs:	Type	Name
	Other	Contract #04A2098
	Caltrans	EA No. 447600

Cross-refs:

Citation information

Author(s): Randall Milliken, Jerome King, and Patricia Mikkelsen

Year: 2006 (Dec)

Title: The Central California Ethnographic Community Distribution Model, Version 2.0, with Special Attention to the San Francisco Bay Area, Cultural Resources Inventory of Caltrans District 4 Rural Conventional Highways

Affiliation: Consulting in the Past; Far Western Anthropological Research Group, Inc.

No. pages: 63

No. maps: 6

Attributes: Other research

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

The study is also within Calaveras, Amador, Tuolumne, Mariposa, Madera, & Tulare counties.

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Alameda, Contra Costa, Lake, Marin, Monterey, Napa, Other, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma, Yolo

USGS quad(s): ~All quads - Alameda Co., ~All quads - Contra Costa Co., ~All quads - Marin Co., ~All quads - Monterey Co., ~All quads - Napa Co., ~All quads - San Benito Co., ~All quads - San Francisco Co., ~All quads - San Mateo Co., ~All quads - Santa Clara Co., ~All quads - Santa Cruz Co., ~All quads - Solano Co., Aetna Springs, Allendale, Annapolis, Arched Rock, Asti, Bird Valley, Bodega Head, Brooks, Calistoga, Camp Meeker, Cazadero, Clarksburg, Clearlake Highlands, Cloverdale, Cotati, Courtland, Cuttings Wharf, Davis, Detert Reservoir, Duncans Mills, Eldorado Bend, Esparto, Fort Ross, Geyserville, Glascock Mtn, Glen Ellen, Grays Bend, Guerneville, Guinda, Healdsburg, Jericho Valley, Jimtown, Kelseyville, Kenwood, Knights Landing, Knoxville, Lake Berryessa, Liberty Island, Madison, Mare Island, Mark West Springs, Merritt, Middletown, Monticello Dam, Mount St Helena, Mt Vaca, Novato, Petaluma, Petaluma Point, Petaluma River, Point Reyes Ne, Rutherford, Sacramento West, Santa Rosa, Saxon, Sears Point, Sebastopol, Sonoma, Taylor Monument, The Geysers, Tombs Creek, Two Rock, Valley Ford, Warm Springs Dam, Whispering Pines, Wilson Valley, Winters, Woodland, Zamora

Address:

PLSS:

Database record metadata

	Date	User	
Entered:	3/1/2007	hagell	
Last modified:	10/29/201	rinerg	
IC actions:	Date	User	Action taken
	3/30/2015	neala	data review; added Lake county quads
	6/12/2015	mikulikc	corrected Yolo County quad locations from "all quads" to quads intersecting the GIS feature for S-032596
	10/20/201	rinerg	remove '~All quads - Sonoma', replace with Sonoma quads intersecting report feature

Record status: Verified

Report Detail: S-033600

Identifiers

Report No.: S-033600

Other IDs:

Cross-refs:

Citation information

Author(s): Jack Meyer and Jeff Rosenthal

Year: 2007 (Jun)

Title: Geoarchaeological Overview of the Nine Bay Area Counties in Caltrans District 4

Affiliation: Far Western Anthropological Research Group, Inc.

No. pages: 42

No. maps: 7

Attributes: Other research

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Nine unrecorded prehistoric resources.

Associated resources

<i>Primary No.</i>	<i>Trinomial</i>	<i>Name</i>
P-01-000001	CA-ALA-000554	Castlewood Site
P-01-000002	CA-ALA-000555	Meadowlark Dairy Site
P-01-000014	CA-ALA-000483	Site 2
P-01-000063	CA-ALA-000043	De Avillo
P-01-000064	CA-ALA-000044	Kaiser
P-01-000067	CA-ALA-000047	
P-01-000080	CA-ALA-000060	Castro Valley
P-01-000124	CA-ALA-000394	Pleasanton Meadows Site
P-01-000139	CA-ALA-000413	Santa Rita Village
P-01-000140	CA-ALA-000414	Iverson Site
P-01-001795	CA-ALA-000566	Hayward Bypass Site
P-01-002110	CA-ALA-000467	H&A-HEP-1
P-01-002160	CA-ALA-000574	Bernal
P-01-002162	CA-ALA-000576	Curtner Site
P-01-002245	CA-ALA-000586	Hwy 238-1
P-07-000019	CA-CCO-000696	Burial Site
P-07-000024	CA-CCO-000004	Slater site
P-07-000037	CA-CCO-000018/H	Marsh Site
P-07-000047	CA-CCO-000030	
P-07-000075	CA-CCO-000133	Ader site
P-07-000079	CA-CCO-000137	Monument
P-07-000088	CA-CCO-000146	Holland Tract
P-07-000089	CA-CCO-000147	
P-07-000108	CA-CCO-000225	Anaclario Site
P-07-000182	CA-CCO-000305	[none]
P-07-000185	CA-CCO-000308	Stone Valley Site
P-07-000186	CA-CCO-000309	The Rossmoor Site
P-07-000217	CA-CCO-000431	Murwood School
P-07-000239	CA-CCO-000459	Los Vaqueros #15 (LV-15)
P-07-000401	CA-CCO-000637	Dam Site
P-07-000721	CA-CCO-000368	Dutra 1
P-21-000010	CA-MRN-000249	4-MRN-249
P-21-000048	CA-MRN-000017	Nelson No.17
P-21-002615	CA-MRN-000674	Pelican site
P-28-000009	CA-NAP-000863	Adams Street Site
P-28-000028	CA-NAP-000015/H	#15, Suscol Mound #5

Report Detail: S-033600

P-28-000301	CA-NAP-000399	B- 55- V V
P-28-000967	CA-NAP-000916	Double Whoa!
P-38-000006	CA-SFR-000006	Loud's Presidio Mount
P-38-000028	CA-SFR-000028	BART Burial
P-38-000101	CA-SFR-000112	49 Stevenson
P-38-000102	CA-SFR-000113	5th & Market
P-38-000119	CA-SFR-000114	
P-41-000080	CA-SMA-000077	University Village Site (Gerow)
P-41-000284	CA-SMA-000273	Coyote Pt. Marina
P-43-000016	CA-SCL-000755	SCU/Old Alameda Burial site
P-43-000189	CA-SCL-000178	MH-22
P-43-000296	CA-SCL-000288	
P-43-000308	CA-SCL-000300	[none]
P-43-000310	CA-SCL-000302	
P-43-000423	CA-SCL-000418/H	
P-43-000424	CA-SCL-000419/H	441 N. 1st
P-43-000448	CA-SCL-000447/H	formerly known as CA-SCL-6E
P-43-000451	CA-SCL-000450	Rosendin 1
P-43-000485	CA-SCL-000484	
P-43-000561	CA-SCL-000566	
P-43-000604	CA-SCL-000609	Ronald McDonald House
P-43-000608	CA-SCL-000613	Stanford Man II
P-43-000614	CA-SCL-000619	Elk Site
P-43-000623	CA-SCL-000675	"Coyote Creek Site"
P-43-001015	CA-SCL-000553	Orchard 1001-1
P-43-001058	CA-SCL-000674	DC-1
P-43-001080	CA-SCL-000702	Waste Management Site
P-43-001163	CA-SCL-000828	Fuel Farm Site
P-43-001194	CA-SCL-000832	Iowa Avenue and Sunnyvale Ave
P-43-001576	CA-SCL-000849	152/156-5
P-48-000007	CA-SOL-000391	Fairfield PEC-1
P-48-000157	CA-SOL-000324	

No. resources: 68

Has informals: Yes

Location information

County(ies): Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma

USGS quad(s): ~All quads - Alameda Co., ~All quads - Contra Costa Co., ~All quads - Marin Co., ~All quads - Napa Co., ~All quads - San Francisco Co., ~All quads - San Mateo Co., ~All quads - Santa Clara Co., ~All quads - Solano Co., ~All quads - Sonoma Co.

Address:

PLSS:

Database record metadata

Date User

Entered: 9/24/2007 guldenj

Last modified: 7/16/2015 rinerg

IC actions: Date User Action taken
7/16/2015 rinerg set Status=verified

Record status: Verified

PROPERTY-NUMBER	PRIMARY-#	STREET ADDRESS	NAMES	CITY NAME	OWN	YR-C	OHP-PROG..	PRG-REFERENCE-NUMBER	STAT-DAT	NRS	CRIT
169370		1116 PINE ST		MARTINEZ	P	1924	PROJ.REVW.	HUD071130D	12/07/07	6Y	
087027	07-001761	824 RICHARDSON DR		MARTINEZ	P	1923	PROJ.REVW.	HUD931223A	02/02/94	6Y	
087026	07-001760	828 RICHARDSON DR		MARTINEZ	P	1923	PROJ.REVW.	HUD931223A	02/02/94	6Y	
087025	07-001759	832 RICHARDSON DR		MARTINEZ	P	1923	PROJ.REVW.	HUD931223A	02/02/94	6Y	
087024	07-001758	836 RICHARDSON DR		MARTINEZ	P	1923	PROJ.REVW.	HUD931223A	02/02/94	6Y	
172325		1435 RICHARDSON ST		MARTINEZ	P	1922	PROJ.REVW.	HUD080611A	07/01/08	6Y	
010511	07-001038	1634 RICHARDSON ST	WITTENMYER HOME	MARTINEZ	P	1890	HIST.SURV.	4553-0014-0000		3S	
163358		4197 RITA DR		MARTINEZ	P	1953	PROJ.REVW.	HUD061019K	10/19/06	6Y	
141061		11 ROBINSDALE RD		MARTINEZ	P	1950	HIST.RES.	DOE-07-03-0031-0000	06/16/03	6Y	
							PROJ.REVW.	HUD030502A	06/16/03	6Y	
131293		1174 SANTA FE AVE		MARTINEZ	P	1943	HIST.RES.	DOE-07-02-0012-0000	04/24/02	6Y	
							PROJ.REVW.	HUD020417B	04/24/02	6Y	
182931		1320 SANTA FE AVE		MARTINEZ	P		PROJ.REVW.	HUD100714II	07/26/10	6Y	
010512	07-001039	STRENTZEL LANE	JOHN MUIR BURIAL SITE	MARTINEZ	P	1856	HIST.SURV.	4553-0015-0000		3S	
010513	07-001040	608 TALBART ST	TENNENT HOME	MARTINEZ	P	1888	HIST.SURV.	4553-0016-0000		3S	
155879		817 TALBART ST		MARTINEZ	P	1930	PROJ.REVW.	HUD050914G	10/17/05	6Y	
084362	07-001754	1115 VINE ST		MARTINEZ	P	1923	PROJ.REVW.	HUD930901A	09/28/93	6Y	
010514	07-001041	524 WARD ST	STEWARTS GROCERY	MARTINEZ	P	1879	HIST.SURV.	4553-0017-0000		7N	
133293		GENERATOR BUILDING / OZOL DFSP	(VIC) MARTINEZ	F	1959	HIST.RES.	DOE-07-99-0391-0000		12/03/99	6Y	
							PROJ.REVW.	DOD991015A	12/03/99	6Y	
133292		GUARDHOUSE / OZOL DFSP	(VIC) MARTINEZ	F	1959	HIST.RES.	DOE-07-99-0390-0000		12/03/99	6Y	
							PROJ.REVW.	DOD991015A	12/03/99	6Y	
133291		ADMINISTRATIVE BUILDING / OZOL DFS	(VIC) MARTINEZ	F	1959	HIST.RES.	DOE-07-99-0389-0000		12/03/99	6Y	
							PROJ.REVW.	DOD991015A	12/03/99	6Y	
133294		FUEL DOCK / OZOL DFSP	(VIC) MARTINEZ	F	1959	HIST.RES.	DOE-07-99-0392-0000		12/03/99	6Y	
							PROJ.REVW.	DOD991015A	12/03/99	6Y	
133290		TANK FARM / TANKS #83001-83012 / O	(VIC) MARTINEZ	F	1958	HIST.RES.	DOE-07-99-0388-0000		12/03/99	6Y	
							PROJ.REVW.	DOD991015A	12/03/99	6Y	
164395		MARTINEZ DAM	(VIC) MARTINEZ	F	1946	PROJ.REVW.	BUR060508C		05/11/06	2S2	
010515	07-001042	ALHAMBRA VALLEY RD	JOHN SWETT WINERY SITE	(VIC) MARTINEZ	P	1853	HIST.SURV.	4553-0018-0000		7R	
010499	07-001026	SR 4	CHRISTIE UNDERPASS, BR. 28-39	(VIC) MARTINEZ	S	1925	HIST.SURV.	4553-0002-0000		7R	
010519	07-001046	CAMINO RICHARDO	EUCALYPTUS GLOBULUS TREE	MORAGA	S		HIST.SURV.	4556-0004-0000		5S2	
010518	07-001045	2100 DONALD DR	HACIENDA DE LAS FLORES	MORAGA	M	1937	HIST.SURV.	4556-0003-0000		7N	
010517	07-001044	MORAGA RD	WILLOW SPRING SCHOOL SITE	MORAGA	P	1855	HIST.SURV.	4556-0002-0000		7R	
155517		370 PARK ST		MORAGA	P	1950	PROJ.REVW.	FCC050728C	09/14/05	6Y	
010516	07-001043	ST MARYS RD	ST MARY'S COLLEGE	MORAGA	P	1928	HIST.SURV.	4556-0001-9999		7R	
010521	07-001048	1002 VIADER DR	MORAGA BARN	MORAGA	P	1913	HIST.SURV.	4556-0006-0000	01/16/92	7R	
							NAT.REG.	07-0015	01/16/92	7J	
129270	07-002535	LOS ARBOLES PUBLIC HOUSING PROJECT	OAKLEY				HIST.RES.	DOE-07-01-0037-0000	12/31/01	6Y	
							PROJ.REVW.	HUD011210D	12/31/01	6Y	
139205		413 LANDIS AVE	OAKLEY		P		HIST.RES.	DOE-07-03-0024-0000	04/16/03	6Y	
							PROJ.REVW.	HUD030404B	04/16/03	6Y	
138436		6200 SELLERS AVE	OAKLEY		P	1938	HIST.RES.	DOE-07-03-0020-0000	03/27/03	6Y	
							PROJ.REVW.	HUD030321C	03/27/03	6Y	
183404		DELTA MENDOTA CANAL (INC. INTAKE C	(VIC) OAKLEY	F	1951	PROJ.REVW.	BUR090305A		04/02/09	6Y	
185394		HOLLAND TRACT RD	HOLLAND TRACT SHED	(VIC) OAKLEY	U	1958	PROJ.REVW.	COE080430E	05/20/08	6Y	
010532	07-001049	24 ADOBE LANE	JOAQUIN MORAGA ADOBE	ORINDA	P	1841	HIST.RES.	NPS-72000223-0000	01/01/72	1S	
							HIST.SURV.	4563-0001-0000	01/01/72	1S	
010537	07-001054	BEAR CREEK RD	HAMPTONS GRAVE	ORINDA	C	1878	HIST.SURV.	SHL-0509-0000	09/24/53	7L	
							HIST.SURV.	4563-0006-0000		5S2	

From:
CALIFORNIA INVENTORY
OF
HISTORIC RESOURCES

March 1976

Edmund G. Brown Jr.
*Governor
State of California*

Claire T. Dedrick
Secretary for Resources

Herbert Rhodes
*Director
Department of Parks and Recreation*



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
P.O. Box 2390 Sacramento 95811

Contra Costa County (Continued)

FERNDALE SPRINGS SITE. ALHAMBRA ROAD NEAR MARTINEZ,
THEME: SOCIAL/EDUCATION.

FERRY LANDING. MOUTH OF ALHAMBRA CREEK NEAR CROCKETT,
THEME: ECONOMIC/INDUSTRIAL.

FISH RANCH. BERKELEY HILLS, ABOVE PRESENT CALDECOTT
TUNNEL, STATE HIGHWAY 24, THEME: ECONOMIC/INDUSTRIAL.

GALINDO, (FRANCISCO) HOME. 1637 AMADOR STREET, CONCORD.
THEME: SOCIAL/EDUCATION.

GEDDES HOUSE. ON MARSH CREEK ROAD, WEST SIDE STATE
HIGHWAY 4, NEAR BRENTWOOD, THEME: EXPLORATION/
SETTLEMENT.

GIANT POWDER WORK. PT. PINOLE. THEME: ECONOMIC/
INDUSTRIAL.

GRANGE HALL. 2ND AND F STREETS, ANTIOCH. THEME: SOCIAL/
EDUCATION.

GUTIERREZ, (CANDIDO) ADOBE. MOUTH OF SAN PABLO CREEK,
SAN PABLO. THEME: GOVERNMENT.

HAMPTON'S GRAVE. ORINDA. THEME: EXPLORATION/SETTLEMENT.

HARLAN HOME, 'EL NIDO'. SOUTH OF SAN RAMON, THEME:
SOCIAL/EDUCATION.

HENRY HOTEL. MOUNT DIABLO ROAD AND CALIF. HIGHWAY 21,
ALAMO. THEME: ECONOMIC/INDUSTRIAL.

HERCULES POWDER COMPANY. HERCULES. THEME: ECONOMIC/
INDUSTRIAL.

HOFFMAN HOUSE. HOFFMAN LANE, BYRON. THEME: SOCIAL/
EDUCATION.

HOOK HOME. 60 HOOKSTON ROAD, PLEASANT HILL. THEME:
EXPLORATION/SETTLEMENT.

IRON HOUSE SCHOOL. CYPRESS AVENUE AT SELLER ROAD,
WALNUT CREEK. THEME: SOCIAL/EDUCATION.

JENKINS, (ALEXANDER) HOUSE. 209 MORAGA WAY, MORAGA.
THEME: EXPLORATION/SETTLEMENT.

KIMBALL HOME. WEST THIRD NEAR E. STREET, ANTIOCH. THEME:
EXPLORATION/SETTLEMENT.

LAFAYETTE PLAZA. MOUNT DIABLO BOULEVARD AND MORAGA
ROAD, LAFAYETTE. THEME: EXPLORATION/SETTLEMENT.

LIBERTY GRAMMAR SCHOOL. EMPIRE ROAD AND MARSH CREEK
ROAD NEAR BRENTWOOD, THEME: SOCIAL/EDUCATION.

MARSH LANDING SITE. P.G. AND E. POWER PLANT AREA, ANTIOCH.
THEME: ECONOMIC/INDUSTRIAL.

MARSH, (CHARLES) HOUSE. ANTIOCH. THEME: EXPLORATION/
SETTLEMENT.

MARSH, (DR. JOHN) MURDER SITE. STATE HWY. 21, W. OF
MARTINEZ, THEME: EXPLORATION/SETTLEMENT.

***MARSH, (JOHN) HOME.** MARSH CREEK ROAD, APPROX. 6 MILES W.
OF BYRON, THEME: EXPLORATION/SETTLEMENT.

MARTINEZ CEMETERY. MARTINEZ. THEME: RELIGION.

MARTINEZ, (VICENTE) ADOBE. MARTINEZ. THEME: EXPLORATION/
SETTLEMENT. p 143

MASON STORE. LARCH STREET AND REDWOOD ROAD, MORAGA
VALLEY. THEME: ECONOMIC/INDUSTRIAL.

MCCABE HOUSE. END OF BRENTWOOD ROAD ON BYRON
HIGHWAY, BRENTWOOD. THEME: EXPLORATION/SETTLEMENT.

MENDENHALL, (WILLIAM) HOME. TASSAJARA ROAD, 4 MILES EAST
OF DANVILLE, THEME: EXPLORATION/SETTLEMENT.

MINER RANCH. SLEEPY HOLLOW AND MINER ROAD AREA, THEME:
ECONOMIC/INDUSTRIAL.

MORAGA LUMBER MILLS SITE. MORAGA. THEME: ECONOMIC/
INDUSTRIAL.

MORAGA SCHOOL. ORINDA. THEME: SOCIAL/EDUCATION.

***MORAGA, (JOAQUIN) ADOBE.** 24 ADOBE LANE, ORINDA. THEME:
ARCHITECTURE.

MORGAN HOUSE. ONE MILE SOUTH OF QUICKSILVER MINE, THEME:
ECONOMIC/INDUSTRIAL.

MOTHER NUT TREE. S.E. CORNER YGNACIO VALLEY ROAD AND OAK
GROVE ROAD, THEME: ECONOMIC/INDUSTRIAL.

MOUNT DIABLO QUICK SILVER CLAIM. INTERSECTION OF MARSH
CREEK AND MORGAN TERRITORY ROADS, THEME: ECONOMIC/
INDUSTRIAL.

MOUNT DIABLO WINERY. MARSH CREEK ROAD, CLAYTON. THEME:
ECONOMIC/INDUSTRIAL.

MOUNT DIABLO WILDLIFE REFUGE. 26 MILES EAST OF OAKLAND,
THEME: ARTS/LEISURE.

***MUIR, (JOHN) NATIONAL HISTORIC SITE.** 4202 ALHAMBRA AVE.,
MARTINEZ. THEME: ARCHITECTURE.

MURPHY AND WALLACE HOMES. RAILROAD AVENUE, SOUTH OF
DAINTY AVENUE, BRENTWOOD. THEME: SOCIAL/EDUCATION.

NEW YORK OF THE PACIFIC (BLACK DIAMOND). PITTSBURG.
THEME: ECONOMIC/INDUSTRIAL.

ORINDA PARK. SAN PABLO DAM ROAD, ORINDA. THEME: ARTS/
LEISURE.

ORINDA PARK HOTEL SITE. DAM ROAD AND BEAR CREEK ROAD,
ORINDA. THEME: ECONOMIC/INDUSTRIAL.

ORINDA PARK SCHOOL. ORINDA. THEME: SOCIAL/EDUCATION.

PACHECO INN. PACHECO. THEME: SOCIAL/EDUCATION.

PACHECO TOWNSITE. PACHECO. THEME: EXPLORATION/
SETTLEMENT.

PACHECO, (DON FERNANDO) ADOBE. GRANT AND SOLANO,
CONCORD. THEME: EXPLORATION/SETTLEMENT.

PACHECO, (DON SALVEO) ADOBE. CENTER PLAZA, CONCORD.
THEME: EXPLORATION/SETTLEMENT.

PARRISH HOUSE OF METHODIST CHURCH. BYRON. THEME:
RELIGION.

PINOLE ADOBE. 3 MILES SOUTH OF PINOLE, WEST BANK OF PINOLE
CREEK, THEME: EXPLORATION/SETTLEMENT.

PITTSBURG LANDING. SAN JOAQUIN RIVER, PITTSBURG. THEME:
ECONOMIC/INDUSTRIAL.

POINT ISABEL. EL CERRITO. THEME: EXPLORATION/SETTLEMENT.

PORT COSTA GRAIN WAREHOUSE. RIVER FRONT BETWEEN
CROCKETT AND PORT COSTA, THEME: ECONOMIC/INDUSTRIAL.

PORTA COSTA. PORT COSTA. THEME: ECONOMIC/INDUSTRIAL.

PRESTON HOUSE. SOUTH OF SMITH CORNERS, WEST SIDE STATE
HIGHWAY 4, NEAR BYRON, THEME: EXPLORATION/SETTLEMENT.

RAILROAD RANCH (OAKWOOD). EL NIDO AND DIABLO BLVD.,
THEME: ECONOMIC/INDUSTRIAL.

Contra Costa County (Continued)

SAKLAN INDIAN VILLAGE. TICE VALLEY, WALNUT CREEK. THEME: ABORIGINAL.

SANTA MARIA CHURCH. ORINDA. THEME: RELIGION.

SARANAP ELECTRIC RAILROAD. MORAGA VALLEY. THEME: ECONOMIC/INDUSTRIAL.

SELBY SMELTER. SELBY. THEME: ECONOMIC/INDUSTRIAL.

SHADELANDS RANCH. 2680 YGNACIO VALLEY ROAD, WALNUT CREEK. THEME: EXPLORATION/SETTLEMENT.

SHREVE'S STORE. MORAGA VALLEY. THEME: EXPLORATION/SETTLEMENT.

SMITHS LANDING. SAN JOAQUIN RIVER, EAST OF ANTIOCH. THEME: ECONOMIC/INDUSTRIAL.

SOMERSVILLE-NORTONVILLE COAL MINES AREA. SEVEN MILES EAST OF PITTSBURG. THEME: ECONOMIC/INDUSTRIAL.

SULLIVAN RANCH. ORINDA. THEME: ECONOMIC/INDUSTRIAL.

SWETT, (JOHN) RANCH. ALHAMBRA VALLEY ROAD, MARTINEZ. THEME: ECONOMIC/INDUSTRIAL.

*TAO HOUSE (EUGENE O'NEILL HOME). END OF KUSS ROAD OFF BRADFORD PLACE, DANVILLE VICINITY. THEME: ARTS/LEISURE.

TIMBER LANDING POINT. INDIAN SLOUGH OFF OLD RIVER. THEME: ECONOMIC/INDUSTRIAL.

TIMBER TRADING CENTER. WEST UNION CEMETERY AT POINT TIMBER ROAD AND STATE HIGHWAY 4. THEME: SOCIAL/EDUCATION.

UNION OIL COMPANY. OLEUM. THEME: ECONOMIC/INDUSTRIAL.

UNION STOCKYARDS SITE. ON RAILROAD AVENUE, TWO BLOCKS SOUTH OF SAN PABLO AVENUE, RODEO. THEME: ECONOMIC/INDUSTRIAL.

VASCO CAVES. SOUTH OF BYRON HOTSPRINGS ROAD. THEME: EXPLORATION/SETTLEMENT.

WAGNER RANCH (OAK VIEW RANCH). SAN PABLO DAM ROAD AND BEAR CREEK ROAD INTERSECTION. THEME: ARCHITECTURE.

WALKER, (JAMES T.) HOUSE. YGNACIO VALLEY ON PINE CANYON ROAD, WALNUT CREEK. THEME: SOCIAL/EDUCATION.

WILLS RANCH. LONE TREE ROAD, NEAR ANTIOCH. THEME: SOCIAL/EDUCATION.

DEL NORTE COUNTY - 14 SITES (ALSO 37 ARCHAEOLOGICAL SITES)**

BROTHER JONATHAN CEMETERY. CRESCENT CITY. THEME: ECONOMIC/INDUSTRIAL. *Desert city quad, p. 72*

CAMP LINCOLN. 6 MILES EAST OF CRESCENT CITY. THEME: MILITARY. *p. 182, Hiouchi or Gasquet quad*

CRESCENT CITY PLANK AND TURNPIKE ROAD. HWY. 101 AND ELK VALLEY ROAD, CRESCENT CITY. THEME: EXPLORATION/SETTLEMENT. *p. 130, Crescent city quad*

CRESCENT CITY LIGHTHOUSE (BATTERY POINT). END OF 'A' STREET, CRESCENT CITY. THEME: ECONOMIC/INDUSTRIAL. *p. 78, Desert city quad*

DEL NORTE COUNTY JAIL. 577 'H' STREET, CRESCENT CITY. THEME: GOVERNMENT. *p. 170, Desert city quad*

FORT TER-WER SITE. TERWER VALLEY. THEME: MILITARY. *p. 185, quad undetermined*

GASQUET TOLL ROAD. GASQUET. THEME: ECONOMIC/INDUSTRIAL. *p. 84, Gasquet quad*

M McNULTY PIONEER MEMORIAL HOME. 7TH AND 'H' STREET, CRESCENT CITY. THEME: SOCIAL/EDUCATION. *p. 210, Crescent city quad*

*OLD REQUA (REKWOI 4-DNO-5). REDWOOD NATIONAL PARK. THEME: ABORIGINAL. *p. 9, Regua quad*

S.S. EMIDIO. FRONT AND H STREETS, CRESCENT CITY. THEME: MILITARY. *p. 187, Crescent city*

SMITH, (JEDEDIAH) CAMPSITE. NEAR HIOUCHI BRIDGE. THEME: EXPLORATION/SETTLEMENT. *p. 159, Hiouchi quad*

SMITH, (JEDEDIAH) CAMPSITE. PEBBLE BEACH. THEME: EXPLORATION/SETTLEMENT. *p. 159, Crescent city quad*

TOLOWA INDIAN VILLAGE. PEBBLE BEACH DR. 100 YDS S. OF WESTERLY TERMINUS OF PACIFIC AVE., CRESCENT CITY. THEME: ABORIGINAL. *p. 11, Crescent city quad*

*YONTOCKET HISTORIC DISTRICT. THEME: ABORIGINAL. *p. 12, Smith River quad*

EL DORADO COUNTY - 40 SITES (ALSO 168 ARCHAEOLOGICAL SITES)**

BAYLEY HOUSE. PILOT HILL. THEME: ECONOMIC/INDUSTRIAL.

CARVED TREE MARKER. TRAGEDY SPRINGS. THEME: EXPLORATION/SETTLEMENT.

*COLOMA AND MARSHALL/GOLD DISCOVERY AREA. STATE ROUTE 49, 9 MILES N. OF PLACERVILLE. THEME: ECONOMIC/INDUSTRIAL.

COLOMA ROAD, COLOMA. MARSHALL GOLD DISCOVERY STATE HISTORIC PARK. THEME: ECONOMIC/INDUSTRIAL.

COLOMA ROAD, RESCUE. THEME: ECONOMIC/INDUSTRIAL.

CONDEMNED BAR. FOLSOM LAKE STATE RECREATION AREA. THEME: EXPLORATION/SETTLEMENT.

DIAMOND SPRINGS TOWNSITE. DIAMOND SPRINGS. THEME: EXPLORATION/SETTLEMENT.

DRY DIGGINGS - OLD HANGTOWN. BEDFORD AND MAIN, PLACERVILLE. THEME: EXPLORATION/SETTLEMENT.

EL DORADO. THEME: EXPLORATION/SETTLEMENT.

EL DORADO'S FALSE FRONT BUILDINGS. EL DORADO. THEME: ECONOMIC/INDUSTRIAL.

EL DORADO-NEVADA HOUSE 'MUD SPRINGS'-OVERLAND PONY EXPRESS ROUTE IN CALIFORNIA. EL DORADO. THEME: ECONOMIC/INDUSTRIAL.

FRIDAYS STATION-OVERLAND PONY EXPRESS ROUTE IN CALIFORNIA. EDGEWOOD. THEME: ECONOMIC/INDUSTRIAL.

GEORGETOWN. MAIN STREET. THEME: EXPLORATION/SETTLEMENT.

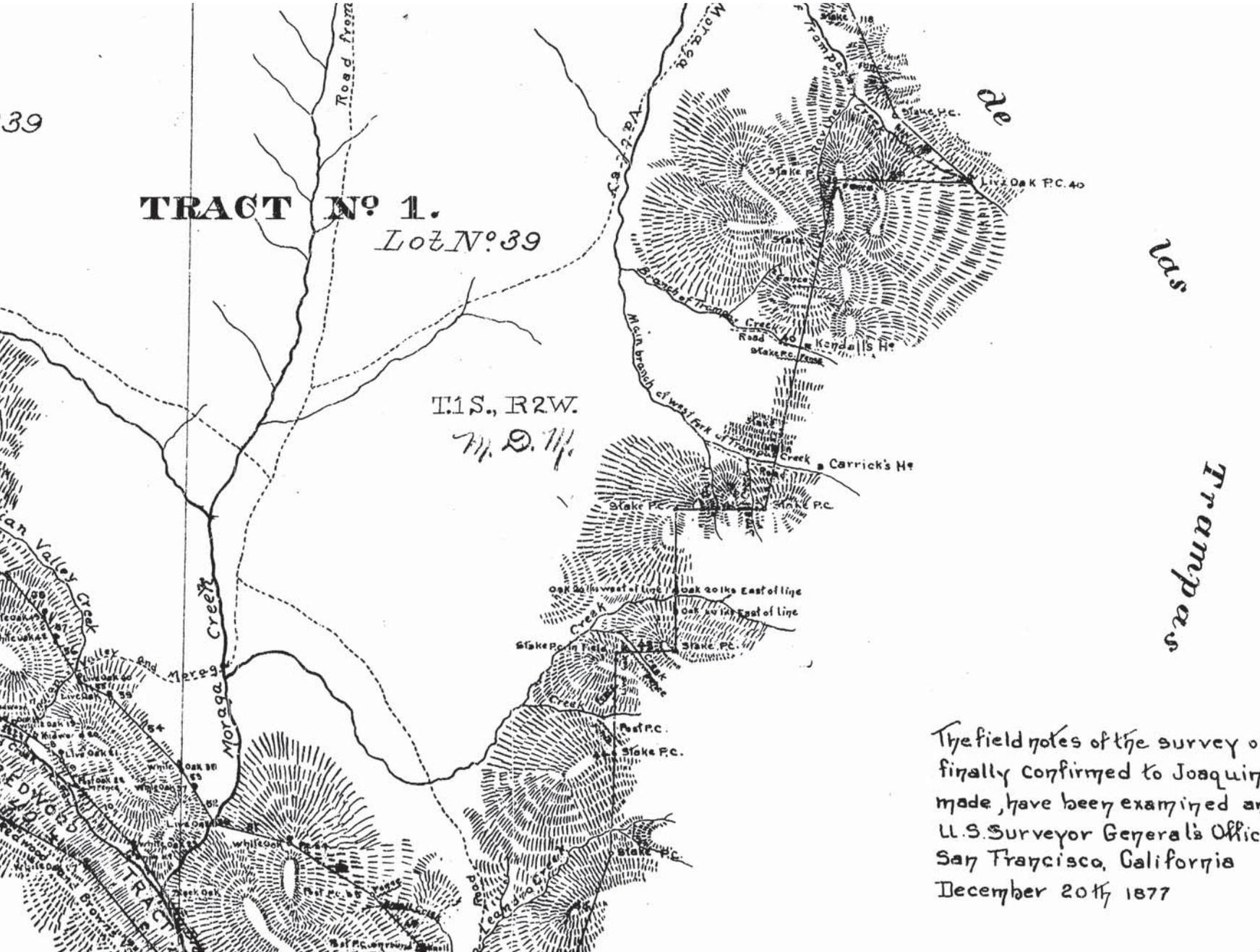
GRANGE HALL SITE (CALIFORNIA'S FIRST). 0.5 MILE NORTH OF PILOT HILL. THEME: SOCIAL/EDUCATION.

GREENWOOD. THEME: EXPLORATION/SETTLEMENT.

HANGMAN'S TREE. 305 MAIN ST., PLACERVILLE. THEME: GOVERNMENT.

HOBOKEN HOUSE. GREENWOOD-SPANISH DRY DIGGINGS ROAD. THEME: ECONOMIC/INDUSTRIAL.

LOG BARN. NORTH FORK OF COSUMNES RIVER, NASHVILLE. THEME: ECONOMIC/INDUSTRIAL.



Nº	Course	Dist.	Nº	Course
1	N 72° W.	80.00	25	S 62 1/4° E.
2	East	25.00	26	N. 70 1/4° E.
3	South	20.00	27	S 60 1/4° E.
4	S 89 3/4° E.	1.35	28	N. 70 3/4° E.
5	N. 17 1/4° E.	3.00	29	N. 6 1/4° E.
6	N. 84 1/2° E.	5.00	30	N. 23 3/4° E.
7	S 9 1/4° E.	2.70	31	S 78 1/4° E.
8	S 39 1/2° E.	2.00	32	N. 57 1/4° E.
9	S 76 3/4° E.	6.00	33	S 68 1/4° E.
10	N. 85 3/4° E.	5.00	34	N. 85 1/2° E.
11	N. 42° E.	1.00	35	S 38 1/2° W.
12	N. 88° E.	7.50	36	S 43 1/2° W.
13	N. 4 1/4° E.	4.00	37	S 23 1/2° W.
14	N. 44° E.	3.00	38	S 50 1/4° W.
15	East	4.00	39	West
16	S 22 1/2° E.	24.00	40	S 11 1/4° W.
17	N. 84 1/2° E.	3.18	41	West
18	S 54 3/4° E.	10.50	42	South
19	S 3 1/2° E.	2.00	43	West
20	S 59 1/2° E.	10.00	44	South
21	N. 18 1/4° E.	2.40	45	S 18 1/4° W.
22	N. 62 1/2° E.	3.00	46	S 59 1/2° W.
23	S 49 3/4° E.	3.00	47	N. 49 3/4° W.
24	N. 88° E.	3.60	48	N. 3° W.

Boundaries of Tract No. 1				
1	S 43 1/4° E.	23.16	8	S 55° E.
2	S 49 3/4° E.	17.48	9	S 32 3/4° E.
3	S 48 1/4° E.	25.95	10	S 45 3/4° E.
4	S 58 1/4° E.	26.66	11	S 32 1/4° E.
5	S 59 1/4° E.	6.85	12	S 57 1/4° W.
6	S 78° E.	3.95	13	N 39 1/4° W.
7	S 56 1/2° E.	7.91	14	N. 60 1/2° W.

The field notes of the survey of the Rancho Laguna de los Palos Colorados, finally confirmed to Joaquin Moraga et al, from which this map was made, have been examined and approved and are on file in the U.S. Surveyor General's Office San Francisco, California December 20th 1877



ATTACHMENT 3

Native American Consultation

Date: November 30, 2015
To: California Native American Heritage Commission
From: NCE
Subject: Request for Native American Contact List and Sacred File Search for the Moraga Culvert Replacement Project

Ms. Cynthia Gomez, Executive Secretary
California Native American Heritage Commission
1550 Harbor Boulevard, Suite 100
West Sacramento, California 95691

Dear Ms. Gomez:

The Town of Moraga (Town), located in Contra Costa County, California, proposes to repair and reconstruct two culverts within the town. Construction is anticipated to occur during dry weather in 2016. These culverts are located in the Las Trampas creek watershed along Bollinger Canyon Road, between Joseph Drive and St. Mary's Road. A section of the northern storm drain pipes is anticipated to be replaced in-kind, and the outfall and slope of the southern storm drain pipe will be stabilized to prevent further erosion.

The legal description of the project area is T.1S., R.2W.; Section 17. Two maps are enclosed for your use. Figure 1 is an overview map of the project area at a 1:24,000 scale with a USGS 7.5' quadrangle background. Figure 2 provides more detail of the project area depicting the culvert replacements.

NCE is assisting the Town in its project planning activities. NCE personnel will be conducting a cultural resources investigation on behalf of the proposed project. We request that you provide us a contact list for that portion of Contra Costa County in the vicinity of the Town. We also request that you conduct a search of your Sacred Lands database for any places of concern that may be located within or adjacent to the proposed project area.

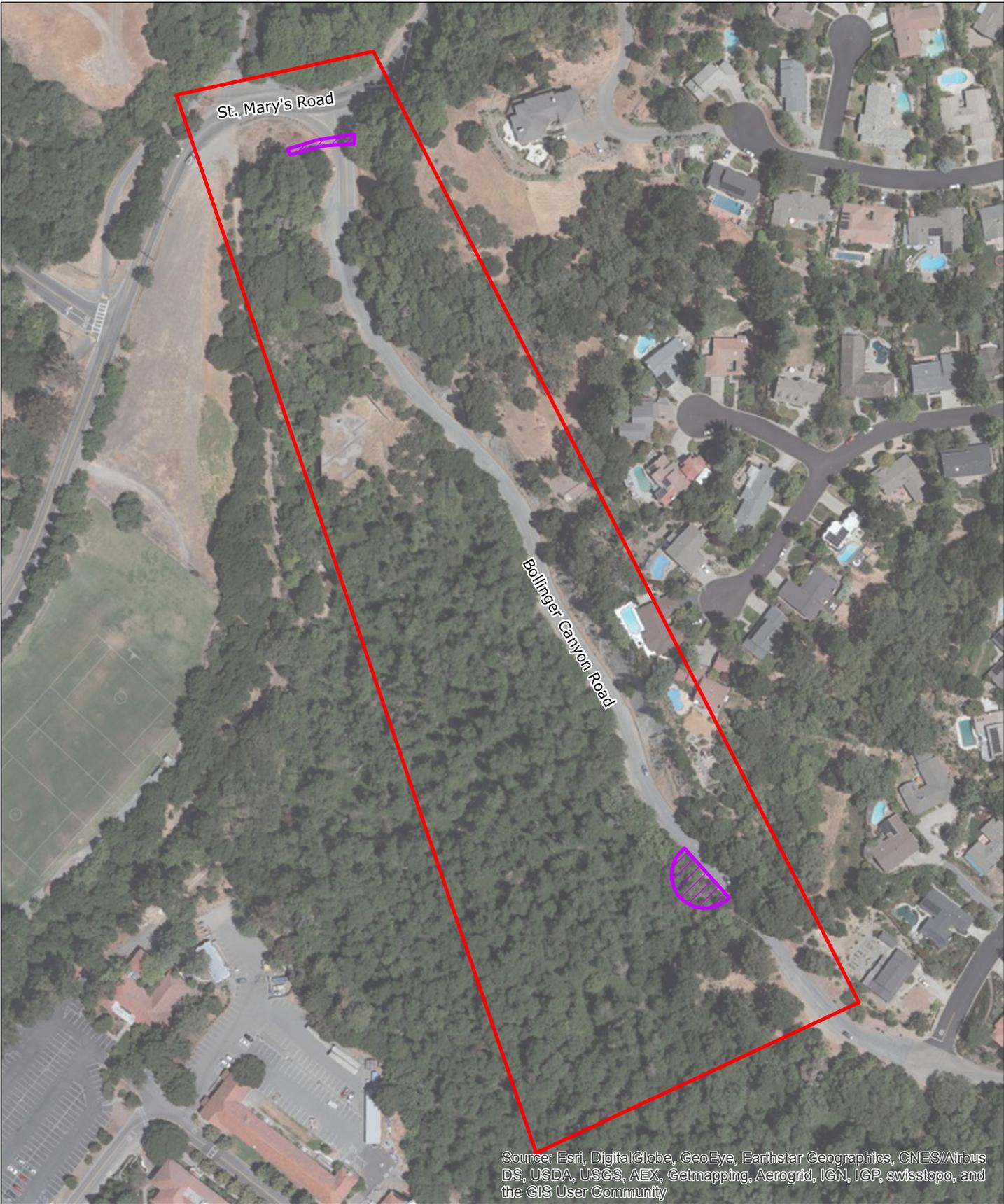
If you have any questions, please feel free to contact me via email at jhall@ncenet.com or by telephone (775-588-2505). I appreciate your assistance and look forward to hearing from you soon. If possible, please provide a response by Friday, December 11, 2015.

Sincerely,



Jeremy Hall
Project Scientist
NCE
PO Box 1760
Zephyr Cove, NV 89448
(775) 588-2505 x22

Enclosed: Figure 1, Overview Map; Figure 2, Area of Potential Effect Map



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Document Path: P:\Active Projects\Moraga Town - A576\576.11.55 - 2016 Pavement Reconstruction Project\Design & Mapping\GIS\Maps\Moraga Detail.mxd

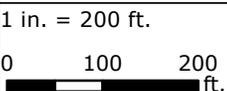
Moraga Culvert Replacement

Project Area Detail Map



Legend

- ▭ Project Area
- ▨ Proposed Culvert Replacement



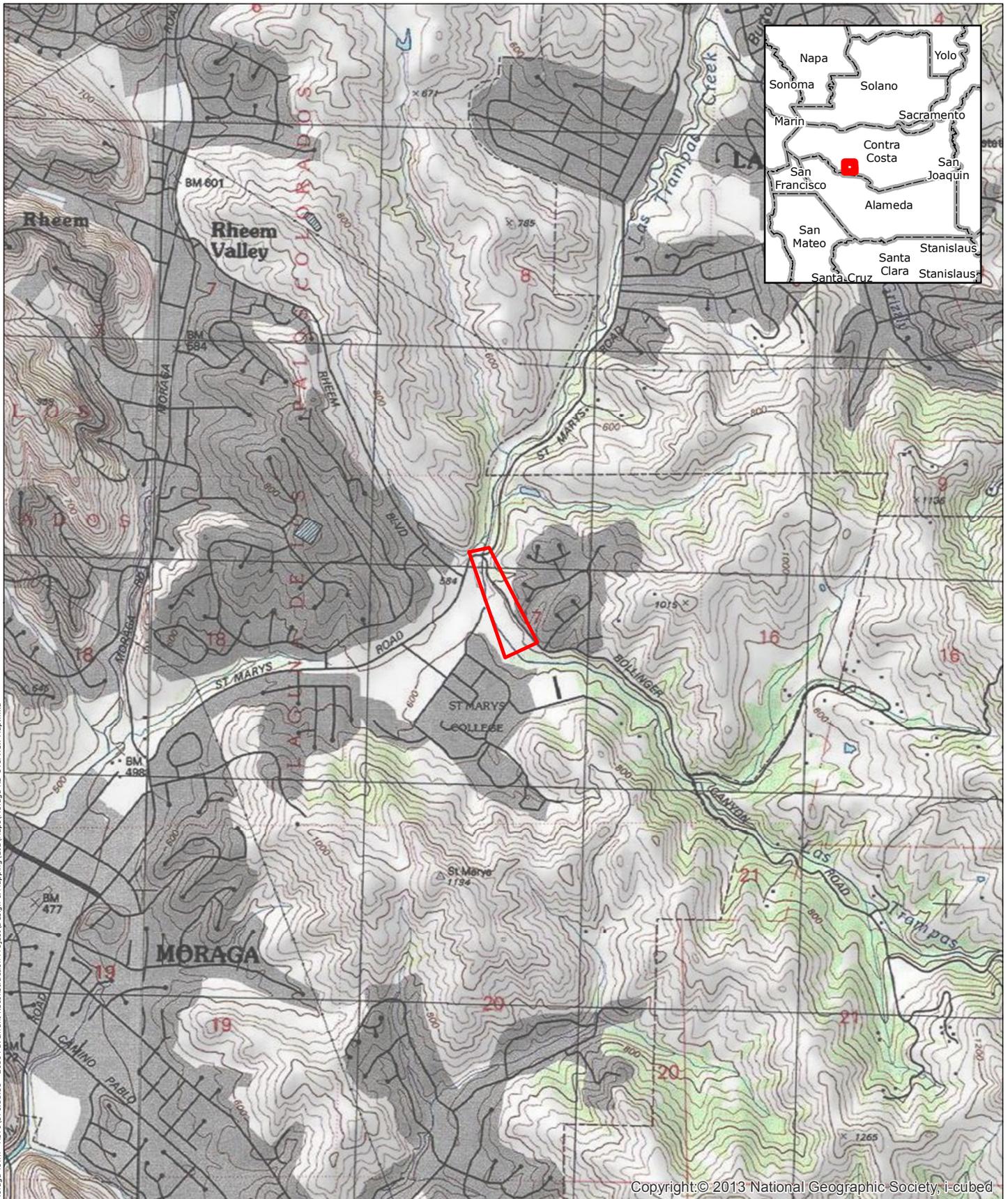
N



Credits: ESRI World Imagery basemap

Date: 11/30/2015
Author: jhall

Figure **1**



Document Path: P:\Active Projects\Moraga Town - A576\576.11.55 - 2016 Pavement Reconstruction Project\Design & Mapping\GIS\Maps\Moraga_RS_Overview_Map.mxd

Copyright: © 2013 National Geographic Society, i-cubed

Moraga Culvert Replacement Project

Project Area Overview Map



Legend

Project Area

1:24,000

0 1,000 2,000
ft.

N



Credits: ESRI World Imagery basemap

Date: 11/30/2015

Author: jhall

Figure

2

NATIVE AMERICAN HERITAGE COMMISSION

1550 HARBOR BLVD., SUITE 100
WEST SACRAMENTO, CA 95691
916-373-3710
Fax (916-373-5471)



December 14, 2015

Jeremy Hall
NCE
PO Box 1760
Zephyr Cove, NV 89448

Sent by Email: jhall@ncenet.com
Number of Pages: 2

RE: Moraga Culvert Replacement project, Contra Costa County

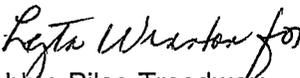
Dear Mr. Hall

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 Contact
Contra Costa County
December 14, 2015**

Katherine Erolinda Perez
P.O. Box 717
Linden , CA 95236
canutes@verizon.net
(209) 887-3415

Ohlone/Costanoan
Northern Valley Yokuts
Bay Miwok

The Ohlone Indian Tribe
Andrew Galvan
P.O. Box 3152
Fremont , CA 94539
chochenyo@AOL.com
(510) 882-0527 Cell

Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

(510) 687-9393 Fax

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

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 assessment for the proposed Moraga Culvert Replacement project, Contra Costa County.



December 15, 2015

Katherine Erolinda Perez
P.O. Box 717
Linden, CA 95236

Re: Request for Native American consultation for the Moraga Culvert Replacement Project,
Contra Costa County

Dear Ms. Perez:

The Town of Moraga (Town), located in Contra Costa County, California, proposes to repair and reconstruct two culverts within the town. Construction is anticipated to occur during dry weather in 2016. These culverts are located in the Las Trampas creek watershed along Bollinger Canyon Road, between Joseph Drive and St. Mary's Road. A section of the northern storm drain pipes is anticipated to be replaced in-kind, and the outfall and slope of the southern storm drain pipe will be stabilized to prevent further erosion.

The legal description of the project area is T.1S., R.2W.; Section 17. Two maps are enclosed for your use. Figure 1 is an overview map of the project area at a 1:24,000 scale with a USGS 7.5' quadrangle background. Figure 2 provides more detail of the project area depicting the culvert replacements.

NCE is assisting the Town in its project planning activities. NCE personnel will be conducting a cultural resources investigation on behalf of the proposed project. As part of the archaeological review for this project, I respectfully request any information that you wish to share about cultural resources that may exist within the project area. This notification provides you the opportunity to disclose the existence of Native American archaeological or cultural sites that could potentially be affected by the project and the opportunity to submit other comments regarding the project.

If you have any questions, please feel free to contact me via email at jhall@ncenet.com or by telephone (775-588-2505). I appreciate your assistance and look forward to hearing from you soon. If possible, please provide a response by Thursday, December 31, 2015.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jeremy Hall", is placed above the typed name.

Jeremy Hall
Project Scientist
NCE
PO Box 1760
Zephyr Cove, NV 89448
(775) 588-2505 x22

Enclosed: Figure 1, Overview Map; Figure 2, Area of Potential Effect Map



December 15, 2015

The Ohlone Indian Tribe
Andrew Galvan
P.O. Box 3152
Fremont, CA 94539

Re: Request for Native American consultation for the Moraga Culvert Replacement Project,
Contra Costa County

Dear Mr. Galvan:

The Town of Moraga (Town), located in Contra Costa County, California, proposes to repair and reconstruct two culverts within the town. Construction is anticipated to occur during dry weather in 2016. These culverts are located in the Las Trampas creek watershed along Bollinger Canyon Road, between Joseph Drive and St. Mary's Road. A section of the northern storm drain pipes is anticipated to be replaced in-kind, and the outfall and slope of the southern storm drain pipe will be stabilized to prevent further erosion.

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Sincerely,

A handwritten signature in blue ink, appearing to read "Jeremy Hall", is written over a faint, large-scale grid pattern that serves as a background for the lower right portion of the page.

Jeremy Hall
Project Scientist
NCE
PO Box 1760
Zephyr Cove, NV 89448
(775) 588-2505 x22

Enclosed: Figure 1, Overview Map; Figure 2, Area of Potential Effect Map



December 15, 2015

Trina Marine Ruano Familiy
Ramona Garibay
30940 Watkins Street
Union City, CA 94587

Re: Request for Native American consultation for the Moraga Culvert Replacement Project,
Contra Costa County

Dear Ms. Garibay:

The Town of Moraga (Town), located in Contra Costa County, California, proposes to repair and reconstruct two culverts within the town. Construction is anticipated to occur during dry weather in 2016. These culverts are located in the Las Trampas creek watershed along Bollinger Canyon Road, between Joseph Drive and St. Mary's Road. A section of the northern storm drain pipes is anticipated to be replaced in-kind, and the outfall and slope of the southern storm drain pipe will be stabilized to prevent further erosion.

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Sincerely,

A handwritten signature in blue ink, appearing to read "J. Hall", is placed above the typed name.

Jeremy Hall
Project Scientist
NCE
PO Box 1760
Zephyr Cove, NV 89448
(775) 588-2505 x22

Enclosed: Figure 1, Overview Map; Figure 2, Area of Potential Effect Map

Jeremy Hall

From: chochenyo@aol.com
Sent: Thursday, December 31, 2015 3:32 PM
To: Jeremy Hall
Cc: Marcy Kamerath; John Heal
Subject: Re: Follow-up for the Moraga Culvert Replacement Project, Contra Costa County

Then I would suggest standard cautionary language that details procedures in the event of an unanticipated or accidental discovery of cultural resources.

Andrew Galvan
An Ohlone/Bay Miwok Man

Sent from my iPhone

On Dec 31, 2015, at 3:11 PM, Jeremy Hall <JHall@ncenet.com> wrote:

Not a problem Andrew. The records search, as well as the pedestrian survey did not identify cultural resources within the project area.

- Jeremy

From: chochenyo@aol.com [<mailto:chochenyo@aol.com>]
Sent: Thursday, December 31, 2015 2:59 PM
To: Jeremy Hall
Cc: Marcy Kamerath; John Heal
Subject: Re: Follow-up for the Moraga Culvert Replacement Project, Contra Costa County

Meanwhile, can you share with me the results of the Lit Search and Foot Survey?

Thank you,

Andrew Galvan
An Ohlone/Bay Miwok Man

Sent from my iPhone

On Dec 31, 2015, at 2:42 PM, Jeremy Hall <JHall@ncenet.com> wrote:

Andrew,

Thank you for responding. Both a literature search and a pedestrian survey have been conducted to date. The Town of Moraga is the CEQA lead for this project, so I will pass on your request to get a copy of the report to them. Once they have reviewed the CEQA document, they will send you the associated cultural report.

Thanks,

- Jeremy

From: chochenyo@aol.com [<mailto:chochenyo@aol.com>]
Sent: Thursday, December 31, 2015 10:39 AM
To: Jeremy Hall
Subject: Re: Follow-up for the Moraga Culvert Replacement Project, Contra Costa County

Hi there,

can you tell me if a Phase I Literature Search and/or a Foot Survey have been under taken for this project? And if so, may I have a copy of that report?

Thank you,

Andrew Galvan
An Ohlone/Bay Miwok Man

Sent from my iPhone

On Dec 31, 2015, at 10:33 AM, Jeremy Hall <JHall@ncenet.com> wrote:

Mr. Galvan,

I am an archaeologist with NCE (Nichols Consulting Engineers). I'm conducting a cultural resources inventory for the Town of Moraga, Contra Costa County, in support of a culvert replacement project. As part of the process, I've been asked by the Native American Heritage Commission to contact you regarding the project. On December 15th, 2015, I sent you a letter containing the project description and maps.

Have you received the letter? If yes and you'd like to provide any comments concerning cultural resources, please provide those to me as soon as possible so I can address them. If you have not received the letter and would like to provide comments, please let me know and I'll email you a copy.

I can be reached at 775-885-2505.

Thanks,

Jeremy Hall
Project Scientist

<image001.jpg>

p (775) 588-2505 **c** (775) 354-9860
f (775) 588-2607 **e** jhall@ncenet.com

NCE
P.O. Box 1760, Zephyr Cove, NV 89448
www.ncenet.com

Collaboration. Commitment. Confidence.SM

ATTACHMENT 4

Project Photos

Photo Log - Moraga Culvert Replacement Project



IMG1471



IMG1472

Photo Log - Moraga Culvert Replacement Project



IMGP1473



IMGP1474

Photo Log - Moraga Culvert Replacement Project



IMGP1475



IMGP1476

Photo Log - Moraga Culvert Replacement Project



IMGP1477



IMGP1478

Photo Log - Moraga Culvert Replacement Project



IMGP1479



IMGP1480

Photo Log - Moraga Culvert Replacement Project



IMGP1481



IMGP1482

Photo Log - Moraga Culvert Replacement Project



IMGP1483



IMGP1484

Photo Log - Moraga Culvert Replacement Project



IMGP1485



IMGP1486

Photo Log - Moraga Culvert Replacement Project



IMG1487



IMG1488

Photo Log - Moraga Culvert Replacement Project



IMGP1489

Appendix C

MITIGATION MONITORING AND REPORTING PLAN

**BOLLINGER CANYON ROAD CULVERT REPAIR PROJECT
MITIGATION MONITORING AND REPORTING PLAN**

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Verification By/Date
I. AESTHETICS					
<i>There are no potentially significant impacts related to aesthetics.</i>					
II. AGRICULTURE AND FORESTRY RESOURCES					
<i>There are no potentially significant impacts related to agriculture and forestry resources.</i>					
III. AIR QUALITY					
<p>Mitigation Measure AIR-III-b,d: The Contractor must comply with all policies and regulations of the Bay Area Air Quality Management District and the California Air Resources Board.</p> <p>In addition, the Contractor will employ the following mitigation measures:</p> <ul style="list-style-type: none"> Water the active grading area at least one time per day for dust control or more if necessary to prevent visible dust plumes from leaving project site and, Water the excavated soil to prevent visible dust plumes when loading soil into trucks for export from the site. 	Contractor	During construction activities	Town of Moraga of Public Works	On a daily basis during grading activities	Submit a daily construction report during grading activities for the project file
IV. BIOLOGICAL RESOURCES					
<p>Mitigation Measure BIO-IV-a,b:</p> <ul style="list-style-type: none"> As trees will be removed and other disturbances will occur during the breeding season (February 1 through August 31), a qualified biologist shall conduct a pre-disturbance survey for tree-nesting raptors and other migratory birds in all trees within the operation footprint and within 250 feet of the footprint no more than 10 days prior to the onset of 	Town of Moraga Department of Public Works/Qualified Biologist	Conduct pre-construction surveys as required, if occupied nests are identified, establish buffer zones and monitor in consultation	Town of Moraga Department of Public Works in contract with a Qualified Biologist	10 days prior to construction for tree-nesting raptors, roosting bats, CRLF, Alameda whipsnake. Spring season prior to	Submit a biological survey/report for the project file

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Verification By/Date
<p>ground disturbance. If nesting migratory birds are detected on the site during the survey, a suitable activity-free buffer should be established around all active nests. The precise dimension of the buffer (up to 250 ft.) would be determined at that time and may vary depending on location and species. Buffers should remain in place for the duration of the breeding season or until it has been confirmed by a qualified biologist that all chicks have fledged and are independent of their parents. Pre-disturbance surveys during the non-breeding season are not necessary for migratory birds, as they are expected to abandon their roosts during construction activities.</p> <p>Implementation of the above measures would mitigate impacts to migratory birds, including tree-nesting raptors, to a less-than-significant level.</p> <ul style="list-style-type: none"> • Prior to vegetation removal, pre-construction surveys should also be conducted for the presence of roosting bats, California red-legged frog, Alameda whipsnake, and any raptors to help avoid direct take of or impact to SSS. If any of these SSS are discovered within the project footprint during the pre-construction survey, avoidance of impacts to these protected species should be conducted in consultation with the CDFW 		with CDFW		construction for special status plant species	

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Verification By/Date
<p>or U.S. Fish and Wildlife Service (USFWS).</p> <ul style="list-style-type: none"> Pre- construction surveys will be conducted to determine if special status plant species are present or absent and will focus on the area within and in the vicinity of proposed ground disturbing activities. Preconstruction activities should occur during the appropriate blooming season, such as spring prior to construction. If these special status plant species surveys result in a determination that species are absent from areas impacted by construction activities, then there would be no impact to the species and mitigation would not be warranted. If species are present then project work should be avoided within fifty feet of any rare plant populations. <p>If the project cannot be redesigned to avoid impacts to the identified species, then compensation measures should include development of a restoration plan for these species. At a minimum, the plan should contain the following elements: (a) location of restoration areas; (b) propagation and planting techniques to be employed for the restoration effort; (c) timetable for implementation; (d) monitoring plan and performance criteria; (e) adaptive management techniques; and (f) site maintenance plan. The plan must be approved by the Town prior to the start of project construction and should replace any special status plants lost during</p>					

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Verification By/Date
<p>construction in the immediate vicinity of the identified population.</p> <ul style="list-style-type: none"> Obscure bumble bees may use habitats in the vicinity. Ground disturbing activities during the time that the bees are hibernating may cause direct impacts to this species. Ground disturbing and construction activities should be limited to the time from May 1st to October 15th to minimize the potential to directly impact obscure bumble bees. Training will be provided to construction crews on protected species, including California red-legged frogs, and Alameda whipsnake and will instruct crews on the necessary steps to take if these species are encountered. 					
<p><u>Mitigation Measure BIO-IV-a,b:</u></p> <ul style="list-style-type: none"> To the extent practicable, the clearing of riparian areas will be minimized and avoided during project construction. After construction is complete, native willow cuttings from the vicinity will be replanted as determined in the JARPA permitting process. The project will require the removal of approximately two California bay trees (<i>Umbellularia californica</i>), two coast live oak trees (<i>Quercus agrifolia</i>), two big leaf maple trees (<i>Acer macrophyllum</i>), and two red willows (<i>Salix laevigata</i>) along the slope adjacent to the outfall. All other 	<p>Contractor/ Town of Moraga and relevant property owners</p>	<p>During and after construction activities</p>	<p>Town of Moraga of Public Works</p>	<p>On a daily basis during grading activities</p>	<p>Submit a daily construction report during grading activities for the project file, and monitoring reports as required by the Construction General Permit (CGP).</p>

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<p>heritage trees, significant trees and other native trees, or oak woodlands shall be protected with construction fencing. After construction is complete, trees will be replanted in the immediate vicinity of the project at a 3:1 mitigation ratio, or a tree replacement ratio as determined by regulatory agencies and specified in environmental permits obtained through the Joint Aquatic Resources Permit Application (JARPA) if it results in a greater number of replacement trees. Removal of California bay trees will be done in a manner that avoids the spread of sudden oak death disease.</p> <ul style="list-style-type: none"> Invasive plants on the site shall be controlled and Best Management Practices (BMPs) shall be implemented to control the spread of sudden oak death disease. The reach of Las Trampas Creek and riparian corridor which are near the project site may provide non-breeding habitat for California red-legged frogs. All direct impacts to the riparian corridor and its buffer will be minimized by limiting vegetation removal within riparian areas, and protecting water quality. To the extent practicable, the clearing of riparian areas will be minimized and avoided during project construction. <p>Water quality of the adjacent riparian area and downstream waters will be protected by BMPs to prevent pollutants and</p>					

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<p>sediment from mobilizing from the project area into the riparian corridor or surface waters. This includes the implementation of BMPs that will prevent spills or leaks from construction staging areas. Any additional measures required by the USFWS to protect CRLF will also be implemented.</p>					
<p>Mitigation Measure BIO-IV-c: Since activities will occur within the OHWM of an ephemeral drainage to Las Trampas Creek, both CWA Section 401 and 404 permits, and CDFW Section 1600 agreement will be required. Compliance with the following mitigation measures will result in less than significant impacts:</p> <ul style="list-style-type: none"> • Prior to construction, the Town of Moraga shall obtain a Waters of the US determination to ensure avoidance of impacts to potential waters. • Permit mitigation measures required by CWA 401,404, and CDFW Section 1600 agreements will be implemented to avoid or minimize impacts to Water of the U.S. at the project site. 	<p>Town of Moraga Department of Public Works and Project Contractor</p>	<p>Before and during construction</p>	<p>Town of Moraga Department of Public Works</p>	<p>During and Post construction</p>	<p>Town to provide verification to agencies as requested in permit/agreement documents. Contractor to provide updates to Town during and at the close out of construction.</p>
<p>Mitigation Measure BIO-IV-d: Due to potential interference with movement of fish and wildlife the following mitigation measure will reduce the impacts to less than significant.</p>	<p>Contractor</p>	<p>During construction</p>	<p>Town of Moraga Department of Public Works</p>	<p>During construction</p>	<p>Contractor to provide schedule updates to Town during and at the close out of construction</p>

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Verification By/Date
<ul style="list-style-type: none"> Construction will be conducted while water is not flowing in the ephemeral drainage and fish and frogs are not present. 					
<p>Mitigation Measure BIO-IV-e: Due to potential disturbance to unique plants and wildlife and trees the following mitigation measures will reduce impacts to less than significant.</p> <ul style="list-style-type: none"> Native trees will be avoided and minimized in the final design, where possible Prior to construction, trees and shrubs will be protected with construction fencing During construction, the contractor will be responsible for implementing BMP's to minimize the introduction of invasive plant species. A local tree permit is required for tree removal within the Town of Moraga. Trees and willow cuttings will be replanted in appropriate areas as determined by the project applicant (Town) and property owners and at an appropriate mitigation ratio. In general, a 3:1 mitigation ratio is recommended for replacing native and riparian trees. A final tree replacement ratio will be determined by regulatory agencies and specified in environmental permits obtained through the Joint Aquatic Resources Permit Application (JARPA). 	Town of Moraga Department of Public Works and Project Contractor	Prior to construction activities as applicable	Town of Moraga Department of Public Works	Prior to construction activities	Tree permits obtained for the project will be saved to the project file

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V. CULTURAL RESOURCES					
<p>Mitigation Measure CUL-V-b,c: While not anticipated, incidental discovery of pre historic and historic period cultural resources which were not previously recorded or otherwise identified may occur during the project.</p> <ul style="list-style-type: none"> Caltrans Standard Specifications Section 14-2 for archaeological and paleontological resources will be incorporated into the final specifications for the project and will require the contractor follow a protocol to protect cultural and paleontological resources: <ol style="list-style-type: none"> Stop all work within a 60-foot radius of the discovery Secure the area Notify the Engineer Do not remove archeological resources or take them from the jobsite. Do not resume work within the radius until authorized. 	Project Contractor, Town of Moraga	If cultural resources are discovered at the project site	Town of Moraga Department of Public Works	Any event where cultural resources are discovered at project site	Registered archaeologist, if applicable
<p>Mitigation Measure CUL-V-d:</p> <ul style="list-style-type: none"> Section 7050.5 of the California Health and Safety Code states that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of 	Project Contractor, Town of Moraga	If human remains are discovered at the project site	Town of Moraga Department of Public Works	Any event where human remains are discovered at project site	County Coroner, Native American Heritage Commission, if applicable

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<p>the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated cultural materials.</p>					
VI. GEOLOGY AND SOILS					
<p>Mitigation Measure GEO-VI-b: The proposed project may impact soils during grading activities. The following mitigation measures reduce the impact to less than significant.</p> <ul style="list-style-type: none"> Obtain coverage under the CGP and develop a SWPPP. As part of the SWPPP, the contractor will be required to implement BMPs for erosion and sediment control, non-stormwater controls, and good housekeeping. The type, quantity, and location of BMPs will be specified in the SWPPP but examples are provided below. Erosion and sediment control BMPs may include silt fencing, construction limit fencing, and stabilized construction access areas. Linear sediment controls such as fiber rolls must be installed along the toe 	Project Contractor	Prior to construction	Town of Moraga Department of Public Works	Prior to issuance of grading permit and through the duration of the project	Provide Town of Moraga Department of Public Works with a preliminary SWPPP at least 14 days prior to construction, updated SWPPP documents as needed, and file an NOT within 90 days of completion.

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<p>of the slope, face of the slope, and at exposed grade breaks to comply with sheet flow lengths specified in Table 1, Attachment D of the CGP (Order No. 2012-006-DWQ).</p> <ul style="list-style-type: none"> • A dewatering contingency plan specified in the SWPPP will be implemented in the event groundwater is intercepted. • Rain event action plans (REAP) will be prepared prior to any qualifying rain event to specify measures required to secure the site and control sediment from mobilizing and erosion occurring within or near the project area. • Stabilization criteria identified in the CGP, Order No. 2012-0006-DWQ, Section II.D.3 will be met prior to project close out. 					
VII. GREENHOUSE GAS EMISSIONS					
<p>Mitigation Measure GHG-VII-a: The proposed project will temporarily increase greenhouse gas emissions during construction activities. The following mitigation measures reduce the impact to less than significant.</p> <ul style="list-style-type: none"> • Use of heavy machinery will be minimized to the fullest extent possible during construction activities. • Vehicles will be turned off when not in use rather than remain in an idling state. • Heavy haul trips will be augmented to reduce emissions and increase fuel 	Project Contractor	Prior to issuance of grading permit	Town of Moraga Department of Public Works	Prior to issuance of grading permit and through the duration of the project	Contractor's construction management plan should be provided to the Town of Moraga for review and approval. The plans shall incorporate the measures recommended in the mitigation.

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efficiency.					
VIII. HAZARDS AND HAZARDOUS MATERIALS					
<i>There are no potentially significant impacts related to hazards and hazardous materials.</i>					
IX. HYDROLOGY AND WATER QUALITY					
<p>Mitigation Measure HWQ-IX-a: The proposed project may impact soils during grading activities. The following mitigation measures reduce the impact to less than significant.</p> <ul style="list-style-type: none"> Obtain coverage under the CGP and develop a SWPPP. As part of the SWPPP, the contractor will be required to implement BMPs for erosion and sediment control, non-stormwater controls, and good housekeeping. The type, quantity, and location of BMPs will be specified in the SWPPP but examples are provided below. Erosion and sediment control BMPs may include silt fencing, construction limit fencing, and stabilized construction access areas. Linear sediment controls such as fiber rolls must be installed along the toe of the slope, face of the slope, and at exposed grade breaks to comply with sheet flow lengths specified in Table 1, Attachment D of the CGP (Order No. 2012-006-DWQ). A dewatering contingency plan specified in the SWPPP will be implemented in the event groundwater is intercepted. Rain event action plans (REAP) will be prepared prior to any qualifying rain event 	Project Contractor	Prior to construction	Town of Moraga Department of Public Works	Prior to issuance of grading permit and through the duration of the project	Provide Town of Moraga Department of Public Works with a preliminary SWPPP at least 14 days prior to construction, updated SWPPP documents as needed, and file an NOT within 90 days of project completion.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Verification By/Date
<p>to specify measures required to secure the site and control sediment from mobilizing and erosion occurring within or near the project area.</p> <ul style="list-style-type: none"> Stabilization criteria identified in the CGP, Order No. 2012-0006-DWQ, Section II.D.3 will be met prior to project close out. Obtain permits from Army Corps and SFRWQCB to ensure compliance with Clean Water Act sections 404 and 401. 					
X. LAND USE AND PLANNING					
<i>There are no potentially significant impacts related to land use and planning.</i>					
XI. MINERAL RESOURCES					
<i>There are no potentially significant impacts related to mineral resources.</i>					
XII. NOISE					
<i>There are no potentially significant impacts related to noise</i>					
XIII. POPULATION AND HOUSING					
<i>There are no potentially significant impacts related to population and housing.</i>					
XIV. PUBLIC SERVICES					
<i>There are no potentially significant impacts related to public services.</i>					
XV. RECREATION					
<i>There are no potentially significant impacts related to recreation.</i>					
XVI. TRANSPORTATION/TRAFFIC					
<i>There are no potentially significant impacts related to transportation and traffic.</i>					
XVII. UTILITIES AND SERVICE SYSTEMS					
<i>There are no potentially significant impacts to utilities and service systems.</i>					