Attachment E

Biological Resources Assessment

Biological Resources Assessment
Lehigh Permanente Quarry

SANTA CLARA COUNTY, CALIFORNIA

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EXECUTIVE SUMMARY

The Permanente Quarry (Quarry) is a surface mining operation for limestone and aggregate materials that has been in operation since the 1930s. Historical and active quarrying areas are surrounded by steep hillsides supporting forests and shrubland. The Quarry operator, Lehigh Southwest Cement Company (Lehigh) is proposing an amendment to the existing reclamation plan for the Quarry and a conditional use permit to address mining and reclamation activities over an estimated 20-year period (Project).

This purpose of this report is to evaluate the impact of the Project on biological resources within the 1,105-acre Project Area. This report also describes the results of WRA's field investigations, which assessed the 3,510-acre Permanente Property for the (1) presence of special status species; (2) potential to support special status species; and (3) presence of other sensitive biological resources protected by local, state, and federal laws and regulations.

The results of this Report include the following:

- The Project Area comprises approximately 1,105 acres. Historical and ongoing mining activities currently account for approximately 537 acres of mining-related disturbance within this area. The remainder of the Project Area is mainly undisturbed land. The Project proposes additional mining disturbance totaling approximately 251 acres, occurring mainly in the proposed South Quarry, which would be followed by large-scale reclamation and revegetation activities across the Project Area. The remaining undisturbed lands would be left in place as buffer areas, or held in reserve for possible future mining activities.

- The Project will improve habitat quality overall by reclaiming approximately 537 acres of existing mining disturbance to oak woodlands, grey pine stands, and native shrubs and grasslands. This represents a net increase in vegetated lands compared to existing conditions and will increase habitat values for wildlife species.

- The Project includes 207 acres of new mining area known as the South Quarry. The South Quarry will be reclaimed to oak woodlands and native vegetation. Oak trees will be replaced at a minimum of three to one ratio. Temporary impacts to habitat for woodrats, breeding birds and bat species are temporary and not regionally significant, and will be replaced through site reclamation. Approximately 0.1 acres of Waters of the U.S. and an additional 0.05 acres of Waters of the State will be affected by the South Quarry and mitigated according to regulatory policy.

- The Project will increase base flows in Permanente Creek by approximately 50 percent as a result of the reclamation of the North Quarry and South Quarry. The combination of increased base flows and seasonal storm flows will be adequate to maintain all aquatic habitats, including existing California Red-legged Frog habitats at the downstream end of the property.

- The Project will affect three sensitive biological communities in the Project Area (willow riparian scrub, oak woodlands, and streams and ponds). No special status plant species are present in the Project Area. The Project will affect approximately 265 acres of common vegetated communities that are not considered sensitive by state or federal agencies.

- Six special status wildlife species have been observed on the Permanente Property: California Red-legged Frog, San Francisco Dusky-footed Woodrat, White-tailed Kite, Olive-sided Flycatcher, Yellow Warbler, and Grasshopper Sparrow. One species, the Pallid Bat, has a high potential to occur. Three additional special status wildlife species have a moderate potential to occur on the Permanente Property: Western Red Bat, Long-eared Owl and Loggerhead Shrike.

- The Project includes the establishment of a 345-acre preservation area to serve as potential mitigation. The preservation area supports 140 acres of oak woodlands, over 6 acres of riparian habitat, and other vegetation communities. The preservation area also provides an area of uniquely undisturbed drainage into Stevens Creek, which supports Steelhead habitat.

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1.0 INTRODUCTION

In April through September, 2008 and February through May, 2009, WRA, Inc. performed an assessment of biological resources at the Permanente Quarry and certain surrounding lands, in Santa Clara County, California (Figure 1). The purpose of the assessment was to gather information necessary to complete a review of biological resources in support of California Environmental Quality Act (CEQA) review.

This report describes the results of WRA's field investigations, which assessed the 1,105-acre Project Area, and broader 3,510-acre Permanente Property, for the (1) presence of special status species; (2) potential to support special status species; and (3) presence of other sensitive biological resources protected by local, state, and federal laws and regulations.

Protocol level special status plant surveys and protocol level surveys for California Red-legged Frog were conducted on site, the results of which are presented herein. This assessment is based on information available at the time of the study and on site conditions that were observed during the period in which the Permanente Property was investigated.

1.1 Permanente Property Description

The Permanente Quarry (Quarry) is a limestone and aggregate mining operation in the unincorporated foothills of western Santa Clara County, approximately two miles west of the City of Cupertino (Figure 1). Elevation ranges from 500 to over 2,000 feet above sea level. The Quarry occupies a portion of an approximately 3,510-acre property owned by Hanson Permanente Cement, Inc. ("Permanente Property"). The Quarry is operated by Lehigh Southwest Cement Company ("Lehigh"). The Project has been submitted by Lehigh.

The Quarry currently comprises approximately 537 acres of operational areas, which consist of surface mining excavations, overburden stockpiling, crushing and processing facilities, access roads, administrative offices and equipment storage. The Quarry also includes other predominantly undisturbed areas, either held in reserve for future mining or which buffer operations from adjacent land uses.

Mining operations take place subject to California's Surface Mining and Reclamation Act (SMARA). SMARA mandates that surface mining operations have an approved reclamation plan that describes how mined lands will be prepared for alternative post-mining uses, and how residual hazards will be addressed. Santa Clara County acts as lead agency under SMARA. The County approved the Quarry's current reclamation plan in March 1985, covering 330 acres.

A cement manufacturing plant lies adjacent to the Quarry on the east. The cement plant also is owned and operated by Lehigh. The cement plant is a separately-permitted industrial use which is not considered part of the Quarry and is not subject to SMARA's requirements. The cement plant was included in the scope of the biological assessment of the Permanente Property; however, it is not included in the description of the proposed Project.

1.2 Project Description

The proposed Project is the County's approval of an amendment to the Quarry's existing reclamation plan. The proposed reclamation plan amendment (RPA) would modify the existing reclamation plan, and associated reclamation requirements, to include all areas that are currently disturbed by mining activities, as well as lands scheduled to be disturbed by mining over approximately the next 20 years. If approved, the amendment and associated reclamation requirements would incorporate approximately 1,105 acres (the "Project Area") of the 3,510-acre ownership. The proposed post-mining use for these areas is open space. The proposed Project Area is shown on Figure 2.

The proposed Project is also the County's approval of a Conditional Use Permit for certain mining operations at the Quarry. The Conditional Use Permit would allow mineral extraction on approximately 117 acres, comprising a portion of the South Quarry (Figure 2), and located within the Project Area immediately south of existing extraction areas. Operations in the South Quarry would include mining, material loading and hauling. Mined rock would be transported to existing facilities in other parts of the Quarry for processing. South Quarry development, mining and reclamation would occur for an estimated 20 years. The South Quarry is included in the proposed RPA and would be reclaimed according to the requirements therein.

For reference, the Project Area encompasses eight smaller and distinct areas, including the Rock Plant, Topsoil Storage Area, East Materials Storage Area (EMSA), Central Materials Storage Area (CMSA) West Materials Storage Area (WMSA), North Quarry, South Quarry, Office/Crusher, and Surge Pile areas (Figure 2). Reclamation activities will be phased throughout the Project Area to ensure that mined lands are reclaimed at the earliest possible time.

2.0 REGULATORY BACKGROUND

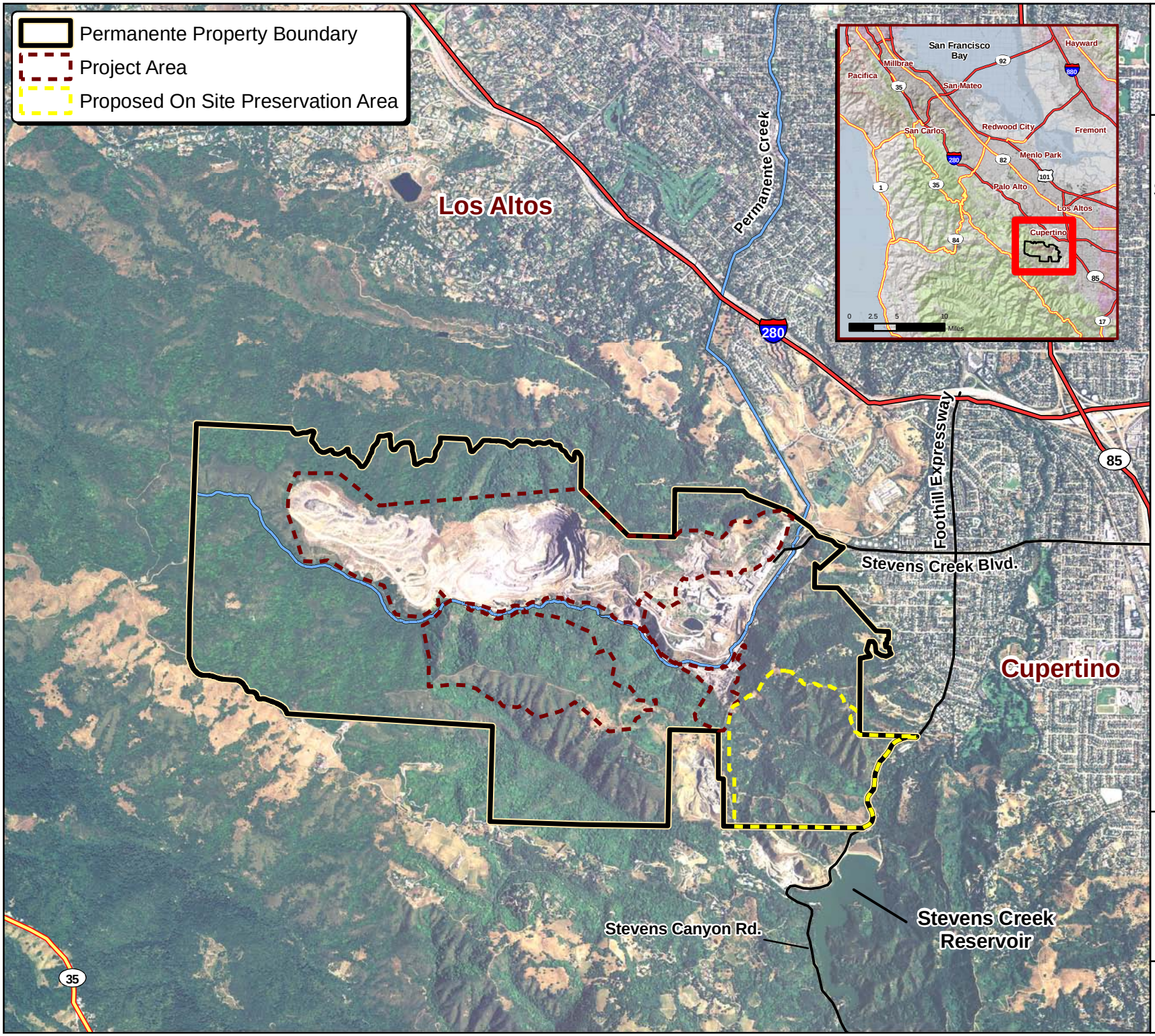
The following sections explain the regulatory context of the biological assessment, including applicable laws and regulations that were applied to the field investigations and analysis of potential Project impacts.

2.1 Sensitive Biological Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, and riparian habitat. These habitats are protected under federal regulations (such as the Clean Water Act), state regulations (such as the Porter-Cologne Act, the California Department of Fish and Game [CDFG] Streambed Alteration Program, and CEQA), or local ordinances or policies (City or County Tree Ordinances, Special Habitat Management Areas, and General Plan Elements).

Waters of the United States

The U.S. Army Corps of Engineers (Corps) regulates "Waters of the United States" under Section 404 of the Clean Water Act. "Waters of the U.S." are defined broadly as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential



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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 1.

Permanente Property Location Map

N
W E
S

0 0.25 0.5 1
Miles

Date: May 2010
Map By: Michael Rochelle
Image: 2005 NAIP
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\2010 Figures\BRA\Location.mxd

Permanente Property Boundary
Project Area (1,105 acres)
EMSA - RPA Amendment Submitted 2009

Limit of Disturbance Boundaries

WMSA (117.6 acres)
North Quarry (274.1 acres)
South Quarry (206.5 acres)
Office/Crusher (39.4 acres)
CMSA (52.2 acres)
Surge Pile (9.0 acres)
Rock Plant (15.5 acres)
Topsoil Storage Area (11.4 acres)

WMSA
North Quarry
South Quarry
Office/ Crusher
CMSA
EMSA
Surge Pile
Rock Plant
Topsoil Storage Area

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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 1.

Project Area Plan

N
W E
S

0 500 1,000 2,000
Feet

Date: May 2010
Map By: Michael Rochelle
Image: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\2010 Figures\BRA\Proposed_Project.mxd

wetland areas, according to the three criteria used to delineate wetlands stated in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as "other waters" and are often characterized by an ordinary high water mark (OHWM). Other waters, for example, generally include lakes, rivers, and streams. The placement of fill material into "Waters of the U.S." (including wetlands) generally requires an individual or nationwide permit from the Corps under Section 404 of the Clean Water Act.

Waters of the State

The term "Waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope, but has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the Corps under Section 404. "Waters of the State" are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact "Waters of the State," are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to "Waters of the State," the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

Streams, Lakes, and Riparian Habitat

Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by CDFG under Sections 1600-1616 of the State Fish and Game Code. Certain alterations to a streambed or lake may require a 1602 Lake and Streambed Alteration Agreement. The term stream, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as follows: "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72).

Riparian and freshwater habitats are identified as biological communities targeted for conservation in the Resource Conservation Element of the Santa Clara County (SCC) General Plan (County of Santa Clara 1995). Riparian setback distances are described as "flexible" in the SCC General Plan, and generally range up to 150 feet, with the larger setbacks recommended for streams in a natural, undisturbed state. Because Permanente Creek has been historically highly altered, a narrower setback is appropriate. No County ordinance explicitly defines a stream setback limit for development. Stream setbacks are approved on a project-by-project basis through discussion with County planners.

Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFG. CDFG ranks sensitive communities as “threatened” or “very threatened” and keeps records of their occurrences in its Natural Diversity Database. Sensitive plant communities are also identified by CDFG on their *List of California Natural Communities Recognized by the CNDDB*. Impacts to sensitive natural communities identified in local or regional plans, policies, regulations or by the CDFG or USFWS must be considered and evaluated under CEQA (California Code of Regulations: Title 14, Div. 6, Chap. 3, Appendix G).

Specific habitats including bayland habitats, riparian and freshwater habitats, grassland/savanna habitats, and chaparral/mixed woodland/evergreen forest areas are generally identified for conservation in the Resource Conservation Element of the Santa Clara County General Plan although specific ordinances for their conservation have yet to be developed. Implementation policies that apply to these habitat types include conformance with state and federal laws regarding commercial timber sales and endangered species preservation. The SCC General Plan specifies that conservation of these habitat types is important for the maintenance of wildlife habitat linkages and surface water quality.

Oak Woodlands

Under Public Resources Code section 21083.4 (SB 1334), Santa Clara County shall mitigate for conversion of oak woodlands that will have a significant effect on the environment. The code defines an oak tree as any species of native oak larger than five inches diameter at breast height (DBH).

2.2 Special Status Species

Special status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal Endangered Species Act (FESA) or California Endangered Species Act (CESA). These acts afford protection to both listed and proposed species. In addition, California Department of Fish and Game (CDFG) Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, sensitive species included in USFWS Recovery Plans, and CDFG special status invertebrates are all considered special status species. Although CDFG Species of Special Concern generally have no special legal status, they are given special consideration under the California Environmental Quality Act (CEQA). In addition to regulations for special status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, and young is illegal. Plant species on California Native Plant Society (CNPS) Lists 1 and 2 are also considered special status plant species. Impacts to these species are considered significant according to CEQA. CNPS List 3 and 4 plants have little or no protection under CEQA, but are included in this analysis for completeness.

Critical Habitat

Critical habitat is a term defined and used in the Federal Endangered Species Act as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The FESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery. In many cases, this level of protection is similar to that already provided to species by the FESA "jeopardy standard."

Santa Clara Valley Habitat Conservation Plan

The Santa Clara Valley Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) is scheduled for completion in 2010. Although the Permanente Property lies outside the limits of the HCP/NCCP, species covered in this plan are also considered in this assessment as they are regionally important for conservation.

2.3 Other Regulatory Issues

Sudden Oak Death

The United States Department of Agriculture restricts the interstate movement of certain regulated and restricted articles from quarantined areas in California to prevent the spread of *Phytophthora ramorum*, the organism that causes Sudden Oak Death (SOD) (7 CFR Part 301). Within California, transport of regulated and restricted articles from quarantined counties is regulated by the California Department of Food and Agriculture (CCR3700). Fourteen California counties including Alameda, Contra Costa, Humboldt, Lake, Marin, Mendocino, Monterey, Napa, San Francisco, Santa Clara, Santa Cruz, San Mateo, Solano and Sonoma Counties are included in the quarantine. Regulated articles include nursery stock and soil and may only be moved interstate from a quarantined area if accompanied by a certificate. Restricted articles include bark chips, firewood, forest stock, or mulch from certain vegetation. Restricted articles may only be moved interstate from a quarantined area by the U.S. Department of Agriculture for experimental or scientific purposes.

3.0 METHODS

Between May 2008 and October 2009, the Permanente Property was traversed on foot to determine (1) biological communities present within the Permanente Property, (2) if existing conditions provided suitable habitat for any special status plant or wildlife species, and (3) if sensitive habitats are present. For those areas that were inaccessible due to extreme terrain or dense vegetation, inspection was conducted using aerial photographs and referencing to areas observed on foot.

3.1 Biological Communities

Prior to the site visit, the Soil Survey of the Santa Clara Area, California [U.S. Department of Agriculture (USDA) 1941], the US Fish and Wildlife Service (USFWS) National Wetland Inventory, U.S. Geologic Survey (USGS) topographic maps and USDA aerial photos were examined to determine if any unique soil types, vegetative features, and/or aquatic features that could support sensitive plant communities were present on the Permanente Property. Biological communities present on the Permanente Property were classified based on existing plant community descriptions described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). However, in some cases it is necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature. Figure 3 shows the general location and extent of the biological communities observed on the Permanente Property. See Appendix C for representative site photographs of the observed plant communities.

3.2 Sensitive Biological Communities and Aquatic Features

Biological communities identified on the Permanente Property were evaluated to determine if they are considered sensitive or non-sensitive as defined by the CEQA and other applicable laws and regulations.

3.2.1 Wetlands and Waters

Wetland areas were identified as areas dominated by plant species with a wetland indicator status[1] of OBL, FACW, or FAC as given on the U.S. Fish and Wildlife Service List of Plant Species that Occur in Wetlands (Reed 1988). Evidence of wetland hydrology can include direct evidence (primary indicators), such as visible inundation or saturation, surface sediment deposits, algal mats and drift lines or indirect indicators (secondary indicators), such as oxidized root channels. Some indicators of wetland soils include dark colored soils, soils with a sulfidic odor, and soils that contain redoximorphic features as defined by the Corps Manual and Field Indicators of Hydric Soils in the United States (NRCS 2002).

Areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation, such as lakes and ponds, or convey water, such as streams, are also subject to Section 404 jurisdiction.

Areas delineated as “Other Waters of the U.S.” are characterized by an ordinary high water (OHW) mark, defined as:

> *...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris,*

[1] OBL = Obligate, always found in wetlands (> 99% frequency of occurrence); FACW = Facultative wetland, usually found in wetlands (67-99% frequency of occurrence); FAC = Facultative, equal occurrence in wetland or non-wetlands (34-66% frequency of occurrence).

or other appropriate means that consider the characteristics of the surrounding areas."

Federal Register Vol. 51, No. 219,
Part 328.3 (e). November 13, 1986

"Other waters" are identified in the field by the presence of a defined river or stream bed, a bank, and evidence of the flow of water, or by the absence of emergent vegetation in ponds or lakes. Corps jurisdiction of waters in non-tidal areas extends to the ordinary high water (OHW) mark. "Other waters" that were found on the Permanente Property were mapped and are described in the Results section of this report; however, some may be exempt from regulation under the Clean Water Act. "Waters of the State" may include additional aquatic areas not meeting federal definitions. Where this occurred, they were mapped as "Waters of the State". "Waters of the U.S." and "Waters of the State" were either mapped using sub-meter accuracy GPS units, or were mapped based on USGS topographic maps and aerial photograph interpretation; stream widths were noted from field observations. Between March 2008 and August 2009, WRA conducted a routine wetland delineation on the Permanente Property and prepared two reports fully describing the methods and results of the study (WRA 2008, 2010). The first of the two reports (WRA 2008) was verified in a letter dated March 02, 2009 (Corps file no. 2008-00356S); the second (WRA 2010a) is currently in the process of being verified.

3.2.2 Riparian Habitat

An inspection was conducted to determine if the banks of drainages, streams and other aquatic features on the Permanente Property support hydrophytic or stream-dependent woody plant species (riparian species). Streams supporting riparian vegetation were noted and the area of the riparian habitat was estimated and mapped using ArcGIS software.

3.2.3 Other Sensitive Biological Communities

The Permanente Property was evaluated for the presence of other sensitive biological communities recognized by the California Department of Fish and Game (CDFG) or other local or regional ordinances. All biological communities on the Permanente Property were mapped and are described in Section 4.1 below.

3.3 Special Status Species

3.3.1 Literature Review

Potential occurrence of special status species on the Permanente Property was evaluated by first determining which special status species occur in the vicinity of the Permanente Property through a literature and database search. Database searches for known occurrences of special status species focused on the Cupertino 7.5 minute USGS quadrangle and the eight surrounding USGS quadrangles. The following sources were reviewed to determine which special status plant and wildlife species have been documented to occur in the vicinity of the Permanente Property:

- California Natural Diversity Database records (CNDDB) (CDFG July 2009a)
- USFWS quadrangle species lists (USFWS July 2009)
- CNPS Electronic Inventory records (CNPS July 2009)
- CDFG publication "California's Wildlife, Volumes I-III" (Zeiner et al. 1990)
- CDFG publication "Amphibians and Reptile Species of Special Concern in California" (Jennings 1994)
- A Field Guide to Western Reptiles and Amphibians (Stebbins, R.C. 2003)
- CDFG CalFish ArcIMS Fish Distribution Mapping Tool and Fish Passage Assessment Database (CDFG September 2009b)
- National Oceanic and Atmospheric Administration NMFS Distribution Maps for California Salmonid Species (1999)

3.3.2 Site Assessment

A site visit was made to the Permanente Property to search for suitable habitats for species identified in the literature review as occurring in the vicinity. The potential for each special status species to occur on the Permanente Property was then evaluated according to the following criteria:

1) No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

2) Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

3) Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

4) High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

5) Present. Species is observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

The site assessment is intended to identify the presence or absence of suitable habitat for each special status species known to occur in the vicinity in order to determine its potential to occur on the Permanente Property. The site visit does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species; however, if a special status species is observed during the site visit, its presence will be recorded and discussed. Appendix A presents the evaluation of potential for occurrence of each special status plant and wildlife species known to occur in the vicinity of the Permanente Property with their habitat requirements, potential for occurrence, and rationale for the classification based on criteria listed above.

3.3.2.1 Rare plant surveys

Based upon a review of the resources and databases given in Section 3.3.1, 81 plant species which have been given special protection status under state and federal species legislation occur in the vicinity of the Permanente Property. These species, their likelihood of occurrence on the Permanente Property, and the results of the protocol level rare plant surveys are presented in Appendix A.

Based on a reconnaissance level site visit and review of the literature, 32 of the 81 listed species were determined to have the potential to occur on the Permanente Property due to their habitat requirements, known distribution, and the habitats provided on the Permanente Property. Protocol level rare plant surveys were then performed to verify the presence or absence of these thirty two species. Forty-nine (49) of the 81 listed species were determined to have no potential to occur on site based on the lack of specific habitat requirements of the species on the Permanente Property such as coastal salt marsh or particular soils type.

Protocol level surveys were conducted in May and July, 2008 by WRA botanists who have experience with the rare plant species that could occur in the area. The surveys followed the protocol for plant surveys described by Nelson (1987). This protocol complies with recommended resource agency guidelines (CNPS 2001, CDFG 2000, USFWS 1996). In small portions of the Permanente Property, terrain, density of poison oak, or other safety issues proved to be significant obstacles to effectively surveying according to these methods. In these cases, all attempts were made to view the area from alternative locations.

All plants observed during the surveys were identified using The Jepson Manual (Hickman 1993), to the taxonomic level necessary to determine rarity.

3.3.2.2 Special Status Wildlife Species

Based upon a review of the resources and databases given in Section 3.3.1, 46 wildlife species which have been given special protection status under state and federal species legislation occur in the vicinity of the Permanente Property. These species, their likelihood of occurrence on the Permanente Property, and the results of the field surveys are presented in Appendix A.

Based on a reconnaissance level site visit and review of the literature, 10 of the 46 listed species were determined to have the potential to occur on the Permanente Property due to their habitat requirements, known distribution, and the habitats provided on the Permanente Property. A site assessment for wildlife species involved the identification of habitat types and quality within Permanente Property as it pertains to special status species. This included actively traversing the Permanente Property to identify important habitat features like small mammal burrows, tree cavities and snags, existing nest structures, rock outcroppings, and water features. Additional breeding bird surveys conducted during the breeding bird window (February 1 – August 31) were used to supplement the reconnaissance level site visit assessment of present habitat and present species, by documenting the type of avian species demonstrating nesting and breeding activity. Additional habitat features such as woodrat stick nests were encountered and noted during these surveys. Collaboration with botanical staff was also used to identify wildlife habitat and unique features identified during protocol level rare plant surveys.

3.4 Aquatic Surveys

WRA biologists conducted aquatic biota surveys within Permanente and Monte Bello Creeks in 2009. The surveys included fish sampling, amphibian surveys, and macroinvertebrate sampling. Fish sampling by net of approximately 100 foot reaches included various habitat features (i.e. pool, riffle, run). Sampling efforts took place in February and May in both watersheds to sample fish across varying flow conditions.

A tandem double observer nocturnal visual encounter survey (VES) methodology was used to survey for amphibians within suitable aquatic habitats within the Study Area. Nocturnal VES surveys were conducted from February through May 2009. Surveys began one hour after sunset and concluded at least one hour before sunrise.

In April 2009, WRA biologists collected 18 benthic macroinvertebrate samples (BMI) at six sites (four sites along Permanente Creek and two sites along Monte Bello Creek) in accordance with the California Stream Bioassessment Procedure (CSBP 2003) for non point source assessments. The CSBP is a regional adaptation of the national U.S. Environmental Protection Agency's (EPA) Rapid Bioassessment Protocols for wadeable streams (Barbour et al. 1999), authored by the California Department of Fish and Game.

All BMI samples remained under the custody of WRA and were processed by WRA biologists. Organisms were removed from the sample and placed in a petri dish for identification under a stereomicroscope. BMIs were then identified to a standard taxonomic level, typically family level for arthropods and order or class for non-arthropods using standard taxonomic keys (McCafferty 1999, Merritt and Cummins 1996, Voshell 2002).

In addition to aquatic biota surveys, water temperature data was collected at various sampling stations along Permanente Creek. Water temperature is an important consideration for some species, especially fish, who can not tolerate warm water temperatures. Rainbow Trout are coldwater species, and have a relatively low tolerance for elevated water temperatures. Exposure to elevated water temperatures may lead to reduced health and fitness, reduced growth rates, increased susceptibility to predation and disease, and depending on life-stage and duration of the exposure, may cause direct mortality.

4.0 RESULTS

The Permanente Property is generally characterized by undeveloped hillsides to the south, and to the north, an operating limestone quarry with associated facilities. The quarry is surrounded on all sides by steeply sloping rugged terrain dominated by a mosaic of various open and impenetrable chaparral and scrub communities, open woodlands, and dense forests. The majority of the area is drained by Permanente Creek which runs west to east through the Permanente Property. Two smaller watersheds are present in the southern portion of the Permanente Property. The Permanente Property is bordered by open space lands to the north and west, Monte Bello Ridge and Stevens Creek Quarry to the south, and Stevens Creek Reservoir to the southeast and residential developments to the east.

The following sections present the results of the biological resources assessment for special status species, sensitive plant communities and aquatic features on the Permanente Property.

4.1 Biological Communities

Table 1 summarizes the area of each biological community type or other habitat observed on the Permanente Property. Biological communities were further classified based on specific vegetation alliances observed within each community. Twenty (20) distinct biological communities are located on the Permanente Property. Non-sensitive biological communities include: 1) ruderal herbaceous grassland, 2) mixed scrub, 3) northern mixed chaparral, 4) chamise chaparral, 5) oak chaparral, 6) poison oak scrub, 7) non-native annual grassland, 8) California bay forest, 9) California buckeye woodland, 10) rock outcrop, 11) revegetated areas, 12) active quarry, 13) disturbed areas, and 14) settling ponds and operational water features. Sensitive biological communities include: 15) wetland, 16) willow riparian forest and scrub, 17) sycamore alluvial woodland, 18) white alder riparian forest, 19) oak woodland, and 20) streams and ponds. The general locations and extent of these communities is shown in Figures 3(a) through 3(d). Table 2 shows the extent of the biological communities within each of the individual Project Areas.

4.1.1 Non-Sensitive Biological Communities

Ruderal herbaceous grassland - Ruderal herbaceous grassland is not described by Holland (1986) but includes habitats previously disturbed and/or reclaimed which have been inactive long enough to recruit a plant community dominated by herbaceous weeds and non-native grasses. Species typical of this plant community in California include brome grasses (*Bromus* spp.), wild oats (*Avena* spp.), Italian thistle (*Carduus pycnocephalus*), wild mustard (*Brassica* sp.), and filaree (*Erodium* sp.). This community is widespread throughout California.

Ruderal herbaceous grassland on the Permanente Property primarily occurs on slopes between quarry roads, or in areas adjacent to quarry activities. Species typical of this biological community on the Permanente Property include Italian thistle, field mustard (*Brassica rapa*), lupine (*Lupinus* sp.), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), yellow star thistle (*Centaurea solstitialis*), oleander (*Nerium oleander*), and slender wild oats (*Avena barbata*). Wildlife observed in this plant community on the Permanente Property include Dark-eyed Junco (*Junco hyemalis*), Ring-necked Snake (*Diadophis punctatus*), and California Towhee (*Pipilo crissalis*).

Mixed scrub - Mixed scrub includes shrub-dominated communities dominated by coyote brush (*Baccharis pilularis*), California sagebrush (*Artemisia californica*), and California buckwheat (*Eriogonum fasciculatum*) partially described as Diablan Sage Scrub by Holland (1986). This community occurs on shallow rocky soils, typically on hot southern exposures of the coast range from Oregon to Central California in areas out of the range of coastal fog incursion.

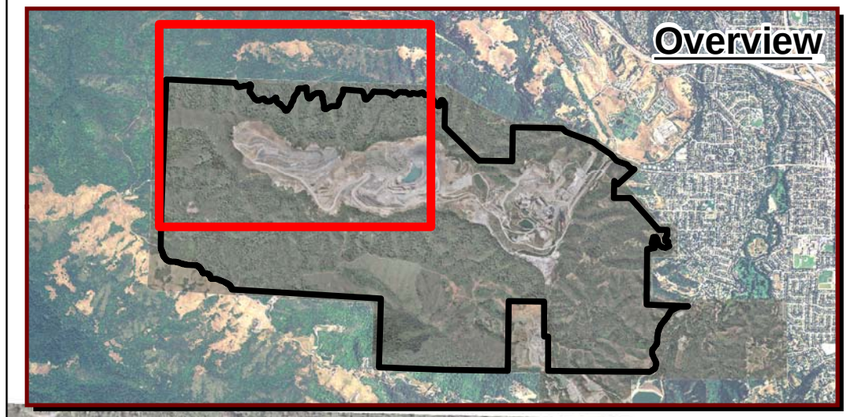
Mixed scrub was mapped in the eastern portion of the Permanente Property on southern exposures. Additionally, small patches of this community type were mapped throughout the Permanente Property where coyote brush or California buckwheat is the dominant shrub type.

Table 1. Biological Communities within the Permanente Property Boundary

Biological Community	Acres
Active Quarry	567.0
Buckeye Woodland	15.6
California Bay Forest	438.4
Chamise Chaparral	465.2
Disturbed	68.0
Mixed Scrub	69.4
Non-native Annual Grassland	48.7
Northern Mixed Chaparral	358.7
Oak Chaparral	226.4
Oak Woodlands and Forests	920.6
Operational Water Holding Feature	10.8
Poison Oak Scrub	109.8
Reclaimed Area	72.5
Rock Outcrop	0.9
Ruderal Herbaceous Grassland	103.0
Sediment Ponds	1.3
Streams and Ponds	8.6
Sycamore Riparian	6.2
Wetland	2.4
White Alder Riparian Forest	15.0
Willow Riparian Forest and Scrub	4.3
Total	**3510.0**

Table 2. Biological Communities within the Project Area

Biological Community	South Quarry (acres)	WMSA (acres)	North Quarry (acres)	Office/Crusher (acres)	CMSA (acres)	EMSA (acres)	Surge Pile (acres)	Rock Plant (acres)	Topsoil (acres)	Total (acres)
Active Quarry	0.1	104.7	231.1	23.2	21.3	65.6	8.7	14.9	2.3	**471.7**
Buckeye Woodland	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.8**
California Bay Forest	54.5	3.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	**59.8**
Chamise Chaparral	62.6	21.3	7.9	0.0	10.9	0.0	0.0	0.0	0.0	**102.7**
Disturbed	20.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	**22.6**
Mixed Scrub	7.6	0.3	1.9	8.3	1.6	0.7	0.7	0.1	0.2	**21.4**
Non-native Annual Grassland	4.6	0.8	1.1	0.0	0.0	1.2	0.0	0.9	1.5	**10.0**
Northern Mixed Chaparral	35.4	1.2	12.3	8.2	12.1	0.0	0.0	0.7	0.0	**70.0**
Oak Chaparral	47.0	13.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	**61.8**
Oak Woodlands and Forests	44.6	17.9	36.6	0.2	3.2	3.6	0.2	1.0	11.7	**119.1**
Operational Water Holding Feature	0.0	0.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0	**6.6**
Poison Oak Scrub	24.1	0.3	0.8	0.1	1.4	0.8	0.0	0.0	1.9	**29.4**
Reclaimed Area	0.0	38.9	18.8	7.8	0.2	0.4	0.0	0.0	1.6	**67.7**
Rock Outcrop	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**
Ruderal Herbaceous Grassland	0.7	13.9	21.1	16.8	3.9	1.7	1.0	0.5	0.5	**60.2**
Sediment Ponds	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.3	0.0	**0.5**
Streams and Ponds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sycamore Riparian	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Wetland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
White Alder Riparian Forest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Willow Riparian Forest and Scrub	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	**0.1**
Total	**303**	**216**	**342**	**65**	**55**	**74**	**11**	**19**	**21**	**1105**



- Permanente Property Boundary
- Project Area
- Disturbance Limit Boundaries
- Active Quarry
- Disturbed
- Rock Outcrop
- Reclaimed Area
- Ruderal Herbaceous Grassland
- Non-native Annual Grassland
- Northern Mixed Chaparral
- Oak Chaparral
- Chamise Chaparral
- Mixed Scrub
- Poison Oak Scrub
- California Buckeye Woodland
- California Bay Forest
- Oak Woodlands and Forest
- Sycamore Alluvial Woodland
- White Alder Riparian Forest
- Willow Riparian Forest and Scrub
- Settling Ponds and Operational Water Holding Feature
- Stream and Pond
- Wetland

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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 3a.

Biological Communities within the Permanente Property Boundary

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0 350 700 1,400
Feet

Date: May 2010
Map By: Michael Rochelle
Image: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\BRA\2010 Report\BioCommunities_A.mxd

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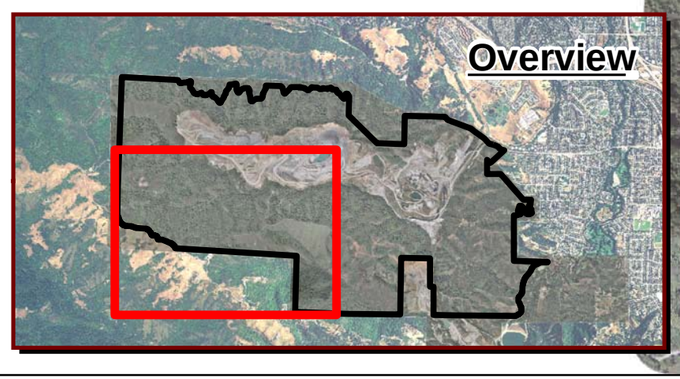
Lehigh Permanente Quarry
Santa Clara County, CA

Figure 3b.

Biological Communities within the Permanente Property Boundary

- Permanente Property Boundary
- Project Area
- Disturbance Limit Boundaries
- Active Quarry
- Disturbed
- Rock Outcrop
- Reclaimed Area
- Ruderal Herbaceous Grassland
- Non-native Annual Grassland
- Northern Mixed Chaparral
- Oak Chaparral
- Chamise Chaparral
- Mixed Scrub
- Poison Oak Scrub
- California Buckeye Woodland
- California Bay Forest
- Oak Woodlands and Forest
- Sycamore Alluvial Woodland
- White Alder Riparian Forest
- Willow Riparian Forest and Scrub
- Settling Ponds and Operational Water Holding Feature
- Stream and Pond
- Wetland



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Date: May 2010
Map By: Michael Rochelle
Image: April 2007
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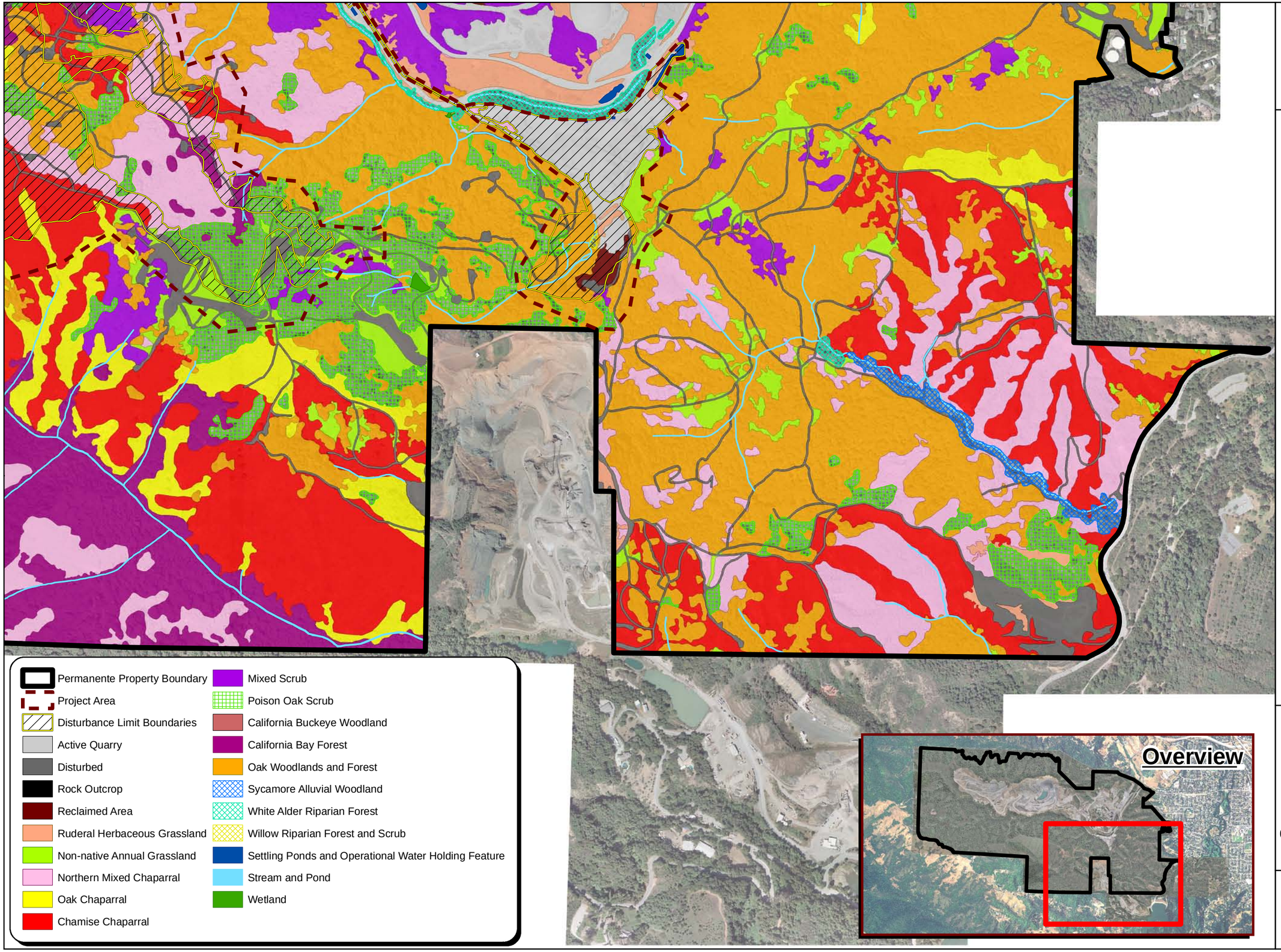
Lehigh Permanente Quarry
Santa Clara County, CA

Figure 3c.

Biological Communities within the Permanente Property Boundary



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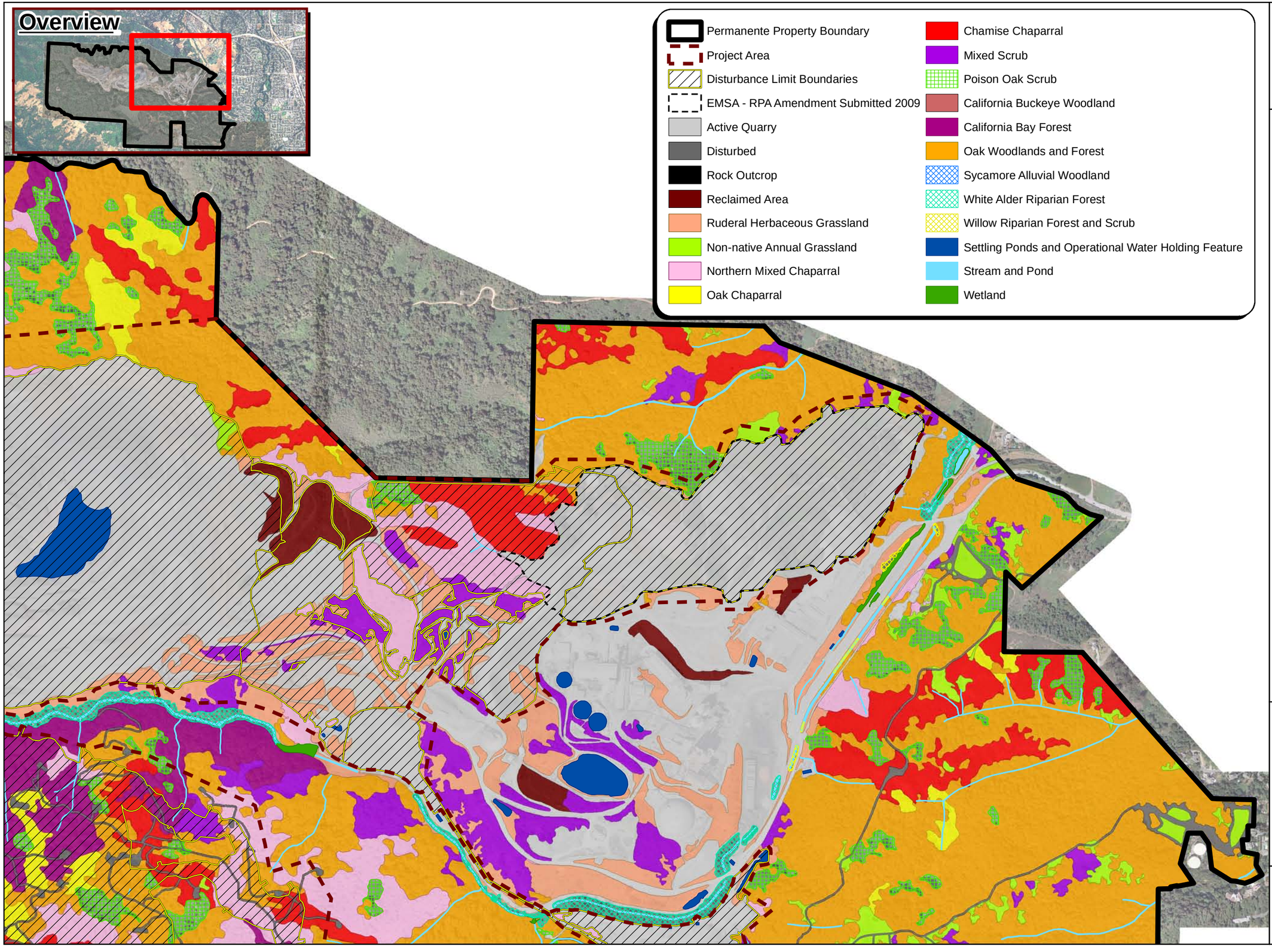
Date: May 2010
Map By: Michael Rochelle
Image: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\BRA\2010 Report\BioCommunities_C.mxd



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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 3d.

Biological Communities within the Permanente Property Boundary

N
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0 350 700 1,400
Feet

Date: May 2010
Map By: Michael Rochelle
Image: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\BRA\2010 Report\BioCommunities_D.mxd

Mixed scrub on the Permanente Property is characterized as dense to moderately open stands to 1.5 meters tall dominated by coyote brush, California sagebrush, and/or California buckwheat with little to no understory vegetation. Associated species include sticky monkey flower (*Mimulus auranticaus*), poison oak (*Toxicodendron diversilobum*), deerweed (*Lotus scoparius*), black sage (*Salvia mellifera*), golden yarrow (*Eriophyllum confertiflora*), and California cudweed (*Gnaphalium californica*). On the Permanente Property, this community type intergrades with chaparrals and oak woodlands. Wildlife observed in this community type on the Permanente Property include Hermit Thrush (*Catharus guttatus*), Northern Pacific Rattlesnake (*Crotalus viridis oreganus*), and Wrentit (*Chamaea fasciata*).

Northern mixed chaparral - Northern mixed chaparral is a community of broadleaved sclerophyll shrubs two to four meters tall forming dense often impenetrable stands dominated by chamise (*Adenostoma fasciculatum*), scrub oak (*Quercus berberidifolia*), various manzanitas (*Arctostaphylos* spp.), and various members of the genus *Ceanothus* (Holland 1986). This community type occurs on dry, rocky, steep, typically south-facing slopes with thin to little soil. It usually occurs below 3,000 feet elevation in Northern California. It is widely distributed throughout the mountain ranges of California.

On the Permanente Property, northern mixed chaparral was mapped in various locations on east and south-facing slopes. Northern mixed chaparral on the Permanente Property forms dense impenetrable stands two to three meters tall with high species diversity in the shrub strata. It intergrades with oak woodlands and oak chaparrals on deeper soils, and chamise chaparral on southern exposures. Species typical of this community type on the Permanente Property include chamise, scrub oak, Eastwood's Manzanita (*Arctostaphylos glandulosa* ssp. *glandulosa*), jimbrush (*Ceanothus oliganthus* var. *sorediatus*), buckbrush (*Ceanothus cuneatus*), birch-leaf mountain mahogany (*Cercocarpus betuloides*), poison oak, yerba santa (*Eriodictyon californicum*), white pitcher sage (*Lepichinia calycina*), coffeeberry (*Rhamnus californicus*), and redberry (*Rhamnus crocea*). There is little to no understory, but where present include Indian warrior (*Pedicularis densiflorus*), Pacific sanicle (*Sanicula crassicaulis*), coyote mint (*Monardella villosa* ssp. *villosa*), and Indian paintbrush (*Castilleja affinis*). Wildlife observed in this community type on the Permanente Property includes Brush Rabbit (*Sylvilagus bachmani*), California Thrasher (*Toxostoma redivivum*) and California Quail (*Callipepla californica*).

Chamise chaparral - Chamise chaparral is a one to three meter-tall chaparral community dominated by chamise with associated species contributing little to overall cover and mature stands containing very little herbaceous understory (Holland 1986). Associated species typically include Manzanita species, scrub oak, buckbrush, birch-leaf mountain mahogany, yerba santa, sage (*Salvia* sp.), and California buckwheat. It has a general distribution similar to northern mixed chaparral, but is more abundant in southern California.

Chamise chaparral on the Permanente Property dominates southern exposures with shallow soils. Chamise chaparral on the Permanente Property ranges from 0.5 to three meters tall forming impenetrable stands with no herbaceous understory. It intergrades with northern mixed chaparral on eastern exposures, and abruptly borders oak woodland and oak chaparral at ridgelines. Occasional associates include scrub oak, toyon (*Heteromeles arbutifolia*), and madrone (*Arbutus menziesii*). Wildlife observed in this community type on the Permanente Property includes Spotted Towhee (*Pipilo maculatus*), Bewick's Wren (*Thryomanes bewickii*), and Anna's Hummingbird (*Calypte anna*).

Oak chaparral - Oak chaparral includes plant communities described in Holland (1986) as scrub oak chaparral and undescribed plant communities dominated by canyon live oak (*Quercus chrysolepis*) under four meters tall. Oak chaparral is a dense, evergreen chaparral dominated by oak shrubs (*Quercus berberidifolia*, *Q. chrysolepis*, and *Q. agrifolia*) with considerable cover of birch-leaf mountain mahogany and accumulated leaf litter in the understory. It ranges from Tehama County to Baja California in the western Sierra Nevada and Coast Ranges.

On the Permanente Property, oak chaparral was mapped on various north and east-facing slopes where conditions are slightly more mesic than other slopes. It intergrades with northern mixed chaparral on northern exposures, chamise chaparral on eastern exposures, and oak woodlands on flatter north-facing slopes. Species typical of this community on the Permanente Property include scrub oak, bush interior live oak (*Quercus wislizeni* var. *frutescens*), coffeeberry, madrone, chaparral pipestem (*Clematis lasiantha*), poison oak, and birch-leaf mountain mahogany. Wildlife observed in this community type on the Permanente Property include Hutton's Vireo (*Vireo huttoni*), Blue-gray Gnatcatcher (*Polioptila caerulea*), and Fox Sparrow (*Passerella iliaca*).

Poison oak scrub - Briefly described in Holland (1986), poison oak scrub is a shrub-dominated community maintained by frequent fires or other disturbance and completely dominated by poison oak. Poison oak scrub on the Permanente Property contains extremely dense, monotypic stands of poison oak to two meters tall. There are no other species associated with this community type. Wildlife observed in this community type on the Permanente Property includes Ruby-crowned Kinglet (*Regulus calendula*), Wrentit, and San Francisco Dusky-footed Woodrat (*Neotoma fuscipes annectens*).

Non-native annual grassland - Non-native annual grassland is described in Holland (1986) as a dense to sparse cover of annual grasses and herbs 0.2 to 0.5 meters high. Characteristic species include wild oats, soft chess (*Bromus hordeaceus*), filaree (*Erodium botrys*, *E. cicutarium*), Italian ryegrass (*Lolium multiflorum*), small fescue (*Vulpia microstachys*), and various native and non-native herbs and wildlfowers. This community type is distributed throughout the valleys and foothills of most of California below 3,000 feet.

Non-native annual grassland was mapped on the Permanente Property in various landscape positions. Non-native annual grassland intergrades with chaparrals and oak woodlands on slopes and ridgelines. Species typical of this community type on the Permanente Property include wild oats, ripgut brome (*Bromus diandrus*), soft chess, Italian ryegrass, filaree, small fescue, California poppy (*Eschscholzia californica*), bird vetch (*Vicia cracca*), and birdfoot trefoil (*Lotus corniculatus*). Wildlife observed in this plant community on the Permanente Property include Western Meadowlark (*Sturnella neglecta*), Bobcat (*Lynx rufus*), and Violet-green Swallow (*Tachycineta thalassina*).

California bay forest - California bay forest is described in Holland (1986) as similar to a mixed evergreen forest but typically consisting entirely of California bay to 30 meters tall. It usually occurs on moist, north-facing slopes and intergrades with redwood forests in moister canyons and mixed chaparral on drier, rockier slopes. This community type is usually very dense and supports little or no understory. Characteristic species include jimbrush, dogwood (*Cornus* sp.), blackberries (*Rubus* sp.), and snowberry. It is distributed along the coast ranges from the

Oregon border to northern San Luis Obispo County below 3,000 feet, with patchy occurrences of stands usually limited to a few acres.

On the Permanente Property, this community type occurs on north-facing slopes and in the protected valley bottoms. This community type on the Permanente Property consists of dense, monotypic stands of California bay with little to no understory. Reproduction is primarily vegetative with many stems arising from a single root system. Wildlife observed in this plant community include Stellar's Jay (*Cyanocitta stelleri*), Chestnut-backed Chickadee (*Poecile rufescens*), and Mule Deer (*Odocoileus hemionus*).

California buckeye woodland - California buckeye woodland is not described in Holland (1986), but includes areas of open woodland dominated by California buckeye. California buckeye woodlands on the Permanente Property usually contain moderate cover of California buckeye with associated elderberry (*Sambucus mexicana*) and coast live oak. The understory is dominated by native grasses and herbs such as California melic grass (*Melica californica*), small-flowered needlegrass (*Nassella lepida*), California buttercup (*Ranunculus californicus*), and pacific sanicle as well as non-native grasses such as Italian ryegrass, soft chess, and ripgut brome. Wildlife observed in this plant community on the Permanente Property include Chestnut-backed Chickadee, American Robin (*Turdus migratorius*), and Red-breasted Sapsucker (*Sphyrapicus ruber*).

Rock outcrop - Rock outcrop includes areas that host little to no soil or plant cover. On the Permanente Property, they are primarily vertical exposures of various rock types amidst chaparral communities on all aspects. Many small rock outcrops are scattered throughout the Permanente Property, but were primarily too small to map in this effort. The largest rock outcrop on the Permanente Property is on the southern side of Permanente Creek in the center of the Permanente Property. This rock outcrop supports sparse coverage of bigleaf maple (*Acer macrophyllum*) saplings and pacific stonecrop (*Sedum spathulifolium*).

Reclaimed areas - Reclaimed areas are defined here as historically disturbed slopes that have been reclaimed by grading to a final contour, planted with native grass species, and/or planted at a low to moderate density with native shrubs and trees including coyote brush, chamise, and oaks from locally collected cuttings and acorns. Irrigation has been applied to some of the more recent, large-scale revegetated areas to encourage the establishment of planted trees and shrubs, and protective cages have been installed around most container plantings to reduce damage from deer browsing. Generally, these areas are dominated by grass species including wild oats, brome grasses, small fescue, and Italian rye-grass with some establishment of yellow star thistle throughout the open areas. Wildlife observed in this plant community on the Permanente Property include Grasshopper Sparrow (*Ammodramus savannarum*), Bewick's Wren, and Spotted Towhee.

Active quarry - Areas identified on the Permanente Property as active quarry have been disturbed by quarry activities and in some locations host a very small number of weedy and/or native plant species including yellow star thistle, coyote brush, chamise, wild oats, sweet fennel (*Foeniculum vulgare*), and field mustard. Generally, plant cover in these areas is very sparse due to the lack of topsoil. This community offers little habitat for plants or animals.

Disturbed areas - Areas identified on the Permanente Property as disturbed have been recently disturbed by non-quarry activities such as plowing for fuel breaks and construction and

maintenance of dirt roads and clearing of hiking trails. Disturbed areas generally have highly compacted soils and provide little habitat for plants or animals.

Settling ponds and operational water features - Settling ponds for quarry runoff and operational water ponds were identified on the Permanente Property as shown in Figures 3a-d.

4.1.2 Sensitive Biological Communities and Aquatic Features

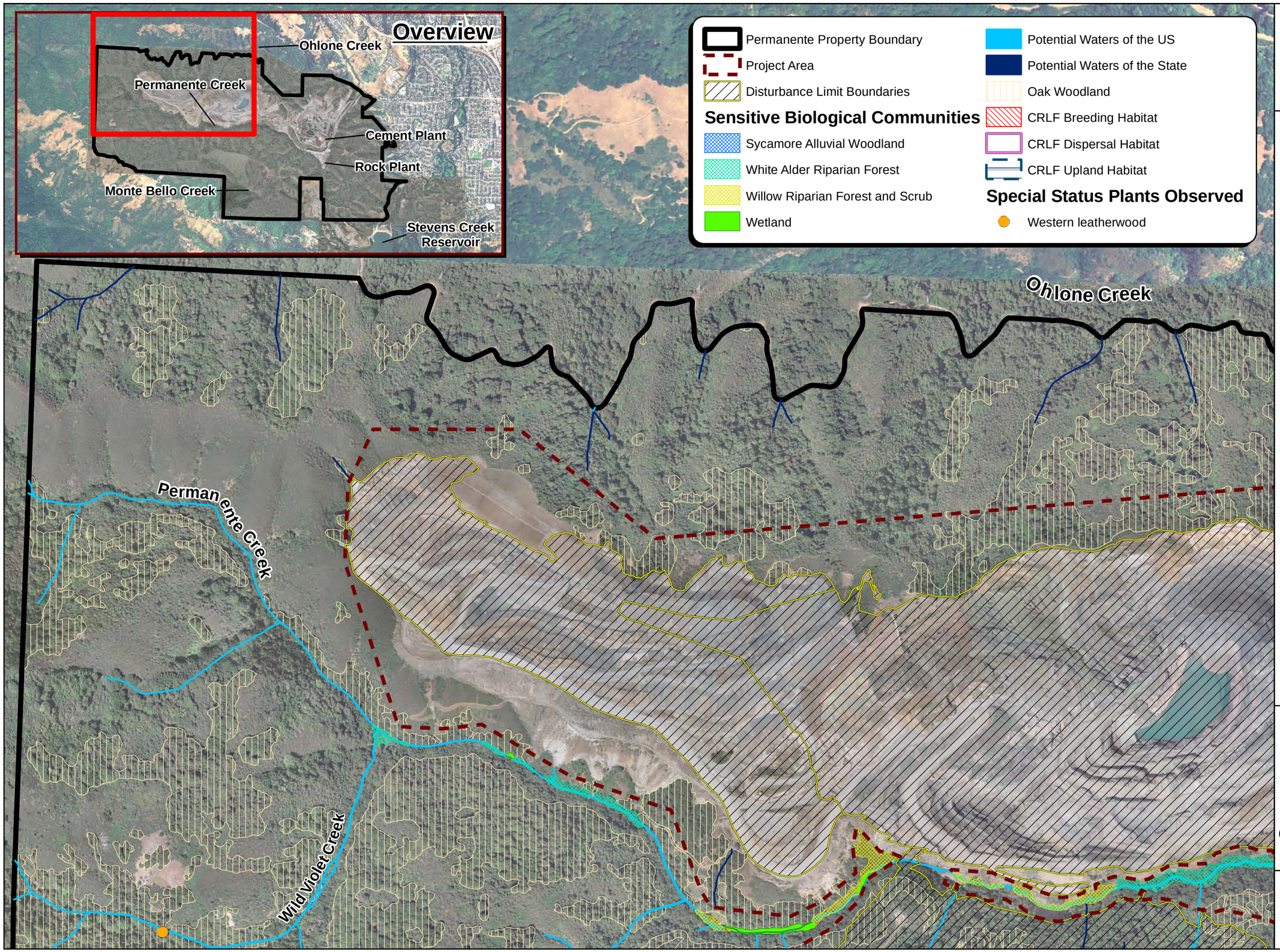
The sensitive biological communities observed on the Permanente Property are shown in Figures 4(a-d) and described below.

Wetland - Wetlands mapped on the Permanente Property include two types of wetland: wetland seeps and freshwater emergent wetlands. Wetland seeps are not described in Holland (1986) but are characterized by a dominance of perennial herbs and ferns that are adapted to wetland conditions. On the Permanente Property, wetland seeps occur along slopes where freshwater lenses intersect the soil surface, or along intermittent spring-fed streams. Wetland seeps on the Permanente Property are dominated by California elk clover (*Aralia californica*), wild ginger (*Asarum caudatum*), giant chain fern (*Woodwardia finbriata*), maiden hair fern (*Adiantum jordanii*), and five-fingered fern (*Adiantum aleuticum*). Wildlife observed in this plant community on the Permanente Property include Stellar's Jay, Bewick's Wren, and California Newt (*Taricha torosa*).

Emergent freshwater wetland occurs in quiet sites permanently flooded with freshwater (Holland 1986). This community is dominated by perennial emergent monocots to five meters tall. Characteristic species of this community type include sedges (*Carex* sp.), bulrush (*Scirpus* sp.), cattails (*Typha* sp.), and spike rush (*Eleocharis* sp.). This community type occurs along the California coast and in coastal valleys near river mouths and around the margins of lakes and springs.

Emergent freshwater wetland on the Permanente Property includes areas adjacent to Permanente Creek which are permanently flooded and host a plant community dominated by perennial emergent grasses and herbs. Four constructed sedimentation basins (Ponds 13, 14, 21 and 22) were mapped as freshwater marshes due to the recruitment of this plant community in the accumulated sediments between maintenance cycles. Species typical of this community type on the Permanente Property include cattail, watercress (*Rorippa nasturtium* ssp. *aquaticum*), field horsetail (*Equisetum arvense*), stinging nettle (*Urtica dioica*), and short spike hedge nettle (*Stachys pycnantha*). Wildlife observed in this plant community on the Permanente Property include Song Sparrow (*Melospiza melodia*), Pacific Tree Frog (*Pseudacris regilla*), and Red-winged Blackbird (*Agelaius phoeniceus*).

Willow riparian forest and scrub - Willow riparian forest and scrub is not described in Holland (1986), but is characterized as a riparian community dominated by various willow species (*Salix* spp.). Species typical of this community type include arroyo willow (*Salix lasiolepis*), red willow (*S. laevigata*), and black willow *(S. gooddinggii*). The overstory ranges from dense to open, and heights range from one to six meters. Associated understory species include short spike hedge nettle, stinging nettle, poison oak, California blackberry (*Rubus ursinus*), and western creek dogwood (*Cornus sericea* ssp. *occidentalis*). It occurs along flat areas adjacent to Permanente Creek and wet tributaries. Wildlife observed in this plant community on the Permanente



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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 4a.

Sensitive Biological Communities and Special Status Species Observed

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Date: May 2010
Map By: Michael Rochelle
Image: 2005 NAIP
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\BRA\2010 Report\SpecialStatus_A.mxd

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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 4b.

Sensitive Biological Communities and Special Status Species Observed

Permanente Creek

Wild Violet Creek

Monte Bello Creek

Permanente Property Boundary
Project Area
Disturbance Limit Boundaries

Sensitive Biological Communities

Sycamore Alluvial Woodland
White Alder Riparian Forest
Willow Riparian Forest and Scrub
Wetland

Potential Waters of the US
Potential Waters of the State
Oak Woodland
CRLF Breeding Habitat
CRLF Dispersal Habitat
CRLF Upland Habitat

Special Status Plants Observed

Western leatherwood

Overview

Ohlone Creek
Permanente Creek
Cement Plant
Rock Plant
Monte Bello Creek
Stevens Creek Reservoir

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Feet

Date: May 2010
Map By: Michael Rochelle
Image: April 2007
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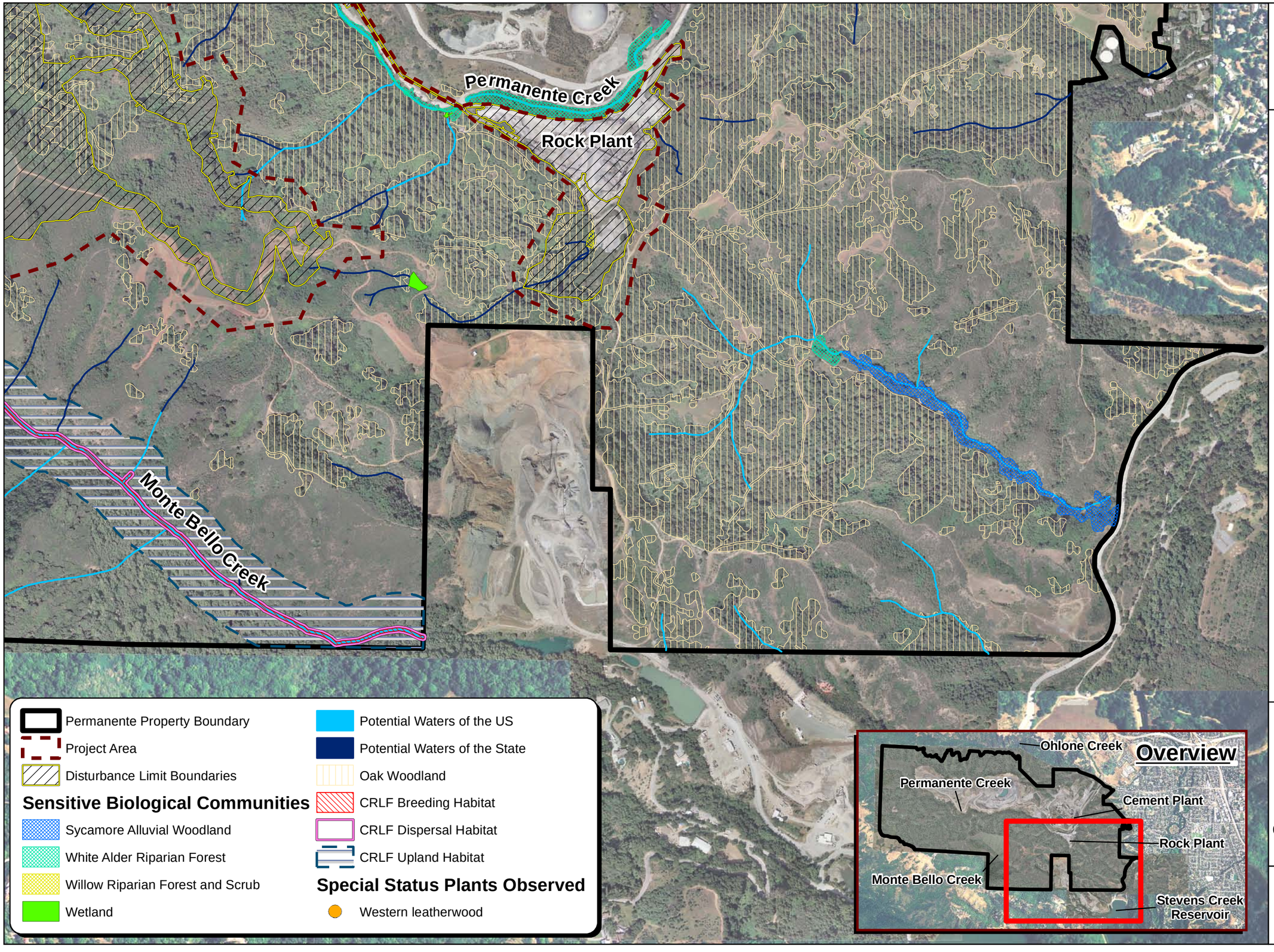

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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 4c.

Sensitive Biological Communities and Special Status Species Observed

N
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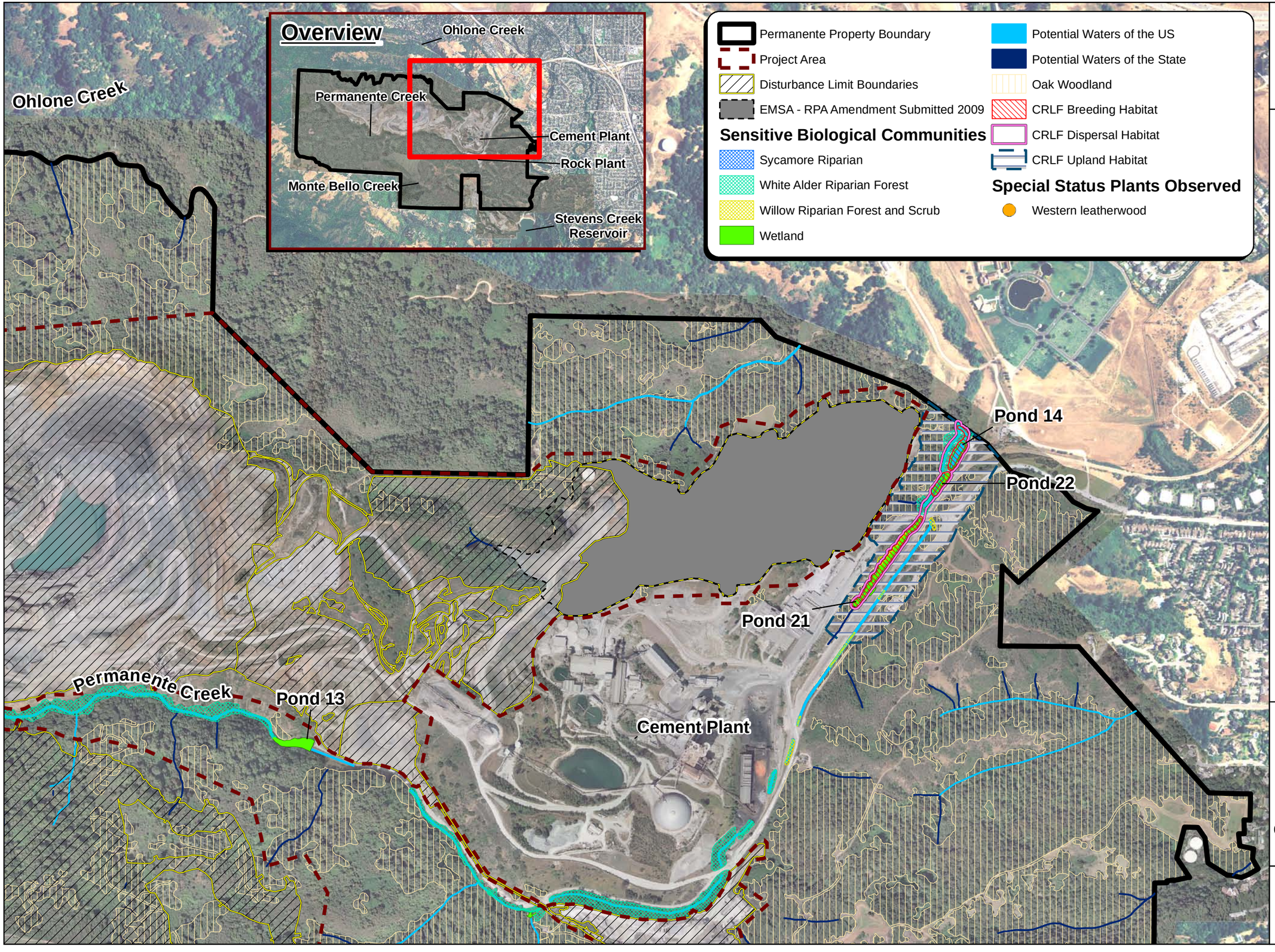
0 350 700 1,400
Feet

Date: May 2010
Map By: Michael Rochelle
Image: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\BRA\2010 Report\SpecialStatus_C.mxd



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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 4d.

Sensitive Biological Communities and Special Status Species Observed

N
W E
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0 350 700 1,400
Feet

Date: May 2010
Map By: Michael Rochelle
Image: April 2007
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Property include Lincoln's Sparrow (*Melospiza linconii*), Wilson's Warbler (*Wilsonia pusilla*), and Great Blue Heron (*Ardea herodias*).

Sycamore alluvial woodland - Sycamore alluvial woodland is described in Holland (1986) as a moderately closed broadleaf riparian forest dominated by sycamore (*Platanus racemosa*) and cottonwood (*Populus fremontii*). Associated species include bigleaf maple (*Acer macrophyllum*), California buckeye, coast live oak, and various willow species. This community type usually occurs on floodplains of sub-perennial streams throughout the coast ranges of California.

Sycamore alluvial woodland was mapped in the far eastern portion of the Permanente Property along one unnamed tributary to Stevens Creek. This community has a moderately open canopy dominated by sycamore with occasional cottonwood, valley oak (*Quercus lobata*), and coast live oak. Understory species include California blackberry, poison oak, and annual grasses. Wildlife observed in this plant community on the Permanente Property include Hairy Woodpecker (*Picoides villosus*), Pacific Slope Flycatcher (*Empidonax difficilis*), and Brown Creeper (*Certhia americana*).

White alder riparian forest - White alder riparian forest is described in Holland (1986) as a medium-tall broadleaf deciduous streamside forest dominated by white alder (*Alnus rhombifolia*) typical of perennial streams in incised canyons below 6,000 feet. Stands in the coast ranges have abundant willows, poison oak, California wild rose (*Rosa californica*), and snowberry in the understory. Associated species include bigleaf maple, western creek dogwood, and Oregon ash (*Fraxinus latifolia*). White alder riparian forest is best formed along rapidly flowing, bedrock-constrained, steep sided canyons, so the riparian corridor is typically narrow.

White alder riparian forest was mapped on the Permanente Property along portions of Permanente Creek. This community type on the Permanente Property is dominated by white alder with abundant bigleaf maple, western creek dogwood, willows, poison oak, and snowberry. Wildlife observed in this plant community on the Permanente Property include Nuttall's Woodpecker (*Picoides nuttallii*), Black Phoebe (*Sayornis nigricans*), and Pacific Slope Flycatcher.

Oak woodland – Several oak woodland community types are described in more detail in Holland (1986), but were lumped in this vegetation mapping effort due to the lack of dominance of one oak species in most of the woodlands encountered on the Permanente Property. Permanente Property's oak woodlands are described as Blue Oak Woodland and Coast Live Oak Woodland in Holland (1986) but also contain oak woodland communities dominated by canyon live oak, and mixed oak woodlands. Species characteristic of these oak woodland types include blue oak (*Quercus douglasii*), coast live oak, canyon live oak, California buckeye, grey pine (*Pinus sabiniana*), California bay, elderberry, toyon, madrone, coffeeberry, poison oak, gooseberries (*Ribes* spp.), and manzanitas. These oak woodland types are distributed throughout California typically in protected valleys and north-facing slopes, intergrading with chaparrals on drier sites and mixed evergreen forests on moister sites.

Oak woodlands were mapped on the Permanente Property primarily along north-facing slopes and in valley bottoms. Oak woodlands on the Permanente Property are predominantly characterized as coast live oak and blue oak woodlands. A few small pockets of oak woodland dominated by interior live oak (northern portion of the Permanente Property) are also present.

Oak woodlands on the Permanente Property have dense and diverse overstories containing madrone, tanbark oak (*Lithocarpus densiflorus*), and California bay with occasional grey pine, and douglas-fir (*Pseudotsuga menziesii*). Species characteristic of the understory include poison oak, coffeeberry, ocean spray (*Holodiscus discolor*), elderberry, toyon, and gooseberries. Wildlife observed in this plant community on the Permanente Property includes Cooper's Hawk (*Accipiter cooperii*), Oak Titmouse (*Oak Titmouse*), and California Deer Mouse (*Peromyscus californicus*).

Streams and ponds - Streams and ephemeral drainages were mapped on the Permanente Property. The most significant of these is Permanente Creek which is a perennial stream that flows across the Permanente Property from its headwaters in the west to the northeastern boundary of the site. Portions of the creek only convey surface water for a few weeks during annual peak rains. Tributaries to Permanente Creek as well as tributaries to Ohlone Creek to the north and to Monte Bello Creek to the south of the Permanente Property were mapped and are described in detail in a jurisdictional determination report submitted to the U.S. Army Corps of Engineers in January 2010 (WRA 2010a).

Permanente Creek

The headwaters of Permanente Creek originate to the west of the Permanente Property. It is fed through a series of seeps and intermittent tributaries. Permanente Creek trends generally west to east, roughly through the center of the property before turning north and flowing for approximately nine miles before emptying into San Francisco Bay. In general, the western-most third of Permanente Creek in the Permanente Property follows a natural course. The central third of the creek has been subjected to historical disturbance, including fill, realignment and road crossings, associated with early mining activities. The eastern third of the creek, after flowing into settling Pond 13, flows through numerous culverts, channelized segments and impoundments before exiting at the north east corner of the Permanente Property. These portions of the Permanente Property have been historically managed and/or diverted as part of the quarry operations, which have been ongoing since the late 1930s based on aerial and historic site photographs. A delineation of Permanente Creek was recently verified by the U.S. Army Corps of Engineers (WRA 2008). Additionally a detailed analysis of the hydrology of Permanente and Monte Bello Creeks was performed by Golder Associates (2010).

Permanente Creek is heavily managed downstream of the Permanente Property where it runs through residential and commercial areas and is generally channelized until reaching Mountain View Slough and south San Francisco Bay. In Los Altos, just north of Mira Monte and Portland Avenues, there is a low flow diversion dam that spills water into Permanente Creek only during very high flow events effectively severing the creek downstream of this dam from receiving flows from upstream. The dam spills from the top through narrow slits from about five to six foot in height. Below this dam Permanente Creek is overgrown with vegetation. The dam is located along the western portion of an 8,000 foot long concrete diversion channel. The Permanente Diversion was designed to divert the majority of storm runoff from the upper Permanente watershed into Stevens Creek. The diversion structure is currently not functioning properly and diverts almost all flow to Stevens Creek (SCVWD 2002).

Generally, tributaries that drain into Permanente Creek are extremely flashy in nature and rarely convey surface flow except during high flow events. The slope to the south of Permanente Creek is densely vegetated and the soils are dominated by various loams which are highly permeable. Since surface water is not largely available (both in time and space) within these

tributaries, they do not serve as aquatic habitat to organisms. Approximately 500 linear feet of Permanente Creek are within the Project Area.

Monte Bello Creek

Monte Bello Creek originates from a combination of seeps and intermittent tributaries to the south of the Permanente Property on the north side of Monte Bello ridge and drains an area of approximately 950 acres in size. The Main Stem, also referred to as the "South Fork", flows northeast until it meets the "North Fork" which originates on the Permanente Property. From the confluence, the Main Stem is perennial and trends southeast until it leaves the Permanente Property and drains into a series of large, in-stream, detention basins on the neighboring property. The creek drains into Stevens Creek Reservoir which empties into Stevens Creek which trends north along Highway 85 and out to San Francisco Bay through Mountain View.

Tributaries to Monte Bello Creek within the Permanente Property range from ephemeral to intermittent. They do not display an OHW mark, nor do they support riparian vegetation. Calcareous limestone is also common in the tributaries to Monte Bello Creek, although no pools were observed which hold water long enough to support fish or breeding amphibians. Monte Bello Creek is not within the Project Area.

Unnamed tributary to Stevens Creek

One unnamed stream and its tributaries were mapped in the southeastern corner of the Permanente Property. This stream is a tributary to Stevens Creek, with their confluence on the eastern side of Stevens Canyon Boulevard. The entire watershed for this stream is located on the Permanente Property. This stream is intermittent, with flow absent as early as May in 2008, although an OHW mark was observed throughout much of its length. No wetland seeps were observed in this watershed. The primary source of flow is runoff from adjacent slopes. The main stem of this stream is a low gradient, unconfined channel which supports a significant overstory of willow scrub and riparian sycamore woodland.

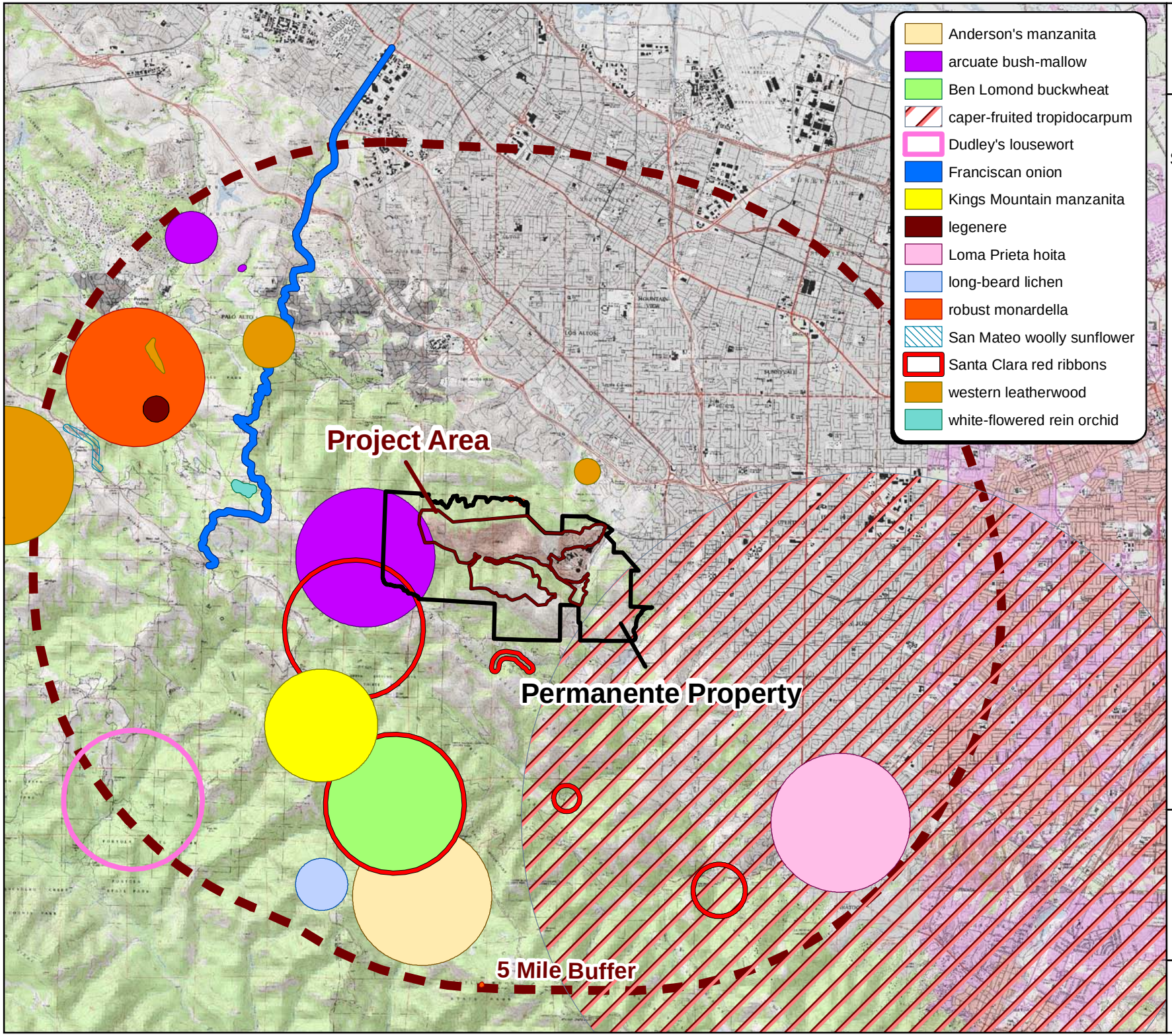
Ohlone Creek tributaries

Ohlone Creek is a tributary to Permanente Creek, although their confluence is north of the Permanente Property. The main stem of Ohlone Creek is located in Rancho San Antonio County Park (Mid-Peninsula Open Space District), but a portion of its watershed and several tributaries are located in the northern portion of the Permanente Property. Tributaries to Ohlone Creek observed on the Permanente Property are ephemeral and do not display an OHW mark. Additionally, they do not support an assemblage of plant species adapted to wetland conditions. The forest overstory in the vicinity of these tributaries is California bay forest and is not considered riparian in nature due to its abundance on ridgelines.

4.2 Special Status Species

4.2.1 Plants

California Natural Diversity Database records (Figure 5) indicate that three special status plant species have been recorded on site although two of these occurrences are unlikely to apply to the Permanente Property due to uncertainties in mapping and identification. Caper-fruited tropidocarpum (*Tropidocarpum capparideum*) is reported in the southeastern corner of the Permanente Property, but the record presented is an approximately five-mile radius around a



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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 5.

Special Status Plant Occurrences within Five Miles of the Permanente Property Boundary

(*Based on CNDDB 2010 Data*)

N
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Miles

Date: May 2010
Map By: Michael Rochelle
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\2010 Reports\BRA\CNDDB_Plants.mxd

reported collection from 1907, which may have been misidentified (CNDDB 2009). Arcuate bushmallow (*Malacothamnus arcuatus*) is reported in the southwestern portion of the Permanente Property near Black Mountain, but the occurrence is an approximately one-mile radius around an uncertain location report from 1926 (CNDDB 2009). Robust coyote mint (*Monardella villosa* ssp. *globosa*) has been recorded on-site as recently as 2006 (CNDDB 2009), but field investigations by WRA biologists in the exact locations of these occurrences did not confirm the presence of this rare subspecies. In the vicinity of the reported occurrence, several populations of a common subspecies of coyote mint (*Monardella villosa* ssp. *villosa*) were observed. It is the professional opinion of the authors of this report that these three reported species are not present on the Permanente Property.

One early season and one late season protocol rare plant field survey was conducted on May 13-15 and July 10, 11, 17, 2008. The surveys corresponded to peak blooming periods for observing and accurately identifying twenty five of the thirty two rare plant species with potential to occur on the Permanente Property and vicinity. The remaining species are identifiable outside their blooming period (one tree, five perennial shrubs, one lichen, and one moss).

A list of plant species observed during the surveys is provided in Appendix B. Two listed species were observed on site; Western leatherwood (*Dirca occidentalis*) and Northern California black walnut (*Juglans hindsii*), although only Western leatherwood is afforded protection under CEQA. These species are described in detail below and their occurrence on the Permanente Property is shown in Figure 5.

Western leatherwood (*Dirca occidentalis*). CNPS List 1B. Western leatherwood is a deciduous shrub in the Mezereum family (Thylemaceae) that blooms from January through March and is endemic to California, specifically the San Francisco Bay Area. It primarily occurs on moist slopes in all types of forest- or shrub- dominated communities at elevations of 50 to 395 meters. One small population (< five individuals) was identified on the streambanks of a tributary to Permanente Creek in the far western portion of the Permanente Property. This population is located outside of the Project Area.

Northern California black walnut (*Juglans hindsii*). CNPS List 1B. Northern California black walnut is a deciduous tree in the walnut family (Juglandaceae) that occurs in riparian forest and riparian woodland from 0 to 440 meters in elevation. The species is historically known from Alameda, Butte, Contra Costa, Lake, Napa, Sacramento, Solano, Sonoma, and Yolo counties; however, it can be difficult to determine which stands are native. Only native stands garner protected status. The species blooms from April to May.

Northern California black walnut was observed in the southern portion of the Permanente Property near the remnants of historic homesites, and in drainages near these sites which serve as distribution corridors for this species. Other tree species observed near these sites include fruit trees (*Prunus* spp.), European olive (*Olea europa*), oleander (*Nerium oleander*), and English walnut (*Juglans regia*). Due to the long history of human disturbance near the observed populations and the strong evidence of horticultural tree plantings, it is the professional opinion of the authors that these populations do not constitute a native population but were in fact cultivated by prior human inhabitants in the last fifty to one hundred years; therefore these trees are not afforded protection under CEQA.

CNPS List 4 species. In addition to these two listed species described above, two CNPS List 4 species were observed during rare plant surveys. List 4 species are afforded no protection under CEQA, however they are identified as potentially limited in distribution, and may become listed species in the future. Santa Catalina Island buckwheat (*Eriogonum giganteum* ssp. *giganteum*) has a native distribution restricted only to Santa Catalina Island. A small population of this species was identified in a revegetated area near the cement plant. It has a history of horticultural plantings outside its native range (Hickman 1993) thus was presumably planted within the active quarry in an area previously revegetated for erosion control. Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*) was observed in several openings in chaparral on thin soils on rock outcrops in the southern portion of the Permanente Property. Observation data for these species may be requested from WRA.

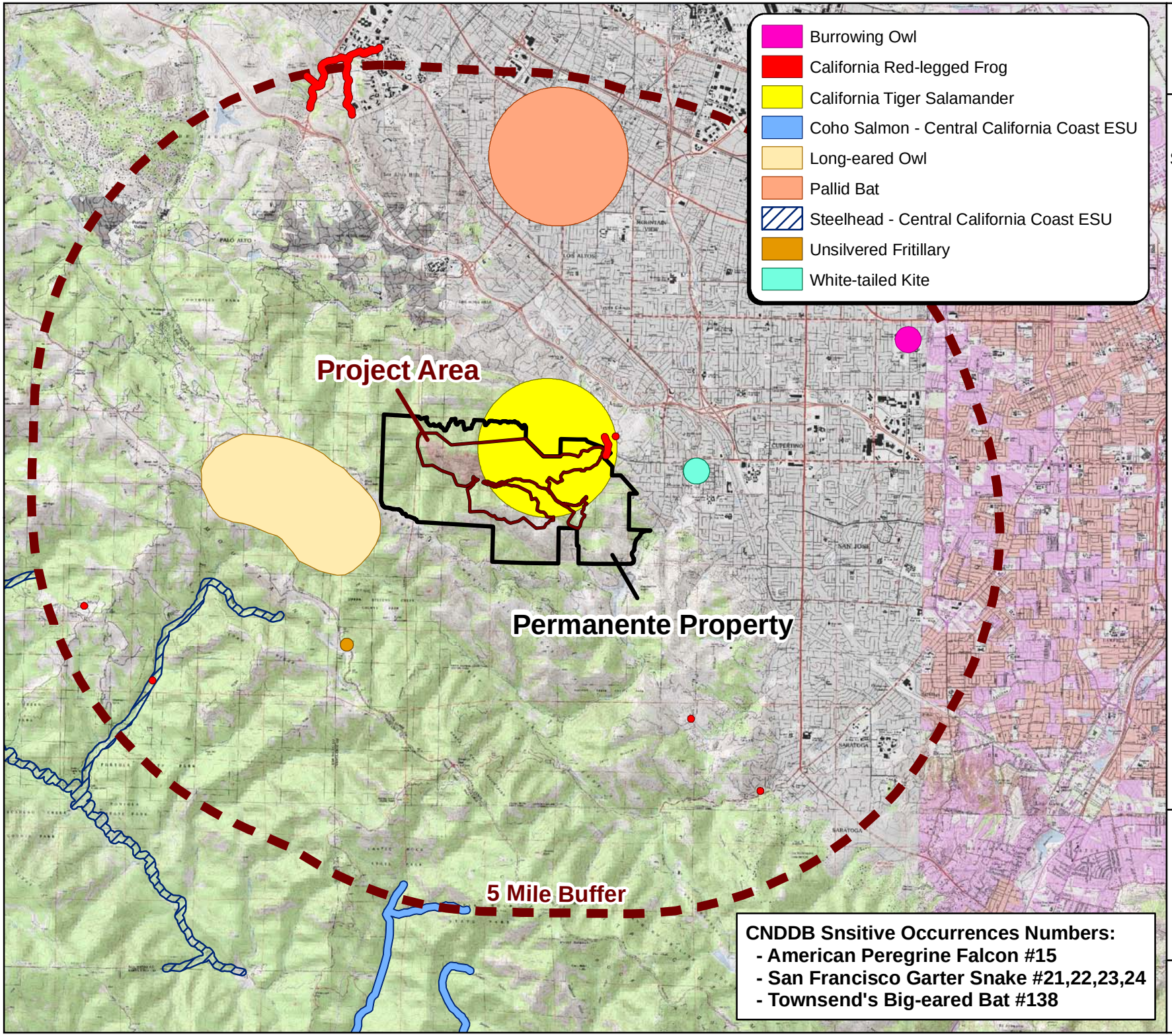
4.2.2 Wildlife

Forty-six special status wildlife species have been recorded in the vicinity of the Permanente Property. These species and their likelihood of occurrence are presented in Appendix A. Figure 6 shows CNDDB documented special status wildlife occurrences within five miles of the Permanente Property. Of these, six species have been documented to occur on the Permanente Property: California Red-legged Frog (*Rana aurora draytonii*), San Francisco Dusky-footed Woodrat, White-tailed Kite (*Elanus leucurus*), Olive-sided Flycatcher (*Contopus cooperi*), Yellow Warbler (*Dendroica petechia*), and Grasshopper Sparrow (*Ammodramus savannarum*). There is a documented California Tiger Salamander (*Ambystoma californiense*) occurrence on the Permanente Property, however the validity of this occurrence is questioned (Jennings pers. comm.) due to the age of the reported occurrence (from 1893) and likely misidentification. One species, the Pallid Bat (*Antrozous pallidus*), has a high potential to occur. Three additional species have a moderate potential to occur on the Permanente Property: Western Red Bat (*Lasiurus blossevillii*), Long-eared Owl (*Asio otus*) and Loggerhead Shrike (*Lanius ludovicianus*).

The Permanente Property is not included in the coverage area for the Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (SCVHCP/NCCP), but is located within five miles of the northwestern portion of SCVHCP/NCCP coverage. The potential for wildlife species covered by the SCVHCP/NCCP to occur on the Permanente Property, but not otherwise addressed in this report, is addressed in Appendix A. Special status wildlife species that are present or have a high or moderate potential to occur on the Permanente Property are discussed below.

4.2.2.1 Species present on the Permanente Property

California Red-legged Frog (*Rana aurora draytonii*), Federally Threatened, CDFG Species of Special Concern. The California Red-legged Frog (CRLF) is a medium-sized frog with reddish-colored legs. The species is generally restricted to riparian and lacustrine habitats in California and northern Baja California. In response to a significant decrease in the historic range of the CRLF, the USFWS listed the subspecies as Threatened in 1996. CRLF prefer deep, quiet pools in creeks, rivers, or lakes below 1,500 meters in elevation. Habitat requirements include fresh emergent or dense riparian vegetation, especially willows adjacent to shorelines. Red-legged Frogs can survive in seasonal bodies of water that are dry for short periods if a permanent water body or dense vegetation stands are nearby; rodent burrows and grasslands provide upland aestivation habitat.



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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 6.

Special Status Wildlife Occurrences within Five Miles of the Permanente Property Boundary

(*Based on CNDDB 2010 Data*)

N
W E
S

0 0.5 1 2
Miles

Date: May 2010
Map By: Michael Rochelle
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\2010 Reports\BRA\CNDDB_Animals.mxd

The USFWS (2008) has defined the four primary constituent elements essential to the conservation of the CRLF and are described below. Aquatic breeding habitat which are standing bodies of fresh water including natural and manmade ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years. Non-breeding aquatic habitats are freshwater and wetted riparian habitats that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult CRLF. Upland habitats are areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 300 feet in most cases and comprised of vegetation such as grasslands, woodlands, wetland, or riparian species that provides shelter, forage, and predator avoidance. Dispersal habitat includes upland or riparian dispersal habitat between occupied locations within a minimum of one mile (1.6 km) of each other and that allows for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled roads without bridges or culverts) to dispersal.

Numerous surveys have been conducted for CRLF on the Permanente Property. CRLF were first discovered on the Permanente Property in September 1997 by Radian International while conducting a CRLF site assessment and field survey (Radian International 1997). These detections were made in a pool located north of Pond 14 between the Pond 14 diversion channel and the channel that drains Pond 14. Since the 1997 survey, the creek channel appears to have undermined this and two other ponds and breached these ponds such that they no longer hold water.

Hagar Environmental Science conducted a fish relocation effort from Ponds 13 and 22 in August of 2000 in preparation of sediment removal from these ponds. The effort was completed in compliance with the issued CDFG permits. During electrofishing surveys, a “few frogs (including one transforming tadpole) were captured”. According to the report, Hagar Environmental (2000), these were “believed to be juvenile foothill yellow-legged frogs” (*Rana boylii*), but were “not positively identified”. It is believed that these were actually CRLF occupying and breeding in Pond 22, as the pond was not at the time, nor is it now, suitable Foothill Yellow-legged Frog (FYLF) habitat. Additionally no FYLF have been detected within the Permanente Creek Watershed (CNDDB 2009).

Dr. Mark Jennings conducted protocol surveys for CRLF on the Permanente Property in 2006 (Jennings 2006b), 2007 (Jennings 2007), biological monitoring for CRLF in October and November 2006 (Jennings 2006a), December 2007 (Jennings 2008b), October 2008 (Jennings 2008c) and August and November 2009 (Jennings 2009a and 2009b). Surveys also were conducted by Dr. Jennings on the night of July 30, 2008 (Jennings 2008a) following current USFWS guidelines. The above-noted studies focused on all existing sedimentation basins and Permanente Creek. Additionally, Dr. Jennings has conducted a CRLF habitat assessment (Jennings 2010) within areas potentially affected by implementation of the proposed Project (Appendix D).

Incidental observations within the Permanente Creek Watershed by WRA biologists are consistent with past studies conducted by Dr. Jennings. In 2009, CRLF adults were frequently seen and vocalizing male CRLFs were detected in February and April in Pond 14. Additionally, a total of 11 CRLF egg masses were observed in Pond 14 in February 2009. CRLF adults have

also been detected in Pond 14, although no evidence of breeding was observed here. The stream channel below Pond 14 also contains two deep pools where CRLF adults and larvae have been detected. It is not likely that CRLF are utilizing these pools as aquatic breeding habitat due to seasonally high water velocities. The larvae likely are washed down from Pond 14 and the adults are utilizing this section of Permanente Creek as non-breeding aquatic habitat.

Within the Monte Bello Creek Watershed, WRA biologists incidentally detected a sub-adult CRLF in the uplands adjacent to Monte Bello Creek on May 7, 2009. This individual was observed approximately 0.5 miles upstream from the southeast Property Boundary where Monte Bello Creek leaves the Permanente Property. The Main Stem and South Fork of Monte Bello Creek provide marginal aquatic breeding habitat based on the lack of deep, slack-water pools, but in some years, moderately deep pools may provide suitable conditions to allow for successful CRLF breeding. The creek also serves as non-breeding aquatic habitat and the surrounding uplands provide dispersal and foraging habitat for CRLF (Jennings 2010 – Appendix D).

The results of these surveys show that CRLF consistently occupy limited areas of lower Permanente Creek, and appear to be present in Monte Bello Creek, but none of this population exists within the Project Area, nor are CRLF likely to be found there. The protocol surveys conducted in 2007 concluded that CRLF were present in Ponds 14, 21, and 22. No CRLF were found in any other sedimentation basin on the Permanente Property. Most recently, CRLF were observed to successfully breed in Ponds 14 and 21. Upstream of the occupied ponds, aquatic breeding habitat is generally not present on the Permanente Property because of lack of deep slack-water pools and lack of upland habitat within the active quarry. CRLF are unlikely to occur in the active quarry or in heavily disturbed portions of the Permanente Property due to lack of cover, exposure to predation and frequent vehicle traffic. Accordingly, upland and dispersal habitat, two primary constituent habitat elements for CRLF, is limited to undisturbed hillside slopes and revegetated areas within 300 feet of occupied portions of Permanente and Monte Bello Creeks and the occupied sedimentation ponds. Permanente Creek may serve as a movement corridor between Pond 21 and downstream breeding locations off site.

Although CRLF occupy a small portion of Permanente Creek in the northeastern most portion of the Permanente Property as well as Monte Bello Creek in the southern most portion of the Permanente Property, CRLF are not likely to disperse between the two occupied locations. The landscape between these two occupied locations is dominated by heavily trafficked roads, paved industrial areas, and unvegetated arid slopes. The ephemeral nature of the intervening creeks and ponds, long distance (1.75 miles) and steep terrain precludes movement between Permanente and Monte Bello Creek drainages (Jennings 2010). Additionally, a history of CRLF surveys on the Permanente Property has failed to detect CRLF occupying the creeks and ponds between these two systems.

San Francisco Dusky-footed Woodrat (*Neotoma fuscipes annectens*), CDFG Species of Special Concern. This subspecies of Dusky-footed Woodrat occurs in the Coast Ranges between San Francisco Bay and the Salinas River (Matocq 2003). It prefers brushy riparian habitats, coast live oak woodland, and dense scrub communities. Prominent stick houses provide evidence of its presence.

On the Permanente Property, San Francisco Dusky-footed Woodrat is locally abundant in densely wooded forests and woodland, and in scrub and shrub habitat. This species' large stick houses are commonly found in nearly every terrestrial/upland biological community on the Permanente Property except chamise chaparral and grasslands.

White-tailed Kite (*Elanus leucurus*), California Fully Protected Species. Kites occur in low elevation grassland, agricultural, wetland, oak woodland, and savannah habitats. Riparian zones adjacent to open areas are also used. Vegetative structure and prey availability seem to be more important than specific associations with plant species or vegetative communities. lightly grazed or ungrazed fields generally support large prey populations and are often preferred to other habitats. Kites primarily feed on small mammals, although, birds, reptiles, amphibians, and insects are also taken. Nest trees range from single isolated trees to trees within large contiguous forests. Preferred nest trees are extremely variable, ranging from small shrubs (less than 10 feet tall), to large trees (greater than 150 feet. tall) (Dunk 1995). White-tailed Kites are regularly observed foraging on the Permanente Property. Although this species has not been documented to nest here, high quality foraging and nesting habitat is present on the Permanente Property.

Olive-sided flycatcher (*Contopus cooperi)*, CDFG Species of Special Concern, USFWS Bird of Conservation Concern. Olive-sided Flycatcher is typically associated with coniferous forest openings, forest edges near natural openings or human-made openings, or open to semi-open forest stands (Altman and Sallabanks 2000). This species frequently occurs along wooded shores of streams, lakes, rivers, ponds, bogs, and muskegs, where natural edge habitat occurs and standing dead trees often are present (Altman and Sallabanks 2000). This species' frequent presence near water may be due to higher insect abundance in these areas.

A female Olive-sided Flycatcher was observed on the Permanente Property on April 22, 2008. This individual may have been a migrant. While this species prefers montane coniferous forest, records of breeding Olive-sided Flycatcher are present at lower elevations near Santa Clara, and Berkeley (Altman and Sallabanks 2000). There are no other documented occurrences of this species within five miles of the Permanente Property in CNDDB (CNDDB 2009).

Yellow Warbler (*Dendroica petechia*), CDFG Species of Special Concern. Yellow Warbler breeds most commonly in wet, deciduous thickets, especially those dominated by willows, and in disturbed and early successional habitats (Lowther et al. 1999). This species is found between 100 to 2,700 meters elevation in California and at higher elevations along watercourses with riparian growth (Lowther et al. 1999). Yellow warbler populations have declined due to brood parasitism by brown-headed cowbirds (*Molothrus ater*) and habitat destruction. This species' diet is primarily comprised of insects supplemented with berries.

Yellow Warbler has been regularly observed on the Permanente Property during migration and breeding season. This species has been frequently observed foraging within scrub oak dominated habitats near ridge lines. On the Permanente Property, suitable breeding habitat is present within the riparian corridors along Permanente Creek, Monte Bello Creek and their major tributaries. This species may breed within the Permanente Property.

Grasshopper Sparrow (*Ammodramus savannarum*), California Species of Special Concern. This species generally prefers moderately open grasslands and prairies with patchy

bare ground. They select different components of vegetation, depending on grassland ecosystem. This sparrow typically avoids grasslands with extensive shrub cover, although some level of shrub cover is important for birds in western regions (Vickery 1996).

Grasshopper Sparrows are ground nesting birds. The nest cup is domed with overhanging grasses and contains a side entrance. Eggs are usually laid in early to mid June and hatch 12 days later. Males and females provide care to the young and second broods are common. This species feed primarily on insects (Vickery 1996).

On the Permanente Property, Grasshopper Sparrows have been observed consistently within sparsely vegetated areas within active quarry areas. Suitable foraging and breeding habitat for this species is abundant within portions of the Permanente Property where shrub, grasslands and bare ground create a habitat mosaic.

4.2.2.2 Species with a high or moderate potential to occur on the Permanente Property

Pallid Bat (*Antrozous pallidus*), CDFG Species of Special Concern, WBWG High Priority. The Pallid Bat is found in a variety of low elevation habitats throughout California. It selects a variety of day roosts including rock outcrops, mines, caves, hollow trees, buildings, and bridges. Night roosts are usually found under bridges, but also in caves, mines, and buildings. Pallid Bats are sensitive to roost disturbance. Unlike most bats, Pallids primarily feed on large ground-dwelling arthropods and prey are typically taken on the ground (Zeiner, et al. 1990). Hollow trees in the oak woodland provide potential roost habitat for this species; therefore, there is a moderate potential for occurrence for this bat.

The Permanente Property supports several rock outcrops which contain suitable cavities capable of supporting roosting Pallid Bats; however roosting habitat is likely marginal within the Project Area. Pallid Bats may, however, roost within the walls of the North Quarry if suitable cracks and crevices are present. Large abandoned buildings and other structures on the Permanente Property provide suitable bat roosting habitat. Buildings and structures within the Project Area are generally limited to portable or temporary buildings that support offices, steel modular shipping containers and various smaller relict operational structures scattered throughout the property. A former aluminum plant building at the north east corner of the Permanente Property, outside of the Project Area, is known to support an unidentified bat roost where an outflight was observed at dusk by WRA biologists. The nearest documented occurrence of the Pallid Bat is 5.0 miles north of the Permanente Property (CNDDB 2009). There is a high potential for this species to roost on the Permanente Property.

Western Red Bat (*Lasiurus blossevillii*), WBWG High Priority. This species is considered highly migratory, and broadly distributed, reaching from southern Canada, through much of the western United States. They are typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas possibly an association with riparian habitat (particularly willows, cottonwoods, and sycamores).

Suitable habitat for Western Red Bat may be present in the sycamore alluvial woodlands, white alder riparian forest and willow riparian forest on the Permanente Property. There are no known occurrences within 5.0 miles of the Permanente Property (CNDDB 2009). There is a moderate potential for this species to occur on the Permanente Property.

Long-eared Owl (*Asio otus*), CDFG Species of Special Concern. Nesting Long-eared Owls range from coastal lowlands to interior deserts and seem to prefer riparian groves, planted woodlots, and belts of live oaks paralleling streams (Shuford 1993). This owl generally frequents dense, riparian and live oak thickets paralleling stream courses, and nearby woodland and forest habitats (Zeiner et al. 1990). Long-eared Owls nest almost exclusively in old stick nests of crows, magpies, ravens, hawks, or herons.

The Permanente Property supports suitable foraging and breeding habitat for this bat species along woodland edges. Typical nesting habitat is present in mature riparian vegetation along on-site portions of Permanente Creek, Monte Bello Creek and associated tributaries. Some portions of otherwise suitable habitat along Permanente Creek, in the vicinity of the active quarry, may be unsuitable due to disturbance associated with quarry activities. A breeding pair of Long-eared Owls was recently documented to occur 1.3 miles west of the Permanente Property (CNDDB 2009). This species has a moderate potential to occur on the Permanente Property.

Loggerhead Shrike (*Lanius ludovicianus*), CDFG Species of Special Concern, USFWS Bird of Conservation Concern. Loggerhead Shrike is a common resident and winter visitor in lowlands and foothills throughout California. It prefers open habitats with scattered trees, shrubs, posts, fences, utility lines or other perches. Nests are usually built on a stable branch in a densely-foliaged shrub or small tree and are usually well-concealed. The highest densities occur in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian pinyon-juniper, juniper, and desert riparian habitats. While this species eats mostly arthropods, they also take amphibians, small to medium-sized reptiles, small mammals and birds, and are also known to scavenge on carrion (Ziener et al. 1990).

Loggerhead Shrike has not been observed on the Permanente Property by WRA biologists, however, suitable nesting and foraging habitat is present. There are no documented occurrences of Loggerhead Shrike within 5 miles of the Permanente Property (CNDDB 2009). This species has a moderate potential to occur on the Permanente Property.

4.2.2.3 Federally and State Listed Species Unlikely to occur within the Permanente Property Boundary

The following species are not likely to occur on the property; however, they are discussed herein for completeness of the analysis. The reasons for a determination that they are not present are provided below. For the purposes of completeness, federal and or state listed species that are unlikely to be present are discussed below:

California Tiger Salamander (*Ambystoma californiense*; CTS) Central Valley Distinct Population Segment (DPS) was listed as Federally Threatened August 4, 2004 (69 FR 47212-47248) and the California Fish and Game Commission approved CTS for listing as State Threatened on March 3, 2010.

CTS require two primary habitat components: aquatic breeding sites and upland terrestrial aestivation or refuge sites. This species inhabits valley and foothill grasslands and the grassy understory of open woodlands, usually within one mile of water (Jennings and Hayes 1994). Adult CTS spend most of their time underground in upland subterranean refugia. Underground

retreats usually consist of ground-squirrel burrows, but can also be under logs and piles of lumber (Holland et al. 1990). CTS primarily use California ground squirrel burrows as upland refuge sites (Loredo et al. 1996, Trenham 2001).

Within the Permanente Property, a historic occurrence of CTS is documented from Permanente Creek[2], however, there are no seasonal waters capable of supporting CTS breeding. Permanente Creek, which is the original documented location of the specimen discussed above, is now channelized, and inhabited by several native and non-native fish species. This species is unlikely to occur on the Permanente Property.

Central California coast Steelhead (*Onchorhynchus mykiss*) DPS was federally listed as threatened in August 1997 (62 Fed Reg. 43937). Steelhead are sea-run (anadromous) Rainbow Trout. In California, Steelhead only run in the winter due to unsuitable summer stream conditions (low flows). Steelhead spawn in cool, clear, well-oxygenated streams with suitable gravel beds and flow velocity. Unlike salmon, which die after spawning, some Steelhead return to their natal streams several times to spawn.

Historically, Permanente Creek reportedly supported Steelhead (Santa Clara County 2010, Garza and Pearse 2008). The closest known extant Steelhead locale to Permanente Creek is Stevens Creek, just over one mile east of Permanente Creek. One of the largest obstacles to Steelhead reproduction is the placement of natural or man-made (anthropogenic) barriers in Steelhead spawning streams. Barriers within a stream course may limit or completely block access of mature inmigrating Steelhead from accessing suitable spawning habitat. In some cases barriers may also prevent outmigrating smolts from reaching the ocean. Partial or complete barriers include waterfalls, debris jams, excessive velocities, high temperatures, high turbidity, and dams (Barnhart 1986).

Because of dams and other barriers to fish passage downstream of the Project Area, there is no potential for Steelhead to occur in Permanente Creek on the Permanente Property. In Los Altos, just north of Mira Monte and Portland avenues, there is a low flow diversion dam that spills water into Permanente Creek only during very high flow events. The dam spills from the top through narrow slits from about five to six feet in height. No plunge pool is present on the downstream side of the diversion dam; therefore it serves as an impassable barrier for in-migrating Steelhead. WRA did not assess any additional barriers that may be present downstream of the diversion dam.

The dam is located along the western portion of an 8,000-foot concrete diversion channel. The Permanente Diversion was designed to divert the majority of storm runoff from the Permanente Creek Watershed into Stevens Creek. The dam structure is currently not functioning properly and diverts almost all flow into Stevens Creek (SCVWD 2002), which has a documented

[2] Dr. Mark Jennings, an expert on rare amphibians, concluded in a report dated October, 2008 that: “The California Tiger Salamander is thought to be present on the Permanente Property because a specimen alleged to be this species, collected in 1893 in the Permanente Creek drainage system, is listed in the CNDDB. However, this is a museum specimen at the California Academy of Sciences that was destroyed during the 1906 San Francisco earthquake and fire. It was not uncommon during the late 19th century for specimens to be misidentified, especially if it was a juvenile or larval individual. Furthermore, the Permanente Property is currently too disturbed to support California Tiger Salamanders, and would preclude any successful breeding in these habitats by California Tiger Salamanders" (HBG, Inc. 2008).

Steelhead run. A Coastal Conservancy Report (2004) concluded that a similar, 3,900-foot concrete channel along Mission Creek in Santa Barbara County acts as a total barrier to Steelhead because during low flows, upstream Steelhead migration is not possible due to the water depth throughout the channel being less than the required 7 inches. When flows increase and the water depth in the channel is greater than 7 inches, increased flow velocities are sustained throughout the long channel with no velocity breaks. Upstream Steelhead passage is prevented due to exhaustion as fish attempt to migrate up the long channel.

Since resident Rainbow Trout are known to occur in Permanente Creek and there are no known barriers to downstream migration for trout, some Rainbow Trout may outmigrate to the ocean. Due to the barriers discussed above, it is not possible for these individuals to return to upper Permanente Creek to spawn and likely become part of the Stevens Creek Steelhead population.

Fish surveys confirmed the absence of Steelhead in Permanente Creek from the Permanente Property boundary downstream to the diversion channel. Liedy (1984) sampled six Permanente Creek sites downstream of the Permanente Property between Charleston Road and Interstate 280 in August 1981 and found no Steelhead. Liedy (2002) also sampled two sites in April 1996, one reach downstream of Highway 101 and one reach upstream of Interstate 280 and found no Steelhead. Since surveys have shown that Steelhead are not present in Permanente Creek between the diversion channel and the Permanente Property, and the diversion channel is a complete barrier to upstream Steelhead migration, Steelhead are unable to access this reach and are therefore unlikely to occur on the Permanente Property.

4.3 Aquatic Surveys

WRA conducted an analysis of the aquatic habitats of Permanente Creek and Monte Bello Creek on the Quarry Property. Some of these results are summarized in the sections that follow. The results of the entire study can be found in Appendix E, Permanente Aquatic Technical Report (WRA 2010b).

4.3.1 Aquatic Wildlife Sampling

The results of the aquatic surveys along Permanente Creek are presented for the “upper” and “lower” reaches of the creek that correspond approximately to stations MS-1 and MS-2, respectively, in Golder’s hydrology report (2010). The upper reach is within a largely natural portion of the Creek, while the lower reach is below the active quarry area and starts near the Rock Plant. These results describe existing conditions as observed in 2009.

Survey results for fish sampling identified three species, resident non-anadromous Rainbow Trout (*Oncorhynchus mykiss*), Sacramento Sucker (*Catostomus occidentalis*), and Western Mosquito Fish (*Gambusia affinis*) within the Permanente Property. Within the upper reaches of Permanente Creek, Rainbow Trout was the only species observed, with fry, juvenile, and adult life stages for this species recorded. Within the lower reach, Rainbow Trout, Sacramento Sucker, and Western Mosquito Fish were observed. For this reach, juvenile and adult Rainbow Trout and Western Mosquito Fish, and adult Sacramento Sucker were observed.

Survey results for amphibians identified nine species within the Permanente Property, including the California Red-legged Frog. Within the upper reaches of Permanente Creek, five amphibian species were observed, including California Giant Salamander (*Dicamptodon ensatus*),

California Newt (*Taricha torosa*), Rough-skinned Newt (*Taricha granulosa*), Ensatina Salamander (*Ensatina eschscholtzii*) and Pacific Tree [=Chorus] Frog (*Hyla [=Pseudacris] regilla*). Within the lower reach of Permanente Creek, six aquatic species, the Rough-skinned Newt adult, California Red-legged Frog, the Pacific Tree [=Chorus] Frog, California Newt, Ensatina Salamander, and Western [=Boreal] Toad (*Bufo [=Anaxyrus] boreas*). California Red-legged Frog egg mass, juvenile and adult life stages have been observed within the lower reach.

Survey results for BMI found similar conditions between upper and lower reaches of Permanente Creek. The physical habitat quality score ranked as very high (a score greater than 160) for both reaches. For species richness, which accounts for the diversity of BMI taxa, the upper reach documented 26 species and 24 species were in the lower reach. Additionally, composition which reflects the number of individuals in a taxon compared to the total number of individuals sampled was similar between the two sampled reaches.

4.3.2 Bioassay Sample

A bioassay was conducted for water samples collected within the Permanente Property in February and April, 2009. For each sample date, water samples were collected from the upper and lower reaches of Permanente Creek. Aquatic Testing Laboratory in Ventura, California performed a Fathead Minnow 96-hour Percent Survival Bioassay (EPA-821-R-03-012) analysis on the collected samples. For all samples there was 100 percent survival of Fathead Minnows (*Pimephales promelas*) subject to the 96-hour test.

The combined results of the field surveys for fish, amphibians, and BMI indicate very similar composition of species and diversity between upper and lower reaches of Permanente Creek. This indicates that water pumped out of the North Quarry does not have a detrimental effect on the aquatic life in the creek. Additionally, the Fathead Minnow acute toxicity test indicates that water from both upper and lower Permanente Creek is not acutely toxic to this species.

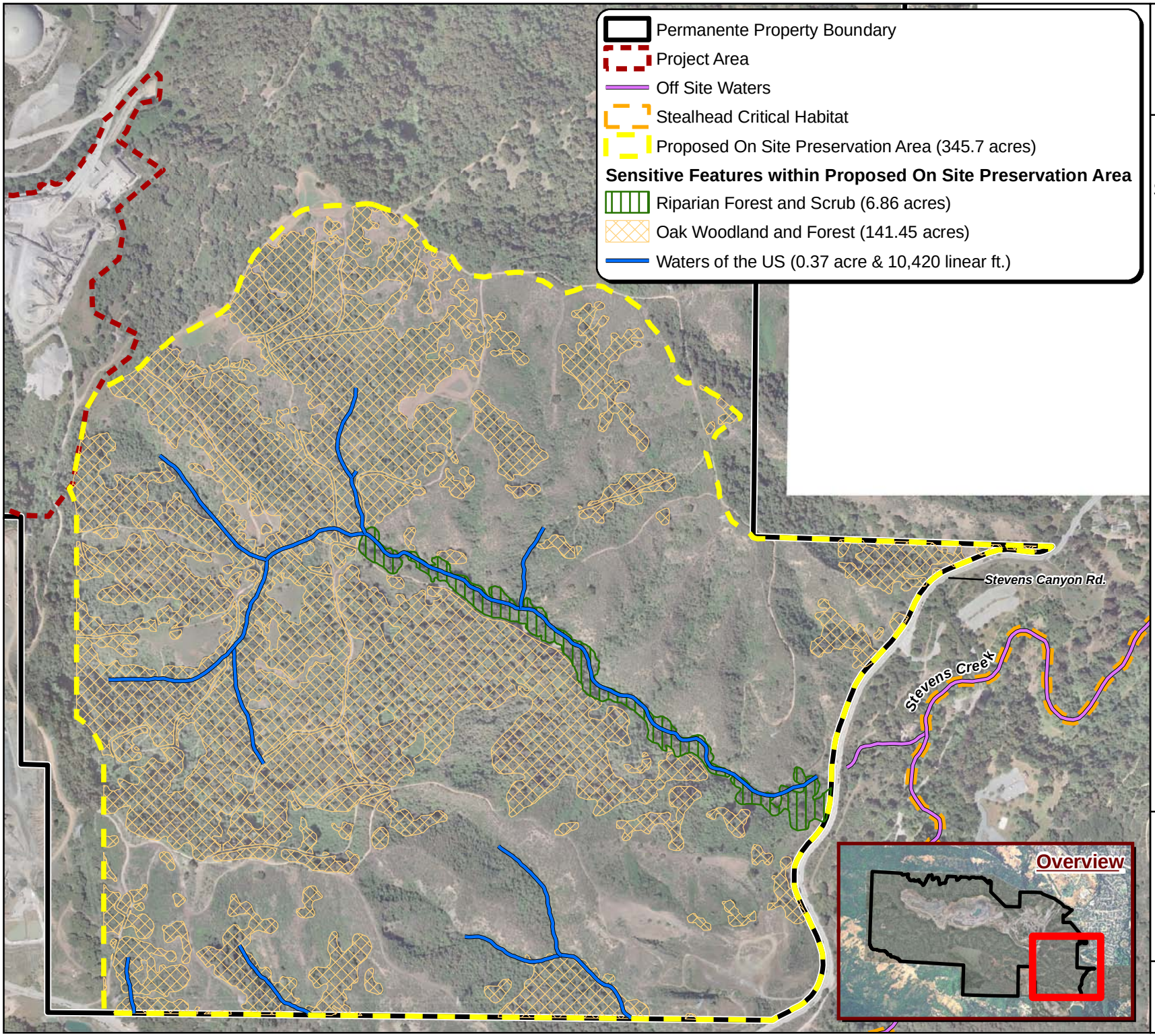
4.4 On-site Preservation Area

A 345-acre portion of the southeast of the Permanente Property is proposed as an on-site preservation area. This area is not part of the proposed RPA but was surveyed for potential sensitive species and habitats similar to the rest of the property. The area will be preserved and managed as a habitat conservation area in perpetuity for partial mitigation to impacts to ephemeral creeks, riparian habitat, oak woodland, and wildlife habitat incurred through the proposed Project.

A wetland delineation, rare plant surveys, mapping of sensitive habitat, and wildlife studies were conducted in the Preservation Area to determine the extent of sensitive resources present. The following sections describe the biological resources present in the Preservation Area which are also shown on Figure 7.

4.4.1 Non-sensitive habitats

Nearly half of the preservation area is composed of non-sensitive habitats such as various chaparral and scrub communities and grassland. These habitats provide habitat for many sensitive and non-sensitive wildlife species as discussed in section 4.4.4, below.



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Lehigh Permanente Quarry
Santa Clara County, CA

Figure 7.

Proposed On Site Preservation

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0 250 500 1,000
Feet

Date: May 2010
Map By: Michael Rochelle
Image Date: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\2010 Figures\BRA\Preservation_Final.mxd

4.4.2 Sensitive Habitats

The preservation area supports three sensitive habitat types including oak woodland, buckeye riparian forest (with willow riparian scrub mixed in), and creeks (Waters of the U.S./State). Approximately 140 acres of oak woodland were mapped in the Preservation Area. The oak woodlands were dominated by coast live oak with large patches of blue oak as well. The main drainage in the Preservation Area supports 6.8 acres of riparian habitat supporting willows and sycamores, and 0.4 acres (10,420 linear feet) of Waters of the United States. The wetland delineation is currently being reviewed and verified by the Corps of Engineers.

4.4.3 Special Status Plant Species

No special status plant species were observed during protocol rare plant surveys conducted in the preservation area in 2008.

4.4.4 Special Status Wildlife Species

The on-site Preservation Area supports San Francisco Dusky-footed Woodrat, avian nesting and foraging habitat, and bat roosting and foraging habitat.

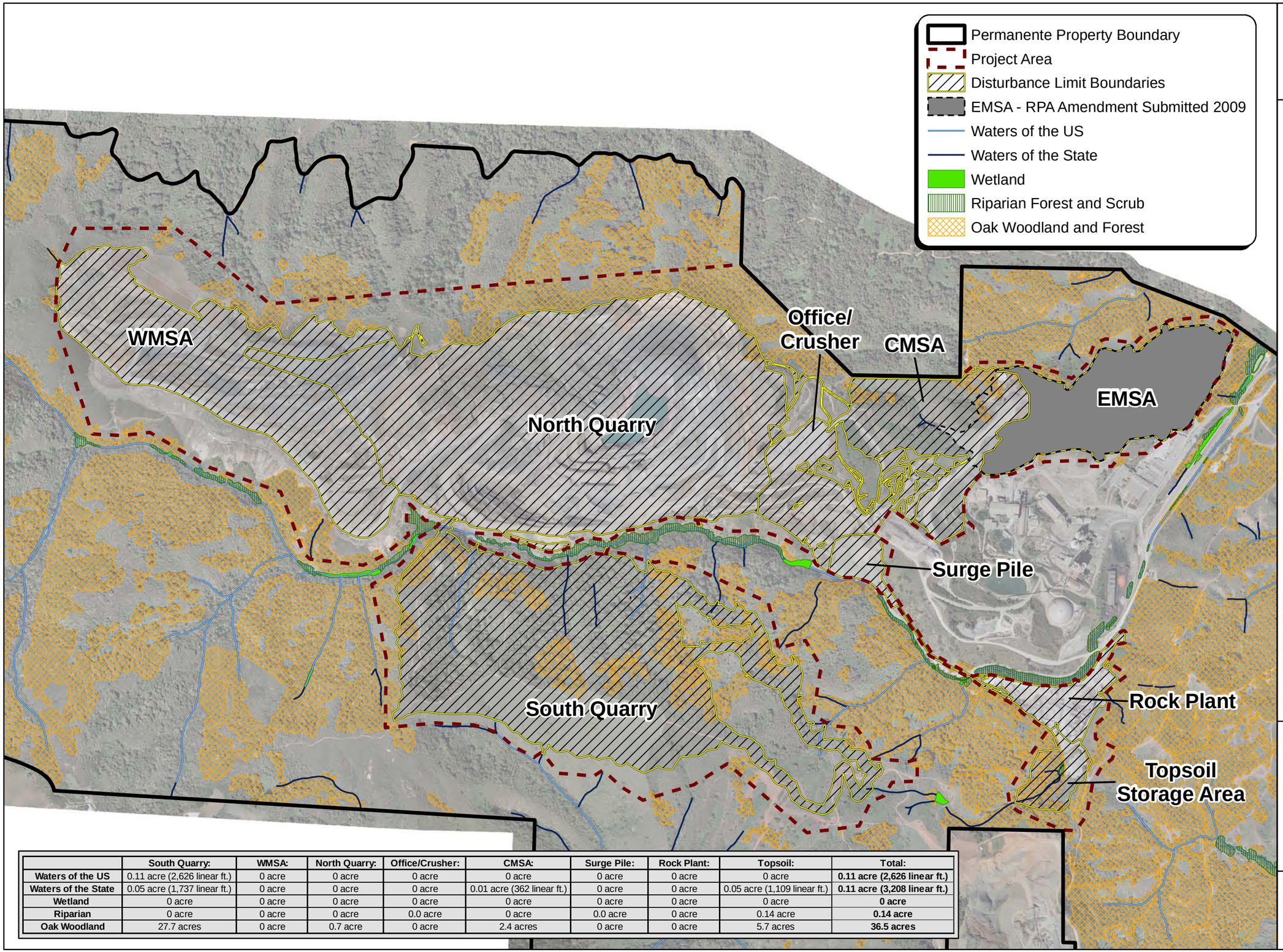
Additionally, approximately 275 acres of the core watershed within the preservation area drains eastward into Stevens Creek below Stevens Creek Reservoir. Stevens Creek supports a Steelhead run and is Critical Habitat for Steelhead up to the reservoir dam. Preservation of this large watershed on the Permanente property will preserve the largest undeveloped tributary watershed of Stevens Creek below the reservoir which will preserve an important source of cool, clean, perennial water for the Steelhead.

5.0 Recommendations to Avoid or Minimize Impacts

5.1 Potential Biological Impacts

Potential impacts to sensitive habitats and species within the Project Area may occur through two primary means. Quarry-related impacts may occur through development of the South Quarry and Topsoil Storage Area as they are grubbed and mined. Reclamation-related impacts are beneficial impacts that may occur as portions of the Project Area that are vegetated are cleared and prepared for final reclamation. These potential impacts are described below and are summarized in Table 3 and shown in Figure 8.

Clearing of the Project Area and impacts to sensitive features will occur incrementally in phases. Each phase will also include portions of revegetation and reclamation of certain areas. Therefore as the Project proceeds, progressively more of the Project Area will be revegetated which will begin the habitat restoration process. Over the 20-year Project lifetime, some of these areas will have been growing for 20 years and will provide habitat for wildlife species. The succession of impacts and revegetation is presented in Table 4 to show the progression of the Project over time.



	South Quarry:	WMSA:	North Quarry:	Office/Crusher:	CMSA:	Surge Pile:	Rock Plant:	Topsoil:	Total:
Waters of the US	0.11 acre (2,626 linear ft.)	0 acre	0 acre	0 acre	0 acre	0 acre	0 acre	0 acre	**0.11 acre (2,626 linear ft.)**
Waters of the State	0.05 acre (1,737 linear ft.)	0 acre	0 acre	0 acre	0.01 acre (362 linear ft.)	0 acre	0 acre	0.05 acre (1,109 linear ft.)	**0.11 acre (3,208 linear ft.)**
Wetland	0 acre	0 acre	0 acre	0 acre	0 acre	0 acre	0 acre	0 acre	**0 acre**
Riparian	0 acre	0 acre	0 acre	0.0 acre	0 acre	0.0 acre	0 acre	0.14 acre	**0.14 acre**
Oak Woodland	27.7 acres	0 acre	0.7 acre	0 acre	2.4 acres	0 acre	0 acre	5.7 acres	**36.5 acres**

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Lehigh Permanente Quarry,

Santa Clara County, California

Figure 8.

Project Impacts

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Date: May 2010
Map by: Michael Rochelle
Aerial: April 2007
File path; I:\acad2000\16000\16143\gis\arcmap\2010 Report\BRA\Proposed Impacts.mxd

Table 3. Project Impacts Summary

	South Quarry	CMSA	WMSA	Rock Plant	North Quarry	Office / Crusher	Surge Pile	Topsoil Storage	Totals
Quarry-Related Impacts									
Sensitive communities									
"other waters"	0.15 ac (4,363 lf)	0.0	0.0	0.0	0.0	0.0	0.0	0.05 ac (1,109 lf)	0.21 ac (5,472 lf)
oak woodland	27.7 ac	0.0	0.0	0.0	0.0	0.0	0.0	5.7 ac	33.4 ac
riparian woodland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14 ac	0.14 ac
Non-sensitive communities									
scrub and woodland habitats	164.4 ac	0.0	0.0	0.0	0.0	0.0	0.0	0.5 ac	165.0 ac
Reclamation-Related Impacts									
Sensitive communities									
"other waters"	0.0	0.01 ac (362 lf)	0.0	0.0	0.0	0.0	0.0	0.0	0.01 ac (362 lf)
oak woodland	0.0	2.4 ac	0.0	0.0	0.7 ac	0.0	<0.1 ac	0.0	3.1 ac
riparian woodland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non-sensitive communities									
Scrub, grassland, and woodland habitats	0.0	25.5 ac	0.0	0.0	3.0 ac	1.0 ac	0.0	0.0	29.5 ac

5.1.1 South Quarry

Approval of a Conditional Use Permit for certain mining operations at the Quarry would allow mineral extraction on approximately 117 acres, comprising a portion of the 206-acre South Quarry (Figure 2). Operations in the South Quarry would include mining, material loading and hauling. Mined rock would be transported to existing facilities in other parts of the Quarry for processing. South Quarry development, mining and reclamation would occur for an estimated 20 years. The South Quarry is included in the proposed RPA and would be reclaimed according to the requirements therein. Existing conditions and potential impacts resulting from approval of the Condition Use Permit are discussed below.

The South Quarry is a steeply sloped area immediately south of Permanente Creek, north of the North Fork Monte Bello Creek and opposite the North Quarry pit. It incorporates a majority of the north facing slope above Permanente Creek along with portions of the ridgeline and the south facing slope above Monte Bello Creek. This area is dominated by chamise and oak chaparral, oak woodland and bay forest but includes other communities such as dense poison oak scrub, grasslands and a small rock outcropping. Five ephemeral headwater tributaries to Permanente Creek and one isolated, ephemeral stream originate from within the South Quarry area and flow north.

The South Quarry includes a small portion of Permanente Creek where a bridge will be built which will be addressed below in Section 5.1.9. The Project Area boundary to the south is in the North Fork of Monte Bello Creek watershed and includes one ephemeral tributary to the North Fork of Montebello Creek which flows southeast into Monte Bello Creek and drains through a neighboring property to Stevens Creek Reservoir. No drainages within the South Quarry support riparian vegetation. These drainages are steep, ephemeral and flashy (they only convey surface flow during and immediately after storm events). Additionally several small, shallow, but perennial seeps are known from the South Quarry. These flow overland for a very short distance before surface water returns underground.

The South Quarry also supports a network of old road beds and evidence of exploratory mining. Additionally, evidence of old buildings is present at various locations. These features have largely been reclaimed naturally by the landscape. Once mining is complete, the area will be graded to final engineered contours and the slopes and terraces will be revegetated according to the RPA.

Non-sensitive communities

Within the South Quarry, approximately 164.4 acres of non-sensitive[3] vegetated communities dominated by chaparral and bay forest will be impacted by vegetation grubbing in preparation for mining activities (Table 5). Impacts will be phased over approximately 20 years, as portions

[3] Non-sensitive vegetated communities include the naturally occurring (undisturbed) non-sensitive plant communities that have potential to support sensitive wildlife species: buckeye woodland, California bay forest, non-native annual grassland, and chaparral and scrub communities.

Table 4. Impacts and Restoration by Phase for the Project Area*

	Phase 1 (Years 1-5)		Phase 2 (Years 6-8)		Phase 3 Years 9-12)		Phase 4 (Years 13-14)		Phase 5 Pre-South Quarry Backfill (Years 15-16)		Phase 5 Post-South Quarry Backfill		Totals	
Community Type	Impacts	Restored	Impacts	Restored	Impacts	Restored	Impacts	Restored	Impacts	Restored	Impacts	Restored	Total Impacts (all phases)	Total Restored (all phases)
Sensitive communities														
"Other waters"	0.14 ac (2,823 lf)	N/A	0.04 ac (1,318 lf)	N/A	0.02 ac (858 lf)	N/A	0.005 ac (229 lf)	N/A	0.02 ac (606 lf)	N/A	N/A	N/A	0.22 ac (5,834 lf)	N/A
Riparian	0.14 ac	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.14 ac	N/A
Oak woodland	17.2 ac	7.7 ac	9.8 ac	3.7 ac	3.1 ac	16.9 ac	1.8 ac	7.7 ac	4.6 ac	<0.1 ac	<0.1 ac	3.3 ac	36.5 ac	39.3 ac
Non-sensitive communities														
Scrub, grassland, and woodland habitat	80.3 ac	81.6 ac	51.4 ac	28.5 ac	44.3 ac	28.2 ac	6.5 ac	32.6 ac	10.9 ac	175.1 ac	1.1 ac	320.4 ac	194.5 ac	666.4 ac

* This table does not include the 2009 EMSA revegetation acreages which amount to an additional 6.7 acres of oak woodland and 53.8 acres of scrub habitat with intermixed grey pine.

of the South Quarry are incrementally grubbed, mined, and revegetated. Re-contouring to engineered slopes and revegetation in accordance with the RPA revegetation plan will commence as soon as mining is complete in each phase. Seeding and planting in accordance with the revegetation plan is designed to lead to replacement of vegetated habitat within the South Quarry. Because revegetation is planned within the South Quarry, impacts to non-sensitive vegetation communities will be temporary.

Sensitive communities

Within the South Quarry, approximately 0.1 acre (2,626 linear feet) of Waters of the U.S. and an additional 0.05 acre (1,737 linear feet) of Waters of the State will be incrementally disturbed by mining activities (Table 5). All impacts to jurisdictional waters will be mitigated according to current agency policy as described in Section 5.2 of this report.

Approximately 27.7 acres of oak woodland will be impacted in the South Quarry by grubbing and site preparation for mining activities (Table 5). Based on tree inventory studies conducted in various habitats on the Property, an estimated 1,380 oak trees will be impacted through oak woodland removal. Impacts will be phased over approximately 20 years, as portions of the South Quarry are incrementally grubbed, mined, and revegetated. Re-contouring to engineered slopes and revegetation in accordance with the revegetation plan will commence as soon as mining is complete in each phase. Tree planting in accordance with the RPA is designed to lead to replacement of oak woodland habitat within the South Quarry. Mitigation for impacts to oak woodland is fully described in Section 5.2.2 of this report.

Table 5. Quarry-related Impacts - South Quarry

Community Type	Total Impacts
Sensitive communities	
"Other waters"	0.15 ac (4,363 lf)
Oak woodland	27.7 ac
Non-sensitive communities	
Scrub, grassland and woodland habitat	164.4

Special status plant species

No impacts will occur to special status plant species in the South Quarry. No special status plant species were observed in this area during protocol level surveys conducted in 2008.

Special status wildlife species

Because the streams within the South Quarry are ephemeral in nature, the portions of Permanente and Monte Bello drainages adjacent to the South Quarry do not support CRLF and are isolated from occupied CRLF habitat via distance, steep topography, arid conditions, and barriers to dispersal. Therefore the South Quarry does not serve as aquatic or upland/dispersal habitat for CRLF. Since no habitat for CRLF is present within the South Quarry, no impacts to CRLF are expected.

Scrub, chaparral, and woodland habitat in the South Quarry provide habitat for San Francisco Dusky-footed Woodrat, breeding birds, and roosting bats. These habitats will be grubbed,

graded, mined and revegetated in phases over approximately 20 years. Temporary loss of habitat for these species within the South Quarry is not regionally significant. However, initial grubbing and vegetation removal could result in the direct take of woodrats, breeding birds, or roosting bats. Suitable measures to avoid direct take of these species during South Quarry development are contained in Section 6 of this report.

The South Quarry will be graded to final engineered contours over phases once an area will no longer be disturbed. The slopes and terraces will be revegetated according to the RPA. As vegetation becomes established, the South Quarry would again serve as habitat for San Francisco Dusky-footed Woodrat, breeding and foraging habitat for bird species and, tree roosting and foraging bats.

5.1.2 CMSA

The CMSA is characterized as a ridge and south-facing slope that is disturbed by past and ongoing quarry operations. The CMSA lies immediately west of the EMSA, which was addressed by a Reclamation Plan Amendment submitted to Santa Clara County in 2009.

The CMSA contains some areas of active quarry and is dominated by scrub and chaparral. Small areas of oak woodland and ruderal herbaceous grassland are also present. The majority of this vegetation will be removed to facilitate final contouring of the area prior to reclamation. The removal of the remaining vegetation is a beneficial, reclamation-related impact that will result in final contour development and revegetation.

Non-sensitive communities

Within the CMSA, approximately 25.5 acres of non-sensitive vegetated communities will be impacted by overburden deposition, slope re-contouring and revegetation in accordance with the RPA (Table 6). Seeding and planting in accordance with the RPA, including those areas currently in active quarry, would ultimately lead to an increase in vegetated habitat in the CMSA. Therefore, the temporary loss of non-sensitive vegetated communities within the CMSA is not regionally significant and is considered to be a beneficial impact that will facilitate reclamation.

Sensitive communities

Within the CMSA, less than 0.01 acre (362 linear feet) of Waters of the State will be filled by overburden deposition and final reclamation. Additionally, approximately 2.4 acres of oak woodland will be impacted by overburden deposition and final reclamation (Table 6).

Table 6. Restoration-related Impacts - CMSA

Community Type	Total Impacts
Sensitive communities	
Waters of the State	0.01 ac (362 lf)
Oak woodland	2.4 ac
Non-sensitive communities	
Scrub, grassland and woodland habitat	25.5 ac

Special status plant species

No impacts will occur to special status plant species in the CMSA. No special status plant species were observed in this area during protocol level surveys conducted in 2008.

Special status wildlife species

The CMSA is over one half mile from the closest CRLF aquatic habitat and no aquatic breeding habitat exists within the CMSA. Additionally there are barriers that prevent CRLF from dispersing through the CMSA. Barriers to dispersal include developed roads subject to heavy vehicle and equipment traffic, a large warehouse, steep rocky slopes and unvegetated equipment and overburden storage yards.

CSMA storm water runoff will be directed to a series of sedimentation basins that are being installed in the EMSA through a series of swales and drains. These basins are designed to drain the CMSA and allow sediments to settle before water is discharged into a tributary to Permanente Creek through an existing culvert at the base of the EMSA. These basins are designed to quickly evacuate storm water through a stove-pipe drop inlet and then fully drain 24 to 48 hours following storm events. Since these basins will quickly process and discharge storm water, they are not expected to serve as aquatic habitat for CRLF. Since no aquatic or upland/dispersal habitat for CRLF is present within the CMSA, deposition of overburden and reclamation of the CMSA is not considered a significant impact to CRLF.

San Francisco Dusky-footed Woodrat is known to inhabit oak woodland, chaparral, and scrub habitats within the CMSA and along the northern disturbance limit boundary. Temporary loss of woodrat habitat within the CMSA is not regionally significant and is not considered to be a significant impact. However, direct take of woodrats or woodrat nests as a result of grubbing is considered to be a significant impact.

Suitable habitat for breeding birds is present within the CMSA. Oak woodland, chaparral, scrub and previously reclaimed areas provide, in aggregate, 28.2 acres of potential habitat for breeding birds protected by the MBTA. White-tailed Kite has been observed flying along the northern disturbance boundary, although no nesting structures have been observed. Grubbing during the breeding bird season could result in direct take of breeding birds, active nests or young. Mortality to special status and non-special status breeding birds covered by the MBTA is considered a significant impact.

The temporary loss of breeding and foraging habitat is not regionally significant and is considered to be a less than significant impact.

Stands of mature oak trees along the northern disturbance boundary have the highest potential to support roosting bats. Other stands of trees within the CMSA are unlikely to support roosting bats as they are highly fragmented and subject to disturbance associated with ongoing quarry activities. Additionally, the CMSA abuts large contiguous woodland to the north and Permanente Creek to the east which provide much higher quality foraging habitat than that which is present within the CMSA.

Once the CMSA has reached capacity and graded to final engineered contours, the slopes and terraces will be revegetated according to the RPA. As vegetation is established, portions of the

EMSA may become a continuation of CRLF upland and dispersal habitat around occupied portions of Permanente Creek. Furthermore, once revegetated, the CMSA would ultimately increase habitat for San Francisco Dusky-footed Woodrat, breeding and foraging habitat for bird species, availability of roost sites for tree roosting bats and foraging habitat for bats.

5.1.3 WMSA

The WMSA was previously the primary depository for quarry overburden. The area is comprised of engineered slopes of rock with intermediate flat terraces. Sporadic shrubby vegetation is present as individual plants or small aggregations of patchy scrub. The steep slopes and terraces lack streams and ponds and are nearly completely devoid of trees except along the fringes of the north and west disturbance limit boundary.

Non-sensitive communities

No undisturbed vegetated communities will be impacted by re-contouring and re-vegetating the WMSA (Table 7); however, approximately 3.6 acres of previously disturbed ruderal habitat and reclaimed areas will be impacted. Seeding and planting in accordance with the RPA (including in areas currently in active quarry) would ultimately lead to an increase in vegetated habitat in the WMSA. Therefore, the temporary loss of non-sensitive vegetated communities within the WMSA is not regionally significant and is considered to be a beneficial impact that will facilitate reclamation.

Sensitive communities

No sensitive communities in the WMSA will be impacted by grading and revegetation.

Special status plant species

No impacts are expected to special status plant species in the WMSA. No special status plant species were observed in the WMSA during protocol level surveys conducted in 2008.

Table 7. Restoration-related Impacts - WMSA

Community Type	Total Impacts
Sensitive communities	
oak woodland	0 ac
Non-sensitive communities	
Scrub, grassland and woodland habitat	0 ac

Special status wildlife species

Within the WMSA no impacts are expected to occur to CRLF or roosting bats.

San Francisco Dusky-footed Woodrat does not inhabit the ruderal or reclaimed areas of the WMSA and no impacts are expected to this species.

Limited nesting and foraging habitat is present within the WMSA for avian species. Small, isolated patched of ruderal habitat and previously reclaimed areas provide, in aggregate, 14.8 acres of potential nesting and foraging habitat.

The isolated patches of grasses and shrubs in the WMSA may be impacted as the area is brought to final engineered contours. The site will also be deposited with soils for revegetation in accordance with the revegetation plan. Grading and soil deposition during the breeding bird season could result in direct take of breeding birds, active nests or young. Mortality to special status and non-special status breeding birds covered by the MBTA is considered a significant impact.

Limited foraging resources are present for foraging special status bat species within the WMSA, however forest edge habitats may be occasionally utilized as a foraging resource. Suitable higher quality foraging habitat for bats is present surrounding the WMSA within the forested portions of the Permanente Property.

Loss of occasional foraging habitat to special status bat species is considered a less than significant impact within the WMSA. Upon completion of the Project, the WMSA will be revegetated in accordance with the RPA. Revegetation of the WMSA, once established, would increase the overall availability of foraging habitat for Townsend's Big-eared Bat resulting in a net benefit in the long term.

Seeding and planting within the WMSA in accordance to the RPA would ultimately lead to an increase in foraging and nesting habitat to special and non-special status birds.

5.1.4 Rock Plant

The Rock Plant functions as the sorting, storage and distribution hub for aggregate rock and is the southern most developed portion of the quarry. This area receives rock via conveyor that is sorted according to size and placed into large piles. The Rock Plant is nearly entirely developed except for two small isolated patches of chaparral in the northwest corner. The Rock Plant abuts Permanente Creek and its associated riparian corridor to the north and includes Pond 17, an open water sedimentation basin. Once the Rock Plant has been graded to final engineered contours, the slopes and terraces will be revegetated according to the RPA.

Non-sensitive communities

No naturally existing vegetated communities will be impacted by re-contouring and re-vegetating the Rock Plant; however, approximately 0.3 acres of previously disturbed ruderal habitat will be impacted (Table 8). Seeding and planting in accordance with the RPA (including in areas currently in active quarry) would ultimately lead to an increase in vegetated habitat in the Rock Plant. Therefore, the temporary loss of non-sensitive vegetated communities within the Rock Plant Project Area is not regionally significant and is considered to be a beneficial impact that will facilitate reclamation.

Sensitive communities

No sensitive communities occur within the Rock Plant disturbance limit.

Table 8. Restoration-related Impacts - Rock Plant

Community Type	Total Impacts
Sensitive communities	
oak woodland	0 ac
Non-sensitive communities	
Scrub, grassland and woodland habitat	0 ac

Special status plant species

No impacts are expected to special status plant species in the Rock Plant. No special status plant species were observed in this area during protocol level surveys conducted in 2008.

Special status wildlife species

Although the Rock Plant is adjacent to Permanente Creek and includes an open water sedimentation basin (Pond 17), no aquatic or upland/dispersal habitat for CRLF is present. Protocol level CRLF surveys completed in 2006 and 2007 and a single night survey conducted in 2008 concluded no CRLF are present within Pond 17. Furthermore, Permanente Creek was surveyed during the 2006 and 2007 protocol level surveys and again in 2009 during a study of the fauna in Permanente Creek and CRLF were concluded to be not present in the section of Permanente Creek adjacent to the Rock Plant. Since CRLF are not present in either the Creek or Pond 17, and no upland/dispersal habitat is present, no impacts to CRLF are expected.

San Francisco Dusky-footed Woodrat is not known to inhabit the small patches of ruderal grassland in the Rock Plant. Therefore no impacts are expected to occur to woodrats within the Rock Plant.

The Rock Plant provides poor nesting and foraging habitat for birds protected by the MBTA. Small, isolated patches of ruderal grassland provide, in aggregate, 0.3 acre of potential nesting habitat for birds covered by the MBTA. Grubbing or vegetation removal during the breeding bird season could result in direct take of breeding birds, active nests or young. Mortality to special status and non-special status breeding birds covered by the MBTA is considered a significant impact.

Within the Rock Plant, potential roosting habitat for bats may be present within buildings or other man-made structures. Roosting habitat is marginal given the frequent disturbance from ongoing activities; however, bats will use occupied buildings and structures if suitable thermal conditions are present. If roosting bats are present in buildings or structures within the Rock Plant, demolition of these structures would be considered take of a bat roost and considered a significant impact.

Foraging habitat for bats is extremely marginal or absent within the Rock Plant. Large tracts of higher quality foraging habitat are present surrounding this area. Temporary loss of foraging habitat within the Rock Plant is not a regionally significant resource is considered a less than significant impact.

Once the Rock Plant has been graded to final engineered contours, the slopes and terraces will be revegetated according to the RPA. As vegetation becomes established, the Rock Plant

would ultimately increase habitat for San Francisco Dusky-footed Woodrat, breeding and foraging habitat for bird species, availability of roost sites for tree roosting bats and foraging habitat for bats.

5.1.5 North Quarry

The North Quarry is an actively mined, large, open-pit quarry. The northern quarry wall is nearly vertical except for terraces at engineered intervals to ensure stability. The pit is roughly 1,000 feet deep and supports a large water feature that collects rain water, storm runoff from portions of the WMSA and ground water seepage through the quarry walls. This feature is annually dewatered and used for dust abatement and pumped into sedimentation basin "Pond 4A" before being discharged into Permanente Creek.

The North Quarry supports reclaimed areas comprised of non native grassland and ornamental trees planted on terraced slopes perched above the open pit. This area is subject to erosion and disturbance by heavy equipment, vehicle traffic, and occasional controlled explosions.

As part of the RPA, the North Quarry will be decommissioned and overburden from the South Quarry will be deposited in the North Quarry according to the final engineered contours as defined in the RPA. The North Quarry will eventually be revegetated in accordance with the RPA.

Non-sensitive communities

Within the North Quarry, approximately 3.0 acres of non-sensitive vegetated communities, mostly comprised of scrub and non-native annual grassland, will be impacted by overburden deposition, slope re-contouring and revegetation in accordance with the RPA (Table 9). An additional 34 acres of previously disturbed ruderal grassland and revegetated areas will also be disturbed through reclamation. Seeding and planting, including those areas currently in active quarry, would ultimately lead to an increase in vegetated habitat in the North Quarry. Therefore, the temporary loss of non-sensitive vegetated communities within the North Quarry is not regionally significant and is considered to be a beneficial impact that will facilitate reclamation.

Sensitive communities

Approximately 0.7 acres of oak woodland occur along the northern fringe of the North Quarry border. Although this area is inaccessible for further removal of aggregate, overburden deposition, slope re-contouring and revegetation in accordance with the RPA may impact oak woodland in this area.

Table 9. Restoration-related impacts - North Quarry

Community Type	Total Impacts
Sensitive communities	
oak woodland	0.7 ac
Non-sensitive communities	
Scrub, grassland and woodland habitat	3.0 ac

Special status plant species

No impacts are expected to special status plant species in the North Quarry. No special status plant species were observed in the North Quarry during protocol level surveys conducted in 2008.

Special status wildlife species

Within the North Quarry, no impacts are expected to CRLF.

San Francisco Dusky-footed Woodrat may inhabit the oak woodland and chaparral/scrub communities along the northern disturbance limit boundary within the North Quarry. These areas have suitable vegetation, understory and are contiguous with surrounding habitat to support this species. Although the North Quarry footprint is not expected to expand, suitable areas may be subject to grading to bring the North Quarry to final engineered contours which may involve vegetation removal, at which time top soil will be deposited and the area revegetated. The time between grubbing and vegetation becoming established enough to serve as suitable nesting habitat for woodrats may take several years of growth. Temporary loss of five acres of marginal woodrat edge habitat within the WMSA is not regionally significant and is not considered to be a significant impact. However, direct take of woodrats or woodrat nests as a result of grubbing is considered to be a significant impact.

Marginal nesting and foraging habitat is present within the North Quarry for avian species. Isolated patches of grasslands, chaparral, scrub, oak woodland and previously reclaimed areas provide, in aggregate, 44.0 acres of potential nesting and foraging habitat, similar to that within the WMSA.

The vegetated areas of the North Quarry may be re-contoured with overburden from the South Quarry. The entire North Quarry will be revegetated in accordance to the RPA. Deposition of rock and soil during the breeding bird season could result in direct take of breeding birds, active nests or young. Mortality to special status and non-special status breeding birds covered by the MBTA is considered a significant impact.

The time between when soil is deposited and vegetation becomes established enough to serve as suitable nesting habitat may take several years of growth. The temporary loss of 44 acres of breeding and foraging habitat is not regionally significant and is considered to be a less than significant impact.

Seeding and planting within the North Quarry in accordance to the RPA would ultimately lead to an increase in foraging and nesting habitat to special and non-special status birds.

Within the North Quarry, potential roosting habitat for bats may be present within cracks and crevices in the near-vertical quarry walls. This habitat is likely marginal given the frequent disturbance from ongoing quarrying activities. However, if roosting bats do roost within the quarry walls, deposition of rock to the final engineered contours during roosting season may entomb bats which is considered take and is a significant impact.

Foraging habitat for bats is extremely marginal within the North Quarry, and only exists along the northern and southern disturbance limit boundaries. Bats may occasionally drink from the

standing water that collects at the bottom of the North Quarry, however neither foraging habitat along the margins or the water feature are regionally significant resources to bats and loss of these resources is considered a less than significant impact.

Furthermore, revegetation of the North Quarry in accordance to the RPA would ultimately lead to an increase of foraging habitat and availability of habitat to tree roosting bat species.

5.1.6 Office and Crusher Area

The Office and Crusher Area abuts the North Quarry to the west, the CMSA to the east and the Surge Pile to the south. This area is largely disturbed and supports several arterial roads along with the main access road to the North Quarry. A large, flat central yard supports the Quarry's operational office, vehicle and heavy equipment parking and miscellaneous storage. Additionally, this area supports the Quarry's primary mechanical rock crusher which processes material extracted from the Quarry. This area is less topographically extreme than the North Quarry and supports isolated patches of grassland, chaparral and scrub which will be left intact and undisturbed for the most part. Portions of this area were previously reclaimed and now contain wildlife habitat.

The inactive portions of the Office/Crusher Area will be revegetated in accordance with the RPA.

Non-sensitive communities

Within the Office/Crusher area, approximately 1.0 acres of non-sensitive vegetated communities dominated by mixed scrub may be impacted through reclamation (Table 10). An additional 15.3 acres of previously disturbed ruderal grassland are also present. Seeding and planting in accordance with the RPA, including those areas currently in active quarry, would ultimately lead to an increase in vegetated habitat in the Office/Crusher area. Therefore, the temporary loss of non-sensitive vegetated communities within the Office/Crusher area is not regionally significant and is considered to be a beneficial impact that will facilitate reclamation.

Sensitive communities

No oak woodland or other sensitive communities will be impacted by reclamation and revegetation of the Office/Crusher Area.

Table 10. Restoration-related impacts - Office/Crusher

Community Type	Total Impacts
Sensitive communities	
oak woodland	0 ac
Non-sensitive communities	
Scrub, grassland and woodland habitat	1.0 ac

Special status plant species

No impacts are expected to special status plant species in the Office/Crusher area. No special status plant species were observed in the Office/Crusher area during protocol level surveys conducted in 2008.

Special status wildlife species

Within the Office/Crusher area, no impacts are expected to CRLF or foraging bat habitat.

San Francisco Dusky-footed Woodrat may inhabit the one acre of mixed scrub that will be impacted within the Office/Crusher area. The time between grubbing and vegetation becoming established enough to serve as suitable nesting habitat for woodrats may take several years of growth. Temporary loss of one acre of isolated woodrat habitat is not regionally significant and is not considered to be a significant impact. However, direct take of woodrats or woodrat nests as a result of grubbing is considered to be a significant impact.

The one acre of mixed scrub and 15.3 acres of disturbed ruderal grassland in the Office/Crusher area serve as limited nesting and foraging habitat for breeding birds covered by the MBTA.

Upon completion of the Project, the Office/Crusher area is intended to be revegetated in accordance to the RPA which may require grading and deposition of rock to the final engineered contours prior to seeding and planting. Grading and deposition during the breeding bird season could result in direct take of breeding birds, active nests or young. Mortality to special status and non-special status breeding birds covered by the MBTA is considered a significant impact.

The time between when rock and soil is deposited and vegetation becomes established enough to serve as suitable nesting habitat may take several years of growth. The temporary loss of 16.3 acres of isolated breeding and foraging habitat is not regionally significant and is considered to be a less than significant impact. Seeding and planting within the Office/Crusher area in accordance to the RPA would ultimately lead to an increase in foraging and nesting habitat to special and non-special status birds.

Within the Office/Crusher area, potential roosting habitat for bats may be present within buildings or other man-made structures. Roosting habitat is likely marginal given the frequent disturbance from ongoing quarrying activities, however bats may use occupied buildings and structures given suitable thermal conditions. If disturbance in the immediate vicinity of the Crusher is halted following decommissioning, this large concrete structure may also provide suitable conditions to be colonized by roosting bats. If roosting bats are present in buildings or structures within the Office/Crusher area, demolition of these structures would be considered take of a bat roost and considered a significant impact.

Foraging habitat for bats is marginal within the Office/Crusher area. Larger tracts of higher quality foraging habitat are present surrounding this area. Temporary loss of foraging habitat within the Office/Crusher area is not a regionally significant resource is considered a less than significant impact.

Revegetation of the Office/Crusher area in accordance to the RPA would ultimately lead to an increase of foraging habitat and availability of habitat to tree roosting bat species.

5.1.7 Surge Pile

The Surge Pile is the staging area for crushed, unsorted rock prior to transportation via conveyors to the Rock Plant. This area consists of single large pile of unconsolidated aggregate rock (approximately one inch to six inches in diameter). The Surge Pile is adjacent to the underground, culverted portion of Permanente Creek. This area is frequently disturbed and supports minimal vegetation and is not suitable habitat for wildlife.

Upon completion of the Project, the Surge Pile will be returned to its underlying grade following removal of the unsorted aggregate. Some areas may be re-contoured before the area is revegetated according to the RPA.

Non-sensitive communities

No naturally existing vegetated communities will be impacted by re-contouring and re-vegetating the Surge Pile; however, approximately 0.3 acres of previously disturbed ruderal habitat will be impacted (Table 11). Seeding and planting in accordance with the RPA, including those areas currently in active quarry, would ultimately lead to an increase in vegetated habitat in the Surge Pile. Therefore, the temporary loss of non-sensitive vegetated communities within the Surge Pile is not regionally significant and is considered to be a beneficial impact that will facilitate reclamation.

Sensitive communities

No oak woodland or other sensitive communities will be impacted by reclamation and revegetation of the Surge Pile (Table 11).

Table 11. Restoration-related impacts - Surge Pile

Community Type	Total Impacts
Sensitive communities	
oak woodland	0 ac
Non-sensitive communities	
Scrub, grassland and woodland habitat	0 ac

Special status plant species

No impacts are expected to special status plant species in the Surge Pile. No special status plant species were observed in this area during protocol level surveys conducted in 2008.

Special status wildlife species

No adverse impacts to CRLF, San Francisco Dusky-footed Woodrat, or roosting or foraging bats are expected. No habitat patches within the Surge Pile are greater than one acre in size that are necessary to support woodrats.

The overwhelming majority of the Surge Pile is disturbed and provides no habitat for nesting or foraging birds. While no breeding birds have been observed nesting within the Surge Pile, small

isolated patches of ruderal grassland provide approximately 0.3 acre of potential nesting and foraging habitat for birds covered by the MBTA.

Upon completion of the Project, the Office/Crusher area is intended to be revegetated in accordance to the RPA which may require grading and deposition of rock to the final engineered contours prior to seeding and planting. Grading and deposition during the breeding bird season could result in direct take of breeding birds, active nests or young. Mortality to special status and non-special status breeding birds covered by the MBTA is considered a significant impact.

The time between when rock and soil is deposited and vegetation becomes established enough to serve as suitable nesting habitat may take several years of growth. The temporary loss of 0.3 acre of breeding and foraging habitat is not regionally significant and is considered to be a less than significant impact.

Seeding and planting within the Office/Crusher area in accordance to the RPA would ultimately lead to an increase in foraging and nesting habitat to special and non-special status birds.

Revegetation of the Surge Pile in accordance to the RPA would ultimately lead to an increase of foraging habitat and availability of habitat to tree roosting bat species and nesting birds.

5.1.8 Topsoil Storage Area

The Topsoil Storage Area is a steeply sloped area immediately south of the Rock Plant incorporating two large existing rock piles, a small, isolated ephemeral stream and an unpaved fire road. This area is vegetated with reclaimed scrub habitat, Oak/Bay woodland with a dense poison oak understory and a small patch of riparian willow thicket adjacent to the stream channel. The stream that runs through the Topsoil Storage Area is ephemeral in nature, is deeply incised and evidence of historic disturbance is present. The stream seasonally drains into the Rock Plant and then travels overland before entering the Quarry's sedimentation basin system before being discharged into Permanente Creek.

Non-sensitive communities

Within the Topsoil Storage Area, approximately 0.5 acre of non-sensitive vegetated communities will be impacted by vegetation grubbing in preparation for temporary topsoil stockpiling (Table 12). Eventual slope re-contouring, seeding and planting in accordance with the RPA, including those areas currently in active quarry, would ultimately lead to an increase in vegetated habitat in the Topsoil Storage Area. Therefore, the temporary loss of 0.5 acre of non-sensitive vegetated communities within the Topsoil Storage Area is not regionally significant and is considered to be a beneficial impact that will facilitate reclamation.

Sensitive communities

Within the Topsoil Storage Area, approximately 0.05 acre (1,109 linear feet) of Waters of the State will be filled by temporary topsoil stockpiling. Approximately 5.7 acres of oak woodland and 0.1 acre of willow riparian scrub will be impacted by grubbing and site preparation for temporary topsoil stockpiling. Direct removal of oak woodland and willow riparian scrub are considered significant impacts (Table 12).

Table 12. Restoration-related impacts - Topsoil Storage Area

Community Type	Total Impacts
Sensitive communities	
Waters of the State	0.05 ac (1,109 lf)
oak woodland	5.7 ac
willow riparian scrub	0.1 ac
Non-sensitive communities	
Scrub, grassland and woodland habitat	0.5 ac

Special status plant species

No impacts are expected to special status plant species in the Topsoil Storage Area. No special status plant species were observed in this area during protocol level surveys conducted in 2008.

Special status wildlife species

Because of the stream's ephemeral nature, isolation from known populations of CRLF, and lack of upland habitat, the Topsoil Storage Area does not serve as aquatic or upland/dispersal habitat for CRLF. Since no habitat for CRLF is present within the Topsoil Storage Area, no impacts to CRLF are expected.

San Francisco Dusky-footed Woodrat is known to inhabit 6.3 acres of oak woodland and scrub habitats within the Topsoil Storage Area. The area will be grubbed, graded and topsoil will be stored until needed for reclamation purposes. Once reclamation is complete the area will be revegetated. The period between grubbing and vegetation becoming established enough to serve as suitable nesting habitat for woodrats may take several years of growth. Temporary loss of 6.3 acres of woodrat habitat within the Topsoil Storage Area is not regionally significant and is not considered to be a significant impact. However, direct take of woodrats or woodrat nests as a result of grubbing is considered to be a significant impact.

Within the Topsoil Storage Area, grassland, oak woodland, scrub, willow riparian and previously reclaimed areas provide, in aggregate, 7.6 acres of habitat to breeding birds. Mature trees and other dense vegetation are important habitat requirements for birds and are present within the Topsoil Storage Area. Grubbing and vegetation removal during the breeding bird season could result in direct take of breeding birds, active nests or young. Mortality to special status and non-special status breeding birds covered by the MBTA is considered a significant impact.

The time between grubbing and post-reclamation vegetation becoming established enough to serve as suitable nesting habitat may take several years of growth. The temporary loss of 7.6 acres of breeding and foraging habitat for avian species is not regionally significant and is considered to be a less than significant impact.

The Topsoil Storage Area is in a north-facing bowl and partially supports a dense tree canopy. No large snags are present and since the area is on a north-facing slope, it receives only low to moderate solar radiation and may lack the appropriate thermal conditions necessary to support a maternity roost. However individuals or small aggregations of bats may use live snags as day roosts within the Topsoil Storage Area. Take of roosts during vegetation removal is considered a significant impact. Additionally the Topsoil Storage Area is contiguous with woodlands to the

east and west, and likely serves as foraging habitat for bat species. Temporary loss of bat foraging habitat associated with topsoil storage is not regionally significant and is not considered a significant impact.

Once topsoil storage is no longer needed for reclamation purposes the area will be returned to original grade and revegetated according to the RPA. As vegetation becomes established, the Topsoil Storage Area would ultimately increase habitat for San Francisco Dusky-footed Woodrat, breeding and foraging habitat for bird species, availability of roost sites for tree roosting bats and foraging habitat for bats.

5.1.9 Impacts to Aquatic Resources

5.1.9.1 Permanente Creek

Permanente Creek is largely outside of the Project Area except for a small portion of the creek located between the North and South Quarries where a bridge crossing is proposed. However, the proposed Project has potential to impact Permanente Creek and downstream sensitive habitats and species through indirect Project effects. Impacts to water quality or reductions in flow caused as a result of the Project could impact sensitive riparian or wetland communities and protected and non-protected aquatic organisms.

The Project Area includes a small reach of Permanente Creek which has ephemeral hydrology. This area contains no riparian vegetation and the wetted channel is minimal (geographically and temporally). The area also corresponds to a historic vehicle crossing once used to access to the South Quarry. This area is also the location of a proposed bridge crossing supporting a 40 foot wide road. The proposed bridge will span the creek and channel will remain as it currently exists with natural substrate. The bridge is designed to accommodate the 100-year base flood.

Changes in the hydrology of Permanente Creek will occur through the proposed Project. These include fluctuations in groundwater flows and discharge and surface water runoff. These mechanisms are discussed in depth in Golder's "Hydrologic Investigation - Permanente Quarry Reclamation Plan Update (2010). The effects of the potential changes in hydrology on sensitive biological habitats and species are discussed below.

Groundwater modeling conducted by Golder Associates (2010) predicts that during the final years of quarrying within the North Quarry (Phases 1 and 2), groundwater input to Permanente Creek will be reduced by approximately 10 percent (-0.11 cfs; as modeled on the 2008-2009 water year). As the South Quarry is developed and overburden is placed in the North Quarry (Phases 3 and 4), the groundwater percolation into the North Quarry will equilibrate result in an increase in groundwater flows into Permanente Creek by approximately 40 percent (+0.46 cfs). The final reclaimed flows (approximately year 2030, Phase 5) are estimated to be almost 50 percent greater (+0.47 cfs) than 2008-2009 flow levels as the groundwater levels equilibrate after reclamation of both North and South Quarries.

As the North Quarry is filled with overburden, active pumping of groundwater seepage from the North Quarry into Perm Creek will be reduced. This reduction in flows will be countered by the rise in groundwater elevation which will result in an increase in direct groundwater discharge into Permanente Creek. This increase in base flow and groundwater elevations should be sufficient to maintain the existing riparian habitats and flow levels in Permanente Creek.

The combination of annual stormwater flows in addition to the overall increase in groundwater discharge will be sufficient to maintain the existing habitats along Permanente Creek below the North Quarry discharge area (Pond 4a). In a technical memo prepared by the Project engineer (Chang 2010) annual precipitation in the Permanente watershed is of sufficient quantity to fill Pond 17 which supports CRLF. A calculation of monthly evaporation rates in the same memo shows that a maximum of 2.5 feet of water will evaporate from the pond over the dry summer months. This will leave over 3 feet of water in the pond, an amount sufficient to support CRLF breeding and development.

Aquatic wildlife species

Permanente Creek in the area of the proposed bridge crossing does not convey surface flow except for several weeks during the wettest portion of the year. The Habitat Assessment conducted by Dr. Jennings (2010 – Appendix D) concludes the creek does not support aquatic or upland dispersal habitat for CRLF within or adjacent to the proposed bridge crossing, and no CRLF have been observed during protocol level surveys for CRLF in 2006 and 2007. Construction of the bridge is not expected to have any impact on CRLF.

A small, but self-sustaining population of resident Rainbow Trout are known to inhabit and spawn upstream of the proposed bridge crossing. Rainbow Trout have been observed outmigrating through the area of the proposed bridge crossing when surface flow is present. If in-stream construction were to take place during the period when surface flow is present, outmigration of Rainbow Trout may be disrupted or mortality to fish may result from alterations to water chemistry, sedimentation, or desiccation.

Hydrology calculations show that Pond 14, the primary CRLF breeding pond, will be filled during the rainy season in an average rainfall year (Chang 2010). While a maximum of 2.5 feet of water will be lost from the pond due to evaporation, the pond will retain at least three feet of water, sufficient to sustain CRLF through development, at least into August, which is the latest that CRLF juveniles would take to develop. This does not take into account additional water that the pond may receive in the dry season as a result of groundwater discharge into Permanente Creek upstream of Pond 14. Therefore there will be sufficient water discharging into Pond 14 annually such that the CRLF population will not be adversely affected by any changes to creek flows during Project implementation.

The increase in base flow as a result of final reclamation is expected to increase both creek depth and wetted width and should increase connectivity of Permanente Creek through the dry section resulting in an increase of available habitat for fish and aquatic amphibians. This should result in an improvement over existing conditions including recruitment of riparian and wetland vegetation along the dry section and associated recruitment of BMI and amphibians as well.

5.1.9.2 Monte Bello Creek

No significant impacts to Monte Bello Creek are expected to result from implementation of the Project. Ground disturbance within the watershed is limited to the southern portion of the South Quarry and will reduce the size of the upper Monte Bello watershed by approximately 42 acres. This corresponds to an approximately four percent reduction in the Creek's watershed.

Monte Bello Creek originates from a series of seeps and intermittent tributaries to the south of the Permanente Property on the north side of Monte Bello Ridge. The main stem, referred to as the "South Fork", flows northeast until it meets the "North Fork" which originates on the property near the southern South Quarry boundary. The North Fork is largely intermittent and ephemeral. It contributes surface flow seasonally and contributes less than 10 percent of the overall flow at the confluence during the wet season, and no flow during the dry season. From the confluence, the main stem is perennial and trends southeast until it leaves the Permanente Property and drains into a series of large, in-stream, detention basins on the neighboring property. The Creek drains into Stevens Creek Reservoir which empties into Stevens Creek which trends north along Highway 85 and out to San Francisco Bay through Mountain View.

Monte Bello Creek is not managed within the Permanente Property and it is not believed to be managed upstream of the property boundary. There are no access roads to or stream crossings across Monte Bello Creek on the Permanente Property. A historic unpaved road travels parallel to the creek along the south bank for a short distance near the downstream property boundary, but had not been utilized by vehicle traffic in many years and is becoming naturally reclaimed by the landscape.

A detailed analysis of groundwater and surface flow modeling by Golder Associates (2010) concludes that the encroachment of the South Quarry into the Monte Bello watershed will result in a maximum reduction of flow of approximately 1.6% which will not significantly reduce the depth or wetted width of the creek.

Special status wildlife species

A habitat assessment conducted by Dr. Jennings (2010 – Appendix D) has concluded that the Main Stem and South Fork of Monte Bello Creek serve as suitable, but marginal CRLF aquatic breeding habitat and suitable upland/dispersal habitat is present within 300 feet of the Main Stem and South Fork. Additionally WRA, Inc. observed a juvenile male CRLF adjacent to the Main Stem Monte Bello Creek. Additionally, Dr. Jennings' report also concludes that dispersal of CRLF between the Permanente and Monte Bello drainages is not feasible due to the steepness of the terrain, barriers to dispersal, and the absence of CRLF from portions of Permanente Creek upstream of Pond 22.

Other tributaries to Monte Bello Creek, including the North Fork, are too ephemeral to serve as aquatic habitat for CRLF. Similarly the North Fork does not serve as dispersal/upland habitat for CRLF. The South Quarry does not encroach within 300 feet of the Main Stem of Monte Bello Creek. No direct or indirect impacts to CRLF habitat are expected within the Monte Bello Creek Drainage as a result of the South Quarry Project.

No fish occur in Monte Bello Creek on the Permanente Property. There are barriers to upstream fish passage along Monte Bello Creek near the downstream property boundary and additional suspected barriers to upstream passage off site. Comprehensive surveys conducted in 2009 by WRA, concluded that fish are absent from Monte Bello Creek within the Permanente Property.

5.2 Avoidance and Minimization Measures

As a result of the proposed Project, potential impacts to sensitive communities including Waters of the U.S., Waters of the State, oak woodland and willow riparian scrub may occur as described in Section 6.0 above. The following mitigation measures are proposed to reduce impacts to less than significant levels and to avoid impacts sensitive wildlife species.

5.2.1 Biological Impact 1: Impacts to Waters of the U.S. and Waters of the State

Impacts to approximately 0.11 acre (2,626 linear feet) of Waters of the U.S. and an additional 0.11 acre (3,208 linear feet) of Waters of the State may occur. To reduce impacts to a less than significant level, the following mitigation measures are proposed:

Mitigation Measure Biology 1A
Prior to proposed filling of jurisdictional waters, necessary regulatory permits will be obtained from the appropriate agencies. Regulatory permits to be obtained include U.S. Army Corps of Engineers Nationwide Permit # 44 (Mining Activities), Regional Water Quality Control Board Section 401 Water Quality Certification and/or Waste Discharge Requirement, and California Department of Fish and Game Section 1602 Lake and Streambed Alteration Agreement. Prior to proposed filling of jurisdictional waters, compliance with all regulatory agency permit conditions shall be demonstrated.

Mitigation Measure Biology 1B
Concurrent with the proposed filling of jurisdictional waters, an on-site preservation area shall be established through a deed restriction or conservation easement. This on site preservation shall protect 0.37 acre (10,420 linear feet) of existing jurisdictional waters in perpetuity, representing a ratio of approximately two linear feet of jurisdictional waters protected for every linear foot of impacted waters. A delineation of jurisdictional waters, verified by the U.S. Army Corps of Engineers, will be submitted verifying that the required amount of jurisdictional waters is present within the preservation area. A Habitat Preservation Plan will be prepared that details the upkeep requirements of the on-site preservation area such as monitoring and reporting requirements, thresholds for action (e.g. for weed or erosion control), access policy, etc. The proposed location for on-site preservation is shown in Figure 7.

5.2.2 Biological Impact 2: Impacts to oak woodland and other trees

Removal of approximately 36.5 acres of oak woodland is proposed (approximately 1,824 oak trees). Similarly, impacts to oak woodland and bay forest will result in the removal of trees greater than 12 inches dbh which is covered by the County of Santa Clara tree preservation ordinance. To reduce impacts to a less than significant level, the following mitigation measures are proposed:

Mitigation Measure Biology 2A
To mitigate for impact to 36.5 acres of oak woodland, an on-site oak preservation area shall be established through a deed restriction or conservation easement. The preservation area shall protect approximately 140 acres of oak woodland, or an estimated 7,000 individual native oak trees, in perpetuity, representing a ratio of 3.8 acres of oak woodland protected for each acre of oak woodland removed. A Habitat Management and Monitoring Plan (HMMP) will be prepared that details the management and monitoring requirements of this Preservation Area. Monitoring requirements will include an annual site visit to inspect the Preservation Area for illegal access, invasive plant problems, and to monitor erosion. An annual report will be prepared that

summarizes the monitoring site visit and any recommendations to prevent degradation of the habitat.

Mitigation Measure Biology 2B
On site replanting and reestablishment of oak woodland and other forested habitat shall be carried out in accordance with the Revegetation Plan. A minimum of 39 acres of oak woodland shall be reestablished through reclamation of the Project Area. Oak trees shall be reestablished at a ratio of at least three oak trees planted for every one oak tree removed, which corresponds to approximately 5,500 oak trees. An additional 39 acres of other native tree planting areas are proposed throughout the Project Area which also include oak tree species. These areas are designed to generate forested habitats relatively quickly but will gradually transform into oak woodland through forest succession, generating even greater oak woodland habitat over time. This planting program will satisfy the County's tree replacement program. Monitoring of tree reestablishment shall be conducted in accordance with the revegetation monitoring plan to ensure successful reestablishment of the required amount of oak woodland habitat.

5.2.3 Biological Impact 3: Impacts to San Francisco Dusky-Footed Woodrat

Potential direct impacts to San Francisco Dusky-footed Woodrat through mortality and destruction of their large stick nests potentially containing young could occur during vegetation removal, grubbing, grading or other ground disturbance activities in wooded or scrub areas where woodrats are likely to be present. Indirect impacts to San Francisco Dusky-footed Woodrat may include increased predation caused by expanding the range of urban adapted predators, such as Raccoon and Coyote into habitats that were previously inaccessible. Increased night time lighting, noise or other human disturbances may cause abandonment of young which may constitute a significant impact. The following mitigation measures are proposed to reduce these potential impacts to a less than significant level:

Mitigation Measure Biology 3A
Within 30 days prior to initial South Quarry ground disturbance, pre-construction surveys for active woodrat stick nests that would be directly impacted should occur. Surveys should take place in all suitable habitat types within the work footprint. Any stick nests within the construction area will be flagged and dismantled under the supervision of a biologist. If young are encountered during the dismantling process, the material will be placed back on the nest and remain unmolested for two to three weeks in order to give the young enough time to mature and leave of their own accord. After two to three weeks, the nest dismantling process may begin again. Nest material should be moved to suitable adjacent areas (oak woodland, scrub, or chaparral) that will not be disturbed. If construction does not occur within 30 days of the pre-construction survey, surveys should be repeated.

Mitigation Measure Biology 3B
To reduce indirect impacts on San Francisco Dusky-footed Woodrat by attracting urban adapted predators, trash and food waste should be disposed of in proper waste receptacles and emptied on a regular basis. Additionally, quarry personnel, contractors, and visitors should be dissuaded from feeding wildlife within the Permanente Property.

5.2.4 Biological Impact 4: Impacts to avian species

Potential direct impacts to nesting special status avian species could occur during construction as a result of the removal of trees and shrubs that contain nests, removal of riparian habitat, ground disturbance, equipment movement, or by direct mortality. Indirect impacts to nesting special status avian species may include increased nighttime lighting and nest abandonment due to noise or other human disturbances during construction. Abandonment of an active nest, eggs, and/or young would constitute a significant impact. The following mitigation measures are proposed:

Mitigation Measure Biology 4A
Conduct as much ground disturbance and vegetation (tree and shrub) removal as is feasible between September 1 and January 30, outside of the breeding season for most bird species.

Mitigation Measure Biology 4B
If ground disturbance or removal of vegetation occurs between February 1 and June 15, pre-construction surveys will be performed within 14 days prior to such activities to determine the presence and location of nesting bird species. If ground disturbance or removal of vegetation occurs between June 16 and August 31, pre-construction surveys will be performed within 30 days prior to such activities.

Mitigation Measure Biology 4C
If active nests are present, establishment of temporary protective breeding season buffers will avoid direct mortality of these birds, nests or young. The appropriate buffer distance is dependent on the species, surrounding vegetation and topography and will be determined by a qualified biologist as appropriate to prevent nest abandonment and direct mortality during construction.

5.2.5 Biological Impact 5: Impacts to bat species

A number of trees, snags and cracks and crevices within the South Quarry are capable of supporting bat roosts in the Project Area. If special status bat species roosts are present, Project development may impact these species either through direct removal of roosts or nearby disturbance. In addition, an increase in night lighting for the proposed Project may result in disturbance to bat movement and behavior and may be a potential indirect impact. Loss of potential bat roosts would constitute a significant impact. Bat foraging habitat is not expected to be negatively impacted by the Project on a regional scale. In fact, bat foraging habitat may be improved following reclamation as more wooded habitat will be present post-reclamation as is currently present on the Permanente Property. The following mitigation measures are proposed to reduce potential impacts to bats to a less than significant level:

Mitigation Measure Biology 5A
Removal of potential bat roost habitat (buildings, large trees, snags, vertical rock faces with interstitial crevices) or construction activities near potential bat roost habitat will take place in September and October to avoid impacts to bat maternity or hibernation roosts.

Mitigation Measure Biology 5B
If the above work window is not feasible, prior to construction, bat roost surveys will be conducted in the Project Area to determine if bats are occupying roosts. If bats are present, a

suitable buffer around the roost site will be instated or bats will be excluded from the roost using methods recommended by a qualified biologist.

Mitigation Measure Biology 5C
Any trees felled during vegetation removal will not be chipped or otherwise disturbed for a period of 48 hours to allow any undetected bats potentially occupying these trees to escape.

5.2.6 Biological Impact 6: Spread of sudden oak death

Verified occurrences of SOD occur in the vicinity of the Project Area (COMTF 2010). Although focused surveys for SOD were not conducted, the presence of the disease within the Project Area is assumed based on the proximity of the nearest verified occurrence and observations of symptoms of the disease on susceptible species within the Project Area. The potential for a significant impact exists if infested plants or plant parts including mulch or firewood are transported to a non-infested county or state. However, because transportation of plants or plant parts outside of the Project Area is not proposed at this time, no significant impacts are expected due to Project implementation. Leaving materials on-site, or moving them only within the 14-county infested area are actions that do not violate state or federal regulations, and would not constitute a significant impact. If movement of plant materials outside the state or 14-county infested area is expected then the impacts may be significant and mitigation may be required.

Revegetation of the Project Area will use a plant palette drawing on a number of plant species resistant to SOD, as described in the Revegetation Plan (WRA 2010c).

Mitigation Measure Biology 6A
If regulated or restricted plant materials are to be transported between the Project Area and a location in a non-infested county or state, the spread of the SOD pathogen will be avoided by obtaining the necessary certificates of transport pursuant to the regulations described in Section 2.3.

6.0 REFERENCES

Altman, B., and R. Sallabanks. 2000. Olive-sided Flycatcher (*Contopus cooperi*). In The Birds of North America, No. 502 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Barnhart, R.A. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific southwest): steelhead. U.S. Fish and Wildlife Service Biological Report 82(11.60). 21 pp.

California Department of Fish and Game (CDFG), Environmental Services Division (ESD). 1994. A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600-1607, California Fish and Game Code.

CDFG. 2000. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities. Revised May 8, 2000. Original publication date December 9, 1983.

CDFG. 2003. California Stream Bioassessment Procedure (CSBP). California Department of Fish and Game Water Pollution Control Laboratory Aquatic Bioassessment Laboratory. Sacramento, California 95814.

CDFG. 2009. CalFish Cooperative Program, Wildlife and Habitat Data Analysis Branch and NCNCR Information Services Branch. http://www.calfish.org. July.

CDFG. 2009. (CNDDB) Natural Diversity Database, Wildlife and Habitat Data Analysis Branch. Sacramento, California. July.

California Native Plant Society (CNPS). June 2001. CNPS Botanical Survey Guidelines. California Native Plant Society.

CNPS. 2009. Electronic Inventory of Rare and Endangered Vascular Plants of California. California Native Plant Society, Sacramento, California.

California Oak Mortality Task Force (COMTF). 2010. Accessed online February 23, 2010 at http://www.suddenoakdeath.org/html/regulations.html

Chang, Wayne W. 2010. Pond 14 Hydrology Analysis Memorandum, Permanente Quarry. April 26, 2010.

Coastal Conservancy, The. 2004. Inventory of Barriers to Fish Passage in California's Coastal Watersheds. Conducted and Compiled by The Coastal Conservancy. Oakland California.

County of Santa Clara. 1995. Santa Clara County General Plan: Charting a Course for Santa Clara County's Future: 1995-2010. San Jose, California.

Dunk, J. R. 1995. White-tailed Kite (*Elanus leucurus*). In The Birds of North America, No. 178 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi 39180-0631.

Garza, J.C. and Pearse, D. 2008. Population Genetics of *Onchorhynchus mykiss* in the Santa Clara Valley Region. Final Report to the Santa Clara Valley Water District (SCVWD). March, 2008.

Golder Associates. 2010. Hydrologic Investigation - Permanente Quarry Reclamation Plan Update, Santa Clara County, California.

Hickman, J.C. (ed.) 1993. The Jepson Manual: Higher Plants of California. University of California Press.

Holland, R. F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Prepared for the California Department of Fish and Game, Sacramento, California

Holland, D. C., M. P. Hayes, and E. McMillan. 1990. Late summer movement and mass mortality in the California Tiger Salamander (*Ambystoma californiense*). Southwestern Naturalist 35:217-220.

Huffman-Broadway Group, Inc. 2008. Biological Assessment Permanente Plant Stormwater Management Facilities Maintenance Project Cupertino, California. San Rafael, California.

Jennings, M. R. 2006a. Biological monitoring of California Red-legged Frog (*Rana draytonii*) for sediment removal at the Hanson Permanente Cement Facility, Cupertino, California. Letter report to The Huffman-Broadway Group, San Rafael, California dated November 26, 2006. 1 p.

Jennings, M. R. 2006b. California Red-legged Frog (*Rana draytonii*) surveys at the Hanson Permanente Cement Facility, Cupertino, California. Final report to The Huffman-Broadway Group, San Rafael, California dated December 30, 2006. 7 p.

Jennings, M. R. 2007. California Red-legged Frog (*Rana draytonii*) surveys at the Hanson Permanente Cement Facility, Cupertino, California. Final report to The Huffman-Broadway Group, San Rafael, California dated August 6, 2007. 7 p.

Jennings, M. R. 2008a. . California Red-legged Frog (*Rana draytonii*) one night survey at the Hanson Permanente Cement Facility, Cupertino, California. Final report to The Huffman-Broadway Group, San Rafael, California dated August 21, 2008. 2 p.

Jennings, M. R. 2008b. Biological monitoring of California Red-legged Frog (*Rana draytonii*) for sediment removal at the Hanson Permanente Cement Facility, Cupertino, California. Letter report to The Huffman-Broadway Group, San Rafael, California dated August 31, 2008. 1 p.

Jennings, M. R. 2008c. Biological monitoring of California Red-legged Frog (*Rana draytonii*) for sediment removal at the Hanson Permanente Cement Facility, Cupertino, California. Letter report to The Huffman-Broadway Group, San Rafael, California dated October 28, 2008. 2 p.

Jennings, M. R. 2009a. California Red-legged Frog (*Rana draytonii*) one night survey at the Hanson Permanente Cement Facility, Cupertino, California. Final report to The Huffman-Broadway Group, San Rafael, California dated August 25, 2009. 1 p.

Jennings, M. R. 2009b. California Red-legged Frog (*Rana draytonii*) one day and night survey at the Hanson Permanente Cement Facility, Cupertino, California. Final report to The Huffman-Broadway Group, San Rafael, California dated November 22, 2009. 2 p.

Jennings, M. R. 2010. Habitat Assessment for the California Red-legged Frog (Rana draytonii) on portions of Permanente Creek and Monte Bello Creek, Santa Clara County, California. Prepared for WRA, Inc., San Rafael, California.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final Report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA. 225 pp.

Leidy, R. A. 1984. Distribution and Ecology of Stream Fishes in the San Francisco Bay Drainage (and associated unpublished data, 1981-1984). Hilgardia 52(8).

Leidy, R. A., USEPA. 2002. Unpublished stream survey data 1992-2002.

Loredo, I., D. Van Vuren, and M. L. Morrison. 1996. Habitat use and migration behavior of the California Tiger Salamander. Journal of Herpetology 30:282-285.

Lowther, P. E., C. Celada, N. K. Klein, C. C. Rimmer and D. A. Spector. 1999. Yellow Warbler (*Dendroica petechia*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/454

Matocq, M. 2003. Dusky-footed Woodrats (*Neotoma fuscipes*) at Hastings: A Research Tradition. Hastings Natural History Reservation. http://www.hastingsreserve.org/Woodrats/DFwoodrats.html

McCafferty, W. P. 1999. Aquatic Entomology the fishermen's and ecologists' illustrated guide to insects and their relatives. Jones and Bartlett Publishers. Sudbury, MA.

Merritt, R. W., and K. W. Cummins. 1996. An introduction to the aquatic insects of North America. Third Edition. Kendall/Hunt Publishing Company.

Moyle, P. B. 2002. Inland fishes of California, revised and expanded. Berkeley and Los Angeles: University of California Press.

Nelson, James R. 1987. *Rare Plant Surveys: Techniques for Impact Assessment.* From Proceedings of a California Conference on the Conservation and Management of Rare and Endangered Plants, Sacramento, California, November 1986. California Native Plant Society Publication.

National Oceanic and Atmospheric Administration (NOAA). National Marine Fisheries Service distribution maps for California Salmonid species. Maps dated: February 1999. http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Maps/Index.cfm

Natural Resources Conservation Service (NRCS). 2002. Field Indicators of Hydric Soils in the United States, version 5.0. G.W. Hurt, P.M. Whited, eds. USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils, Fort Worth, TX.

Radian International. 1997. Red-legged Frog Site Assessment and Field Survey for Kaiser Cement Permanente Facility.

Reed, Jr., Porter B. 1988. National List of Plant Species That Occur in Wetlands: National Summary. U.S. Fish & Wildlife Service. Biol. Rep. 88 (24). 244 pp.

Santa Clara County. 2010 (currently in production). Santa Clara County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP).

Santa Clara Valley Water District (SCVWD). 2002. Permanente Creek Flood Protection Project history and background. Santa Clara Valley Water District copyright 2002. Accessed online 10/9/2008 at http://www.scvwd.dst.ca.us/Water/Watersheds_-_streams_and_floods/Watershed_info_&_projects/Lower_Peninsula/Permanente_Creek/Project_history.shtm

Shuford, W. D. 1993. The Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds. California Avifauna Series 1. Bushtit Books, Bolinas, CA.

Stebbins, R.C. A Field Guide to Western Reptiles and Amphibians, 3rd Edition. 2003. The Peterson Field Guide Series, Houghton Mifflin Company, New York.

Trenham, P. C. 2001. Terrestrial habitat use by adult California Tiger Salamanders. Journal of Herpetology 35:343-346.

U.S. Department of Agriculture, Soil Conservation Service.1941. Soil Survey of Santa Clara Area, California. In cooperation with the University of California Agricultural Experiment Station.

U.S. Fish and Wildlife Service (USFWS). 1996. *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants.* Guidelines and protocols available online at: http://www.fws.gov/sacramento/es/protocol.htm.

USFWS. 2008. Revised Critical Habitat for the California Red-Legged Frog (*Rana aurora draytonii*); Proposed Rule. Federal Register 50 CFR Part 17: September 16, 2008 (Volume 73, Number 180). Page 53491-53540.

USFWS. July 2009. Quadrangle Species Lists, Sacramento Fish and Wildlife Service.

Vickery, Peter D. 1996. Grasshopper Sparrow (*Ammodramus savannarum*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/239

Voshell, Jr, J. R. 2002. A guide to common freshwater invertebrates of North America. McDonald and Woodward Publishing Co., Blacksburg, Virginia.

WRA, Inc. 2008. *Delineation of Potential Clean Water Act Section 404 Jurisdiction, Santa Clara County, California*. Prepared for Hansen Permanente. August. Verified by the U.S. Army Corps of Engineers March 2, 2009 (Corps File No. 2008 00356S).

WRA, Inc. 2010a. *Delineation of Potential Clean Water Act Section 404 Jurisdictional Wetlands and Waters, Lehigh Permanente Quarry, Santa Clara County, California*. Prepared for Lehigh Southwest Cement Company. January.

WRA, Inc. 2010b. *Permanente Aquatic Technical Report, Lehigh Permanente Quarry, Santa Clara County, California*. Prepared for Lehigh Southwest Cement Company. May.

WRA, Inc. 2010c. *Revegetation Plan, Permanente Quarry, Santa Clara County, California*. Prepared for Lehigh Southwest Cement Company. May.

Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White. 1990. California's Wildlife, Volume I-III: Amphibians and Reptiles, Birds, Mammals. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento.

APPENDIX A. Potential for Special Status Species to Occur on the Permanente Property

Appendix A. Potential for Special Status Plant and Wildlife Species to Occur in the Permanente Property. List compiled from the California Department of Fish and Game (CDFG) Natural Diversity Database (July 2009), U.S. Fish and Wildlife Service (USFWS) Species Lists, and California Native Plant Society (CNPS) Electronic Inventory search of the Cupertino, Castle Rock Ridge, Big Basin, Milpitas, San Jose West, Los Gatos, Mountain View, Palo Alto, and Mindego Hill USGS 7.5' quadrangles, Santa Clara Valley HCP/NCCP species, and a review of other CDFG lists and publications (Jennings and Hayes 1994, Zeiner et al. 1990).

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Mammals				
Salt-marsh Wandering Shrew *Sorex vagrans halicoetes*	SSC	Salt marshes of the south arm of San Francisco Bay. Medium high marsh 6 to 8 feet above sea level where abundant driftwood is scattered among *Salicornia*.	**No Potential.** No suitable tidal marsh habitat is available in the Permanente Property or vicinity. The nearest documented occurrence of this species is 8.7 miles northeast of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Pallid Bat *Antrozous pallidus*	SSC, WBWG High Priority	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Sensitive to disturbance of roosting sites.	**Moderate Potential.** Suitable roost habitat is present within the Permanente Property in tree hollows and in adjacent areas in buildings. Disturbance associated with quarry operations may preclude the presence of this species. The nearest documented occurrence of this species is 5.0 miles north of the Permanente Property (CNDDB 2009).	Removal of potential bat roost habitat (buildings, large trees, snags, and deposition of rock within the North Quarry) will take place in September and October to avoid impacts to roosts. If this is not feasible, surveys will be conducted. If bats are present, a buffer will be instated or bats will be excluded from the roost. Installation of outdoor artificial lighting will incorporate measures to lessen potential impacts to bats .

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Western Red Bat *Lasiurus blossevillii*	SSC	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat edges & mosaics with trees that are protected from above & open below with open areas for foraging.	**Moderate Potential.** The Permanente Property contains suitable large trees and edge habitat to support foraging and roosting red bats. Disturbance associated with quarry operations may preclude the presence of this species. There are no known occurrences within 5.0 miles of the Permanente Property (CNDDB 2009).	Removal of potential bat roost habitat (buildings, large trees, snags, and deposition of rock within the North Quarry) will take place in September and October to avoid impacts to roosts. If this is not feasible, surveys will be conducted. If bats are present, a buffer will be instated or bats will be excluded from the roost. Installation of outdoor artificial lighting will incorporate measures to lessen potential impacts to bats .
Townsend's Big-eared Bat *Corynorhinus townsendii*	SSC, WBWG High Priority	Live in a wide variety of habitats but most common in mesic sites. Day roosts highly associated with caves and mines. Need appropriate roosting, maternity, and hibernacula sites free from human disturbance.	**Unlikely.** Suitable roost habitat is limited to Buffer areas. Disturbance associated with the quarry may preclude the presence of this species. There are no documented occurrences within 5 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Saltmarsh Harvest Mouse *Reithrodontomys raviventris*	FE, SE, CFP	Found only in the saline emergent wetlands of San Francisco bay and its tributaries. Primary habitat is pickleweed-dominated, saline emergent marshes. Requires adjacent, upland areas for escape from high tides. Does not burrow.	**No Potential.** No suitable tidal marsh habitat is available in the Permanente Property or vicinity. There are no documented occurrences within 5.0 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
San Francisco Dusky-footed Woodrat *Neotoma fuscipes annectens*	SSC	Forest habitats of moderate canopy & moderate to dense understory. May prefer chaparral & redwood habitats. Constructs nests of shredded grass, leaves & other material. May be limited by availability of nest-building materials.	**Present.** San Francisco Dusky-footed Woodrats are present within the Permanente Property.	Prior to ground disturbance, preconstruction surveys for active woodrat stick nests should occur. Any stick nests within the construction area will be flagged and avoided if possible. If avoidance is not feasible, the nests shall be dismantled by hand under the supervision of a biologist Trash and food waste should be disposed of in proper waste receptacles and emptied on a regular basis. Additionally, quarry personnel, contractors, and visitors should be dissuaded from feeding wildlife within the Quarry Property. Outdoor artificial lighting will incorporate measures to lessen potential impacts to woodrats .

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
San Joaquin Kit Fox *Vulpes macrotis mutica*	FE	San Joaquin Kit Fox occupies annual grasslands or grassy open stages with scattered shrubby vegetation. This species needs loose-textured sandy soils for burrowing, and suitable prey base.	**Unlikely.** Marginal habitat for San Joaquin Kit Fox is present within the Permanente Property. The nearest documented occurrence of this species is in excess of 20 miles east southeast of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
American Badger *Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	**Unlikely.** The forested portions of the Permanente Property are dense. Open portions of the Permanente Property have recently been disced. The nearest documented occurrence of this species is 9.4 miles north west of the Permanente Property.	No further actions are recommended for this species.
Birds				

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Northern Harrier *Circus cyaneus*	SSC	Nests and forages in open meadows, savannah and grassland habitats, often in association with wetlands. Nests on ground in shrubby vegetation; nest built of a large mound of sticks in wet areas. May also occur in upland desert steeps; they generally avoid forested and mountainous areas.	**Unlikely.** Open grassland habitat within the Permanente Property is not of sufficient size to support Northern Harriers. Only very marginal nesting habitat of small size is present within the Permanente Property and is seasonally disturbed (disced). The nearest documented occurrence of nesting harriers is 11.3 miles north of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
Golden Eagle *Aquila chrysaetos*	CFP, BCC, SLC	Nests and forages along rolling foothills, mountain areas, sage-juniper flats and deserts. Cliff-walled canyons provide nesting habitat in most parts of their range, they are also known to nest in large trees in open areas.	**Unlikely.** Within the Permanente Property there are no large trees within open areas that are not subject to disturbance from quarry operations. Additionally there are no unvegetated cliffs that are suitable to support nesting Golden Eagles. The nearest documented occurrence of nesting harriers is 15.5 miles northeast of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
White-tailed Kite *Elanus leucurus*	CFP	Year-long resident of coastal and valley lowlands; rarely found away from agricultural areas. Preys on small diurnal mammals and occasional birds, insects, reptiles, and amphibians.	**Present.** White-tailed Kites have been observed within the Permanente Property. Suitable nesting habitat is present within the Permanente Property. The nearest documented occurrence of nesting kites is 1.7 miles east of the Permanente Property (CNDDB 2009).	If brush and vegetation removal occurs between February 1 and September 1, pre-construction breeding bird surveys should be conducted in the vicinity and within 14 days of ground disturbance to avoid disturbance to active nests, eggs, and/or young.
American Peregrine Falcon *Falco peregrinus anatum*	FD, SE, BCC, CFP,	Prefers dry, open terrain, either level or hilly. Forages far afield, even to marshlands and ocean shores. Nests near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape on a depression or ledge in an open site.	**Unlikely**. Marginal nesting habitat is present adjacent to the Permanente Property. Disturbance associated with quarry operations may preclude this species from nesting. This species was observed flying over the Permanente Property on July 10, 2008. The nearest documented occurrence of nesting Peregrine Falcons is 11.3 miles east of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Black Rail *Laterallus jamaicensis coturniculus*	ST, CFP	Rarely seen resident of saline, brackish, and fresh water emergent wetlands of the San Francisco Bay area. Nests in dense stands of pickleweed.	**Unlikely.** Small patches of marginal habitat are present in the detention ponds along Permanente Creek. There are no documented occurrences within 5.0 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
California Clapper Rail *Rallus longirostris obsoletus*	FE, SE	Found in tidal salt marshes of the San Francisco Bay area. Requires mud flats for foraging and dense vegetation on higher ground for nesting.	**No Potential.** No suitable habitat is available in the Permanente Property or vicinity. There are no documented occurrences within 5.0 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
Western Snowy Plover *Charadrius alexandrinus nivosus*	FT, CSC, BCC, RP	Federal listing applies only to the Pacific coastal population. Found on sandy beaches, salt pond levees and shores of large alkali lakes. Requires sandy, gravelly or friable soils for nesting.	**No Potential.** There is no sandy beach or alkali flat habitat within the Permanente Property. There are no documented occurrences within 5.0 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
California Least Tern *Sterna (Sternula) antillarum browni*	FE, SE, CFP	Nests along the coast from San Francisco Bay south to northern Baja California. Breeding colonies in San Francisco Bay found in abandoned salt ponds and along estuarine shores. Colonial breeder on barren or sparsely vegetated, flat substrates near water.	**No Potential.** There is no sandy beach or salt pond habitat within the Permanente Property. There are no documented occurrences within 5.0 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Marbled Murrelet *Brachyramphus marmoratus*	FT, SE	Feeds near shore; nests inland along the Pacific coast from Eureka to the Oregon border, and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland. Nests often built in Douglas-fir or redwood stands containing platform-like branches.	**No Potential.** There is no coastal old-growth redwood habitat within the Permanente Property. There are no documented occurrences within 5.0 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
Long-eared Owl *Asio otus*	CSC	Nests in mature riparian bottomlands with willows and cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	**Moderate Potential.** Suitable oak woodland habitat within the Permanente Property uplands and along the Permanente Creek Riparian corridor within and adjacent to the Permanente Property. Disturbance associated with quarry operations may preclude presence of this species. The nearest documented occurrence of nesting Short-eared Owls is 4.2 miles west of the Permanente Property (CNDDB 2009).	If brush and vegetation removal occurs between February 1 and September 1, pre-construction breeding bird surveys should be conducted in the vicinity and within 14 days of ground disturbance to avoid disturbance to active nests, eggs, and/or young.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Burrowing Owl *Athene cunicularia*	CSC, BCC	Frequents open, dry annual or perennial grasslands and scrub habitats with low-growing vegetation, perches and abundant burrows. Preys upon insects, small mammals, reptiles, birds, and carrion. Subterranean nester; nests and roosts in old burrows of small mammals.	**Unlikely.** The Permanente Property is dominated by steep, densely vegetated slopes and hardscape. These areas do not provide suitable habitat for this species. Marginal burrowing habitat is present along the railroad tracks where California Ground Squirrels have been observed. This area is subject to high levels of disturbance. The nearest documented occurrence of breeding Burrowing Owls is 5.3 miles northeast of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
Olive-sided Flycatcher *Contopus cooperi*	SSC, BCC	Nesting habitats are mixed conifer, montane hardwood-conifer, douglas-fir, redwood, red fir & lodgepole pine. Most numerous in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain.	**Moderate Potential.** Foraging habitat and marginal nesting habitat is present within the Permanente Property. A female Olive-sided Flycatcher was observed within the Permanente Property on April 22, 2008. There are no documented occurrences of this species recorded in CNDDB (CNDDB 2009).	If brush and vegetation removal occurs between February 1 and September 1, pre-construction breeding bird surveys should be conducted in the vicinity and within 14 days of ground disturbance to avoid disturbance to active nests, eggs, and/or young.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Loggerhead Shrike *Lanius ludovicianus*	SSC, BCC	Occurs in woodland, grassland, savannah, pinyon-juniper forest, desert, and scrub habitats. Prefers open areas with sparse shrubs, trees, posts, and other suitable perches which to forage for large insects. Nests are well-concealed above ground in densely-foliaged shrub or tree.	**Moderate Potential.** Foraging habitat is present in grassland portions of the Permanente Property. Trees and shrubs are present for nesting. The are no documented occurrences of this species within 5.0 miles of the Permanente Property (CNDDB 2009).	If brush and vegetation removal occurs between February 1 and September 1, pre-construction breeding bird surveys should be conducted in the vicinity and within 14 days of ground disturbance to avoid disturbance to active nests, eggs, and/or young.
Least Bell's Vireo *Vireo bellii pusillus*	FE, SE, BCC, SLC	This species is a Summer resident of Southern California but whose range is extending northward. Nesting occurs in riparian areas in vicinity of water or in dry river bottoms. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, coyote brush or mesquite.	**Unlikely.** The Permanente Property is outside the known distribution for this species. The nearest documented occurrence of breeding Least Bell's Vireos is 37.5 miles southeast of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Yellow Warbler *Dendroica petechia*	SSC	Riparian plant associations. Prefers willows, cottonwoods, aspens, sycamores, & alders for nesting & foraging. Also nests in montane shrubbery in open conifer forests.	**Present.** Foraging and nesting habitat is present within the Permanente Property. This species has not been documented breeding on-site, Yellow Warblers have been observed within the Permanente Property by WRA Biologists. There are no documented occurrences of this species within 5 miles of the Permanente Property (CNDDB 2009).	If brush and vegetation removal occurs between February 1 and September 1, pre-construction breeding bird surveys should be conducted in the vicinity and within 14 days of ground disturbance to avoid disturbance to active nests, eggs, and/or young.
Saltmarsh Common Yellowthroat *Geothlypis trichas sinuosa*	SSC, BCC	Resident of the San Francisco Bay region, in fresh and salt water marshes. Frequents low, dense vegetation near water. Requires thick, continuous cover down to water surface for foraging, and tall grasses, tule patches, or willows for nesting.	**Unlikely.** No suitable marsh habitat is available in the Permanente Property. May occasionally be seen foraging and/or dispersing through the Permanente Property. The nearest documented occurrence is 8.0 miles north of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Grasshopper Sparrow *Ammodramus savannarum*	SSC	Favors native grasslands with a mix of grasses, forbs and scattered shrubs. This species is loosely colonial when nesting. Prefers dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes.	**Present.** Suitable grassland habitat is available for this species to nest within the Permanente Property. This species has been identified within the Permanente Property. There are no documented occurrences of this species nesting within 5 miles of the Permanente Property (CNDDB 2009).	If brush and vegetation removal occurs between February 1 and September 1, pre-construction breeding bird surveys should be conducted in the vicinity and within 14 days of ground disturbance to avoid disturbance to active nests, eggs, and/or young.
Alameda Song Sparrow *Melospiza melodia pusillula*	SSC, BCC	Resident of salt marshes bordering south arm of San Francisco Bay. Inhabits *Salicornia* marshes; nests low in *Grindelia* bushes (high enough to escape high tides) and in *Salicornia*.	**No Potential.** No suitable marsh habitat is available in the Permanente Property. There are no documented occurrences of this species within 5.0 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Tricolored Blackbird *Agelaius tricolor*	SSC, BCC, RP	A highly colonial species, most numerous in the Central Valley and vicinity. Usually nests over or near freshwater in dense cattails, tules, or thickets of willow, blackberry, wild rose or other tall herbs. Requires breeding habitat sufficient to support 30 nesting pairs.	**Unlikely.** Suitable freshwater marsh vegetation is not present in patch sizes large anough to support this species. This species has not been detected during 2006-2010 surveys. The nearest documented breeding colony is 14.0 miles northeast of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
Reptiles and Amphibians				
Western Pond Turtle *Emys (Clemmys) marmorata*	SSC, SLC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter.	**Unlikely.** Permanente Creek is relatively shallow and fast-flowing within the Permanente Property. Detention basins may provide marginal habitat for Western Pond Turtles, although upland habitat is limited around these basins. The nearest documented occurrence is 8.5 miles southeast of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
San Francisco Garter Snake *Thamnophis sirtalis tetrataenia*	FE, SE	Vicinity of freshwater marshes, ponds and slow moving streams in San Mateo County and northern Santa Cruz County. Prefers dense cover & water depths of at least one foot. Upland areas near water are also very important.	**Unlikely.** Santa Clara County is outside the accepted range of this sub-species. The nearest documented occurrence is 8.0 miles west of the Permanente Property (USFWS 2006).	No further actions are recommended for this species.
Alameda Whipsnake *Masticophis lateralis euryxanthus*	FT	Alameda Whipsnake is restricted to valley-foothill hardwood habitat of the Coast Ranges between Monterey and San Francisco Bay. They inhabit south-facing slopes and ravines where shrubs form a vegetative mosaic with oak trees and grasses.	**Unlikely.** There are no known occurrences of Alameda Whipsnake in Santa Clara County. Suitable habitat for Alameda Whipsnake is present, however the Permanente Property is outside of the accepted distribution of this sub species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
California Tiger Salamander *Ambystoma californiense*	FT, SSC, SLC	Inhabits annual grassland habitats with mammal burrows. Seasonal ponds and vernal pools are crucial to breeding.	**Unlikely.** Poor quality habitat is present in isolated sections of Permanente Creek adjacent to the Permanente Property. Poor water quality and annual disturbance in quarry detention ponds are likely to preclude breeding within the Permanente Property. Last known occurrence in Permanente Creek drainage system was in 1893 (CNDDB 2009) and was likely misidentified. Suitable upland estivation habitat with small mammal burrows is limited within the Permanente Property or adjacent areas.	No further actions are recommended for this species.
Foothill Yellow-legged Frog *Rana boylii*	SSC, SLC	FYLF occurs in partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. They need at least some cobble-sized substrate for egg-laying and at least 15 weeks to metamorphose.	**Unlikely.** Watersheds within the Permanente Property are either heavily shaded, channelized or have armored substrate. Focused amphibian surveys have failed to detect this species. The nearest documented occurrence of this species is 7.8 miles west-southwest of the Study Are (CNDDB 2009)	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
California Red-legged Frog *Rana aurora draytonii*	FT, SSC, SLC	Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive vegetation. Documented to disperse through upland habitats after rains.	**Present.** CRLF have been documented within the Permanente Property. This species breeds in Pond 14 and 21 and are present in Pond 22. Pond 22 presently does not provide aquatic breeding habitat for CRLF. Adult CRLF currently occupy Ponds 14, 21 and 22, and within Permanente Creek downstream from Pond 14. Additionally, Ponds 4A, 13, 20 and 21 are considered to be suitable habitat for CRLF, with Pond 13 supporting breeding habitat. One adult CRLF was observed in the Montebello Creek watershed along the southern Property boundary. Montebello Creek may provide suitable aquatic breeding habitat in some years and non-aquatic breeding, upland foraging and dispersal habitats.	A pre-construction survey shall be conducted immediately preceding construction activites within 300 feet of CRLF habitat. An erosion and sedimentation control plan will be implemented to prevent impacts to CRLF outside of the RPA Area. No leaks of mechanical fluids such as fuels, oils and solvents are allowed. Hazardous materials will be stored in sealable containers in a designated location at least 300 feet from any pool, pond or waterway. Water levels in Ponds 14 and 22 should be monitored during mining activities. The existing screw gate above Pond 14 will be used to maintain stable water levels to prevent take of CRLF. Upon completion of the Project, all areas subjected to ground disturbance will be reclaimed according to the RPA.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Fishes				
Green Sturgeon *Acipenser medirostris*	FT, NMFS	Green Sturgeon spawn in the Sacramento and Klamath Rivers. Requires water temperatures between 8-14 degrees celsius to spawn. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	**No Potential.** Permanente Property is outside of the present distribution range of Green Sturgeon (NOAA 2008).	No further actions are recommended for this species.
Pacific Lamprey *Lampetra tridentata*	SLC	Found in Pacific coast streams north of San Luis Obispo County, however regularly runs in the Santa Clara River. This species prefers high velocity, gravel bottomed areas for spawning with water temps between 12-18 degrees Celsius. Juveniles need soft sand or mud.	**Unlikely.** Pacific Lamprey are capable or surmounting all but the largest barriers to upstream migration (Moyle 2002). The Permanente Creek Diversion is a possible barrier to this species. This species was not detected within the Permanente Property during focused fish surveys in 2009. There are no documented occurrences of this species in CNDDB (2008).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Tidewater Goby *Eucyclogobius newberryi*	FE	Tidewater Gobies occur in brackish water habitats along the California Coast from Agua Hedionda Lagoon in San Diego County to the mouth of the Smith River. They are found in shallow lagoons and lower stream reaches. They require fairly still but not stagnant water and high oxygen levels.	**No Potential.** Permanente Property is outside of the present distribution range of Tidewater Goby (NOAA 2008).	No further actions are recommended for this species.
Delta Smelt *Hypomesus transpacificus*	FT	Delta Smelt are found in the Sacramento - San Joaquin Delta. They seasonally occur in Suisun Bay, Carquinez Strait and San Pablo Bay. This species most often occurs at salinities less than 2 ppt and is seldom found at salinities greater than 10 ppt.	**No Potential.** Permanente Property is outside of the present distribution range of Delta Smelt (NOAA 2008).	No further actions are recommended for this species.
Chinook Salmon - Central Valley fall run ESU *Oncorhynchus tshawytscha*	SSC, SLC	Central Valley fall run Chinook Salmon include all naturally spawned populations of fall-run Chinook salmon in the Sacramento River and its tributaries in California, including the Feather River, as well as the Feather River Hatchery spring-run Chinook program. This species requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees Celsius for spawning.	**No Potential.** Permanente Property is outside of the present distribution range of Central Valley fall run Chinook Salmon (NOAA 2008).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Chinook Salmon - Central Valley spring run ESU *Oncorhynchus tshawytscha*	FT, NMFS	Central Valley spring run Chinook Salmon include all naturally spawned populations of spring-run Chinook salmon in the Sacramento River and its tributaries in California, including the Feather River, as well as the Feather River Hatchery spring-run Chinook program. This species requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees Celsius for spawning.	**No Potential.** Permanente Property is outside of the present distribution range of Central Valley spring run Chinook Salmon (NOAA 2008).	No further actions are recommended for this species.
Chinook Salmon - Sacramento River winter run ESU *Oncorhynchus tshawytscha*	FE, NMFS	Winter run Chinook Salmon occur in the Sacramento River below Keswick Dam. They spawn in the Sacramento River but not in tributary streams. This species requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees Celsius for spawning.	**No Potential.** Permanente Property is outside of the present distribution range of Sacramento River winter run Chinook Salmon (NOAA 2008).	No further actions are recommended for this species.
Coho Salmon - Central California Coast ESU *Oncorhynchus kisutch*	FE, NMFS	Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water and sufficient dissolved oxygen.	**No Potential.** Permanente Property is outside of the present distribution range of central California Coast Coho Salmon (NOAA 2008).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Steelhead - Central Valley ESU *Oncorhynchus mykiss*	FT, NMFS	Populations in the Sacramento and San Joaquin rivers and their tributaries. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	**No Potential.** Permanente Property is outside of the present distribution range of Central Valley Steelhead (NOAA 2008)	No further actions are recommended for this species.
Steelhead - central CA coast ESU *Oncorhynchus mykiss*	FT, NMFS	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	**Unlikely.** Documented to occur in Peters Creek on the west side of Highway 35 within 3 miles of Permanente Property (CNDDB 2009). Barriers along Permanente Creek including the Permanente Creek Diversion are complete barriers to upstream migration and preclude the presence of this species in the Permanente Property.	No further actions are recommended for this species.
Invertebrates				
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT, SSI, RP	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay and San Jose. *Plantago erecta* is the primary host plant; *Orthocarpus densiflorus* and *O. purpurscens* are the secondary host plants.	**No Potential.** Suitable serpentine soil habitat is not present in the Permanente Property. There are no documented occurrences within 5 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
San Bruno elfin butterfly *Incisalia mossii bayensis*	FE	Occurs on coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain in San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium*.	**No Potential.** The Permanente Property is outside the known range for this species. There are no documented occurrences within 5 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
unsilvered fritillary butterfly *Speyeria adiaste adiaste*	SSI	Restricted range: Santa Clara north to San Mateo County; east to north Los Angeles County and Kern County. Larval host plant is *Viola quercetorum*. Adults utilize openings in redwood and coniferous forests, oak woodlands, and chaparral habitats.	**Unlikely.** The host plant of this species has not been identified within the Permanente Property and/or adjacent areas. The nearest documented occurrence is 3.9 miles southwest of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
Zayante band-winged grasshopper *Trimerotropis infantilis*	FE	Isolated sandstone deposits in the Santa Cruz Mountains (the Zayante Sand Hills Ecosystem) mostly on sand parkland habitat but also in areas with well-developed ground cover & in sparse chaparral with grass.	**No Potential.** The Permanente Property does not contain suitable soils to support this species and is outside the accepted range of this species. The nearest documented occurrence is 10.4 miles south-southeast of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
conservancy fairy shrimp *Branchinecta conservatio*	FE	This species is endemic to the grasslands of the northern two-thirds of the Central Valley. They are found in large, turbid pools and inhabit pools located in swales formed by old, braided alluvium. Occupied pools remain inundated until June.	**No Potential.** The Permanente Property is outside the known range for this species. There are no documented occurrences within 5 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.
vernal pool tadpole shrimp *Lepidurus packardi*	FE, SSI, RP	Inhabits vernal pools and swales in the Sacramento Valley and San Francisco Bay Area containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	**Unlikely.** Marginal seasonal wetland habitat is present within the Permanente Property. There is no known connectivity between the known occurrences of this species and the Permanente Property. There are no documented occurrences within 5 miles of the Permanente Property (CNDDB 2009).	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Plants				
San Mateo thorn mint *Acanthomintha duttonii*	List 1B, FE, SE	Occurs in chaparral and valley and foothill grassland on serpentinite soils. 5-300 meters. Blooms April-June.	**No Potential.** The Permanente Property lacks suitable serpentinite soils. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Franciscan onion *Allium peninsulare* var. *franciscanum*	List 1B	Occurs in cismontane woodland, valley and foothill grassland on clay, volcanic, and often serpentinite soils. 52 - 300 meters. Blooms May-June.	**No Potential.** The Permanente Property lacks suitable clay, volcanic, and serpentinite soils. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Sharsmith's onion *Allium sharsmithiae*	List 1B	Occurs in chaparral and cismontane woodland on rocky, serpentinite soils. 400-1200 meters. Blooms March-May.	**No Potential.** The Permanente Property lacks suitable serpentinite soils. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
bent-flowered fiddleneck *Amsinckia lunaris*	List 1B	Occurs in coastal bluff scrub, cismontane woodland and valley and foothill grassland. 3-500 meters. Blooms March-June.	**No Potential.** Although suitable grassland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
slender silver moss *Anomobryum julaceum*	List 2	Occurs in broadleafed upland forest, lower montane coniferous forest, and North Coast coniferous forest on damp rock and soils on outcrops and roadcuts. 100-1000 meters.	**No Potential.** Although suitable forested habitat for this species is present in the Permanente Property, the only known occurrence of this species in the vicinity of the Permanente Property is uncertain (CDFG 2008). Additionally, this species was not observed during rare plant surveys.	No further actions are recommended for this species.
Santa Cruz Mountains manzanita *Arctostaphylos andersonii*	List 1B	Occurs in openings and edges of broadleafed upland forest, chaparral, and North Coast coniferous forest. 60-730 meters. Blooms November-April.	**No Potential.** Although suitable chaparral habitat is present in the Permanente Property, this species can be identified out of its blooming period and was not identified on site during rare plants surveys.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Schreiber's manzanita *Arctostaphylos glutinosa*	List 1B	Occurs in closed-cone coniferous forest, and chaparral on diatomaceous shale. 170-685 meters. Blooms (November-April).	**No Potential.** Although suitable chaparral habitat is present in the Permanente Property, this species can be identified out of its blooming period and was not identified on site during rare plants surveys.	No further actions are recommended for this species.
Pajaro manzanita *Arctostaphylos pajaroensis*	List 1B	Occurs in chaparral on sandy soils. 30-760 meters. Blooms December-March.	**No Potential.** The Permanente Property lacks suitable chaparral habitat on sandy soils.	No further actions are recommended for this species.
King's Mountain manzanita *Arctostaphylos regismontana*	List 1B	Occurs in broadleafed upland forest, chaparral and North Coast coniferous forest on granitic or sandstone substrates. 305-730 meters. Blooms January-April.	**No Potential.** The Permanente Property lacks suitable forest or chaparral habitat on granitic or sandstone substrates.	No further actions are recommended for this species.
Bonny Doon manzanita *Arctostaphylos silvicola*	List 1B	Occurs in closed-cone coniferous forest, chaparral and lower montane coniferous forest on inland marine-derived sandy soils. 120-600 meters. Blooms February-March.	**No Potential.** The Permanente Property lacks suitable forest and chaparral habitats on inland marine-derived sandy soils.	No further actions are recommended for this species.
alkali milk-vetch *Astragalus tener var. tener*	List 1B	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands. 1-170m. Blooms March-June.	**No Potential.** The Permanente Property lacks suitable alkali flooded habitats.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
brittlescale *Atriplex depressa*	List 1B	Occurs in chenopod scrub, meadows and seeps, playas, valley and foothill grassland and vernal pools, on alkaline clay soils. 1-320 meters. Blooms May-Oct.	**No Potential.** The Permanente Property lacks suitable alkaline clay soils.	No further actions are recommended for this species.
San Joaquin spearscale *Atriplex joaquiniana*	List 1B	Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with *Distichlis spicata*, *Frankenia salina*, etc. 1-250m. Blooms April-October.	**No Potential.** The Permanente Property lacks suitable alkali wetlands.	No further actions are recommended for this species.
big-scale balsamroot *Balsamorhiza macrolepis var. macrolepis*	List 1B	Occurs in chaparral, cismontane woodland and valley and foothill grassland, sometimes on serpentinite soils. 90-1400 meters. Blooms March-June.	**No Potential.** Although suitable chaparral and woodland habitat on non-serpentinite soils is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
round-leaved filaree *California macrophylla*	List 1B	Occurs in cismontane woodland and valley and foothill grassland on clay soils. 15-1200 meters. Blooms March-May.	**No Potential.** The Permanente Property lacks suitable clay soils. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Santa Cruz Mountains pussypaws *Calyptridium parryi var. hesseae*	List 3	Occurs in chaparral and cismontane woodland. 305-1115 meters. Blooms May-July.	**No Potential.** Although suitable chaparral and woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
chaparral harebell *Campanula exigua*	List 1B	Occurs in chaparral, usually on rocky, serpentinite soils. 275-1250 meters. Blooms May-June.	**No Potential.** The Permanente Property lacks suitable serpentinite soils.	No further actions are recommended for this species.
Sharsmith's harebell *Campanula sharsmithiae*	List 1B	Occurs in chaparral, usually on serpentine barrens. 480-855 meters. Blooms April-June.	**No Potential.** The Permanente Property lacks suitable serpentinite barrens.	No further actions are recommended for this species.
Tiburon paintbrush *Castilleja affinis ssp. neglecta*	List 1B, FE, ST	Occurs in valley and foothill grassland on serpentinite soils. 60-400 meters. Blooms April-June.	**No Potential.** The Permanente Property lacks suitable serpentinite soils.	No further actions are recommended for this species.
pink creamsacs *Castilleja rubicundula ssp. rubicundula*	List 1B	Occurs within openings in chaparral, cismontane woodland, meadows and seeps and in valley and foothill grassland on serpentinite soils. 20-900 meters. Blooms April-June.	**No Potential.** The Permanente Property lacks suitable serpentinite soils.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
coyote ceanothus *Ceanothus ferrisiae*	List 1B, FE	Occurs in chaparral, coastal scrub and valley and foothill grassland on serpentinite soils. 120-460 meters. Blooms January-May.	**No Potential.** The Permanente Property lacks suitable serpentinite soils. This species is known from fewer than five occurrences in the Mt. Hamilton Range.	No further actions are recommended for this species.
Congdon's tarplant *Centromadia parryi ssp. congdonii*	List 1B	Occurs on valley and foothill grassland on alkaline soils. 1-230 meters. Blooms May-October, occasionally to November.	**No Potential.** The Permanente Property lacks suitable alkaline soils.	No further actions are recommended for this species.
Ben Lomond spineflower *Chorizanthe pungens var. hartwegiana*	List 1B, FE	Occurs in lower montane coniferous forest, on maritime ponderosa pine sandhills. 90-610 meters. Blooms April-July.	**No Potential.** The Permanente Property lacks suitable coniferous forest or pine sandhill habitat.	No further actions are recommended for this species.
robust spineflower *Chorizanthe robusta var. robusta*	List 1B, FE	Occurs maritime chaparral, openings in cismontane woodland, coastal dunes, and sandy or gravelly coastal scrub. 3-300 meters. Blooms April-September.	**No Potential.** Although suitable woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Mt. Hamilton fountain thistle *Cirsium fontinale var. campylon*	List 1B	Occurs in chaparral, cismontane woodland and valley and foothill grassland in serpentinite seeps. 100-890 meters. Blooms April-October, occasionally beginning in February.	**No Potential.** The Permanente Property lacks suitable serpentinite seep habitat.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Crystal Springs fountain thistle *Cirsium fontinale var. fontinale*	List 1B, FE, SE	Occurs in chaparral openings, cismontane woodland, and valley and foothill grassland in serpentinite seeps. 46-175 meters. Blooms May-October.	**No Potential.** The Permanente Property lacks suitable serpentinite seep habitat.	No further actions are recommended for this species.
lost thistle *Cirsium praeteriens*	List 1A	Habitat unknown. Possibly an introduction from the Old World. Known from only two collections from Palo Alto, the most recent in 1901. 0-100 meters. Blooms June-July.	**No Potential.** Although suitable habitat for this species may be present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Santa Clara red ribbons *Clarkia concinna* ssp. *automixa*	List 4			
San Francisco collinsia *Collinsia multicolor*	List 1B	Occurs in closed-cone coniferous forest and coastal scrub, sometimes on serpentinite soils. 30-250 meters. Blooms March-May.	**No Potential.** Although suitable forest and scrub habitat on non-serpentinite soils is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Point Reyes bird's beak *Cordylanthus maritimus* ssp. *palustris*	List 1B	Occurs in coastal salt marsh. 0-10 meters. Blooms June-October.	**No Potential.** The Permanente Property lacks suitable salt marsh habitat.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Mt. Hamilton coreopsis *Coreopsis hamiltonii*	List 1B	Occurs in cismontane woodland on rocky soils. 550-1300 meters. Blooms March-May.	**No Potential.** Although suitable woodland habitat on rocky soils is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Sant Cruz cypress *Cupressus abramsiana*	List 1B, FE, SE	Occurs within closed-cone coniferous forest, chaparral, and lower-montane coniferous forest. Restricted to the Santa Cruz mountains, usually found with *Pinus attenuata*. 280-800 meters.	**No Potential.** The Permanente Property hosts very few coniferous species. This tree species was not identified during rare plant surveys.	No further actions are recommended for this species.
Hospital Canyon larkspur *Delphinium californicum ssp. interius*	List 1B	Occurs in openings in chaparral, and mesic sites in cismontane woodland. 230-1095 meters. Blooms April-June.	**No Potential.** Although suitable chaparral and woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Norris' beard moss *Didymodon norrisii*	List 2	Occurs in cismontane woodland, and lower montane coniferous forest on rocky, intermittently mesic sites. 600-1973 meters.	**No Potential.** Although suitable woodland and forest habitat is present in the Permanente Property, this species was not identified during rare plant surveys.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
western leatherwood *Dirca occidentalis*	List 1B	Occurs in broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland, usually on brushy slopes and mesic sites. 50-395 meters. Blooms January-March.	**Present.** This shrub species is identifiable outside of its blooming period, and was observed in one location along the banks of an intermittent creek in the western portion of the Permanente Property.	Impacts to this plant species should be avoided as possible.
Santa Clara Valley dudleya *Dudleya setchellii*	List 1B, FE	Occurs in cismontane woodland and valley and foothill grassland on rocky, serpentinite outcrops. 60-455 meters. Blooms April-October.	**No Potential.** The Permanente Property lacks serpentinite outcrops.	No further actions are recommended for this species.
Brandegee's eriastrum *Eriastrum brandegeeae*	List 1B	Occurs in chaparral and cismontane woodland on volcanic, sandy soils. 305-1030 meters. Blooms April-August.	**No Potential.** The Permanente Property lacks suitable chaparral and woodland habitat on volcanic or sandy soils. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Tracy's eriastrum *Eriastrum tracyi*	List 1B, SR	Occurs in chaparral and cismontane woodland. 315-975 meters. Blooms June-July.	**No Potential.** Although suitable chaparral and woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Santa Catalina Island buckwheat *Eriogonum giganteum* ssp. *giganteum*	List 4			
Ben Lomond buckwheat *Eriogonum nudum* var.*decurrens*	List 1B	Occurs in chaparral, cismontane woodland, and lower montane coniferous forest, usually found on maritime Ponderosa Pine sandhills. 50-800 meters. Blooms June-October.	**No Potential.** The Permanente Property lacks suitable chaparral, woodland, and forest habitats on maritime Ponderosa Pine sandhills.	No further actions are recommended for this species.
San Mateo woolly sunflower *Eriophyllum latilobum*	List 1B, FE, SE	Occurs in cismontane woodland, often on serpentine in roadcuts. 45-150 meters. Blooms May-June.	**No Potential.** The Permanente Property lacks suitable woodland habitat with serpentine outcrops.	No further actions are recommended for this species.
Hoover's button-celery *Eryngium aristulatum* var. *hooveri*	List 1B	Occur in alkaline depressions, vernal pools, roadside ditches and other wet places near the coast. 5-45 meters. Blooms in July.	**No Potential.** The Permanente Property lacks suitable alkaline depressions and vernal pool habitat.	No further actions are recommended for this species.
talus fritillary *Fritillaria falcata*	List 1B	Occurs in chaparral, cismontane woodland and lower montane coniferous forest on serpentinite talus fields. 300-1525 meters. Blooms March-May.	**No Potential.** The Permanente Property lacks suitable chaparral and woodland on serpentinite talus fields.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
fragrant fritillary *Fritillaria liliacea*	List 1B	Occurs in cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland, usually associated with serpentine. 3-410 meters. Blooms February-April.	**No Potential.** The Permanente Property lacks suitable woodland, prairie, scrub, or grassland habitats on serpentine soils.	No further actions are recommended for this species.
short-leaved evax *Hespervax sparsiflora* var. *brevifolia*	List 2	Occurs in coastal bluff scrub and coastal dunes. 0-215 meters. Blooms March-June.	**No Potential.** The Permanente Property lacks suitable coastal bluff scrub and dune habitat.	No further actions are recommended for this species.
Marin western flax *Hesperolinon congestum*	List 1B, FT, ST	Occurs in valley and foothill grasslands and chaparral, on serpentinite soils. 30-365 meters. Blooms April-July.	**No Potential.** The Permanente Property lacks suitable serpentinite soils.	No further actions are recommended for this species.
Northern California black walnut *Juglans hindsii*	List 1B	Occurs in riparian forest and riparian woodland. 0 to 440 meters. Blooms April to May. The species is historically known from Alameda, Butte, Contra Costa, Lake, Napa, Sacramento, Solano, Sonoma, and Yolo counties. Only native stands garner protected status.	**No Potential.** Although this species was observed within the Permanente Property, it was determined not to be a native stand. Native stands of this species was not identified during rare plant surveys which were conducted during its blooming period. No native stands are known from Santa Clara County.	No further actions are recommended for this species.
Loma Prieta hoita *Hoita strobilina*	List 1B	Occurs in chaparral, cismontane woodland, riparian woodland, usually on serpentine soils and mesic sites. 30-860 meters. Blooms May-July.	**No Potential.** The Permanente Property lacks suitable chaparral and woodland habitat on serpentine soils.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Contra Costa goldfields *Lasthenia conjugens*	List 1B, FE	Occurs in cismontane woodland, playas, valley and foothill grassland, and alkaline vernal pools. 0-470 meters. Blooms March-June.	**No Potential.** The Permanente Property lacks suitable wetland habitat. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
legenere *Legenere limosa*	List 1B	Vernal pools. 1-880 meters. Blooms April-June.	**No Potential.** The Permanente Property lacks suitable vernal pool habitat.	No further actions are recommended for this species.
woolly-headed lessingia *Lessingia hololeuca*	List 3	Occurs in broadleafed upland forest, coastal scrub, lower montane coniferous forest and valley and foothill grassland. Usually associated with clay and serpentine soils. 15-305 meters. Blooms June-October.	**No Potential.** The Permanente Property lacks suitable clay and serpentine soils. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
smooth lessingia *Lessingia micradenia* var. *glabrata*	List 1B	Occurs in chaparral, cismontane woodland, usually on serpentine soils near roadsides. 120-420 meters. Blooms July-November.	**No Potential.** The Permanente Property lacks suitable serpentine soils. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Mt. Hamilton lomatium *Lomatium observatorium*	List 1B	Occurs in cismontane woodland. 1219-1330 meters. Blooms March-May.	**No Potential.** Although suitable woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
arcuate bushmallow *Malacothamnus arcuatus*	List 1B	Occurs in chaparral, cismontane woodland, usually in gravelly alluvium. 15-355 meters. Blooms April-September.	**No Potential.** The Permanente Property lacks suitable chaparral and woodland habitats on gravelly alluvium.	No further actions are recommended for this species.
Davidson's bushmallow *Malacothamnus davidsonii*	List 1B	Occurs in chaparral, cismontane woodland, coastal scrub and riparian woodland, usually in sandy washes. 185-855 meters. Blooms June-January.	**No Potential.** The Permanente Property lacks suitable chaparral, woodland, and scrub habitat in sandy washes.	No further actions are recommended for this species.
Hall's bushmallow *Malacothamnus hallii*	List 1B	Occurs in chaparral, coastal scrub, some populations on serpentine. 10-760 meters. Blooms May-September.	**No Potential.** Although suitable chaparral habitat on non-serpentine soils is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Oregon meconella *Meconella oregana*	List 1B	Occurs in coastal prairie and coastal scrub. 250-620 meters. Blooms March-April.	**No Potential.** The Permanente Property lacks suitable coastal scrub and prairie habitat.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Mt. Diablo cottonweed *Micropus amphibolus*	List 3	Occurs in broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland in rocky soils. 45-825 meters. Blooms March-May.	**No Potential**. This species was observed in grassland areas outside of the eastern boundary of the Permanente Property. It was not identified on site during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
San Antonio Hills monardella *Monardell antonina* ssp. *antonina*	List 3	Occurs in chaparral and cismontane woodland. 500-1000 meters. Blooms June-August.	**No Potential.** Although suitable chaparral and woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
robust monardella *Monardella villosa* ssp.*globosa*	List 1B	Occurs in openings in chaparral, broadleafed upland forest, cismontane woodland, and valley and foothill grassland. 30-915 meters. Blooms June-July.	**No Potential.** Although suitable chaparral, forest, and woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
prostrate navarretia *Navarretia prostrata*	List 1B	Occurs in coastal scrub, meadows and seeps, valley and foothill grassland, and alkaline vernal pools. 15-700 meters. Blooms April-July.	**No Potential.** The Permanente Property lacks suitable seep and vernal pool habitats. Additionally, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Kellman's bristle moss *Orthotrichum kellmanii*	List 1B	Occurs in chaparral and cismontane woodland. Restricted to sandstone outcrops. 343-685 meters. Blooms January-February.	**No Potential.** The Permanente Property lacks suitable sandstone outcrops.	No further actions are recommended for this species.
Dudley's lousewort *Pedicularis dudleyi*	List 1B, SR	Occurs in chaparral, lower montane coniferous forest, North Coast coniferous forest. 60-900 meters. Blooms April-June.	**No Potential.** Although suitable chaparral and forest habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Santa Cruz mountains beardtongue *Penstemon rattanii* var. *kleei*	List 1B	Occurs in chaparral, lower montane coniferous forest and North Coast coniferous forest, usually on sandy shale slopes and sometimes in the transition zone between forest and chaparral. 400-1100 meters. Blooms May-June.	**No Potential.** Although suitable chaparral and forest habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
white-rayed pentacheata *Pentachaeta bellidiflora*	List 1B, FE, SE	Occurs in valley and foothill grassland, often associated with serpentine soils. 35-620 meters. Blooms March-May.	**No Potential.** The Permanente Property lacks suitable grassland habitat on serpentine soils.	No further actions are recommended for this species.
San Benito pentachaeta *Pentachaeta exilis ssp. aeolica*	List 1B	Occurs in cismontane woodland and valley and foothill grassland. 640-855 meters. Blooms March-May.	**No Potential.** Although suitable woodland and grassland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Mt. Diablo phacelia *Phacelia phacelioides*	List 1B	Occurs in chaparral and cismontane woodland in rocky soils. 500-1370 meters. Blooms April-May.	**No Potential.** Although suitable chaparral and woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
white-flowered rein orchid *Piperia candida*	List 1B	Occurs in broadleafed upland forest, lower montane coniferous forest and North Coast coniferous forest, occasionally on serpentinite soils. 30-1310 meters. Blooms May-September.	**No Potential.** Although suitable forest habitat on non-serpentine soils is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
hairless popcorn-flower *Plagiobothrys glaber*	List 1A	Occurs in alkaline meadows and seeps, coastal salt marshes and swamps. 15-180 meters. Blooms March-May.	**No Potential.** The Permanente Property lacks suitable alkaline meadows and seeps, and suitable coastal salt marshes and swamps.	No further actions are recommended for this species.
hooked popcorn-flower *Plagiobothrys uncinatus*	List 1B	Occurs in chaparral (sometimes on sandy soils), cismontane woodland and valley and foothill grassland. 300-760 meters. Blooms April-May.	**No Potential.** Although suitable chaparral, woodland, and grassland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
slender-leaved pondweed *Potamogeton filiformis*	List 2	Occurs in assorted shallow freshwater marshes and swamps. 300-2150 meters. Blooms May-July.	**No Potential.** The Permanente Property lacks suitable freshwater marsh and swamp habitat.	No further actions are recommended for this species.
rock sanicle *Sanicula saxatilis*	List 1B, SR	Occurs in broadleafed upland forest, chaparral and valley and foothill grassland, on rocky soils and outcrops. 620-1175 meters. Blooms April-May.	**No Potential.** Although suitable forest, chaparral, and grassland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
chaparral ragwort *Senecio aphanactis*	List 2	Occurs in chaparral, cismontane woodland, and coastal scrub, often alkaline soils. 15-800 meters. Blooms January-April.	**No Potential.** The Permanente Property lacks suitable alkaline soils.	No further actions are recommended for this species.
San Francisco campion *Silene verecunda* ssp. *verecunda*	List 1B	Occurs in coastal bluff scrub, chaparral, coastal prairie, coastal scrub and valley and foothill grassland, often on mudstone or shale. 30-645 meters. Blooms March-June.	**No Potential.** Although suitable chaparral and grassland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Santa Cruz microseris *Stebbinoseris decipiens*	List 1B	Occurs in openings in broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub and valley and foothill grassland. Sometimes on serpentine soils. 10-500 meters. Blooms April-May.	**No Potential.** Although suitable forest, chaparral, and grassland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.
Metcalf Canyon jewel-flower *Streptanthus albidus* ssp. *albidus*	List 1B, FE	Occurs in relatively open areas in dry grassy meadows on serpentine soils and serpentine balds. 45-800 meters. Blooms April-July.	**No Potential.** The Permanente Property lacks suitable serpentinite soils and serpentinite bald habitat.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
most beautiful jewel-flower *Streptanthus albidus* ssp. *peramoenus*	List 1B	Occurs in chaparral, cismontane woodland and valley and foothill grassland, often on serpentine soils. 110-1000 meters. Blooms April-June.	**No Potential.** The Permanente Property lacks suitable serpentine soils.	No further actions are recommended for this species.
Mt. Hamilton jewel-flower *Streptanthus callistus*	List 1B	Occurs in chaparral and cismontane woodland. 600-790 meters. Blooms April-May.	**No Potential.** Although suitable chaparral and woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period. This species is known from approximately five occurrences in the Mt. Hamilton Range.	No further actions are recommended for this species.
California seablite *Sueda californica*	List 1B, FE	Occurs in coastal salt marshes and swamps. 0-15 meters. Blooms July-October.	**No Potential.** The Permanente Property lacks suitable coastal salt marshes and swamps.	No further actions are recommended for this species.
two-fork clover *Trifolium amoenum*	List 1B, FE	Occurs in coastal bluff scrub and valley and foothill grassland, occasionally on serpentinite soils. 5-415 meters. Blooms April-June.	**No Potential.** Although suitable grassland habitat on non-serpentinite soils is present in the Permanente Property, this species was not identified during rare plant surveys which were conducted during its blooming period.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
saline clover *Trifolium depauperatum* var. *hydrophilum*	List 1B	Typically found in valley and foothill grassland or vernal pools in mesic, alkaline soils. Occasionally in marshes and swamps. 0-300m. Blooms April-June.	**No Potential.** The Permanente Property lacks suitable vernal pool or grassland habitats on alkaline soils.	No further actions are recommended for this species.
caper-fruited tropidocarpum *Tropidocarpum capparideum*	List 1B	Occurs in valley and foothill grassland on alkaline clay soils. 0-455 meters. Blooms March-April.	**No Potential.** The Permanente Property lacks suitable grassland habitat on alkline clay soils. The known occurrences in the vicinity of the Permanente Property date from 1902 and 1907, and may have been incorrectly identified.	No further actions are recommended for this species.
Methuselah's beard lichen *Usnea longissima*	none	Occurs in North Coast coniferous forest, closed-cone coniferous forest and cismontane woodland. Found near open water, either the margins of rivers and streams or of lakes or standing water in swamps.	**No Potential.** Although suitable forest and woodland habitat is present in the Permanente Property, this species was not identified during rare plant surveys.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS

*** Key to status codes:**

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
FD	Federal De-listed
FPD	Federal Proposed for De-listing
NMFS	Species under the Jurisdiction of the National Marine Fisheries Service
BCC	USFWS Birds of Conservation Concern
RP	Sensitive species included in a USFWS Recovery Plan or Draft Recovery Plan
SE	State Endangered
ST	State Threatened
SR	State Rare
CSC	CDFG Species of Special Concern
Draft CSC	4 April 2000 Draft CDFG Species of Special Concern
CFP	CDFG Fully Protected Animal
SSI	CDFG Special Status Invertebrates
SLC	Species of Local Concern - Included for coverage under a Habitat Conservation Plan (HCP)
WBWG	Western Bat Working Group High Priority species
List 1A	CNPS List 1A: Plants presumed extinct in California
List 1B	CNPS List 1B: Plants rare, threatened or endangered in California and elsewhere
List 2	CNPS List 2: Plants rare, threatened, or endangered in California, but more common elsewhere
List 3	CNPS List 3: Plants about which CNPS needs more information (a review list)
List 4	CNPS List 4: Plants of limited distribution - a watch list

APPENDIX B. Species Observed on the Permanente Property

Appendix B. Species observed within the Permanente Property Boundary

Scientific name	Common name
MAMMALS	
Neotoma fuscipes annectens	San Francisco Dusky-footed Woodrat
Peromyscus californicus	California Deer Mouse
Sylvilagus bachmani	Brush Rabbit
Sciurus griseus	Western Gray Squirrel
Spermophillus beecheyi	California Ground Squirrel
Tamias merriami	Merriam's Chipmunk
Lynx rufus	Bobcat
Canis latrans	Coyote
Procyon lotor	Raccoon
Mephitis mephitis	Striped Skunk
Odocoileus hemionus	Mule Deer
BIRDS	
Ardea herodias	Great Blue Heron
Anas platyrhynchos	Mallard
Anas americana	American Wigeon
Anas clypeata	Northern Shoveler
Bucephala clangula	Common Goldeneye
Bucephala albeola	Bufflehead
Lophodytes cucullatus	Hooded Merganser
Cathartes aura	Turkey Vulture
Pandion haliaetus	Osprey
Elanus leucurus	White-tailed Kite
Falco sparverius	American Kestrel
Accipiter cooperii	Cooper's Hawk
Buteo lineatus	Red-shouldered Hawk
Buteo jamaicensis	Red-tailed Hawk
Falco peregrinus	Peregrine Falcon
Callipepla californica	California Quail
Zenaida macroura	Mourning Dove
Columba livia	Rock Pigeon
Columba fasciata	Band-tailed Pigeon
Aeronautes saxatalis	White-throated Swift
Calypte anna	Anna's Hummingbird
Selasphorus sasin	Allen's Hummingbird
Sphyrapicus ruber	Red-breasted Sapsucker
Picoides pubescens	Downy Woodpecker
Picoides villosus	Hairy Woodpecker
Picoides nuttallii	Nuttall's Woodpecker
Colaptes auratus	Northern Flicker
Contopus cooperi	Olive-sided Flycatcher
Empidonax difficilis	Pacific-slope Flycatcher
Myiarchus cinerascens	Ash-throated Flycatcher
Sayornis nigricans	Black Phoebe
Vireo huttoni	Hutton's Vireo

Scientific name	Common name
Cyanocitta stelleri	Steller's Jay
Aphelocoma californica	Western Scrub Jay
Corvus Corax	Common Raven
Corvus brachyrhychos	American Crow
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Tachycineta thalassina	Violet-green Swallow
Tachycineta bicolor	Tree Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Hirundo rustica	Barn Swallow
Baeolophus inornatus	Oak Titmouse
Poecile rufescens	Chestnut-backed Chickadee
Psaltriparus minimus	Bushtit
Certhia americana	Brown Creeper
Thryomanes bewickii	Bewick's Wren
Chamaea fasciata	Wrentit
Regulus calendula	Ruby-crowned Kinglet
Polioptila caerulea	Blue-gray Gnatcatcher
Sialia maxicana	Western Bluebird
Turdus migratorius	American Robin
Catharus ustulatus	Swainson's Thrush
Catharus guttatus	Hermit Thrush
Toxostoma redivivum	California Thrasher
Vermivora celata	Orange-crowned Warbler
Dendroica petechia	Yellow Warbler
Dendroica cerulea	Cerulean Warbler
Dendroica coronata	Yellow-rumped Warbler
Dendroica townsendii	Townsend's Warbler
Dendroica occidentalis	Hermit Warbler
Wilsonia pusilla	Wilson's Warbler
Pipilo maculatus	Spotted Towhee
Pipilo crissalis	California Towhee
Ammodramus savannarum	Grasshopper Sparrow
Passerculus sandwichensis	Savannah Sparrow
Zonotricha atricapilla	Golden-crowned Sparrow
Zonotricha leucophrys	White-crowned Sparrow
Passerella iliaca	Fox Sparrow
Melospiza melodia	Song Sparrow
Melospiza linconii	Lincoln's Sparrow
Junco hyemalis	Dark-eyed Junco
Sturnella neglecta	Western Meadowlark
Agelaius phoeniceus	Red-winged Blackbird
Euphagus cyanocephalus	Brewer's Blackbird
Carpodacus mexicanus	House Finch
Carduelis psaltria	Lesser Goldfinch
Carduelis tristis	American Goldfinch
AMPHIBIANS	
Taricha torosa	California newt

Scientific name	Common name
Taricha granulosa	Rough-skinned Newt
Dicamptodon ensatus	California Giant Salamander
Batrachoseps attenuatus	California Slender Salamander
Aneides lugubris	Arboreal Salamander
Ensatina eschscholtzii	Ensatina
Bufo [=Anaxyrus] boreas	Western [=Boreal] Toad
Rana aurora draytonii	California Red-legged Frog
Hyla [=Pseudacris] regilla	Pacific Tree [=Chorus] Frog
REPTILES	
Sceloporus occidentalis	Western Fence Lizard
Eumeces skiltonianus	Western Skink
Elgaria multicarinata	Southern Alligator Lizard
Cnemidophorus tigris	Western Whiptail (lizard)
Pituophis catenifer	Gopher Snake
Lampropeltis getula	California Kingsnake
Thamnophis elegans	Western Terrestrial Garter Snake
Diadophis punctatus	Ringneck Snake
Crotalus viridis	Western Rattlesnake
FISHES	
Gambusia affinis	Mosquitofish
Gasterosteus aculeatus Linnaeus	Three-spined Stickleback
Catostomus occidentalis	Sacramento Sucker
Onchorynchus mykiss	Rainbow Trout
INVERTEBRATES	
Papilio rutulus	western tiger swallowtail (butterfly)
Papilio zelicaon	anise swallowtail (butterfly - yellow form)
Anthocharis sara	Sara orangetip (butterfly)
Glaucopsyche lygadmus	silvery blue (butterfly)
Plebejus acmon	acmon blue (butterfly)
Euphydryas chalcedona	variable checkerspot (butterfly)
Phyciodes mylitta	mylitta crescent (butterfly)
Vanessa atalanta	red admiral (butterfly)
Vanessa cardui	painted lady (butterfly)
Junonia coenia	common buckeye (butterfly)
Limenitis lorquini	Lorquin's admiral (butterfly)
Coenonympha tullia	common ringlet (butterfly)
Hyalophora euryalus	ceanothus silk moth

PLANTS		
Family	**Scientific name**	**Common name**
Aceraceae	*Acer macrophyllum*	Big leaf maple
Aceraceae	*Acer negundo*	box elder
Aceraceae	*Acer saccharinum*	silver maple
Amaranthaceae	*Amaranthus albus*	pigweed amaranth
Amygdalaceae	*Oemleria cerasiformis*	Indian plum
Anacardiaceae	*Toxicodendron diversilobum*	poison oak
Anarcadiaceae	*Rhus trilobata*	skunk brush
Anarcadiaceae	*Schinus molle*	Peruvian pepper tree

Family	Scientific name	Common name
Apiaceae	*Anthriscus caucalis*	bur chervil
Apiaceae	*Conium maculatum*	poison hemlock
Apiaceae	*Foeniculum vulgare*	sweet fennel
Apiaceae	*Osmorhiza chilensis*	sweet cicely
Apiaceae	*Sanicula crassicaulis*	Pacific sanicle
Apiaceae	*Scandix pecten-veneris*	Venus' needle
Apiaceae	*Torilis arvensis*	hedge parsley
Apocynaceae	*Nerium oleander (Horticultural)*	oleander
Apocynaceae	*Vinca major*	periwinkle
Araliaceae	*Aralia californica*	bear clover
Araliaceae	*Hedera helix*	English ivy
Aristolochiaceae	*Asarum caudatum*	wild ginger
Asteraceae	*Achillea millefolium*	common yarrow
Asteraceae	*Achyrachaena mollis*	blow wives
Asteraceae	*Adenocaulon bicolor*	trailfinder
Asteraceae	*Anaphalis margaritaceae*	pearly everlasting
Asteraceae	*Artemisia californica*	California sagebrush
Asteraceae	*Artemisia douglasiana*	California mugwort
Asteraceae	*Artemisia dracunculus*	tarragon
Asteraceae	*Aster radulensis*	rough-leaved aster
Asteraceae	*Baccharis pilularis*	coyote brush
Asteraceae	*Carduus pycnocephalus*	Italian thistle
Asteraceae	*Centaurea calcitrapa*	purple star thistle
Asteraceae	*Centaurea melitensis*	tocalote
Asteraceae	*Centaurea solstitialis*	yellow star thistle
Asteraceae	*Cichorium intybus*	chickory
Asteraceae	*Cirsium arvense*	canada thistle
Asteraceae	*Cirsium occidentale*	cobweb thistle
Asteraceae	*Cirsium vulgare*	bull thistle
Asteraceae	*Conyza canadensis*	horseweed
Asteraceae	*Dittrichia graveolens*	stinkwort
Asteraceae	*Eriophyllum confertiflorum*	golden yarrow
Asteraceae	*Eriophyllum lanatum*	woolly sunflower
Asteraceae	*Filago gallica*	Filago
Asteraceae	*Gnaphalium californicum*	California cudweed
Asteraceae	*Gnaphalium canescens ssp beneolens*	cudweed
Asteraceae	*Gnaphalium luteo-album*	everlasting cudweed
Asteraceae	*Grindelia camporum*	Great Valley gumweed
Asteraceae	*Heterotheca grandiflora*	telegraphweed
Asteraceae	*Hieracium albiflorum*	white hawkweed
Asteraceae	*Hypochaeris glabra*	smooth catsear
Asteraceae	*Hypochaeris radicata*	rough catsear
Asteraceae	*Lactuca serriola*	prickly wild lettuce
Asteraceae	*Lactuca virosa*	bitter lettuce
Asteraceae	*Lagophylla ramosissima ssp. ramosissima*	common hareleaf
Asteraceae	*Madia elegans*	common madia
Asteraceae	*Madia exigua*	meager tarweed

Family	Scientific name	Common name
Asteraceae	*Madia sativa*	coast tarweed
Asteraceae	*Picris echioides*	bristly ox-tongue
Asteraceae	*Senecio vulgare*	common groundsel
Asteraceae	*Silybum marianum*	milk thistle
Asteraceae	*Sonchus asper*	prickly sow thistle
Asteraceae	*Sonchus oleraceus*	common sow thistle
Asteraceae	*Stylocline gnaphaloides*	everlasting nest straw
Asteraceae	*Uropappus lindleyi*	silver puffs
Asteraceae	*Wyethia glabra*	smooth mule ears
Asteraceae	*Wyethia helenioides*	whitehead mule ears
Asteraceae	*Xanthium strumarium*	cocklebur
Berberidaceae	*Berberis pinnata ssp pinnata*	California barberry
Betulaceae	*Alnus rhombifolia*	white alder
Blechnaceae	*Woodwardia fimbriata*	giant chain fern
Boraginaceae	*Amsinckia menziesii*	fiddle neck
Boraginaceae	*Amsinckia tessellata*	fiddle neck
Boraginaceae	*Cryptantha clevlandii*	common cryptantha
Boraginaceae	*Cynoglossum grande*	hound's tongue
Boraginaceae	*Heliotropium curassavicum*	heliotrpoe
Boraginaceae	*Plagiobothrys nothofulvus*	rusty popcornflower
Brachytheciaceae	*Homalothecium pinnatifidum*	pinnatifid homalothecium moss
Brassicaceae	*Brassica nigra*	black mustard
Brassicaceae	*Brassica rapa*	wild mustard
Brassicaceae	*Capsella bursa-pastoris*	shepherd's purse
Brassicaceae	*Cardamine oligosperma*	bitter cress
Brassicaceae	*Lepidium latipes*	dwarf pepperweed
Brassicaceae	*Nasturtium officinale*	water cress
Brassicaceae	*Raphanus sativus*	wild radish
Brassicaceae	*Rapistrum rugosum*	wild turnip*
Brassicaceae	*Sinapis arvensis*	charlock mustard
Brassicaceae	*Streptanthus glandulosus ssp. glandulosus*	bristly jewelflower
Bryaceae	*Bryum* sp.	bryum moss
Caprifoliaceae	*Lonicera hispidula var vacillans*	California honeysuckle
Caprifoliaceae	*Lonicera interrupta*	chaparral honeysuckle
Caprifoliaceae	*Sambucus mexicana*	blue elderberry
Caprifoliaceae	*Symphoricarpos albus*	snowberry
Caprifoliaceae	*Symphoricarpos mollis*	creeping snowberry
Caryophyllaceae	*Cerastium arvense*	field chickweed
Caryophyllaceae	*Cerastium glomeratum*	sticky chickweed
Caryophyllaceae	*Stellaria media*	common chickweed
Chenopodiaceae	*Salsola soda*	alkali russian thistle
Convolvulaceae	*Calystegia sp*	morning glory
Convolvulaceae	*Convolvulus arvensis*	field bindweed
Cornaceae	*Cornus nutalii*	dogwood
Cornaceae	*Cornus sericea ssp. occidentalis*	western creek dogwood
Corylaceae	*Corylus cornuta var. californica*	California hazel

Family	Scientific name	Common name
Crassulaceae	*Dudleya cymosa ssp. cymosa*	canyon live forever
Crassulaceae	*Sedum spathulifoium*	Pacific stonecrop
Cucurbitaceae	*Marah fabaceus*	california manroot
Cupressaceae	*Calocedrus decurrens*	incense cedar
Cupressaceae	*Cupressus sempervirens (Horticultural)*	Italian cypress
Cyperaceae	*Cyperus eragrostis*	tall flat-sedge
Cyperaceae	*Eleocharis macrostachya*	common spikerush
Cyperaceae	*Schoenoplectus acutus*	common three square
Cyperaceae	*Schoenoplectus americanus*	chairmaker's bulrush
Dennstaedtiaceae	*Pteridium aquilinum*	bracken fern
Dryopteridaceae	*Athyrium filix-femina var. cyclosorum*	lady fern
Dryopteridaceae	*Dryopteris arguta*	coast wood fern
Equisetaceae	*Equisetum arvense*	common horsetail
Equisetaceae	*Equisetum telmateia ssp. Braunii*	giant horsetail
Ericaceae	*Arbutus menziesii*	Pacific madrone
Ericaceae	*Arctostaphylos glandulosa*	Eastwood manzanita
Ericaceae	*Arctostaphylos glauca*	big berry manzanita
Ericaceae	*Arctostaphylos tomentosa ssp. crustacea*	brittleleaf manzanita
Ericaceae	*Arctostaphylos viscida*	white-leaf manzanita
Euphorbiaceae	*Croton setigerus*	turkey mullein
Fabaceae	*Cytisus scoparius*	Scotch broom
Fabaceae	*Lathyrus tingitanus*	Tangier pea
Fabaceae	*Lathyrus vestitus var. vestitus*	wild pea
Fabaceae	*Lotus corniculatus*	birdfoot deervetch
Fabaceae	*Lotus humistratus*	short podded trefoil
Fabaceae	*Lotus purshianus var. purshianus*	Spanish clover
Fabaceae	*Lotus scoparius*	deerweed
Fabaceae	*Lotus wrangelianus*	Chilean trefoil
Fabaceae	*Lupinus albifrons var. albifrons*	silver bush lupine
Fabaceae	*Lupinus bicolor*	miniature lupine
Fabaceae	*Lupinus microcarpus var. densiflorus*	chick lupine
Fabaceae	*Lupinus nanus*	sky lupine
Fabaceae	*Lupinus succulentus*	succulent lupine
Fabaceae	*Medicago polymorpha*	bur clover
Fabaceae	*Medicago sativa*	alfalfa
Fabaceae	*Melilotus indicus*	annual sweetclover
Fabaceae	*Pickeringia montana*	Chaparral pea
Fabaceae	*Rupertia physodes*	California tea
Fabaceae	*Trifolium dubium*	shamrock
Fabaceae	*Trifolium hirtum*	rose clover
Fabaceae	*Trifolium incarnatum*	crimson clover
Fabaceae	*Trifolium wildenovii*	tomcat clover
Fabaceae	*Vicia cracca*	bird vetch
Fabaceae	*Vicia sativa*	spring vetch
Fabaceae	*Vicia sativa ssp sativa*	common vetch
Fabaceae	*Vicia villosa*	hairy vetch
Fagaceae	*Lithocarpus densiflorus*	tanoak

Family	Scientific name	Common name
Fagaceae	*Quercus agrifolia*	coast live oak
Fagaceae	*Quercus berberidifolia*	scrub oak
Fagaceae	*Quercus chrysolepis*	canyon live oak
Fagaceae	*Quercus douglasii*	blue oak
Fagaceae	*Quercus durata*	leather oak
Fagaceae	*Quercus wislizenii*	interior live oak
Fagaceae	*Quercus wislizenii* var. *frutescens*	bush interior live oak
Fissidentaceae	*Fissidens limbatus*	fissidens moss
Garryaceae	*Garrya elliptica*	coast silk tassel
Gentianaceae	*Centaurium muehlenbergii*	Muehlenbeg's centaury
Geraniaceae	*Erodium botrys*	broadleaf filaree
Geraniaceae	*Erodium cicutarium*	redstem filaree
Geraniaceae	*Geranium dissectum*	cutleaf geranium
Geraniaceae	*Geranium molle*	dovefoot geranium
Grossulariaceae	*Ribes californicum*	hillside gooseberry
Grossulariaceae	*Ribes malvaceum*	chaparral currant
Grossulariaceae	*Ribes sanguineum*	flowering red currant
Hippocastanaceae	*Aesculus californica*	California buckeye
Hydrophyllaceae	*Eriodictyon californicum*	yerba santa
Hydrophyllaceae	*Nemophila heterophylla*	canyon nemophila
Hydrophyllaceae	*Nemophila menziesii*	baby blue eyes
Hydrophyllaceae	*Nemophila parviflora*	smallflower nemophila
Hydrophyllaceae	*Phacelia campanularia*	desert bells
Hydrophyllaceae	*Phacelia cicutaria*	caterpillar phacelia
Hypericaceae	*Hypericum calycinum*	Aaron's beard
Iridaceae	*Iris douglasiana*	Doulgas' iris
Iridaceae	*Iris fernaldii*	Fernald's iris
Iridaceae	*Sisyrinchium bellum*	blue-eyed grass
Juglandaceae	*Juglans californica var hindsii*	Northern California black walnut
Juglandaceae	*Juglans regia (horticultural)*	English walnut
Juncaceae	*Juncus effusus*	common rush
Juncaceae	*Juncus patens*	spreading rush
Juncaceae	*Juncus xiphioides*	irisleaf rush
Juncaceae	*Luzula comosa*	woodland rush
Lamiaceae	*Lepechinia calycina*	white pitcher sage
Lamiaceae	*Monardella villosa ssp. villosa*	coyote mint
Lamiaceae	*Nepeta cataria*	catnip
Lamiaceae	*Pogogyne seraphylloides*	thyme leaf mesamint
Lamiaceae	*Salvia columbariae*	chia
Lamiaceae	*Salvia leucophylla*	purple sage
Lamiaceae	*Salvia mellifera*	black sage
Lamiaceae	*Satureja douglasii*	yerba buena
Lamiaceae	*Scutellaria tuberosa*	blue skullcap
Lamiaceae	*Stachys albens*	cobwebby hedge nettle
Lamiaceae	*Stachys bullata*	California hedgenettle
Lamiaceae	*Stachys pycnantha*	short spike hedge nettle

Family	Scientific name	Common name
Lauraceae	*Umbellularia californica*	California bay
Lemnaceae	*Lemna sp*	pondweed
Liliaceae	*Brodiaea elegans*	harvest brodiaea
Liliaceae	*Calochortus albus*	white fairy lantern
Liliaceae	*Calochortus luteus*	yellow mariposa lily
Liliaceae	*Calochortus superbus*	superb mariposa lily
Liliaceae	*Calochortus venustus*	butterfly Mariposa lily
Liliaceae	*Chlorogalum pomeridianum*	soap plant
Liliaceae	*Dichlostemma capitatum*	blue dicks
Liliaceae	*Disporum hookeri*	drops of gold
Liliaceae	*Disporum smithii*	coast fairy bells
Liliaceae	*Fritillaria affinis*	checker lily
Liliaceae	*Lilium pardalinum*	tiger lily
Liliaceae	*Smilacina racemosa*	large false Solomon's seal
Liliaceae	*Smilacina stellata*	little false solomon's seal
Liliaceae	*Trillium chloropetalum*	common trillium
Liliaceae	*Triteleia laxa*	Ithuriel's spear
Liliaceae	*Veratrum californicum var californicum*	corn lily
Liliaceae	*Zigadenus fremontii*	death camas
Liliaceae	*Zigadenus venenosus var venenosus*	death camas
Linaceae	*Linum grandiflorum*	flowering flax
Lythraceae	*Lythrum hyssopifolium*	Hyssop's loosestrife
Malvaceae	*Malacothamnus fasciculatus*	chaparral bushmallow
Malvaceae	*Malacothamnus fremontii*	fremont's bushmallow
Malvaceae	*Malva parviflora*	cheeseweed
Mniaceae	*Leucolepis acanthoneuron*	leucolepis umbrella moss
Myricaceae	*Myrica californica*	California wax myrtle
Myrtaceae	*Eucalyptus camaldulensis*	red gum
Myrtaceae	*Eucalyptus globulus*	blue gum
Neckeraceae	*Neckera douglasii*	Douglas neckera
Nyctaginaceae	*Mirabilis californica*	California four o'clock
Oleaceae	*Olea europa (horticultural)*	European olive
Onagraceae	*Camissonia ovata*	sun cup
Onagraceae	*Clarkia concinna ssp. automixa*	Santa Clara red ribbons
Onagraceae	*Clarkia purpurea ssp. quadrivulnera*	winecup clarkia
Onagraceae	*Clarkia unguiculata*	woodland clarkia
Onagraceae	*Epilobium brachycarpum*	annual fireweed
Onagraceae	*Epilobium canum*	California fuschia
Onagraceae	*Epilobium ciliatum var. ciliatum*	fringed willowherb
Orchidaceae	*Corallorhiza striata*	striped coralroot
Orchidaceae	*Epipactis helleborine*	helloborine
Orchidaceae	*Piperia elegans*	elegant rein orchid
Orobanchaceae	*Orobanche bulbosa*	chaparral broomrape
Orobanchaceae	*Orobanche fasciculata*	clustered broomrape
Papaveraceae	*Eschscholzia californica*	California poppy

Family	Scientific name	Common name
Papaveraceae	*Stylomecon heterophylla*	wind poppy
Pinaceae	*Cedrus deodara*	Deodar cedar
Pinaceae	*Pinus contorta*	lodgepole pine
Pinaceae	*Pinus pinea*	Italian stone pine
Pinaceae	*Pinus sabiniana*	grey pine
Pinaceae	*Pseudotsuga menziesii*	Douglas-fir
Plantaginaceae	*Plantago erecta*	California plantain
Plantaginaceae	*Plantago lanceolata*	English plantain
Plantaginaceae	*Plantago major*	common plantain
Platanaceae	*Platanus racemosa*	western sycamore
Poaceae	*Aira caryophylla*	silver hairgrass
Poaceae	*Arrhenatherum eliatus*	tall oatgrass
Poaceae	*Avena barbata*	slender wild oats
Poaceae	*Avena fatua*	common wild oats
Poaceae	*Brachypodium distachyon*	false brome
Poaceae	*Briza minor*	little quaking grass
Poaceae	*Bromus carinatus*	California brome
Poaceae	*Bromus catharticus*	rescue grass
Poaceae	*Bromus diandrus*	ripgut brome
Poaceae	*Bromus hordeaceus*	soft chess
Poaceae	*Bromus japonicus*	Japanese brome
Poaceae	*Bromus madritensis ssp. rubens*	foxtail brome
Poaceae	*Bromus sterilis*	poverty brome
Poaceae	*Bromus vulgaris*	Columbia brome
Poaceae	*Cortaderia selloana*	pampas grass
Poaceae	*Cynodon dactylon*	bermuda grass
Poaceae	*Cynosurus echinatus*	hedgehog dogtail grass
Poaceae	*Dactylis glomerata*	orchard grass
Poaceae	*Elymus glaucus*	blue wildrye
Poaceae	*Elymus multisetas*	big squirreltail grass
Poaceae	*Festuca arundinacea*	tall fescue
Poaceae	*Festuca occidentalis*	western fescue
Poaceae	*Festuca rubra*	red fescue
Poaceae	*Gastridium ventricosum*	nit grass
Poaceae	*Hordeum marinum ssp gussoneanum*	Mediterranean barley
Poaceae	*Hordeum murinum ssp. leporinum*	foxtail barley
Poaceae	*Leymus triticoides*	creeping wild rye
Poaceae	*Lolium multiflorum*	Italian ryegrass
Poaceae	*Melica californica*	California melic grass
Poaceae	*Melica imperfecta*	small flowered melica
Poaceae	*Nassella lepida*	small flowered needlegrass
Poaceae	*Nassella pulchra*	purple needle grass
Poaceae	*Panicum capillare*	witchgrass
Poaceae	*Phalaris aquatica*	Harding grass
Poaceae	*Phalaris californica*	California canarygrass
Poaceae	*Piptatherum miliaceum*	smilograss

Family	Scientific name	Common name
Poaceae	*Poa annua*	annual bluegrass
Poaceae	*Polypogon monspeliensis*	rabbitsfoot grass
Poaceae	*Taeniantherum caput-medusae*	Medusa-head grass
Poaceae	*Vulpia microstachys*	three-weeks fescue
Poaceae	*Vulpia myuros*	rattail fescue
Polemoniaceae	*Eriastrum abramsii*	Abram's woollystar
Polemoniaceae	*Navarretia heterodoxa*	Calistoga pincushion plant
Polemoniaceae	*Navarretia squarrosa*	skunkbush
Polygonaceae	*Eriogonum fasciculatum*	california buckwheat
Polygonaceae	*Eriogonum giganteum var. giganteum* (planted)	Santa Catalina Island buckwheat
Polygonaceae	*Eriogonum nudum*	naked buckwheat
Polygonaceae	*Polygonum arenastrum*	common knotweed
Polygonaceae	*Rumex conglomeratus*	clustered dock
Polygonaceae	*Rumex crispus*	curly dock
Polygonaceae	*Rumex pulcher*	fiddle dock
Polypodiaceae	*Polypodium californicum*	California polypody
Portulacaceae	*Calandrinia ciliata*	red maids
Portulacaceae	*Claytonia parviflora*	miner's lettuce
Portulacaceae	*Claytonia perfoliata*	miner's lettuce
Portulacaceae	*Claytonia siberica*	candyflower
Primulaceae	*Anagallis arvensis*	scarlet pimpernell
Primulaceae	*Trientalis latifolia*	star-flower
Pteridaceae	*Adiantum aleuticum*	five-finger fern
Pteridaceae	*Adiantum jordanii*	California maiden-hair fern
Pteridaceae	*Pellaea andromedifolia*	coffee fern
Pteridaceae	*Pentagramma triangularis*	gold back fern
Ranunculaceae	*Actaea rubra*	baneberry
Ranunculaceae	*Aquilegia formosa*	western columbine
Ranunculaceae	*Clematis lasiantha*	chaparral clematis
Ranunculaceae	*Delphinium californicum ssp. californicum*	coast larkspur
Ranunculaceae	*Delphinium nudicale*	red larkspur
Ranunculaceae	*Ranunculus californicus*	common buttercup
Ranunculaceae	*Ranunculus canus*	Great Valley buttercup
Ranunculaceae	*Thalictrum fendleri var fendleri*	Fendler's meadow rue
Rhamnaceae	*Ceanothus cuneatus*	buckbrush
Rhamnaceae	*Ceanothus integerrimus*	deer brush
Rhamnaceae	*Ceanothus leucodermis*	chaparral whitethorn
Rhamnaceae	*Ceanothus oliganthus*	hairy ceanothus
Rhamnaceae	*Rhamnus californicus*	coffeeberry
Rhamnaceae	*Rhamnus crocea*	redberry
Rhamnaceae	*Rhamnus tomentella*	hoary coffeeberry
Rosaceae	*Adenostema fasciculatum*	chamise
Rosaceae	*Cercocarpus betuloides*	birch-leaf mountain mahogany

Family	Scientific name	Common name
Rosaceae	*Fragaria vesca*	woodland strawberry
Rosaceae	*Heteromeles arbutifolia*	toyon
Rosaceae	*Holodiscus discolor*	Ocean spray
Rosaceae	*Physocarpus capitatus*	Pacific ninebark
Rosaceae	*Prunus emarginata*	bitter cherry
Rosaceae	*Prunus ilicifolius*	holly-leaf cherry
Rosaceae	*Rosa californica*	wild rose
Rosaceae	*Rosa gymnocarpa*	wood rose
Rosaceae	*Rubus discolor*	western raspberry
Rosaceae	*Rubus parviflorus*	western thimbleberry
Rosaceae	*Rubus ursinus*	California blackberry
Rosaceae	*Sanguisorba minor ssp. muricata*	small burnet
Rubiaceae	*Galium aparine*	common bedstraw
Rubiaceae	*Galium porrigens*	climbing bedstraw
Rubiaceae	*Galium tricornutum*	rough bedstraw
Salicaceae	*Populus balsamifera ssp. trichocarpa*	black cottonwood
Salicaceae	*Populus fremontii*	Fremont's cottonwood
Salicaceae	*Salix babylonica*	weeping willow
Salicaceae	*Salix gooddingii*	Gooding's black willow
Salicaceae	*Salix laevigata*	red willow
Salicaceae	*Salix lasiolepis*	arroyo willow
Salicaceae	*Salix lucida ssp. lasiandra*	shining willow
Saxifragaceae	*Lithophragma heterophylla*	hillside woodland star
Scophulariaceae	*Pedicularis densiflorus*	Indian warrior
Scrophulariaceae	*Antirrhinum kellogii*	Kellogg's snapdragon
Scrophulariaceae	*Castilleja affinis*	indian paintbrush
Scrophulariaceae	*Castilleja densiflora ssp. densiflora*	dense owl's clover
Scrophulariaceae	*Castilleja exserta*	purple owl's clover
Scrophulariaceae	*Castilleja foliolosa*	woolly paintbrush
Scrophulariaceae	*Collinsia heterophylla*	Chinese houses
Scrophulariaceae	*Cordylanthus rigidus ssp. rigidus*	rigid bird's beak
Scrophulariaceae	*Keckiella cordifolia*	climbing penstemon
Scrophulariaceae	*Kickxia elatine*	sharp leaved fluellin
Scrophulariaceae	*Linaria maroccana*	Moroccan toad flax
Scrophulariaceae	*Mimulus aurantiacus*	bush monkey flower
Scrophulariaceae	*Mimulus cardinalis*	cardinal monkey flower
Scrophulariaceae	*Mimulus guttatus*	seep monkey flower
Scrophulariaceae	*Penstemon centranthifolius*	scarlet bugler
Scrophulariaceae	*Penstemon heterophyllus ssp. heterophyllus*	foothill penstemon
Scrophulariaceae	*Scrophularia californica*	beeplant
Scrophulariaceae	*Veronica anagallis-aquatica*	water speedwell
Scrophulariaceae	*Veronica persica*	speedwell
Solanaceae	*Datura stramonium*	jimson weed
Solanaceae	*Solanum elaeagifolium*	silverleaf nightshade
Solanaceae	*Solanum umbelliferum*	blue witch nightshade
Sterculiaceae	*Fremontodendron californica*	flannel-bush

Family	Scientific name	Common name
Taxaceae	*Torreya californica*	California nutmeg
Taxodiaceae	*Sequoia sempervirens*	redwood
Thymelaeaceae	*Dirca occidentalis*	western leatherwood
Typhaceae	*Typha angustifolia*	narrow-leafed cattail
Urticaceae	*Urtica dioica*	stinging nettle
Verbenaceae	*Verbena lasiostachys*	common vervain
Violaceae	*Viola ocellata*	twoeyed violet
Lichens		
Parmeliaceae	*Evernia prunastri*	oakmoss
Parmeliaceae	*Hypogymnia* sp.	tube lichen
Parmeliaceae	*Parmelia* sp.	none
Parmeliaceae	*Platismatia* sp.	ragbag
Parmeliaceae	*Usnea rubicunda*	red beard lichen
Ramalinaceae	*Ramalina menziesii*	lace lichen

APPENDIX C. Representative Site Photographs

Top: Overview of North Quarry

Bottom: Revegetated slope, WMSA

Photographs taken May 13, 2008

wra
ENVIRONMENTAL CONSULTANTS

Top: Chaparral and oak woodland habitats northwest of the North Quarry
Bottom: Oak woodland habitat east of the North Quarry

Photographs taken Sept. 28, 2006, July 11, 2008

wra
ENVIRONMENTAL CONSULTANTS

Top: Settling pond
Bottom: Active Quarry, North Quarry

Photographs taken Sept. 28, 2006

wra
ENVIRONMENTAL CONSULTANTS

Top: Step pools in Permanente Creek, upstream (west) of the Project Area

Bottom: Permanente Creek in the western portion of the Permanente Property

Photographs taken May 15, 2008 and Sept. 28, 2006

wra
ENVIRONMENTAL CONSULTANTS

APPENDIX D. CRLF Survey Results and Habitat Assessment

Jennings 2006A

RANA RESOURCES
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#12,312b
November 26, 2006

Dr. Robert Terry Huffman
The Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901-3209

Dear Terry:

This letter is my monitoring report regarding sediment removal in Pond #13A, 13B, and 17 on the Hanson Permanente Cement Plant. I served as the biological monitor for California red-legged frogs (*Rana draytonii*) while sediment was removed from Pond #13B on 26, 27, 30 October, Pond #13A on 30 October, and Pond #17 on 01, 02, and 03 November 2006. I conducted pre-construction surveys during the day on 24 and 25 October and at night on 23 and 24 October. I also provided a training session with the workers on 24 October. No California red-legged frogs were observed in the areas adjacent to the three sediment ponds during the monitoring period and thus no frogs were injured or harmed. Equipment problems resulted in only partial removal of sediment in pond #13A and #13B. Sediment was completely removed from Pond #17.

Please let me know if you have any questions on the above. Thanks again for allowing me to be involved with this project.

Sincerely,

Mark R. Jennings

Mark R. Jennings
President and
Herpetologist/Fisheries Biologist

Jennings 2006B

2006 CALIFORNIA RED-LEGGED FROG (*Rana draytonii*) SURVEYS AT THE HANSON PERMANENTE CEMENT FACILITY, CUPERTINO, CALIFORNIA

Prepared by:

Mark R. Jennings
Rana Resources
P.O. Box 2185
Davis, CA 95617-2185

For

Terry Huffman
The Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901-3209

December 30, 2006

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Protocol surveys were conducted for California red-legged frogs (CRLFs; *Rana draytonii*) on 21 February; 25 March; 02, 11, and 29 April; 06 May; 31 July; and 08 August 2006, at the Hanson Permanente Cement Facility in the vicinity of Cupertino, California, to determine the use of in-stream and off-stream sediment settling ponds by this species. As with previous surveys of the facility grounds, CRLFs were found to not only inhabit Permanente Creek, but they also inhabited Pond #13, 14, 21, and 22. No CRLFs were found in Pond #04A, 04B, 04C, 05, 09, 10, 11, 13A, 13B, 16, 17, 18, 19, and 20. Instead, Pacific treefrogs (*Hyla regilla*) were found to inhabit and breed in all ponds examined, as well as many of the watercourses between the sediment ponds. Additionally, Coast Range newts (*Taricha torosa torosa*) were found to breed in Pond #13, and 14, as well as Permanente Creek. CRLFs were observed to successfully breed only in Pond #14 and 21 as well as the watercourse downstream of Pond #20. These data indicate that CRLFs continue to live and reproduce on the Hanson Permanente Cement Facility property in harmony with current operations. The proposed removal of sediment from Pond #13A, 13B, and 17—where CRLFs were not observed—will have no adverse effects on the CRLF population inhabiting this part of the Permanente Creek drainage.

INTRODUCTION

The Hanson Permanente Cement Facility is located in Santa Clara County, in the vicinity of Cupertino, California (Figure 1). The facility surrounds the lower reaches of the Permanente Creek drainage with 18 current settling ponds installed to remove suspended sediments from the water that is drained from quarry and other facility operations. The resulting water from the sediment ponds runs through rock filters before being discharged into Permanente Creek (except for pond 14, which is a standard retention basin that allows all sediments to settle prior to water flowing through a weir and joining Permanente Creek). Because certain settling ponds need to be cleaned out from time to time in order to keep them functional, protocol surveys were conducted to during 2006 determine if they were being used by the federally threatened California red-legged frog (CRLF; *Rana draytonii*). These surveys follow previous surveys conducted for the

Figure 1. Location of the Hanson Permanente Cement Facility.

species during 2005. Per recent taxonomic changes with frog species in California, I follow Jennings (2004) and Shaffer et al. (2004) and use the scientific name "*Rana draytonii*" for the CRLF. In almost all other documents and field guides, this frog is stated as the subspecies "*Rana aurora draytonii*" (e.g., see Stebbins 2003).

STUDY AREA

The Hanson Permanente Cement Facility is an approximately 3,650-acre piece of land that lies just southwest of the intersection of I-280 and Hwy 85 in Santa Clara County (Figure 1). The facility is along the lower reaches of Permanente Creek and contains various buildings, rock crushers, storage yards, sand and rock quarries, paved roads, railroad tracks, and aggregate conveyors located over a wide area. A total of 18 settling ponds are used to remove excess sediment from water received from facility and quarry operations. The resulting water in these settling ponds is discharged into Permanente Creek (Figure 2). These settling ponds also have vegetation present and are used by a wide variety of wildlife including Coast Range newts (*Taricha torosa torosa*), Pacific treefrogs (*Hyla regilla*), California toads (*Bufo boreas halophilus*), and CRLF (Jennings, pers. observ.). The surrounding hillsides and flats have mixed oak (*Quercus* spp.) woodlands, with scattered chaparral and other vegetation. The settling ponds contain cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.), as well as scattered patches of willows (*Salix* sp.) and Himalayan blackberries (*Rubus discolor*). Willows and Himalayan blackberries are common along the main Permanente Creek channel.

MATERIALS AND METHODS

The surveys for the CRLF followed guidelines as set forth by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 2005). All settling ponds were surveyed during daylight hours on 21 February, 25 March, 06 May, and 31 July 2006, and at night on 25 March; 02, 11, and 29 April; and 08 August 2006. Surveys were conducted as per protocol survey standards for the CRLF (U.S. Fish and Wildlife Service 2005) and my long-term experience with this species (e.g., see Jennings and Hayes 1994). A flashlight

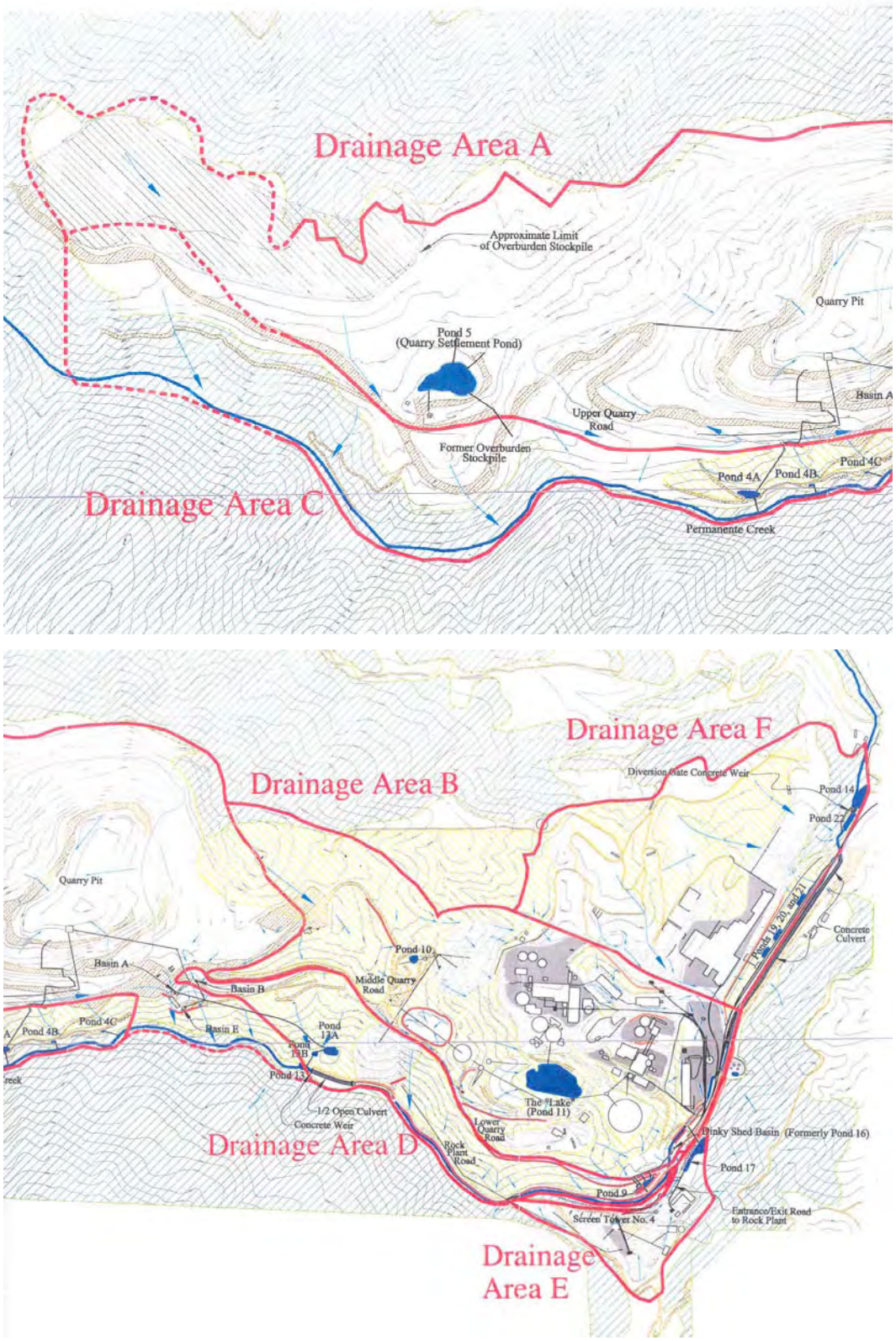

Figure 2. Location of settling ponds on the Hanson Permanente Cement Facility grounds. The top and bottom maps represent the western and eastern portions of the property.

was used to locate the eye shines of frogs during nighttime hours and I repeatedly listened for calling male CRLFs using the identifications provided by Davidson (1995).

RESULTS AND DISCUSSION

CRLFs were found only in Permanente Creek and Pond #13, 14, 21, and 22. No CRLFs were found in Pond #04A, 04B, 04C, 05, 09, 10, 11, 13A, 13B, 16, 17, 18, 19, and 20. Instead, Pacific treefrogs were found to inhabit and breed in all ponds examined, as well as many of the watercourses between the sediment ponds. Additionally, Coast Range newts were found to breed in Pond #13, and 14, as well as Permanente Creek. CRLFs were observed to successfully breed only in Pond #14 and 21 as well as the watercourse downstream of Pond #20. Each of these locations was found to have calling male CRLFs, as well as larvae and metamorphs.

The reason that CRLFs are probably not found in more of the settling ponds is due to the shallow nature of most of these water bodies. They are designed to trap sediment and this quickly results in water depths below 1 foot in depth (or drying completely on a regular basis). The resulting mud flats or cattail thickets were found to contain numerous raccoon (*Procyon lotor*) footprints and I observed raccoons almost every time during my nighttime surveys. The presence of so many CRLF predators on a regular basis probably mediates against juvenile or adult CRLFs dispersing into these shallow water habitats.

Additionally, a number of these sediment ponds are isolated from where CRLFs are known to be present. The long distance movement of CRLFs overland is probably very hazardous with all the natural predators present within the facility grounds.

In summary, these data indicate that CRLFs continue to live and reproduce on the Hanson Permanente Cement Facility property in harmony with current operations. Because CRLFs do not use Pond #13A, 13B, and 17, the proposed removal of sediment from these settling ponds have no adverse effects on the CRLF population inhabiting this part of the Permanente Creek drainage.

LITERATURE CITED

Davidson, C. 1995. Frog and toad calls of the Pacific Coast. Library of Natural Sounds, Cornell Laboratory of Ornithology, Ithaca, New York. 27 pages + 1 cassette.

Jennings, M. R. 2004. An annotated check list of the amphibians and reptiles of California and adjacent waters (third, revised edition). California Fish and Game, 90(4):161-213.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, under contract number 8023. iii+225 p.

Shaffer, H. B., G. M. Fellers, S. R. Voss, J. C. Olive, and G. B. Pauly. 2004. Species boundaries, phylogeography, and conservation genetics of the red-legged frog (*Rana aurora*/*draytonii*) complex. Molecular Ecology, 13(9):2667-2677.

Stebbins, R. C. 2003. A field guide to western reptiles and amphibians. Third edition. Houghton Mifflin Company, Boston, Massachusetts. xiii+533 p.

U.S. Fish and Wildlife Service. 2005. Revised guidance on site assessments and field surveys for the California red-legged frog [dated August, 2005]. 26 p. (typewritten).

Jennings 2007

2007 CALIFORNIA RED-LEGGED FROG (*Rana draytonii*) SURVEYS AT THE HANSON PERMANENTE CEMENT FACILITY, CUPERTINO, CALIFORNIA

Prepared by:

Mark R. Jennings
Rana Resources
P.O. Box 2185
Davis, CA 95617-2185

For

Terry Huffman
The Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901-3209

August 06, 2007

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EXECUTIVE SUMMARY

Protocol surveys were conducted for California red-legged frogs (CRLFs; *Rana draytonii*) on 30 March; 06, 13, and 22 April; 05, and 12 May; 07 July; and 04 August 2007, at the Hanson Permanente Cement Facility in the vicinity of Cupertino, California, to determine the use of in-stream and off-stream sediment settling ponds by this species. As with previous surveys of the facility grounds, CRLFs were found to not only inhabit Permanente Creek, but they also inhabited Pond #13, 14, 21, and 22. No CRLFs were found in Pond #04A, 04B, 04C, 05, 09, 10, 11, 13A, 13B (dry by July), 16, 17 (dry by July), 18, 19, and 20. Instead, Pacific treefrogs (*Hyla regilla*) were found to inhabit and breed in all ponds examined, as well as many of the watercourses between the sediment ponds. Additionally, Coast Range newts (*Taricha torosa torosa*) were found to breed in Pond #13, 14, and 22, as well as Permanente Creek. CRLFs were observed to successfully breed only in Pond #14 and 21 as well as the watercourse downstream of Pond #20. These data indicate that CRLFs continue to live and reproduce on the Hanson Permanente Cement Facility property in harmony with current operations. The proposed removal of sediment from Pond #13A (dry since July), 13B, and 17 (dry since July)—where CRLFs were not observed—will have no adverse effects on the CRLF population inhabiting this part of the Permanente Creek drainage.

INTRODUCTION

The Hanson Permanente Cement Facility is located in Santa Clara County, in the vicinity of Cupertino, California (Figure 1). The facility surrounds the lower reaches of the Permanente Creek drainage with 18 current settling ponds installed to remove suspended sediments from the water that is drained from quarry and other facility operations. The resulting water from the sediment ponds runs through rock filters before being discharged into Permanente Creek (except for pond 14, which is a standard retention basin that allows all sediments to settle prior to water flowing through a weir and joining Permanente Creek). Because certain settling ponds need to be cleaned out from time to time in order to keep them functional, protocol surveys were conducted to during 2007

Figure 1. Location of the Hanson Permanente Cement Facility.

determine if they were being used by the federally threatened California red-legged frog (CRLF; *Rana draytonii*). These surveys follow previous protocol surveys conducted for the species during 2006 (Jennings 2007). Per recent taxonomic changes with frog species in California, I follow Jennings (2004) and Shaffer et al. (2004) and use the scientific name "*Rana draytonii*" for the CRLF. In almost all other documents and field guides, this frog is stated as the subspecies "*Rana aurora draytonii*" (e.g., see Stebbins 2003).

STUDY AREA

The Hanson Permanente Cement Facility is an approximately 3,650-acre piece of land that lies just southwest of the intersection of I-280 and Hwy 85 in Santa Clara County (Figure 1). The facility is along the lower reaches of Permanente Creek and contains various buildings, rock crushers, storage yards, sand and rock quarries, paved roads, railroad tracks, and aggregate conveyors located over a wide area. A total of 18 settling ponds are used to remove excess sediment from water received from facility and quarry operations. The resulting water in these settling ponds is discharged into Permanente Creek (Figure 2). These settling ponds also have vegetation present and are used by a wide variety of wildlife including Coast Range newts (*Taricha torosa torosa*), Pacific treefrogs (*Hyla regilla*), California toads (*Bufo boreas halophilus*), and CRLF (Jennings, pers. observ.). The surrounding hillsides and flats have mixed oak (*Quercus* spp.) woodlands, with scattered chaparral and other vegetation. The settling ponds contain cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.), as well as scattered patches of willows (*Salix* sp.) and Himalayan blackberries (*Rubus discolor*). Willows and Himalayan blackberries are common along the main Permanente Creek channel.

MATERIALS AND METHODS

The surveys for the CRLF followed guidelines as set forth by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 2005). All settling ponds were surveyed during daylight hours on 30 March, 22 April, and 22 July 2007, and at night on 06 and 13 April; 05, and 12 May; and 04 August 2007. Surveys were conducted as per protocol survey

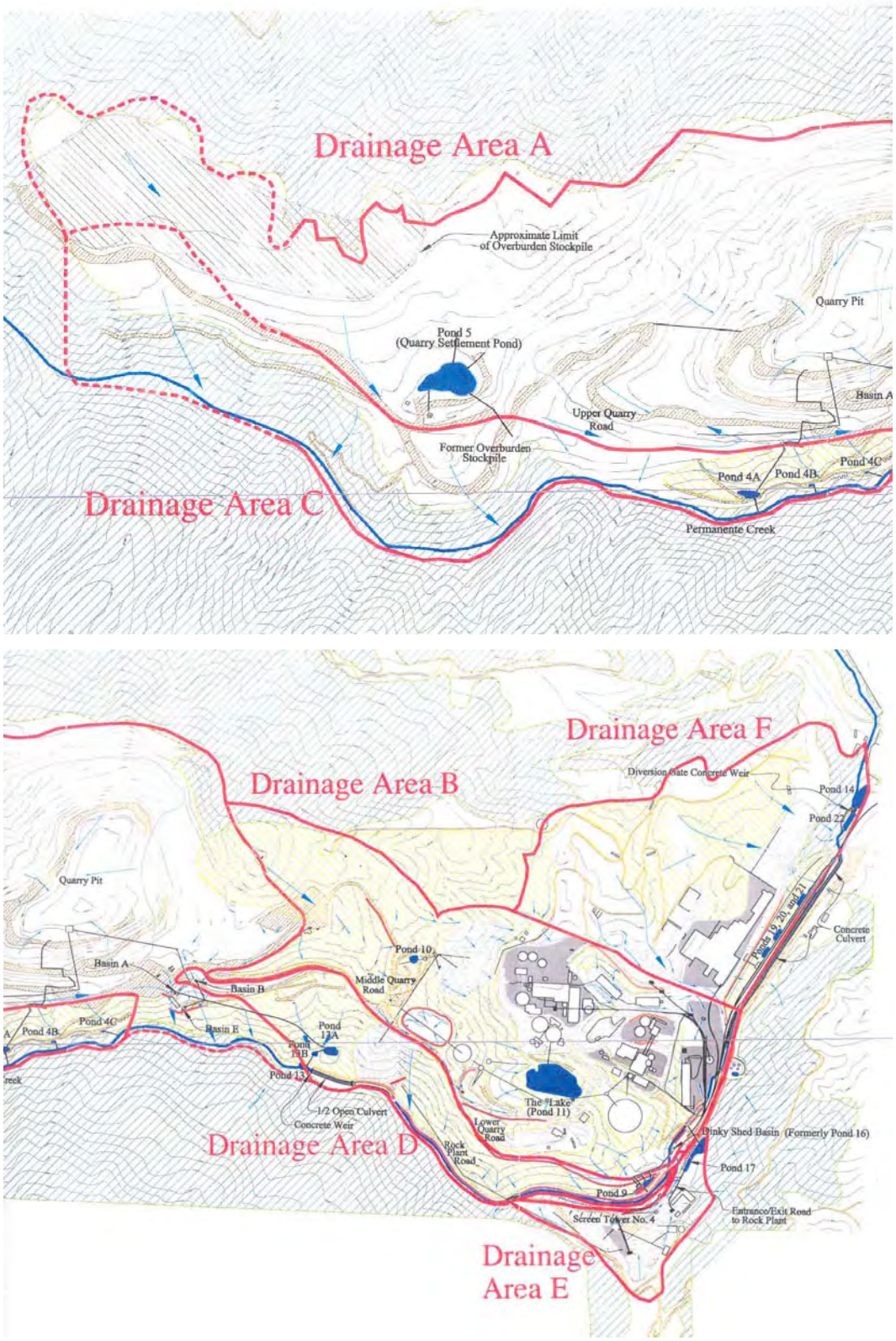

Figure 2. Location of settling ponds on the Hanson Permanente Cement Facility grounds. The top and bottom maps represent the western and eastern portions of the property.

standards for the CRLF (U.S. Fish and Wildlife Service 2005) and my long-term experience with this species (e.g., see Jennings and Hayes 1994). A flashlight was used to locate the eye shines of frogs during nighttime hours and I repeatedly listened for calling male CRLFs using the identifications provided by Davidson (1995).

RESULTS AND DISCUSSION

CRLFs were found only in Permanente Creek and Pond #13, 14, 21, and 22. No CRLFs were found in Pond #04A, 04B, 04C, 05, 09, 10, 11, 13A, 13B (dry by July), 16, 17 (dry by July), 18, 19, and 20. Instead, Pacific treefrogs were found to inhabit and breed in all ponds examined, as well as many of the watercourses between the sediment ponds. Additionally, Coast Range newts were found to breed in Pond #13, 14 and 22, as well as Permanente Creek. CRLFs were observed to successfully breed only in Pond #14 and 21 as well as the watercourse downstream of Pond #20. Each of these locations was found to have calling male CRLFs, as well as larvae and metamorphs.

The reason that CRLFs are probably not found in more of the settling ponds is due to the shallow nature of most of these water bodies. They are designed to trap sediment and this quickly results in water depths below 1 foot in depth (or drying completely on a regular basis as occurred with Pond #13B and 17). The resulting mud flats or cattail thickets were found to contain numerous raccoon (*Procyon lotor*) footprints and I observed raccoons almost every time during my nighttime surveys. The presence of so many CRLF predators on a regular basis probably mediates against juvenile or adult CRLFs dispersing into these shallow water habitats.

Additionally, a number of these sediment ponds are isolated from where CRLFs are known to be present. The long distance movement of CRLFs overland is probably very hazardous with all the natural predators present within the facility grounds.

In summary, these data indicate that CRLFs continue to live and reproduce on the Hanson Permanente Cement Facility property in harmony with current operations.

Because CRLFs do not use Pond #13A, 13B, and 17, the proposed removal of sediment from these settling ponds have no adverse effects on the CRLF population inhabiting this part of the Permanente Creek drainage.

LITERATURE CITED

Davidson, C. 1995. Frog and toad calls of the Pacific Coast. Library of Natural Sounds, Cornell Laboratory of Ornithology, Ithaca, New York. 27 pages + 1 cassette.

Jennings, M. R. 2004. An annotated check list of the amphibians and reptiles of California and adjacent waters (third, revised edition). California Fish and Game, 90(4):161-213.

Jennings, M. R. 2007. 2006 California red-legged frog (*Rana draytonii*) surveys at the Hanson Permanente Cement Facility, Cupertino, California. Final report to The Huffman-Broadway Group, San Rafael, California. 7 p.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, under contract number 8023. iii+225 p.

Shaffer, H. B., G. M. Fellers, S. R. Voss, J. C. Olive, and G. B. Pauly. 2004. Species boundaries, phylogeography, and conservation genetics of the red-legged frog (*Rana aurora*/*draytonii*) complex. Molecular Ecology, 13(9):2667-2677.

Stebbins, R. C. 2003. A field guide to western reptiles and amphibians. Third edition. Houghton Mifflin Company, Boston, Massachusetts. xiii+533 p.

U.S. Fish and Wildlife Service. 2005. Revised guidance on site assessments and field surveys for the California red-legged frog [dated August, 2005]. 26 p. (typewritten).

Jennings 2008A

RANA RESOURCES
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Davis, CA 95617-2185

(530) 753-2727
RanaResources@aol.com

#13,712b
August 21, 2008

Mr. Robert Perrera
Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901

Dear Robert:

Per your request, I surveyed for California red-legged frogs (CRLF; *Rana draytonii*) at night on 30 July 2008 in the various sedimentation basins (Ponds), aquatic habitats, and in Permanente Creek proper at the Hanson Permanente Cement Facility near Cupertino.

I conducted one night survey following the current guidance outlined in the U.S. Fish and Wildlife Service *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* dated August 2005. I examined all aquatic habitats and found CRLFs to be present in Pond #22 (where 2 adults were observed) and Pond #14 (where 12 adults were observed).

Ponds #13A, #13B, and #16 were observed to be dry, while Ponds #19 #20, and #21 contained very low levels of water due to the drought and lateness of the summer. Suitable riparian habitat, cover and living conditions for CRLF were present at Ponds #4a, #13, #19, #20 and #21 and along Permanente Creek.

Pond #9 and Pond #17 were found to contain many Coast Range newts (*Taricha torosa torosa*), despite the large amount of sediment present in both of these water bodies. Newts were also common in Pond #4a and #13, and in Permanente Creek proper. I did not observe any CRLFs or California toads (*Bufo boreas halophilus*) in Pond #9 or Pond #17. Presumably I would have observed them had they been present due to the relative lack of riparian vegetation at both locations and good visibility.

Pond #11 was found to contain water, but the lack of riparian vegetative cover around the edge and the poor water quality precludes the presence of CRLFs and other amphibians.

Pacific treefrogs (*Hyla regilla*) were common residents at all the aquatic habitats (except for Pond #11) that contained water. Since it was late in the season, I did not hear the Pacific treefrogs breeding calls but I did find their larvae. Additionally, I observed several raccoons (*Procyon lotor*) on the property at night and observed one foraging near the Facility entrance in broad daylight.

In closing, CRLFs are generally found at locations where they have been observed during past surveys in 2006 and 2007 and that they have not colonized other Ponds or aquatic habitats. Therefore, proposed sediment removal in settling ponds 9, 13A, 13B and 17 should be able to proceed without any harm to the resident CRLF population as long as adequate biological monitoring and educational measures are taken.

Please let me know if you have any questions or need additional information.

Sincerely,

Mark R. Jennings
President and
Herpetologist/Fisheries Biologist

Jennings 2008B

RANA RESOURCES
P.O. 2185
Davis, CA 95617-2185

(530) 753-2727
RanaResources@aol.com

#13,726
August 31, 2008

Dr. Robert Terry Huffman
The Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901-3209

Dear Terry:

This letter is my monitoring report regarding sediment removal in Pond #9, #13A, #13B, and #17 on the Hanson Permanente Cement Facility grounds. You, Robert Perrera, Tom Yocum, and I served as a team of biological monitors for California red-legged frogs (*Rana draytonii*) while sediment was continually removed from Ponds on 20 and 21 December 2007 by Top Grade Construction crews working around the clock. You, Tom, and I conducted pre-construction surveys during the night of 19 December 2007. I also provided a training session with the two major crews of workers on 20 December 2007 and bilingual brochures on California red-legged frogs were given to each individual worker. No California red-legged frogs were observed in the areas adjacent to the four sediment ponds during the monitoring period and thus no frogs were injured or harmed.

Please let me know if you have any questions on the above. Thanks again for allowing me to be involved with this project.

Sincerely,

Mark R. Jennings
President and
Herpetologist/Fisheries Biologist

Jennings 2008C

RANA RESOURCES
P.O. 2185
Davis, CA 95617-2185

(530) 753-2727
RanaResources@aol.com

#13,830
October 28, 2008

Dr. Robert Terry Huffman
The Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901-3209

Dear Dr. Huffman:

This letter represents the 2008 monitoring report regarding sediment removal in Pond #9, #13A, #13B, and #17 on the Hanson Permanente Cement Facility grounds. I oversaw the removal of sediment from the ponds during 06-10, 13-17, and 25 October 2008 in the capacity as a biological monitor to minimize construction impacts to California red-legged frogs (*Rana draytonii*). The sediment was removed by Mark Coulter of Coulter Gradall, Inc., who worked from just after sun up to around 6:00 PM each day. A pre-construction survey was conducted by me during the night of 05 October 2008. I also provided a training session with the Gradall operator, the dump truck operators (for Hanson Permanente), and the Environmental Manager and Rock Plant Foreman (for Hanson Permanente). Bilingual brochures on California red-legged frogs were given to each individual in the training session. No California red-legged frogs were observed in the areas adjacent to the four sediment ponds during the monitoring period and thus no frogs were injured or harmed.

Please let me know if you have any questions on the above. Thanks again for allowing me to be involved with this project.

Sincerely,

Mark R. Jennings

Mark R. Jennings
President and
Herpetologist/Fisheries Biologist

INSERVICE PRESENTATIONS GIVEN AT
~~THE AVALON PROJECT SITE~~ Hanson Permanente Cement Facility

Date: 10/06/08

Biological Monitor: Mark R. Jennings

	Name	Date	Company
1).	Mark Munoz	10-6-08	Lehigh
2).	Mark Cortez	10-6-08	Lehigh Contractor
3).	Juan Villa	10-6-08	Lehigh
4).	Scott Renfrew	10/6/08	Lehigh
5).			
6).			
7).			
8).			
9).			
10).			
11).			
12).			
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16).			
17).			
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19).			
20).			

Jennings 2009A

RANA RESOURCES
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Davis, CA 95617-2185

RanaResources@aol.com

#14,428a
August 25, 2009

Mr. Robert Perrera
The Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901

Dear Robert:

This letter is my summary of our California red-legged frog (*Rana draytonii*; CRLF) preconstruction surveys and CRLF training to construction personnel on the Hanson 3 Project. Night preconstruction surveys were conducted by me on Ponds 4, 9, and 17 during the evening of 09 August 2009 after it became dark. Day preconstruction surveys were conducted by Robert Perrera of The Huffman-Broadway Group, at the same ponds during the morning of 10 August 2009. Additionally, CRLF training was given to the construction crew (see the attached signature sheet) by Robert Perrera and the field supervisor (Scott Renfrew) on 10 August 2009 and an educational brochure containing color photographs of CRLF and a description of their habitat were given to each individual attending this meeting. No CRLFs were observed in or around the ponds during preconstruction surveys and, according to the field supervisor, no CRLFs were observed during Pond maintenance activities.

Thanks again for allowing me to be involved with this project. Please feel free to contact me if you have any questions regarding the above.

Sincerely,

Mark

Mark R. Jennings
President & Herpetologist/Fisheries Biologist

Jennings 2009B

ATTORNEY CLIENT PRIVEDGED

RANA RESOURCES
P.O. Box 2185
Davis, CA 95617-2185

RanaResources@aol.com

#14,596
November 22, 2009

Mr. Robert Perrera
The Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901

Dear Robert:

This letter is my summary of my California red-legged frog (*Rana draytonii*; CRLF) preconstruction surveys, CRLF training to Campanella Construction personnel, and biological monitoring of sediment removal on Pond #13 on the Hanson 3 Project. As prescribed in our protocol, day and night preconstruction surveys for CRLF were conducted by me on both 15 and 16 November 2009. Surveys were conducted during the afternoon (between 3:00 PM and 4:00 PM) and after it became dark (between 9:00 PM and 10:00 PM). No frogs or other amphibians (except Coast Range newts (*Taricha torosa*)) were observed, although the weather conditions of 45°F-54°F (air temperature), partly cloudy-clear sky, and no moon present, were suitable for CRLF to be active.

On the morning of 17 November 2009 at 7:00 AM, CRLF training was given to the construction crew of 2 individuals from Campanella Construction by me and an educational brochure containing color photographs of CRLF and a description of their habitat were given to each individual attending this meeting. Subsequently, we then proceeded to Pond #13 where I supervised the removal of red alder (*Alnus rubra*) and willow (*Salix* sp.) trees <3 inches BH and the lopping of trees larger than this diameter within the boundary of the project site where sediment was to be removed. These trees were growing around the edge of the pond and had to be either removed or topped to a height of approximately 5 feet in order to allow the removal of sediment from the pond by mechanical equipment. We were also able to leave 6 large alder trees intact and most of a large willow tree intact within the project site. During the removal and topping of the trees, I also monitored the removal of sediment and cattails (*Typha* sp.) by Mark Coulter in a Gradall until 2:30 PM on 17 November and 6:00 AM-2:00 PM on18 November 2009. Gary Deghi of The Huffman-Broadway Group, Inc., continued the monitoring of sediment removal from 6:00 AM-5:00 PM on 19 November 2009 when the work was completed. No CRLFs were observed during the removal of vegetation or sediment, although I did rescue one adult Coast Range newt from the project site on 18 November. The newt was immediately released (unharmed) upstream of the sediment removal activities.

Thus, no CRLF were observed during this operation and the sediment was successfully removed from Pond #13. The tree branches and trees that were cut and piled next to the entrance road to the pond will be removed sometime next week before they start decomposing and providing potential future cover for any wildlife species.

Thanks again for allowing me to be involved with this project. Please feel free to contact me if you have any questions regarding the above.

Sincerely,

Mark R. Jennings

Mark R. Jennings
President & Herpetologist/Fisheries Biologist

Jennings 2010

Lehigh Permanente Quarry CRLF Habitat Assessment

HABITAT ASSESSMENT FOR THE CALIFORNIA RED-LEGGED FROG (*Rana draytonii*), ON PORTIONS OF PERMANENTE CREEK AND MONTE BELLO CREEK, SANTA CLARA COUNTY, CALIFORNIA

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February 14, 2010

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EXECUTIVE SUMMARY

A habitat assessment was conducted for the California red-legged frog (CRLF; *Rana draytonii*) on 28 January and 10 February 2009 on a portion of Permanente Creek (above Pond 4A between PASR 9-10), a small intermittent pond [= "Ridge-Top Pond"] on the hillside southwest of the Rock Plant, and the upper reaches of Monte Bello Creek (MASR 4 to the property boundary) on a part of Lehigh Southwest Cement Company's approximately 3,510-acre Permanente Quarry Property ("Quarry Property"), in the vicinity of Cupertino, California, to determine if the species was potentially present or could utilize this area. The results of the habitat assessment are as follows:

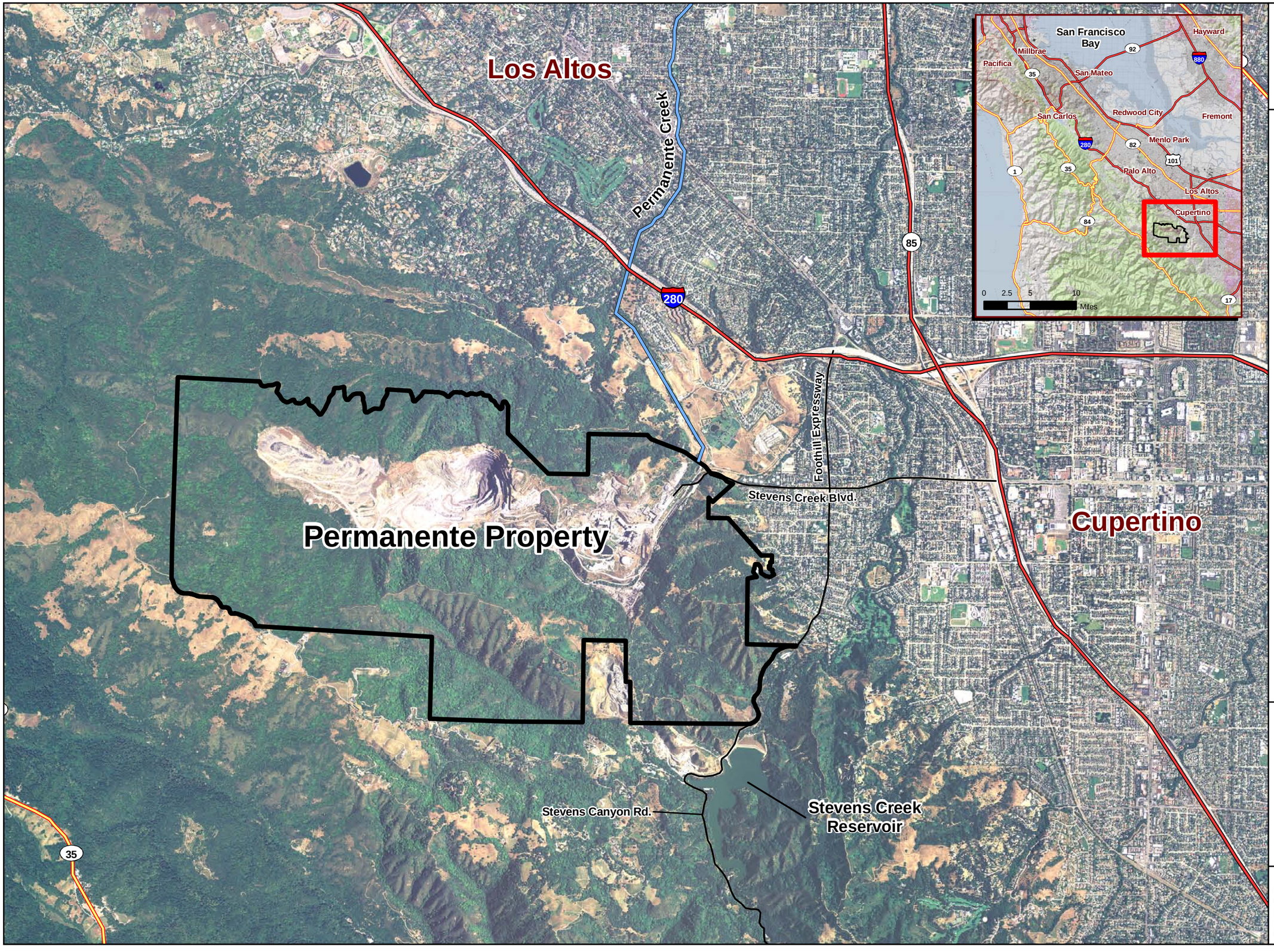
- Examination of Permanente Creek between PASR 9 and 10 indicates that the area is much too ephemeral (i.e.: holds water less than 3 months out of the year) to support suitable habitat for CRLF. Although there is a known population of CRLF in Permanente Creek near the entrance of the Quarry Property (i.e.: in Pond 14 and adjacent aquatic areas that are located within and adjacent to PASR 1), there is no evidence that CRLF have inhabited any of the other stream or pond habitats upstream of this location within the Permanente Creek system. This appears to be due to the intermittent nature of many of the aquatic habitats present and the presence of a large number of raccoons (*Procyon lotor*) on the Quarry Property.
- Examination of Ridge-Top Pond southwest of the Rock Plant reveals that this feature is too ephemeral (even during above average years of rainfall) to support suitable aquatic habitat for CRLF. It is also effectively isolated by terrain and distance from known CRLF habitats on the Quarry Property.
- Examination of Monte Bello Creek within the Quarry Property showed that the aquatic habitat is marginal for CRLF due to the pools on the stream being 2-feet deep or less. However, biologists from WRA, Inc., recently observed a CRLF within this stream, about 850 meters upstream from the property line on 07 May 2009; thus confirming the presence of this species in the drainage. There is no evidence to show that CRLF move between the known population locations in the Permanente Creek system and parts of Monte Bello Creek due to the steepness of the terrain, long distances between aquatic habitats, the ephemeral nature of the

intervening creeks and ponds, and other overland barriers which would preclude potential overland movement between the two drainage systems.

INTRODUCTION

The Lehigh Southwest Cement Company's Permanente Quarry Property (Quarry Property) is located in Santa Clara County, in the vicinity of Cupertino, California (Figure 1). The Quarry Property surrounds the upper portion of Permanente Creek drainage between PASR 1 and PASR 15 with 18 current settling ponds installed both instream and in upland areas to remove suspended sediments from the water drained from the quarry pit and other quarry operations. The resulting water enters the sediment ponds before being discharged into Permanente Creek. The instream ponds (Ponds 12, 14, and 22 [Figure 2a]) allow sediments to settle prior to water flowing over concrete weirs at the downstream end of these features. These instream ponds are in various states of functionality. Pond 14 is a large open water pond with a wetland fringe dominated by cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.) and other emergent vegetation. Pond 22 has been filled to capacity with sediment and is dominated by emergent vegetation within the interior and riparian vegetation along the exterior banks. Pond 13 currently has a partial, but reduced state of functionality due to the accumulation of sediment.

Previous studies have documented the presence of a breeding population of the California red-legged frog (CRLF; *Rana draytonii*) on the part of Permanente Creek near the entrance of the facility (i.e.: in Pond 14 and adjacent aquatic areas that are located below PASR 2) (Figure 2a; Jennings 2006, 2007). However, no CRLF have been observed during previous yearly protocol surveys of ponds on the Quarry Property and other aquatic habitats upstream of PASR 1 to PASR 15 (Jennings 2006) and PASR 1 to PASR 10 (Jennings 2007). The following habitat assessment of three separate aquatic habitats was conducted to determine potential suitability for CRLF in support of the Biological Resources Assessment conducted by WRA (2010). These locations include a portion of the upper part of Permanente Creek above Pond 4 between PASR 9-10 (Figure 2b), a small intermittent pond [=Ridge-Top Pond] on the hillside southwest of the Rock Plant



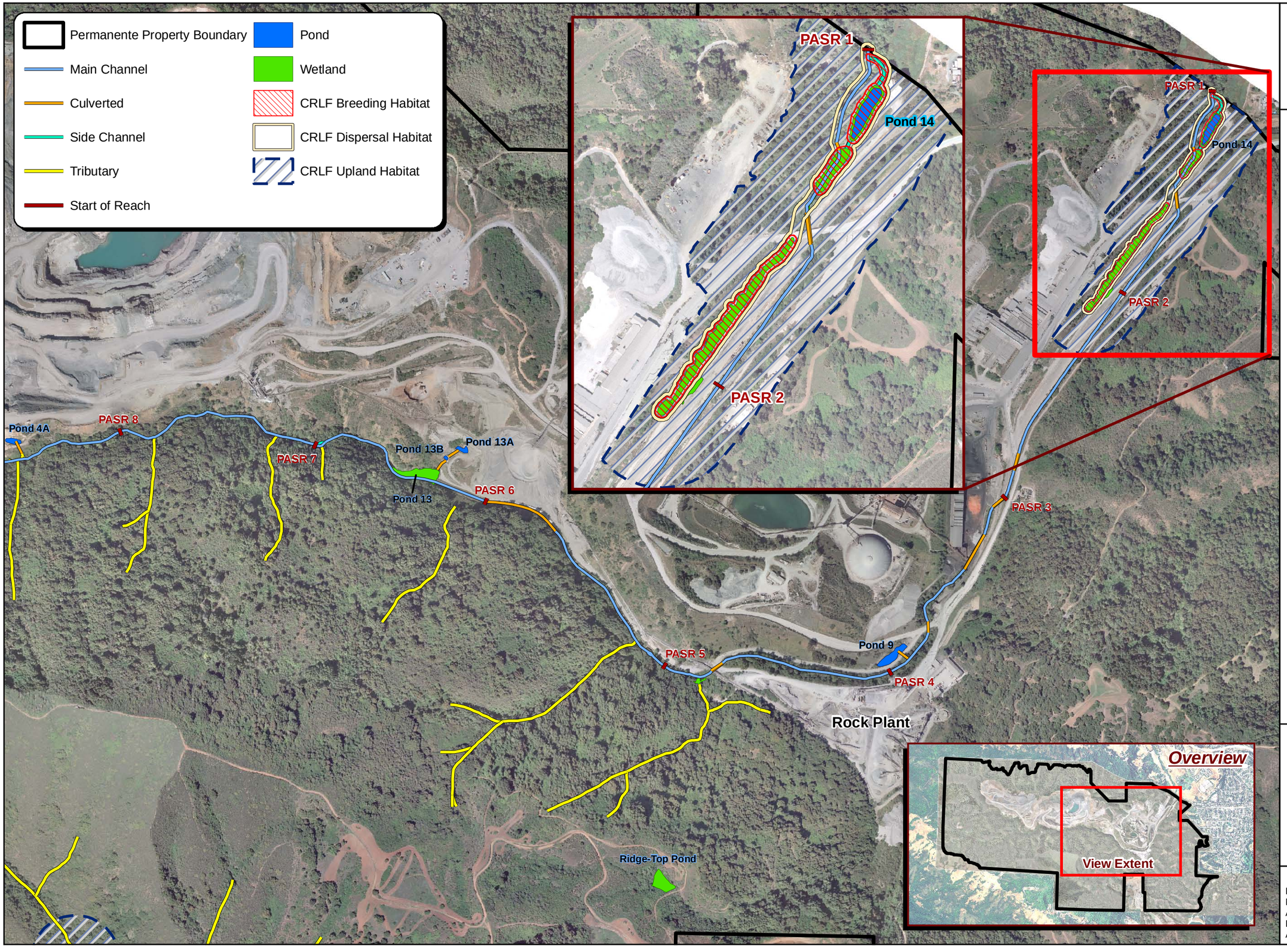
wra
ENVIRONMENTAL CONSULTANTS

Lehigh Permanente Quarry
Santa Clara County, CA

Figure 1.

Permanente Property Location Map

Date: May 2010
Map By: Michael Rochelle
Image: 2005 NAIP
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\Delineation\Property Wide\Location.mxd



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Lehigh Permanente Quarry
Santa Clara County, California

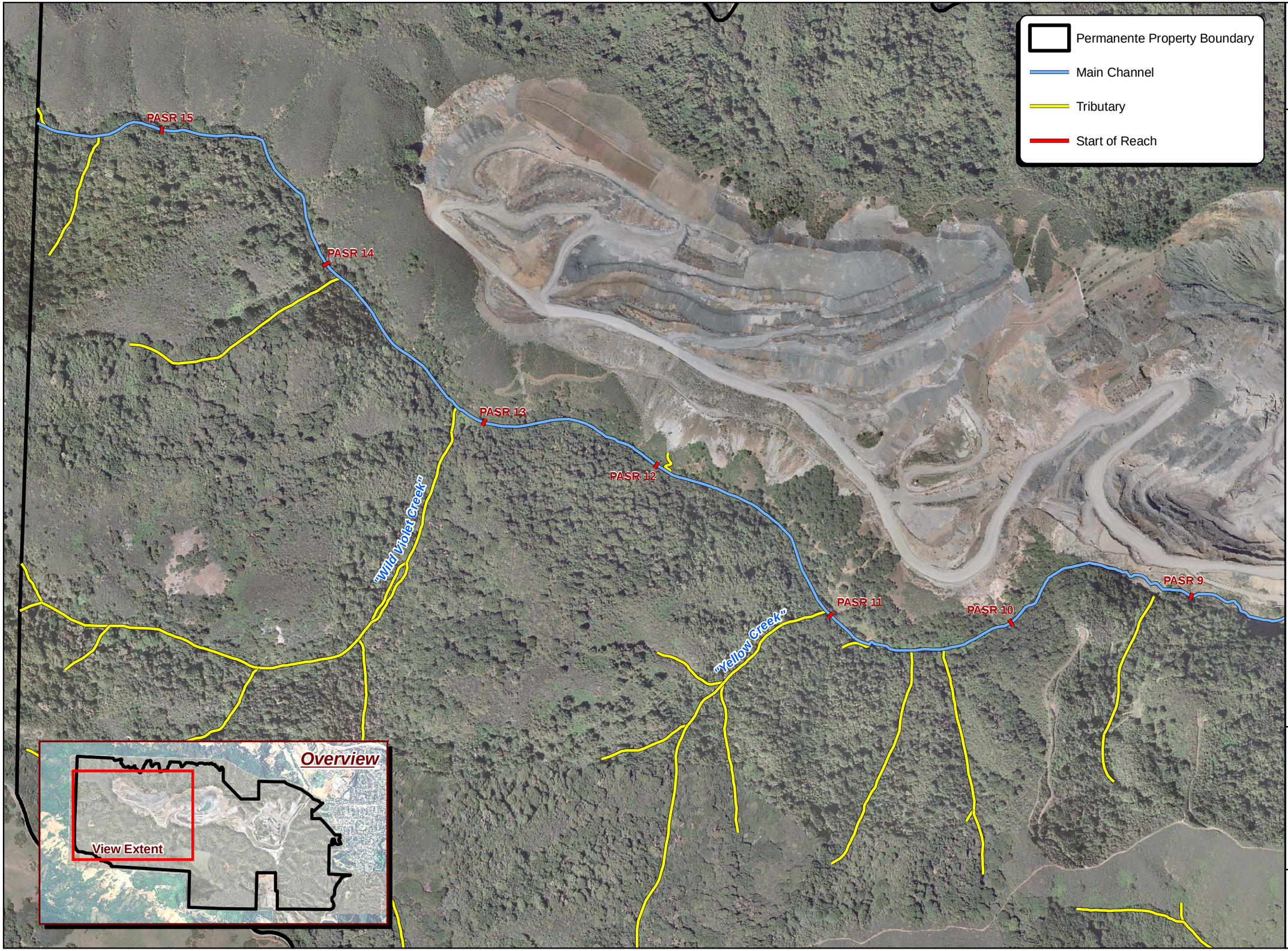
Figure 2a.

Permanente Creek East CRLF Habitat Assessment Map

N
W E
S

0 250 500 1,000
Feet

Date: May 2010
Map By: Michael Rochelle
Aerial: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\Aquatic\CRLF\Perm1.mxd



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Lehigh Permanente Quarry
Santa Clara County, California

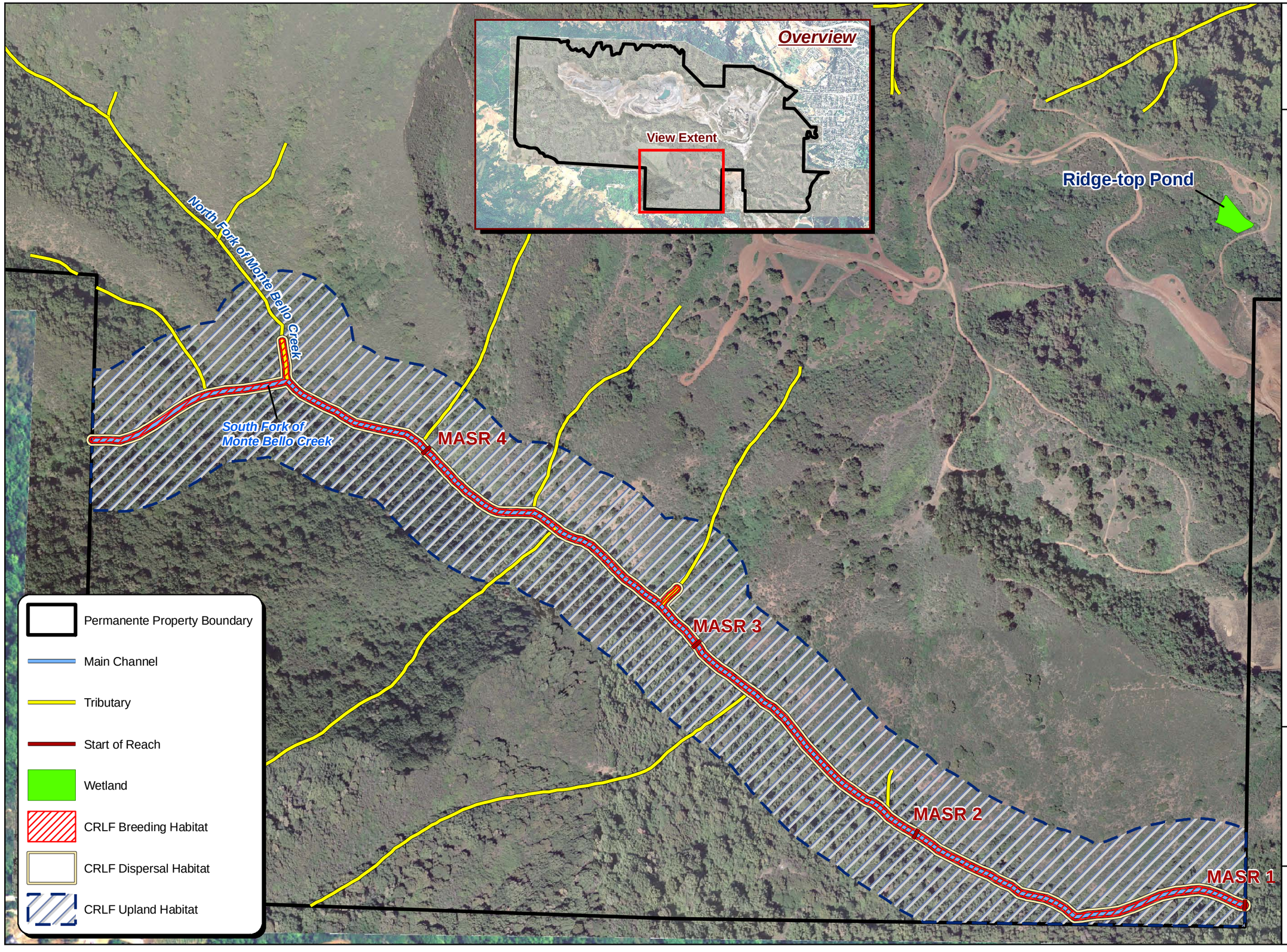
Figure 2b.

Permanente Creek West CRLF Habitat Assessment Map

N
W E
S

0 250 500 1,000
Feet

Date: May 2010
Map By: Michael Rochelle
Aerial: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\Aquatic\CRLF\Perm2.mxd



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Lehigh Permanente Quarry
Santa Clara County, California

Figure 2c.

Monte Bello Creek CRLF Habitat Assessment Map

N
W E
S

0 150 300 600
Feet

Date: May 2010
Map By: Michael Rochelle
Aeiral: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\Aquatic\CRLF Assessment\Montebello.mxd

(Figure 2c), and Monte Bello Creek from MASR 4 to the Quarry Property boundary (Figure 2c). Each habitat assessment was conducted to determine whether any actual or potential breeding, feeding, movement corridors, and estivation/hibernation habitats are present for CRLF.

Per recent taxonomic changes with frog species in California, I follow Jennings (2004) and Shaffer et al. (2004) and use the scientific name "*Rana draytonii*" for the CRLF. In almost all other documents and field guides, this frog is stated as the subspecies "*Rana aurora draytonii*" (e.g., see Stebbins 2003). The scientific and common names of other amphibians and reptiles mentioned in this report follow Jennings (2004), except for very recent taxonomic changes in the families Bufonidae and Ranidae. In these cases, the older generic name is placed in parenthesis.

STUDY AREA

Lehigh Southwest Cement Company's Permanente Quarry Property (Quarry Property) is an approximately 3,510-acre property that lies southwest of the intersection of I-280 and Hwy 85 in Santa Clara County (Figure 1). The facility is located along much of the upper Permanente Creek drainage and a portion of the upper Monte Bello Creek drainage and contains various buildings, rock crushers, storage yards, rock quarrying areas, paved roads, railroad tracks, and aggregate conveyors located over a wide area. Approximately 18 settling ponds are used to remove excess sediment from water received from the quarry pit and other quarry operations to maintain high water quality and adhere to regulatory standards. The resulting water in these settling ponds is discharged into Permanente Creek proper (Figures 2a and 2b).

Permanente Creek is fed through a series of springs and intermittent tributaries and trends generally west to east, roughly through the center of the Quarry Property (Figures 2a and 2b). The creek is crossed by three major quarry access roads that are used for site access and transport of materials and equipment between onsite facilities. In general, the upstream, western-most 1/3 of Permanente Creek on the Quarry Property follows a

natural course. The central 1/3 of the creek has been subjected to historical disturbance, including fill, realignment and road crossings, associated with early mining activities. The downstream, eastern 1/3 of the creek, after flowing into settling Pond 13, flows through numerous culverts, channelized segments and impoundments before exiting in the northeast corner of the Quarry Property (Figure 2a).

Permanente Creek receives water from ongoing quarry activities including annual dewatering of the main quarry pit. These flows enter Permanente Creek after sediments are allowed to settle in Pond 4A (Figure 2a). Due to a binary pumping system (i.e. either on or off), releases of water into Permanente Creek are subject to frequent starting and stopping due to an automated pumping regime that is dependent on water levels in the main quarry pit. Because of the quarry pit input, Permanente Creek flows almost year-round in segments below Pond 4A.

Immediately upstream from Pond 4A (PASR 8-9), a section Permanente Creek approximately 1,850 feet long (depending on time of year) is dry for all but a few weeks in a given water year when flows peak as a result of storm flows. Upstream of the referenced "dry section," one begins to notice a few isolated pools of water in the stream channel that hold water for longer periods of time during the year. Upstream of PASR 10, one encounters flows in the stream channel that remain perennial to the confluence of Permanente Creek and "Wild Violet Creek" (just upstream of PASR 12; Figure 2b). Above this confluence, Permanente Creek becomes ephemeral and intermittent. Wild Violet Creek is ephemeral and intermittent for all but the northernmost 350 feet (closest to the confluence). The calcareous nature of the bedrock present in the area gives rise to a number of sinks and springs within the channel of Permanente Creek and tributaries, and in places, flows can be transported under the surface during the dry season.

Generally, tributaries that drain into Permanente Creek are extremely flashy in nature and rarely convey surface flow except during high flow events. The slope to the south of Permanente Creek is densely vegetated and the soils are dominated by various loams which are highly permeable.

Monte Bello Creek originates from a series of seeps and intermittent tributaries from the north side of Monte Bello Ridge (Figure 2c). The main stem, also dubbed the "South Fork," flows northeast until it meets the "North Fork" (upstream of MASR 4) which originates on the property (Figure 2c). The North Fork is largely intermittent and ephemeral. It contributes surface flow only seasonally and is estimated to less than 10 percent of the overall flow at the confluence during storm events. From the confluence, the main stem is perennial and trends southeast until it leaves the facility at MASR 1 and drains into a series of large, in-stream, detention basins on the neighboring property. Within the Quarry Property, Monte Bello Creek has no roadways and is largely intact with naturally vegetative slopes (Figure 2c).

Tributaries to Monte Bello Creek on the Quarry Property range from ephemeral to intermittent. They do not display an ordinary high-water (OHW) mark, nor do they support riparian vegetation. Calcareous limestone is also common in the tributaries to Monte Bello Creek, although no pools are present within these tributaries that hold water long enough to support breeding amphibians.

Ridge-Top Pond is located on a hillside southwest of the Rock Plant (Figures 2a and 2c). It is less than an acre in size and contains a dense cover of introduced spiny cockleburs (*Xanthium spinosum*). The uplands around this location are largely composed of chaparral species. The pond appears to have been originally created by putting up a small earthen dam in a drainage channel and therefore is an historical feature which is not part of Quarry Property's current stormwater management system.

A total of 20 distinct biological plant communities are located on the facility grounds. These include: 1) ruderal herbaceous grassland (e.g., *Avena* spp., *Bromus* spp., *Cenaurea* spp.), 2) mixed scrub (e.g., *Baccharis pilularis, Artemisia californica, Eriogonum fasciculatum*), 3) northern mixed chaparral (e.g., *Ceanothus* spp., *Arctostaplylos glandulosa, Heteromeles arbutiofolia*) , 4) chamise chaparral (e.g., *Adenostoma fasciculatum*), 5) oak chaparral (e.g., *Quercus* spp.), 6) poison oak scrub (e.g.,

Toxicodendron diversilobum), 7) non-native annual grassland (e.g., *Avena* spp. *Bromus* spp.), 8) California bay forest (e.g., *Umbellularia californica*), 9) California buckeye woodland (e.g., *Aesculus californica*), 10) rock outcrop, 11) revegetated areas, 12) active quarry, 13) disturbed areas,14) settling ponds and operational water features, 15) wetland (e.g., *Typha angustifolia*), 16) willow riparian forest and scrub (e.g., *Salix* spp.), 17) sycamore alluvial woodland (e.g., *Platanus racemosa*), 18) white alder riparian forest (e.g., *Alnus rhombifolia*), 19) oak woodland (e.g., *Quercus* spp.), and 20) streams and ponds. The most common habitat types encountered on the property (besides active quarry, reclaimed, and disturbed areas) are oak woodland, California bay forest, chamise chaparral, northern mixed chaparral, oak chaparral, ruderal herbaceous grassland, and poison oak scrub.

The settling ponds on the Quarry Property, are, depending on the pond, used by a wide variety of wildlife including California newts (*Taricha torosa*), Pacific treefrogs (*Hyla regilla*), western toads (*Anaxyrus* (*Bufo*) *boreas*), and in some locations within PASR1, CRLF. Some of the settling ponds contain cattails and bulrushes, as well as scattered patches of willows (*Salix* sp.) and Himalayan blackberries (*Rubus discolor*). Willows and Himalayan blackberries are common along the main Permanente Creek channel near the entrance of the Quarry Property at PASR 1. Scattered clumps of white alders (*Alnus rhombifolia*) are present within the mainstream of Permanente Creek and Monte Bello Creek.

This habitat assessment was conducted in a portion of Permanente Creek (upstream of Pond 4A between reach PASR 9 and 10) where it flows through a rocky area adjacent to the quarry pit. There is evidence of a number of former machinery and concrete building parts (along with quarry rock) in the stream channel that were apparently deposited here at various times during earlier periods of quarry activity. As mentioned earlier, although streamflow in this part of Permanente Creek is only present during the winter and early spring months (after sufficient rainfall), a few scattered willows are present in the rocky stream channel. The uplands to the north are largely covered with pieces of rock and

gravel and ruderal vegetation. Large trees such as oaks are scarce here due to the extreme steepness (>70%) and instability of the uplands.

Prior to 2006, general biological surveys were conducted on the Quarry Property and reported CRLF at locations where they were subsequently noted again by me (Jennings 2006, 2007). In 2006, I examined the Permanente Creek drainage from PASR 1-15 and all the known settling ponds and conducted a habitat assessment and protocol CRLF survey at each location (Jennings 2006). Subsequently in 2007, I conducted protocol surveys for CRLF in all the extant settling ponds and aquatic habitats along Permanente Creek from PASR 1-10 that I thought might potentially harbor this species (Jennings 2007). To date, CRLF have only been found at the ponds and aquatic habitats in the vicinity of PASR 1.

MATERIALS AND METHODS

This habitat assessment for the CRLF followed guidelines as set forth by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 2005). Ridge-Top Pond was examined by Dr. Michael N. Josselyn and me on 28 January 2009. The upper portions of Permanente Creek (between PASR 9-10) and Monte Bello Creek (MASR 4 to the property boundary) were examined by Rob Schell and me on 10 February 2009. Standard data sheets were filled out (see Appendix A).

CALIFORNIA RED-LEGGED FROG OVERVIEW

Federal listing status: Threatened. State listing status: Species of Special Concern. On 15 January 1992, the CRLF was petitioned for listing as an endangered species by the U.S. Fish and Wildlife Service (Sorensen 1993) based on a 70% range reduction and continued threats to surviving populations (Miller 1994). The frog was subsequently listed as Threatened by the U.S. Fish and Wildlife Service on 23 May 1996 (Miller et al. 1996), with further recent revisions to critical habitat and management of this species (U.S. Fish and Wildlife Service 2006).

The CRLF is a large brown to reddish-brown frog that attains lengths up to 3.25-5.5 inches from the tip of the snout to the end of its vent. These frogs have prominent dorsolateral folds and diffuse moderate-sized dark brown to black spots that sometimes have light centers (Storer 1925, Jennings and Hayes 1994). The distribution of red or red-orange pigment is highly variable, but usually restricted to the belly and the undersurfaces of the thighs, legs and feet (Jennings and Hayes 1994). Frogs in southern California often have red only on the undersurfaces of the feet (Jennings pers. observ.). There are prominent dorsolateral folds, which are yellow or orange-colored in juveniles (Stebbins 2003). The groin has a distinct black mottling on a white or yellow background. The iris is dark brown with iridophores on the upper and lower portions of the iris (Jennings and Hayes 1994).

Larvae range in length from 0.55-3.15 inches in total length and have up to 2-3 upper and 3-4 lower tooth rows (Stebbins 2003). Newly hatched tadpoles generally are blackish in color, gradually changing to a brown background color with darker marbling or spots after a week or two of growth (Storer 1925).

This amphibian is the largest native frog in the state. There are data to support elevating the CRLF to a full species separate from the northern red-legged frog (*Rana aurora*) [see Hayes and Miyamoto 1984, Hayes and Kremples 1986, Green 1985]. The large zone of intergradation along the Pacific slope of the North Coast Range reported by Hayes and Kremples (1986) has been greatly contracted to a point in mid-Mendocino County by recent biochemical studies (Shaffer et al. 2004).

Life History and Ecology

CRLF are pond-dwelling amphibians that generally live in the vicinity of permanent aquatic habitats including livestock ponds and pools in perennial streams (Jennings and Hayes 1994). The most optimal habitat is characterized by dense, shrubby riparian vegetation associated with deep (>2.3 feet), still, or slow-moving water (Hayes and

Jennings 1988, Jennings 1988). The shrubby riparian vegetation that structurally seems to be most suitable for this frog is that provided by arroyo willow (*Salix lasiolepis*), although cattails and bulrushes also can provide suitable habitat (Jennings 1988). Although CRLF are found in ephemeral streams and ponds, populations cannot be maintained where all surface water disappears (Jennings and Hayes 1994). This frog is infrequent or absent in habitats where introduced aquatic predators such as green sunfish (*Lepomis cyanellus*), Louisiana red-swamp crayfish (*Procambarus clarkii*) and bullfrogs (*Lithobates* (*Rana*) *catesbeianus*) are present (Hayes and Jennings 1986, 1988), probably because the larval stages are susceptible to such predators (Jennings and Hayes 1994).

Reproduction occurs at night in permanent ponds or the slack water pools of streams during the winter and early spring (late November-through April) after the onset of warm rains (Storer 1925, Hayes and Jennings 1988, Jennings and Hayes 1994). Males generally appear at breeding sites from 2-4 weeks before females (Storer 1925). At breeding sites, males typically call in small mobile groups of 3-7 individuals that attract females (Jennings and Hayes 1994). Females amplex with males and attach egg masses containing approximately 2,000-6,000 eggs to an emergent vegetation brace at depths usually from 3-4 inches deep (Storer 1925). Eggs hatch after 6-14 days (depending on the prevailing water temperature), and the resulting larvae require 3.5-7 months to attain metamorphosis (Storer 1925). Some tadpoles may also over winter (Fellers et al. 2001a). Juvenile frogs are about 1 inch (25.4 millimeters) long at metamorphosis and commonly sun themselves during the day at the edge of the riparian zone next to the breeding site. As they grow, they gradually shift from diurnal and nocturnal periods of activity, to largely nocturnal activity (Hayes and Tennant 1986). During periods of rainfall, both juveniles and a few adults may disperse away from breeding sites and may be found some distance (up to 0.5 mile) away from the nearest water (Jennings, unpubl. data). Frogs found in the coastal drainages appear to be rarely inactive, whereas those found in interior sites probably hibernate (Storer 1925). Frogs generally reach sexual maturity in their second year for males and third year for females (Jennings and Hayes 1985). During extended periods of drought, frogs may take 3-4 years to reach sexual maturity

(Jennings and Hayes 1994). Based on limited field data, CRLF appear to live about 8-10 years in the wild (Jennings, unpubl. data).

CRLF have declined largely due to habitat loss and the introduction of non-native aquatic predators such as green sunfish, red-swamp crayfish and bullfrogs (Jennings and Hayes 1994). It is possible that a pathogen also helped to eliminate frog populations in southern California during the 1970s (Fellers et al. 2001b). Recent work suggests that nitrate/nitrite pollution (Marco et al. 1999) and pesticide drift (Davidson et al. 2001, 2002) also may be responsible for frog declines in California.

CRLF were historically found west of the Sierra Nevada crest from mid-Mendocino County and the vicinity of Redding, south into northwestern Baja California (Jennings 1995). Within the Quarry Property, there are recent records of CRLF in the aquatic habitats adjacent to Permanente Creek on the lowest parts of the facility grounds (i.e: Pond 14 and adjacent areas that are located downstream of PASR 2; Jennings 2006, 2007) and this population continues to breed and survive in the aquatic habitats where it has been observed. However, no CRLF have been observed upstream of these locations in the more marginal habitats of the portions of Permanente Creek upstream of PASR 2 and surrounding settling ponds.

RESULTS AND DISCUSSION

Based on my habitat assessment and examination of the three study areas, I have reached the following conclusions:

Permanente Creek, between PASR 9-10, lacks suitable aquatic and upland habitats for CRLF. This is due to the lack of water in the stream here for most of the year. Water appears to only be present in the stream channel at this location during the rainy season, which would mean that this section of Permanente Creek is dry for approximately 9 months out of the year. The lack of water presence for much of the year also explains why the stream channel lacks a fringe of riparian vegetation along this same reach.

Additionally, this location is at least a half-mile from known CRLF habitats (within PASR 1) and there are many barriers (e.g., roads, piped drainages, buildings, etc.) between PASR 1 and PASR 9-10 that would preclude overland movement and colonization. Also, raccoons (*Procyon lotor*) are abundant in the area and presumably would predate any frog they encountered in upland habitats or shallow aquatic areas. This, in my professional opinion, CRLF are absent from the portion of Permanente Creek within PASR 9-10.

The Ridge-Top Pond also appears to lack suitable aquatic and upland habitats for CRLF. This is due to the lack of water at the site for approximately 9 months out of the year (even during periods of above average rainfall), and the absence of a fringe of riparian vegetation. Additionally, the Ridge-Top Pond is at least a half mile from known CRLF habitats (at PASR1) and there are many barriers (e.g., roads, piped drainages, buildings, etc.) between these locations. Likewise, raccoons are also abundant in the area and presumably would predate any CRLF they encountered in upland habitats or shallow water areas. Thus, in my professional opinion, CRLF are absent from that portion of the Ridge-Top Pond.

Monte Bello Creek appears to contain suitable, but marginal habitat for CRLF due to the pools on the stream being 2-feet deep or less. Biologists from WRA, Inc., observed a CRLF within this stream, about 850 meters upstream from the property line on 07 May 2009 (R. Schell, pers. comm.) indicating the presence of the species in the Monte Bello Creek drainage. In my professional opinion, and based on the marginal habitat for CRLF within the portion of the drainage examined, the presence of this individual is from a breeding location somewhere within the Monte Bello Creek system. The individual is not believed to have come from the Permanente Creek system due to the steepness of the terrain, the long distance between suitable aquatic habitats, the ephemeral nature of the intervening creeks and ponds, and other overland barriers which preclude overland movement between the two creek systems.

LITERATURE CITED

Davidson, C., H. B. Shaffer, and M. R. Jennings. 2001. Declines of the California red-legged frog: spatial analysis of the climate change, UV-B, and pesticide hypotheses. Ecological Applications, 11(2):464-479.

Davidson, C., H. B. Shaffer, and M. R. Jennings. 2002. Spatial tests of the pesticide drift, habitat destruction, UV-B, and climate change hypotheses for California amphibian declines. Conservation Biology, 16(6):1588-1601.

Fellers, G. M., D. E. Green, and J. E. Longcore. 2001a. Oral chytridiomycosis in mountain yellow-legged frogs (*Rana muscosa*). Copeia 2001:945-953.

Fellers, G. M., A. E. Launer, G. B. Rathbun, S. Bobzien, J. Alvarez, D. Sterner, R. B. Seymour, and M. Westphal. 2001b. Overwintering tadpoles in the California red-legged frog (*Rana aurora draytonii*). Herpetological Review, 32(3):156-157.

Green, D. M. 1985. Differentiation in heterochromatin amount between subspecies of the red-legged frog, *Rana aurora*. Copeia, 1985(4):1071-1074.

Hayes, M. P., and M. R. Jennings. 1986. Decline of ranid frog species in western North America: are bullfrogs (*Rana catesbeiana*) responsible? Journal of Herpetology, 20(4):490-509.

Hayes, M. P., and M. R. Jennings. 1988. Habitat correlates of distribution of the California red-legged frog (*Rana aurora draytonii*) and the foothill yellow-legged frog (*Rana boylii*): implications for management. Pages 144-158 In: R. C. Szaro, K. E. Severson, and D. R. Patton (technical coordinators). Management of Amphibians, Reptiles, and Small Mammals in North America. Proceedings of the Symposium, July 19-21, 1988, Flagstaff, Arizona. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado. General Technical Report (RM-166):1-458.

Hayes, M. P., and D. M. Kremples. 1986. Vocal sac variation among frogs of the genus *Rana* from western North America. Copeia, 1986(4):927-936.

Hayes, M. P., and M. M. Miyamoto. 1984. Biochemical, behavioral and body size differences between the red-legged frogs, *Rana aurora aurora* and *Rana aurora draytoni*. Copeia, 1984(4):1018-1022.

Hayes, M. P., and M. R. Tennant. 1986. Diet and feeding behavior of the California red-legged frog, *Rana aurora draytonii* (Ranidae). The Southwestern Naturalist, 30(4):601-605.

Jennings, M. R. 1988. Natural history and decline of native ranids in California. Pages 61-72 In: H. F. De Lisle, P. R. Brown, B. Kaufman, and B. McGurty (editors). Proceedings of the Conference on California Herpetology. Southwestern Herpetologists Society, Special Publication (4):1-143.

Jennings, M. R. 1995. Native ranid frogs in California. Pages 131-134 In: E. T. LaRoe, G. S. Farris, C. E. Puckett, P. D. Doran, and M. J. Mac (editors). Our Living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems. U.S. Department of the Interior, National Biological Service, Washington, D.C. xi+530 p.

Jennings, M. R. 2004. An annotated check list of the amphibians and reptiles of California and adjacent waters (third, revised edition). California Fish and Game, 90(4):161-213.

Jennings, M. R. 2006. 2006 California red-legged frog (*Rana draytonii*) surveys at the Hanson Permanente Cement Facility, Cupertino, California. Final report to The Huffman-Broadway Group, San Rafael, California. 7 p.

Jennings, M. R. 2007. 2007 California red-legged frog (*Rana draytonii*) surveys at the Hanson Permanente Cement Facility, Cupertino, California. Final report to The Huffman-Broadway Group, San Rafael, California. 7 p.

Jennings, M. R., and M. P. Hayes. 1985. Pre-1900 overharvest of the California red-legged frog (*Rana aurora draytonii*): the inducement for bullfrog (*R. catesbeiana*) introduction. Herpetologica, 41(1):94-103.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, under contract number 8023. iii+225 p.

McCasland, C., and B. Twedt. 2000. Endangered and threatened wildlife and plants; proposed designation of critical habitat for the California red-legged frog (*Rana*

aurora draytonii). Federal Register, 65(176):54892-54932. [Monday, September 11, 2000].

Miller, K. J. 1994. Endangered and threatened wildlife and plants; proposed endangered status for the California red-legged frog. Federal Register, 59(22):4888-4895. [Wednesday, February 2, 1994].

Miller, K. J, A. Willy, S. Larsen, and S. Morey. 1996. Endangered and threatened wildlife and plants; determination of threatened status for the California red-legged frog. Federal Register, 61(101):25813-25833. [Thursday, May 23, 1996].

Rathbun, G. B., M. R. Jennings, T. G. Murphey, and N. R. Siepel. 1993. Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, California. Final report prepared for the California Department of Parks and Recreation, San Simeon Region, through Cooperative Agreement (14-16-0009-01-1909). U.S. Fish and Wildlife Service, National Ecology Research Center, Piedras Blancas Research Station, San Simeon, California. xi+103 p.

Shaffer, H. B., G. M. Fellers, S. R. Voss, J. C. Olive, and G. B. Pauly. 2004. Species boundaries, phylogeography, and conservation genetics of the red-legged frog (*Rana aurora*/*draytonii*) complex. Molecular Ecology, 13(9):2667-2677.

Sorensen, P. C. 1993. Endangered and threatened wildlife and plants; finding on petition to list the California red-legged frog. Federal Register, 58(136):38553. [Monday, July 19, 1993].

Sorensen, P., and L. J. Propp. 1992. Endangered and threatened wildlife and plants; 90-day finding and commencement of status reviews for a petition to list the western pond turtle and California red-legged frog. Federal Register, 57(193):4561-45762. [Monday, October 5, 1992].

Stebbins, R. C. 2003. A field guide to western reptiles and amphibians. Third edition. Houghton Mifflin Company, Boston, Massachusetts. xiii+533 p.

Storer, T. I. 1925. A synopsis of the Amphibia of California. University of California Publications in Zoology, 27:1-342.

U.S. Fish and Wildlife Service. 2005. Revised guidance on site assessments and field surveys for the California red-legged frog [dated August, 2005]. 26 p. (typewritten).

U.S. Fish and Wildlife Service 2006. Endangered and threatened wildlife and plants; designation of critical habitat for the California red-legged frog, and special rule exemption associated with final listing for existing routine ranching activities. Federal Register, 71(71):19244-19346. [Thursday, April 13, 2006].

APPENDIX A

Completed California Red-Legged Frog Habitat Assessment Data Sheets

California Red-Legged Frog Habitat Site Assessment Data Sheet

Site Assessment reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Site Assessment: 01/28/2009 (mm/dd/yyyy)

Site Assessment Biologists: Jennings, Mark (Last name, first name); Josselyn, Mike (Last name, first name)

_____ (Last name) _____ (first name); _____ (Last name) _____ (first name)

Site Location: Santa Clara Hanson Permanente Cement Facility, Small pond south of Rock Plant
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S)

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Hanson Permanente Cement Facility
Brief description of proposed action:
Determine if small intermittent pond is suitable CRLF habitat

1) Is this site within the current or historic range of the CRF (circle one)? (YES) NO

2) Are there known records of CRF within 1.6 km (1 mi) of the site (circle one)? (YES) NO
If yes, attach a list of all known CRF records with a map showing all locations.

GENERAL AQUATIC HABITAT CHARACTERIZATION

(if multiple ponds or streams are within the proposed action area, fill out one data sheet for each)

POND:
Size: < 1 acre Maximum depth: 4 feet

Vegetation: emergent, overhanging, dominant species: covered with a dense stand of spiny cockleburs

Substrate: Sand, silt

Perennial or Ephemeral (*circle one*). If ephemeral, date it goes dry: Probably by May 1st of each year.

California Red-Legged Frog Habitat Site Assessment Data Sheet

STREAM:

Bank full width: _____

Depth at bank full: _____

Stream gradient: _____

Are there pools (circle one)? YES NO

If yes,

Size of stream pools: _____

Maximum Depth of stream Pools: _____

Characterize non-pool habitat: run, riffle, glide, other: _____

_____

_____

Vegetation: emergent, overhanging, dominant species: _____

_____

_____

Substrate: _____

_____

Bank description: _____

_____

_____

Perennial or Ephemeral (*circle one*). If ephemeral, date it goes dry: _____

Other aquatic habitat characteristics, species observations, drawings, or comments:

Intermittent pond is located on a hillside above the Rock Plant. Very isolated and was human created by creating an earthen dam across a small drainage. Was completely dry during our visit at the end of January. Probably holds water for about 3 months at most. Lacks much vegetation except for cockleburs. IS not considered CRLF habitat.

Raccoon tracks noted on road to the location.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs.
3. Maps with important habitat features and species locations

California Red-Legged Frog Habitat Site Assessment Data Sheet

Site Assessment reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Site Assessment: 02/10/2009 (mm/dd/yyyy)

Site Assessment Biologists: Jennings, Mark (Last name) (first name) Schell, Rob (Last name) (first name)

_____ (Last name) _____ (first name) _____ (Last name) _____ (first name)

Site Location: Santa Clara, Hanson Permanente Cement Facility, upper portion of Permanente Creek next to open pit quarry.
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S)

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Hanson Permanente Cement Facility
Brief description of proposed action: To put a proposed expansion bridge across the creek channel.

1) Is this site within the current or historic range of the CRF (circle one)? (YES) NO

2) Are there known records of CRF within 1.6 km (1 mi) of the site (circle one)? (YES) NO
If yes, attach a list of all known CRF records with a map showing all locations.

GENERAL AQUATIC HABITAT CHARACTERIZATION

(if multiple ponds or streams are within the proposed action area, fill out one data sheet for each)

POND:

Size: _____ Maximum depth: _____

Vegetation: emergent, overhanging, dominant species: _____

_____

_____

Substrate: _____

_____

Perennial or Ephemeral (*circle one*). If ephemeral, date it goes dry: _____

California Red-Legged Frog Habitat Site Assessment Data Sheet

STREAM:

Bank full width: 4 ft.
Depth at bank full: 2 ft.
Stream gradient: 8%

Are there pools (circle one)? (YES) NO

If yes,

Size of stream pools: 4ft. x 4 ft.
Maximum Depth of stream Pools: 2 ft.

Characterize non-pool habitat: run, riffle, glide, other: Can't tell because the creek is completely dry here

Vegetation: emergent, overhanging, dominant species: Mostly rock with coyote brush, western poison oak, scattered blackberries, and an occasional willow bush.

Substrate: Mostly rock with some gravel. Many pieces of old concrete and metal machinery.

Bank description: Steep -- edge of quarry where rocks and boulders dumped over the side in the past. Upstream is shaded by larger oaks.

Perennial or (Ephemeral) (*circle one*). If ephemeral, date it goes dry: by May 1st

Other aquatic habitat characteristics, species observations, drawings, or comments:

Stream was completely dry during our visit in February. Probably doesn't hold water for very long as most run off from the nearby quarry is directed to Quarry Ponds #5 and 4A. Raccoons are common in the area. Their tracks were observed around Quarry Pond #4A. Area not considered CRLF habitat. No frogs seen in any of the Quarry ponds or Permanente Creek downstream of Quarry to buildings during yearly surveys of 2005, 2006, and 2007.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs.
3. Maps with important habitat features and species locations

California Red-Legged Frog Habitat Site Assessment Data Sheet

Site Assessment reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Site Assessment: 02/10/2009
(mm/dd/yyyy)

Site Assessment Biologists: Jennings, Mark (Last name, first name) Schall, Rob (Last name, first name)

_____ (Last name, first name) _____ (Last name, first name)

Site Location: Santa Clara, Hanson Permanente Cement Facility Montebello Creek
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S)

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Hanson Permanente Cement Facility
Brief description of proposed action:
Determine habitat suitability for CRLF in Montebello Creek.

1) Is this site within the current or historic range of the CRF (circle one)? (YES) NO

2) Are there known records of CRF within 1.6 km (1 mi) of the site (circle one)? (YES) NO
If yes, attach a list of all known CRF records with a map showing all locations.

GENERAL AQUATIC HABITAT CHARACTERIZATION

(if multiple ponds or streams are within the proposed action area, fill out one data sheet for each)

POND:

Size: 3 feet Maximum depth: 2 feet

Vegetation: emergent, overhanging, dominant species: Overstory of Oaks, California Bay, and willows. Some blackberries and trees at spots.

Substrate: lots of bedrock and boulders. Some gravels

(**Perennial**) **or Ephemeral** (*circle one*). If ephemeral, date it goes dry: _____

California Red-Legged Frog Habitat Site Assessment Data Sheet

STREAM:

Bank full width: 4 feet
Depth at bank full: 2 feet
Stream gradient: 10%

Are there pools (circle one)? (YES) NO

If yes,

Size of stream pools: 3 feet
Maximum Depth of stream Pools: 2 feet

Characterize non-pool habitat: run, riffle, glide, other: 30% Run, 10% Riffle, 10% Glides, 50% Pools. Springs present along and off stream.

Vegetation: emergent, overhanging, dominant species: Overstory of Oaks, California Bay, and Willows. A few alders. Some blackberries and tules in spots.

Substrate: Mostly bedrock and boulders. Some gravel.

Bank description: Steep, with Oaks, Coyote brush, and Poison oak.

Perennial or Ephemeral (*circle one*). If ephemeral, date it goes dry: _____

Other aquatic habitat characteristics, species observations, drawings, or comments:

Creek appears to be marginal habitat for CRLF because of the shallow nature of the plunge pools. Area B frequented by raccoons and a few wading birds. Protocol surveys need to be conducted to determine if CRLF's are present or not.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs.
3. Maps with important habitat features and species locations

APPENDIX E. Permanente Aquatic Technical Report

Permanente Aquatic Technical Report
Lehigh Permanente Quarry

SANTA CLARA COUNTY, CALIFORNIA

Prepared For:
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EXECUTIVE SUMMARY

WRA, Inc. collected biological and physical data on Permanente Creek and Monte Bello Creek and their major tributaries within the 3,510-acre Lehigh Permanente Quarry property between January and May, 2009. WRA evaluated physical attributes that relate to habitat quality such as water temperature, frequency of riffles, runs and pools, channel width and depth, in-stream cover and substrate composition. WRA also inventoried fish, amphibian and invertebrate communities that rely on these watersheds using current accepted scientific methods.

The results of this study indicate the following:

- Overall physical habitat quality within Permanente and Monte Bello Creeks is high, and supports a diversity of benthic macroinvertebrates, a natural and diverse amphibian assemblage and a self-sustaining population of Rainbow Trout, notwithstanding historic and ongoing mining activities.

- Physical habitat quality in Permanente Creek varies depending on location. The upper reaches of Permanente Creek are largely unaltered and represent a perennial cold-watered stream with the highest diversity of benthic macroinvertebrates, a diverse amphibian assemblage and self-sustaining Rainbow Trout measured in this study. The middle reaches tend to be dry except for the wettest times of year and are too ephemeral to allow benthic macroinvertebrates to colonize, or for fish or amphibians to carry out phases critical to their life history. The lower reaches are marked by augmented flows in addition to groundwater-input base flows. The physical habitat in the lower reaches is altered from natural conditions, containing a trapezoidal concrete channel and in-stream sedimentation control ponds.

- Monte Bello Creek is not significantly altered within the Lehigh Permanente Quarry property. Monte Bello Creek supports a native amphibian assemblage whose densities increase along a gradient traveling in a downstream to upstream direction. Benthic macroinvertebrate sampling indicates that Monte Bello Creek supports a diverse community of aquatic insects throughout the watershed. No fish exist in Monte Bello Creek as a result of suspected downstream barriers. The Main Stem and South Fork of Monte Bello Creek are wholly perennial, and convey a majority of the surface flow through the system. The North Fork of Monte Bello Creek is ephemeral and intermittent, and during the wettest periods of the year contributes at most approximately 10% of the total surface water to the Main Stem.

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Table 1. Acronyms Used in Report

ASR	Aquatic Survey Reach
BMI	Benthic Macroinvertebrate
BRA	Biological Resource Assessment
CFS	Cubic Feet per Second
CRLF	California Red-legged Frog
CSBP	California Stream Bioassessment Procedure
LWD	Large Woody Debris
MASR	Monte Bello Aquatic Survey Reach
MBMI	Monte Bello Benthic Macroinvertebrate sampling location
MCS	Monte Bello Cross Section location
MFS	Monte Bello Fish Sample reach location
PASR	Permanente Aquatic Survey Reach
PBMI	Permanente Benthic Macroinvertebrate sampling location
PCS	Permanente Cross Section location
PFS	Permanente Fish Sample reach location
SHRM	California Department of Fish and Game California Salmonid Steam Habitat Restoration Manual
SL	Standard Length - fish measurement (tip of the snout to the posterior end of the last vertebra)

1.0 INTRODUCTION

From January through May 2009, WRA, Inc. performed an assessment of the aquatic resources within the Permanente Creek and Monte Bello Creek watersheds on the approximately 3,510 acre Lehigh Permanente Quarry property (Property), in Santa Clara County, California (Figure 1). The purpose of the assessment was to collect information on existing aquatic fauna, habitat, and physical parameters to determine the stream habitat quality within the Property.

This report describes the condition of the existing habitat, reports long term temperature data and the results of focused surveys for fish, amphibians and benthic macroinvertebrates. The study was conducted between January and May and represents the seasonal high-flow period in this system.

This aquatic assessment provides detailed information on the distribution of aquatic species and habitats within the Property. This assessment is not an official protocol level survey for listed species that may be required for project approval by local, state, or federal agencies. This assessment is based on information available at the time of the study and on site conditions that were observed during late winter and early spring of 2009.

Figures and graphs pertaining to the results section of this report will be referenced in the text and are appended to the end of this report in Appendix B. For the purpose of this study, Property refers to the approximately 3,510 acre Lehigh Permanente Quarry property, and the Study Area refers to aquatic stream habitat within the Lehigh Permanente Quarry property.

1.1 Study Area Description

The Study Area is comprised of aquatic stream habitats within the Lehigh Permanente Quarry property (including in-stream sedimentation basins) and tributaries that are capable of supporting aquatic life. The capability of supporting aquatic life is defined as any aquatic body that contains adequate flow or inundation for sufficient duration to allow aquatic organisms to access, occupy and complete a component of their lifecycle (i.e. spawning fish, metamorphosis of amphibian larvae, or colonization by aquatic invertebrates). Aquatic surveys were focused in areas, known through previous site visits, to be perennially wetted. Refer to the Biological Resource Assessment (BRA) prepared by WRA, Inc. (2010) for a more thorough description of the Lehigh Permanente property.

1.1.1 Permanente Creek

The headwaters of Permanente Creek originate to the west of the Study Area. It is fed through a series of springs and intermittent tributaries. Permanente Creek trends generally west to east, roughly through the center of the Property before turning north and flowing for approximately nine miles eventually emptying into San Francisco Bay. Approximately 5 miles (26,000 linear feet) of the main stem of Permanente Creek within the Property was included in the survey effort. The in-stream sedimentation basins labeled in Figures 2a and 2b as Pond 14, Pond 22, and Pond 13 are also included in this study. Several other sedimentation basins lie adjacent to Permanente Creek. These operational features collect runoff and discharge into Permanente

Creek when conditions are appropriate. Refer to the BRA for a more thorough description of Permanente Creek and the Lehigh Permanente Quarry property surrounding the creek.

A major tributary to Permanente Creek is Wild Violet Creek which drains a large portion of the southwest corner of the Property. Wild Violet Creek is ephemeral and intermittent for all but the northernmost 350 feet (closest to the confluence). No tributaries, save for Wild Violet Creek, are considered to be habitat for aquatic organisms. Generally, tributaries that drain into Permanente Creek are ephemeral and rarely convey surface flow except during high flow events.

1.1.2 Monte Bello Creek

Monte Bello Creek originates from an unverified water source (presumed to be a combination of irrigation runoff and natural seeps) to the south of the Property on the north side of Monte Bello Ridge. The main stem, also dubbed the "South Fork", flows northeast until it meets the "North Fork" which originates on the Property. The North Fork is largely intermittent and ephemeral. It contributes surface flow seasonally and is estimated to less than 10 percent of the overall flow at the confluence. From the confluence, the main stem is perennial and trends southeast until it leaves the Property and drains into a series of large, in-stream, detention basins on the neighboring property. Monte Bello Creek drains into Steven's Creek Reservoir which in turn empties into Steven's Creek which trends north along Highway 85 and out to San Francisco Bay through Mountain View.

Monte Bello Creek is not regulated within the Study Area, and it is not believed to be managed upstream of the Study Area. There are no access roads to or stream crossings of Monte Bello Creek within the Study Area. A historic road travels parallel to the creek along the south bank for a short distance near the downstream Study Area boundary, but had not been utilized by vehicle traffic in some years. Further assessment of Monte Bello Creek and the detention basins on the neighboring property was not performed because permission was not granted to access these areas by the land owner.

2.0 METHODS

Permanente Creek was broken into sixteen, 1,650 foot (500 meter) long Aquatic Survey Reaches (Figure 2a and 2b), beginning at the downstream (northeast) Study Area boundary (PASR1) and counting upstream incrementally to the upstream (west) edge of the Study Area.

Monte Bello Creek was broken into four, 1,650 foot (500 meter) Aquatic Survey Reaches (MASR 1-4), beginning at the downstream Study Area boundary (MASR1) and counting upstream along the main stem incrementally to the upstream extent within the Study Area.

The locations of sample points and survey reaches in relation to the Aquatic Survey Reaches can be found in Table 2, and Figures 2a, 2b, and 2c.

Table 2. Locations of Sample Points and Survey Reaches in Relation to Aquatic Survey Reaches.

Watershed	Aquatic Survey Reach Number	Hobo Loggers (HOBO)	Fish Sampling (PFS / MFS)	Benthic Macroinvertebrate (PMBI / MBMI)	Cross Sections (PCS / MCS)
Permanente	1	HOBO 4	PFS 1	PBMI 1	PCS 1, PCS 2, PCS 3, PCS 4
	2		PFS 2		
	3	HOBO 5		PBMI 2	PCS 5
	4		PFS 3, PFS 4		PCS 6
	5	HOBO 6	PFS 5		PCS 7, PCS 8
	6		PFS 6		PCS 9
	7		PFS 7	PBMI 3	PCS 10
	8	HOBO 7			PCS 11, PCS 12
	9				PCS 13
	10		PFS 8	PBMI 4	PCS 14
	11	HOBO 8			PCS 15
	12		PFS 9		PCS 16
	13				PCS 17

Watershed	Aquatic Survey Reach Number	Hobo Loggers (HOBO)	Fish Sampling (PFS / MFS)	Benthic Macroinvertebrate (PMBI / MBMI)	Cross Sections (PCS / MCS)
Monte Bello	1				
	2		MFS 1	MBMI 1	MCS 1
	3	HOBO 1	MFS 2		
	4	HOBO 2, HOBO 3		MBMI 2	MCS 2, MCS 3

2.1 Physical Habitat

2.1.1 Water Temperature

To determine water temperature conditions within Permanente and Monte Bello Creeks, five (5) digital data loggers (*HOBO Water Temp Pro v2*) were installed in Permanente Creek and three (3) more in Monte Bello Creek. Each logger was cased in a 6 inch section of 2 inch diameter PVC pipe with a butt-cap at one end. Each logger was sunk with a 2-pound weight and tethered to a fixed point using 16-gauge galvanized steel wire. Details of each loggers' placement is described below (Figure 2a, 2b, 2c).

The loggers ("Hobos") were calibrated and programmed to record water temperature at 30 minute intervals beginning on January 23, 2009. Data was uploaded from the loggers on May 28, 2009, however the loggers remain deployed to record thermal conditions during the hotter summer months. Daily averages were calculated from each location and graphed along with precipitation data and air temperature data recorded at a permanent weather station in Santa Clara, approximately 8 miles east of the Study Area. These data are presented in Section 3.1.1 below.

All eight water temperature logger locations are described below and shown in Figures 2a, 2b, 2c, and Table 2.

Hobo1: Monte Bello Creek - within MASR3 - approximately 3,950 feet (1,200 meters) upstream from the Property line.

Hobo2: Monte Bello Creek - within MASR4 - approximately 5,100 feet (1,550 meters) upstream from the Property line.

Hobo3: South Fork Monte Bello Creek - within MASR4 - approximately 5,900 feet (1,800 meters) upstream from the Property line (approximately 230 feet (70 meters) upstream from the confluence with North Fork Monte Bello Creek.
Hobo4: Permanente Creek - within PASR1 - at the confluence with the main stem Permanente Creek (Pond 14 diversion) and the Pond 14 outfall channel.
Hobo5: Permanente Creek - within PASR3 - immediately adjacent to the "Dinky Shed" - approximately 410 feet (125 meters) downstream of the Pond 9 outflow.
Hobo6: Permanente Creek - within PASR5 - approximately 70 feet (20 meters) downstream of the enclosed culvert.
Hobo7: Permanente Creek - within PASR8 - approximately 200 feet (60 meters) downstream of the Pond 4A outflow.
Hobo8: Permanente Creek - within PASR11 - approximately 460 feet (140 meters) upstream of the Kaiser Homestead.

2.1.2 Habitat Typing

Habitat typing surveys were conducted by two biologists in accordance with the methodology presented in the California Department of Fish and Game California Salmonid Stream Habitat Restoration Manual (SHRM). The inventory sampled approximately 10 percent of the habitat units within the surveyed length. All habitat units in the survey were classified by habitat type and their lengths were measured. Habitat types encountered for the first time were fully measured for all the parameters and characteristics and recorded on the SHRM habitat inventory form. Additionally, out of every ten habitat units listed on the field form, one is randomly selected to be fully measured. Because pool habitat tends to serve as a more important habitat feature for fish species, pools were measured for all the parameters and characteristics more frequently than the prescribed 10 percent protocol.

Four levels of classification used to describe physical fish habitat. Each higher level in the sequence includes more descriptive categories of habitat types. For this survey, habitat types were inventoried to a modified Level III/IV category. In a Level IV classification, which is the most thorough classification of stream habitat types listed in SHRM, there are a total of 24 unique habitat features used for the habitat inventory. A modified Level III/IV classifies the three major habitat units (riffle, pool, and flatwater) into:

- Riffle types are based off of surface gradient (riffle or cascade), with riffles categorized by gradient and cascades categorized by gradient and substrate type;
- Pool types are based off their location in the stream channel (main channel and lateral scour) and their cause of formation (plunge and step pools);
- Flatwater was only characterized as a run.

To reduce the complexity of the habitat analysis and to prevent significant variation if additional habitat typing surveys are performed in later years, only nine of the 24 unique habitat features were used. The main reduction in habitat units used in this survey was due to the simplification of pool type classification (using only four of 15 types) and using only one of five flatwater habitat types.

There are eleven components to the SHRM inventory form:

Flow and Water Quality - collected concurrently, and presented in a separate report entitled Hydrologic Investigation (Golder Associates, May 2010).

Channel Type - conducted according to the classification system developed and revised by David Rosgen (1994). Methodology is described in the SHRM.

Temperatures - water and air temperatures were measured and recorded every tenth habitat unit while habitat typing.

Habitat Unit Type - uses the 24 habitat classification types defined by in the SHRM. As previously described, only nine of the 24 habitat types were utilized for this survey.

Embeddedness - the depth of cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment.

Shelter Rating - composed of those elements within a stream channel that provide juvenile salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition for prey.

Substrate Composition - ranges from small silt/clay to large boulder and bedrock elements.

Canopy - recorded using modified handheld spherical densiometers as described in the SHRM.

Bank Composition and Vegetation - dominant types of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was recorded.

Large Woody Debris Count - all pieces partially or entirely below the elevation of bankfull discharge are counted and recorded.

Average Bankfull Width - measured and recorded at the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units). These widths are presented as an average for the channel type reach.

2.2 Fish Assemblage

Several methodologies were employed to determine the fish assemblage within the Permanente and Monte Bello watersheds. Fish assemblage is defined as a group of fish species contained within a given water body. Permanente Creek was surveyed using fish sample reaches, snorkel surveys, and incidental observations. Monte Bello Creek was surveyed using fish sample reaches, stream bank observations and incidental observations. The following methods are outlined below, with the exception of incidental detections which are defined in section 2.5.

2.2.1 Fish Sampling

Two biologists conducted seine net sampling within a total of eleven (11) fish sample reaches created within Permanente and Monte Bello Creek. Nine (9) fish sample reaches were established on Permanente Creek and two (2) fish sample locations on Monte Bello Creek, see Figures 2a, 2b and 2c.

Each fish sample reach covered approximately 100 feet (31 meters), and sampled various habitat features that were inventoried during the habitat typing survey (i.e. pool, riffle, run). Block nets were placed upstream and downstream of the sample reach to contain fish within the reach, then two biologists sampled the reach using a seine net (10'x4'x1/8"). If geomorphic or in-stream cover prevented the seine net from being hauled, a modified "kick down" method was employed. Two sampling efforts took place on February 11 and 12 and May 6, 7 and 12, were completed in both watersheds to sample fish across varying flow conditions.

Number of individuals, species and relevant physiological data was recorded. All measurements of fish were taken in standard length (SL) as defined by Murphy and Willis (1996). Size classes are defined based on the Moyle (2002) description of average growth rates of Rainbow Trout in coldwater streams; with fry measuring less than two inches SL, juveniles measuring two inches to 4.7 inches SL, and adults measuring greater than 4.7 inches SL.

2.2.2 Snorkel Survey

A snorkel survey (fish count) was conducted once peak flows had receded. On Permanente Creek, reaches PASR1 through PASR8 were surveyed on April 14 and 15; reaches PASR10 through PASR12 were surveyed on April 22, 2009. PASR9 was not surveyed due to the extensive dry portion within this reach and the shallow depths that dominated this low gradient section. Two biologists followed a modified Hankin-Reeves methodology which classifies the streams into a number of habitat types and then randomly samples each habitat type (Koehler 2005). Habitat type classification was conducted prior to the snorkel survey, and was outlined in section 2.1.2. Stream reaches within the Permanente and Monte Bello watersheds with suitable habitat were surveyed beginning at the downstream Study Area boundary moving upstream, with the recording biologist trailing behind the primary observer. A minimum of 328 feet (100 meters), or 20 percent of each ASR, was surveyed. Surveys were concluded when fish were no longer observed, the stream channel went dry, a barrier to spawning migration was reached, or the Study Area boundary was reached.

Fish numbers were standardized to the average distance surveyed in each ASR and the resulting enumeration and composition data are presented in Section 3.2.2 below.

2.2.3 Stream Bank Observation

A stream bank observation was utilized in the Monte Bello Creek watershed as an alternative to the snorkel surveys described above. This methodology was chosen due to the shallow water condition within Monte Bello Creek. This survey was carried out concurrently with the Permanente Creek snorkel survey to determine the presence or absence of fish within Monte Bello Creek. Two biologists followed the SHRM methodology by walking the length of all ASRs

within Monte Bello Creek and scanning for fish visually while wearing polarized glasses. Based of the SHRM, this methodology of observation of fish from the stream bank or other vantage point is a commonly used technique to determine presence or absence of fish.

2.3 Amphibians

A tandem double observer nocturnal visual encounter survey (VES) methodology was used to survey for amphibians within suitable aquatic habitats within the Study Area.

Permanente and Monte Bello Creeks were divided into 1,650 foot (500 meter) Aquatic Survey Reaches (PASR and MASR respectively). Each reach was walked at least once. The primary observer used a combination of head-lamp and flashlight to identify animals within the stream and immediately adjacent banks. The secondary observer would follow the primary observer and record data as well as scan the banks of the stream within and up to 16 feet (5 meter) of the stream edge. Each animal was identified to species, lifestage, and sex (if possible).

Two nocturnal VES surveys were conducted in order to account for various species differences in breeding behavior and ecological requirements. The first VES series was conducted on February 24, 25, and March 3, 2009. Surveys began one hour after sunset and concluded at least one hour before sunrise. Alternating “odd numbered” reaches were walked during the first survey series (MASR1, MASR3, PASR1, PASR3, PASR5, etc.). The second VES series was conducted on May 12, 13, and 14, 2009. Similarly to the first surveys, opposite alternating “even numbered” reaches were walked (MASR2, MASR4, PASR2, PASR4, PASR6, etc.). PASR1 was surveyed during both VES series, on February 24 and again on May 12, 2009. At the start of VES surveys, PASR1 was the only reach within the Study Area known to be inhabited by Federally Threatened California Red-legged Frog (CRLF); (*Rana draytonii*). As such, the surveys were structured to capture both the presence of CRLF in various lifestages. Yellow Creek and Wild Violet Creek were not included in VES surveys, however incidental observations from these tributaries are shown in Tables 11 and 12.

The number of detections made during VES were standardized to 100 minutes of survey effort per 1,650 (500 meter) survey reach. Standardized detections were rounded to the nearest whole non-zero number (e.g. 0.4 detections = 1 detection).

2.4 Benthic Macroinvertebrates

Between April 14, 2009 and April 16, 2009, WRA Biologists collected 18 benthic macroinvertebrate samples (BMI) at six sites (four sites along Permanente Creek and two sites along Monte Bello Creek) in accordance with the California Stream Bioassessment Procedure (CSBP 2003) for non point source assessments. The CSBP is a regional adaptation of the national U.S. Environmental Protection Agency's (EPA) Rapid Bioassessment Protocols for wadeable streams (Barbour et al. 1999), authored by the California Department of Fish and Game.

2.4.1 Physical Habitat Quality

The physical habitat was scored at each BMI sample location. Ten (10) parameters were scored according to the descriptions in Barbour et al. (1999):

Epifaunal substrate/available cover - the relative quantity and variety of natural structures in the stream, such as cobble (riffles), large rocks, fallen trees, logs and branches, and undercut banks, available as refugia, feeding, or sites for spawning and nursery functions of aquatic macrofauna.

Embeddedness - the extent to which rocks (gravel, cobble, and boulders) and snags are covered or sunken into the silt, sand, or mud of the stream bottom.

Velocity/Depth Combinations - included for high-gradient streams under this parameter as an important feature of habitat diversity.

Sediment Deposition - the amount of sediment that has accumulated in pools and the changes that have occurred to the stream bottom as a result of deposition.

Channel Flow Status - the degree to which the channel is filled with water.

Channel Alteration - Channel alteration is a measure of large-scale changes in the shape of the stream channel.

Frequency of Riffles or Bends - a way to measures the the heterogeneity occurring in a stream.

Bank Stability -a measure of whether the stream banks are or have the potential to eroded.

Bank Vegetative Protection - a measure of the amount of vegetative protection afforded to the stream bank and the near-stream portion of the riparian zone.

Riparian Vegetative Zone Width - requires measures the width of natural vegetation from the edge of the stream bank out through the riparian zone.

2.4.2 Benthic Macroinvertebrates

BMI samples were collected from six sites. At each site, three randomly chosen transects running perpendicular to the flow of the stream were sampled. Three locations representing the habitats along the transect were sampled within a 2 ft area upstream of a 1 ft wide D-frame kick-net with 0.5 mm mesh. The duration of sampling ranged from 60-120 seconds, depending on the amount of boulder and cobble-sized substrates that required rubbing by hand. This composite sample was transferred into a wide-mouth jar containing alcohol as a preservative.

All six sample locations are described below and are shown in Figures 2a, 2b, and 2c and Table 2.

PBMI 1: Permanente Creek - Pond 14 diversion. Approximately 200 feet upstream from the Property Boundary.
PBMI 2: Permanente Creek - Downstream of the Rock Plant
PBMI 3: Permanente Creek - Approximately 1000 feet downstream of Pond 4A discharge.
PBMI 4: Permanente Creek - Approximately 300 feet upstream of the Kaiser Homestead.

MBMI 1: Monte Bello Creek - Approximately 2500 feet upstream of the Property boundary
MBMI 2: Monte Bello Creek - Approximately 200 feet downstream of the South Fork - North Fork confluence.

All BMI samples remained under the custody of WRA and were processed by WRA biologists. Organisms were removed from the sample and placed in a petri dish for identification under a stereomicroscope. All invertebrates were separated from the surrounding detritus and transferred to vials containing 70 percent ethanol. BMIs were then identified to a standard taxonomic level, typically family level for arthropods and order or class for non-arthropods using standard taxonomic keys (McCafferty 1999, Merritt and Cummins 1996, Voshell 2002).

A description of the biological metrics used to describe characteristics of the BMI community is shown in Table 3 below. Some of the biological metrics are used universally and some are more regional having evolved over recent years of use in California streams. They have been categorized into the following types (Barbour et al. 1999):

Richness Measures - reflects the taxonomic diversity of the aquatic assemblage where increasing diversity correlates with increasing health of the assemblage and suggests that niche space, habitat and food sources are adequate to support survival and propagation of a variety of species.

Composition Measures - reflects the relative contribution of the population of individual taxa to the total fauna.

Tolerance/Intolerance Measures - reflects the relative sensitivity of the community to aquatic perturbations. The taxa used are usually pollution tolerant and intolerant, but are generally nonspecific to the type of stressors. Percent Hydropsychid Cassidflies and Baetid mayflies are regional metrics that have evolved to be particularly useful in California. The metric values usually increase as the effects of pollution in the form of organics and sedimentation increases.

Functional Feeding Groups - provides information on the balance of feeding strategies in the aquatic assemblage. The functional feeding group composition is a surrogate for complex processes of trophic interaction, production and food source availability.

Table 3. Bioassessment metrics used to describe characteristics of the benthic macroinvertebrate (BMI) community collected from Permanente and Monte Bello Creeks.

Biological Metric	Description
Richness Measures	
Taxa Richness	Total number of individual taxa
EPT Taxa	Number of taxa in the Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly) insect orders
Ephemeroptera Taxa	Number of mayfly taxa (families)
Plecoptera Taxa	Number of stonefly taxa (families)

Trichoptera Taxa	Number of caddisfly taxa (families)
Composition Measures	
EPT Index	Percent composition of mayfly, stonefly and caddisfly larvae.
Modified EPT Index	EPT Index minus the more tolerant Hydropsychids and Baetids.
Shannon Diversity Index	General measure of sample diversity that incorporates richness and evenness (Shannon and Weaver 1963)
Tolerance/Intolerance Measures	
Tolerance Value	Value between 0 and 10 weighted for abundance of individuals designated as pollution tolerant (higher values) and intolerant (lower values)
Percent Intolerant Organisms	Percent of organisms in sample that are highly intolerant to impairment as indicated by a tolerance value of 0, 1 or 2
Percent Tolerant Organisms	Percent of organisms in sample that are highly tolerant to impairment as indicated by a tolerance value of 8, 9 or 10.
Percent Hydropsychidae	Percent of organisms in the caddisfly family Hydropsychidae.
Percent Baetidae	Percent of organisms in the caddisfly family Baetidae
Percent Dominant Taxa	Percent composition of the single most abundant taxon
Functional Feeding Groups	
Percent Gatherer - Collectors	Percent of macrobenthos that collect or gather fine particulate matter.
Percent Filterers - Collectors	Percent of macrobenthos that filter fine particulate matter.
Percent Scrapers	Percent of macrobenthos that graze upon periphyton*.
Percent Predators	Percent of macrobenthos that feed on other organisms.
Percent Shredders	Percent of macrobenthos that shreds coarse particulate matter.
*Periphyton is a complex mixture of algae, cyanobacteria, heterotrophic microbes, and detritus that is attached to submerged surfaces in most aquatic ecosystems.	

2.5 Incidental Detections

In the course of conducting surveys, detections of non-target species were recorded, including several species that were not detected in the course of the targeted surveys. These incidental detections are presented and described in Section 3.2 and 3.3 below.

3.0 SURVEY RESULTS

The following sections describe the results of the studies outlined in section 2.0 above.

3.1 Physical Results

3.1.1 Water Temperature

Water temperature is a critical component of defining suitable habitats for fish, amphibians and benthic macroinvertebrates. Thermal thresholds for Rainbow Trout as described by Moyle (2002) were used to assess temperature suitability for juvenile Rainbow Trout rearing habitat.

Permanente Creek

Water temperature monitoring indicated widely varying temperature conditions between the 5 Hobo locations within Permanente Creek. Hobo location 7 (Hobo7) recorded both thermal extremes within Permanente Creek. The maximum daily temperature recorded in the creek was 24°C (75°F), and the minimum daily temperature recorded in the creek was 3.9°C (39°F).

Figure 3 shows the mean daily temperatures at five (5) Hobo locations along Permanente Creek overlaid with atmospheric data collected at California Weather Database Station CIMIS #69 in San Jose, California.

Monte Bello Creek

Water temperature monitoring indicated relatively uniform temperature conditions across the three Hobo locations in Monte Bello Creek. Maximum daily temperature recorded in the creek was 16.4°C (61.5°F) at station HOBO2 and the minimum daily temperature recorded was 5.4°C (41.7°F) also at station HOBO2.

Figure 4 shows the mean daily temperatures at three Hobo locations along Monte Bello Creek overlaid with atmospheric data collected at California Weather Database Station CIMIS #69 in San Jose, California.

3.1.2 Habitat Typing

Permanente Creek

The habitat inventory of Permanente Creek took place from April 6 though April 8 and on April 15, 2009. 21,410 feet (6,527 meters) of Permanente Creek was typed beginning at the downstream Property boundary working upstream. Habitat typing was concluded at the confluence of Permanente and Wild Violet Creeks. The habitat inventory took place between PASR1-PASR13. PASR14 and above were considered uninhabitatable to fish species and provided only marginal habitat for amphibian species.

Rosgen channel typing was conducted by the URS Corporation (URS) as part of their geomorphic survey, conducted during the same 2009 survey period. In total, 16 cross sections were taken. Rosgen channel type for PASR1-PASR13 is provided in Table 4.

Table 4. Rosgen Channel Types for Permanente Aquatic Survey Reaches, Provided by URS

Aquatic Survey Reach	Total Length (ft)	Rosgen Channel Type(s)***	Comments
PASR1	2,103.2*	G4, F4	Includes Side Channel below Pond 14 and Pond 14
PASR2	1,640.4	N/A	Concrete lined channel
PASR3	1,640.4	A4	
PASR4	1,640.4	A4	
PASR5	1,640.4	B4c, A3	
PASR6	1707.3**	A3	
PASR7	1640.4	B2a	
PASR8	1640.4	B3	
PASR9	1640.4	B3/B3a, B4c	
PASR10	1640.4	D4/6	Gravel and silt/clay are the dominant substrate
PASR11	1640.4	A4	
PASR12	1640.4	B4	
PASR13	1640.4	A4	

* - PASR1 has a side channel (length 462.8 ft) incorporated in the survey reach.
**- PASR6 has a side channel (length 66.9 ft) incorporated in the survey reach.
***Rosgen Channel Types:

- A = steep, narrow, cascading, step-pool, high energy debris transporting and usually associated with depositional soils.
- B = moderately entrenched, riffle dominated, infrequently spaced pools, very stable plan and profile, stable banks, moderate gradients and low width-to-depth ratios.
- C = low gradient, meandering, point-bar, riffle/pool, alluvial, broad a well defined floodplain.
- D = multiple channels with longitudinal and transverse bars, very wide with eroding banks.
- F = highly entrenched, meandering riffle/pool, low gradient with a high width-to-depth ratio.
- G = entrenched "gully" step-pool dominated, moderate gradients with low width-to-depth ratios.

Channel types that have a substrate classification number of six associated with them are dominated by bedrock. A two depicts boulder dominated substrate, three indicates a primarily cobble dominated system and a four channel type exhibits gravel as the primary substrate.

Additionally, a channel type that has a lower case letter following the substrate classification number indicates that the reach exhibits some of the characteristics of that category type.

Temperature

Water temperatures taken by field crews during the habitat typing survey period ranged from 7.5° to 16°C (46° to 61°F), and air temperature ranged from 9.5° to 25°C (49° to 77°F).

Habitat Unit Type

The frequency of Level II habitat type occurrences along Permanente Creek amount to 35 percent pool units, 20 percent flatwater units, 40 percent riffle units, 4 percent culvert units and 1 percent dry units (Figure 5). Based on the total length of this survey, Level II habitat units consist of 17 percent pool units, 29 percent flatwater units, 37 percent riffle units, 8 percent culvert units and 9 percent dry units (Figure 6).

Nine (9) level IV habitat types were identified and used. The most abundant habitat types (by frequency of occurrence) were 21 percent Low Gradient Riffle units, 20 percent Run units, and 17 percent Mid-Channel Pool units (Figure 7). The dominant habitat types (by total length) were Run units (29 percent), Low Gradient Riffle units (22 percent), and High Gradient Riffle units (13 percent).

Ninety-six pools were identified along Permanente Creek. Main channel pools comprised 71.9 percent of pools encountered with scour pools making up the remaining 28.1 percent (Figure 8). Main channel pools comprise 83 percent of the total length of all pools. Permanente Creek pools are relatively shallow, with only 1 of the 31 (3 percent) pools measured having a depth of two feet or greater.

Shelter Rating

Shelter ratings for each habitat unit is expressed using a scale from 0-300. A pool with a shelter rating of 100 is desirable. Riffle habitats had a mean shelter rating of 72, flatwater habitats had a mean shelter rating of 47, and pool habitats had a mean shelter rating of 133. Of the pool types, main channel pools had a mean shelter rating of 118 and scour pools had a mean shelter rating of 172.

Within Permanente Creek on a whole, bubble curtains provide the dominant in-stream cover, and the second most dominant form of cover for the creek is terrestrial vegetation. Figure 9 details pool cover composition along Permanente Creek.

Substrate Composition

Table 5 summarizes dominant substrates by habitat type. Figure 10 depicts the dominant substrate observed in pool tail-outs.

Table 5. Dominant Substrates By Habitat Type in Permanente Creek

Habitat Type*	Total Habitat Units	Habitat Units Fully Measured	Percent Total Dominant						
			Silt/Clay	Sand	Gravel	Small Cobble	Large Cobble	Boulder	Bedrock/ Calcified Substrate
Low Gradient Riffle (LGR)	57	14	0	7	21	36	0	0	36
High Gradient Riffle (HGR)	45	12	0	0	25	25	8	0	42
Cascade (CAS)	8	5	20	20	0	0	0	20	40
Bedrock Sheet (BRS)	1	1	0	0	0	0	0	0	100
Run (RUN)	55	16	31	0	50	6	0	0	13
Mid-channel Pool (MCP)	48	18	17	22	28	11	0	0	22
Step Pool (STP)	21	6	0	33	33	0	0	0	33
Corner Pool (CRP)	3	0	0	0	0	0	0	0	0
Plunge Pool (PLP)	24	9	11	11	33	22	0	0	22
Culvert (CUL)	12	0	0	0	0	0	0	0	0
*Dry sections of the creek are not incorporated in this table.									

Canopy

The mean percent canopy cover along the surveyed length of Permanente Creek was 77 percent. Hardwood trees comprise 100 percent of the canopy cover along Permanente Creek (Figure 11). On average, 23 percent of the canopy along Permanente Creek was described as open. Individual reach analysis for inventoried habitat features for Permanente Creek is provided in Appendix A.

Monte Bello Creek

The habitat inventory of Monte Bello Creek took place from April 6 though April 8 and on April 15, 2009. 6,674 feet (2,034 meters) of Monte Bello Creek was typed beginning at the downstream Study Area boundary and working upstream. Rosgen channel typing was

completed at three cross section locations by WRA. The results of the Rosgen typing and how they pertain to the aquatic survey reaches is provided in Table 6.

Table 6. Rosgen Channel Types for Monte Bello Aquatic Survey Reaches

Aquatic Survey Reach	Total Length (feet)	Rosgen Channel Type(s)*	Comments
MASR1	1,640.4	B4	
MASR2	1,640.4	B4	
MASR3	1,640.4	A2/B2	Channel type A characteristics except for greater width-to-depth ratio typical of B.
MASR4	1,743.1	B1/A1	Channel type B characteristics except higher gradient slope typical of A.

*Rosgen Channel Types:
- A1/A2 = steep, narrow, cascading, step-pool, high energy debris transporting and usually associated with depositional soils and boulder or bedrock dominated substrate.
- B = moderately entrenched, riffle dominated, infrequently spaced pools, very stable plan and profile, stable banks, moderate gradients and low width-to-depth ratios with gravel or bedrock dominated substrate.

Temperature

Water temperatures taken by field crews during the habitat typing surveys ranged from 8° to 10°C (48° to 50°F), and air temperature ranged from 10.5° to 12°C (51° to 54°F).

Habitat Unit Type

The Level II habitat occurrence frequency within Monte Bello Creek amounted to 19 percent flatwater units, 41 percent riffle units, 41 percent pool units (Figure 12). Based on total length of Level II habitat types, 21 percent were flatwater units, 43 percent were riffle units and 36 percent were pool units (Figure 13).

Seven level IV habitat types were identified in Monte Bello Creek. The most abundant habitat types (by frequency of occurrence) were high gradient riffle units (28 percent), run units (19 percent), and plunge pool and step pool units (14 percent) (Figure14). The dominant habitat types (by percent total length) high gradient riffle units (34 percent), step pool units (21 percent) and run units (20 percent).

Sixty (60) pools were identified along Monte Bello Creek. Main channel pools were most abundant at 65 percent frequency, and comprising 75 percent of all pools by length (Figure 15). Monte Bello pools are relatively shallow, with only 1 of 18 (6 percent) pools measured for depth having a depth of two feet or greater.

Shelter Rating

Shelter ratings for each habitat unit is expressed using a scale from 0-300. A pool with a shelter rating of 100 is desirable. Riffle habitat types had a mean shelter rating of 37, flatwater habitat types had a mean shelter rating of 13, and pool habitat had a mean shelter rating of 80. Main channel pools had a mean shelter rating of 66; scour pools had a mean shelter rating of 98.

Within Monte Bello Creek, bubble curtains are the dominant cover type, and the second most dominant for of cover within Monte Bello Creek is boulders. Figure 16 details pool cover types in Monte Bello Creek.

Substrate Composition

Table 7 summarizes dominant substrates by habitat type. Gravel was observed in 52 percent of pool-tail outs, and sand was observed in 29 percent of pool-tail outs (Figure 17).

Table 7. Summary of Dominant Substrates by Habitat Type in Monte Bello Creek

Habitat Type	Total Habitat Units	Habitat Units Fully Measured	Percent Total Dominant						
			Silt/Clay	Sand	Gravel	Small Cobble	Large Cobble	Boulder	Bedrock
Low Gradient Riffle (LGR)	8	3	0	33	33	33	0	0	0
High Gradient Riffle (HGR)	42	7	0	29	57	0	0	14	0
Cascade (CAS)	10	4	0	25	50	0	0	25	0
Run (RUN)	28	6	0	50	50	0	0	0	0
Mid-channel Pool (MCP)	19	5	0	80	20	0	0	0	0
Step Pool (STP)	20	5	0	40	60	0	0	0	0
Plunge Pool (PLP)	21	8	0	38	50	0	0	0	13

Canopy

The mean percent canopy cover for the surveyed length of Monte Bello Creek was 84 percent. Hardwood trees comprise 100 percent of the canopy cover along Monte Bello Creek. On average, 16 percent of the canopy along Monte Bello Creek was described as open. Figure 18 describes the canopy cover along Monte Bello Creek. Individual reach analysis for inventoried habitat features for Monte Bello Creek is provided in Appendix A.

3.2 Fish Assemblage Results

3.3.1 Fish Assemblage

Permanente Creek

Fish assemblage data for Permanente Creek was compiled from two fish sample surveys, a snorkel survey and incidental observations recorded during the reconnaissance, habitat typing, and two amphibian focused VES. A total of three fish species were documented within the surveyed reaches of Permanente Creek during the duration of this study; Rainbow Trout (*Oncorhynchus mykiss*), Sacramento Sucker (*Catostomus occidentalis*), and Western Mosquito Fish (*Gambusia affinis*).

Table 8 shows observed species according to ASR and rough species distribution within the Study Area. Solid squares represent species that were detected in a given reach during the fish assemblage survey which includes the fish sample reaches and the snorkel survey. Open squares represent detections that were made in a given reach in the course of performing non-fish focused surveys (i.e. habitat typing).

A survey conducted by URS in 2000 documented Rainbow Trout and Threespine Stickleback (*Gasterosteus aculeatus*) within Permanente Creek. That survey coincided with dewatering of Ponds 13 and 22 for maintenance purposes. Rainbow Trout ranging from 3.5 to 12 inches were recorded during that survey. URS also noted that upstream of Pond 13 (the area referenced in this report as PASR10 and PASR11) a greater diversity of Rainbow Trout age groups were present compared to other sections of the creek. These reaches are also where Threespine Stickleback were documented. However, this species was not observed during the course of this study. URS concluded that Permanente Creek supports a small self-sustaining population of resident native coastal Rainbow Trout, which is consistent with the findings of this study.

Refer to the BRA which discusses the potential for Steelhead in detail. The results of that assessment determined that Steelhead are unlikely to occur due to downstream barriers to upstream migration. Therefore, Rainbow Trout within the Study Area are not the Federally Threatened Steelhead which are anadromous.

Table 8. Presence of Fish Species by Reach in Permanente and Monte Bello Creeks.

Watershed		Permanente													Yellow Creek	Violet Wild Creek	Monte Bello			
Aquatic Survey Reach Number		1	2	3	4	5	6	7	8	9	10	11	12	13	1	1	1	2	3	4
Rainbow Trout *Oncorhynchus mykiss*	Adult	■	■	■				□		■	■	■	■	□						
	Juvenile	■		□			□			■	■	■	□							
	Fry										■	□	■	□						
Sacramento Sucker *Catostomus occidentalis*		■	□																	
Western Mosquitofish *Gambusia affinis*		■																		

■ - Positive detection made during Fish Assemblage Surveys
□ - Incidental Detection

Monte Bello Creek

Fish were surveyed for in Monte Bello Creek by conducting two rounds of fish sample surveys, a stream bank survey and the compilation of incidental observations recorded during reconnaissance, habitat typing, and two focused amphibian VES. No fish were observed within Monte Bello Creek in the Study Area. Because all survey method results were negative for fish, no fish assemblages are present in Monte Bello Creek.

3.2.1 Fish Sampling

Permanente Creek

Two sampling events took place at the 9 fish sample reaches within Permanente Creek on February 12 and May 5, 2009. The results the fish sample surveys are presented in Table 9 and Figure 19. Size classes of Rainbow Trout captured during fish sampling are provided in Table 10 and graphically in Figure 20. Figure 21 shows the age class breakdown of Rainbow Trout as percent of total catch.

Table 9. Permanente Creek Fish Sample Results.

Fish Sample Reach (PASR)	Date	Species	Number	Size Class*	Time	Water Temp (°C)	Air Temp (°C)	Reach Length (ft.)
PFS1 (PASR1)	2/12/09	Rainbow Trout	1	A	1030	9	7.5	100
		Rainbow Trout	3	J				
		Sacramento Sucker	3	4.5", 2 x6"				
	5/6/09	Rainbow Trout	1	A	1100	10.5	21	100
PFS2 (PASR2)	2/12/09	-	-	-	1200	10	10	130
	5/6/09	-	-	-	1220	16	26	130
PFS3 (PASR4)	2/12/09	-	-	-	1330	12.5	9	125
	5/6/09	Rainbow Trout	1	A	1300	16.5	24	125
PFS4 (PASR4)	2/12/09	-	-	-	1400	N/A	9	N/A
	5/6/09	-	-	-	1415	18	25	100
PFS5 (PASR5)	2/12/09	-	-	-	1430	7.5	9	100
	5/6/09	-	-	-	1500	18	23	100
PFS6 (PASR6)	2/12/09	-	-	-	1520	9	9	100
	5/6/09	-	-	-	1600	18	22	100
PFS7 (PASR7)	2/12/09	-	-	-	1620	8.5	7	100
	5/7/09	-	-	-	1530	18.5	21	100
PFS8 (PASR10)	2/11/09	Rainbow Trout	1	A	1340	9	6	130
		Rainbow Trout	1	F				
		Rainbow Trout	1	J				
	5/13/09	-	-	-	1700	12	24	130
PFS9 (PASR12)	2/11/09	Rainbow Trout	3	F	1605	8.5	-	100
		Rainbow Trout	1	J				
	5/13/09	Rainbow Trout	3	J	1730	11	21	100
		Rainbow Trout	1	A				

*Size Class F = Fry J = Juveniles A = Adults

3.2.2 Snorkel Surveys

Snorkel survey results are presented in Table 10 and Figure 22. Size classes of observed Rainbow Trout during the snorkel survey are provided graphically in Figure 23. Figure 24 provides the age class breakdown of Rainbow Trout observed based on the percent total detections.

Table 10. Permanente Creek Snorkel Survey Results.

Reach	Length Surveyed (ft)	Species	Rainbow Trout			Other Fish	Standardized Number*
			Fry (< 2" SL)	Juvenile (2 - 4.7" SL)	Adult (>4.7" SL)		
PASR1 - Side Channel and Pond 14	154	Sacramento Sucker	-	-	-	1	3
		Mosquito Fish	-	-	-	25	71
PASR1	557.6	Rainbow Trout	0	2	6	-	6
		Sacramento Sucker	-	-	-	4	3
PASR2	360.8	Rainbow Trout	0	0	0	-	0
PASR3	249.3	Rainbow Trout	0	0	1	-	2
PASR4	328	Rainbow Trout	0	0	0	-	0
PASR5	328	Rainbow Trout	0	0	0	-	0
PASR6	415	Rainbow Trout	0	0	0	-	0
PASR7	328	Rainbow Trout	0	0	0	-	0
PASR8	437	Rainbow Trout	0	0	0	-	0
PASR9	0	Rainbow Trout	NA	NA	NA	NA	NA
PASR10	564	Rainbow Trout	0	5	2	-	6
PASR11	894	Rainbow Trout	0	5	17	-	11
PASR12	987	Rainbow Trout	0	5	5	-	5
PASR13	246	Rainbow Trout	0	0	3	-	5
PASR14	328	Rainbow Trout	0	0	0	-	0
* Standardized number of fish observed for the mean 440 ft snorkel survey distance.							

3.3 Amphibian Results

Section 3.3.1 presents amphibian presence and distribution within Permanente and Monte Bello Watersheds including detections during focused surveys and incidentally. Section 3.3.2 presents the results of the VES including distribution and relative density by ASR.

3.3.1 Amphibian Assemblage

Table 11 presents the observed aquatic amphibian species by reach. Aquatic amphibian species are those species whose life history requires aquatic habitat in order to complete their lifecycle. Table 12 presents the observed terrestrial amphibian species by reach. Terrestrial amphibian species are those that do not require aquatic habitats to complete their life cycle. Each of the terrestrial species below are in the family Plethodontidae, or lungless salamanders.

The following tables show which species were observed in each ASR. Solid squares represent species that were detected in a given reach during the course of nocturnal VES. Open squares represent incidental detections that were made in a given reach in the course of performing non amphibian focused surveys (i.e. habitat typing).

Only one special-status amphibian species was detected during the course of this study. The Federally Threatened California Red-legged Frog (*Rana draytonii*; CRLF) was first documented within the Study Area during a field survey conducted by Radian International in September 1997. This survey recorded four CRLF utilizing a pond approximately 100 feet due north from the Pond 14 diversion gate. This pool, described as being approximately five feet long by 10 feet wide and approximately three feet deep, has since been breeched by channel scour and no longer holds water.

Subsequent surveys conducted by URS in 2000 and Rana Resources in 2006, 2007 and 2008 have documented CRLF occupying Ponds 14 and 22. The results of the present study are consistent with recent reports prepared by Rana Resources (2006a, 2006b, 2007, 2008a, 2008b, 2008c). Within PASR1, CRLF adults, egg masses and larvae were detected in Pond 14. CRLF adults were observed in Pond 22, although no signs of breeding were observed in Pond 22 during the 2009 breeding period. Furthermore the channel associated with the Pond 14 outfall contains one pool that is nearly 3 feet deep. CRLF adults were consistently observed in this pool. CRLF larvae were also observed in the section of stream below Pond 14 to the confluence, including the plunge pool below the Pond 14 diversion gate and the aforementioned pool. These larvae are believed to have been washed down from Pond 14, and are not believed to represent breeding occurring in this section of stream. No CRLF were documented in any other Aquatic Survey Reach.

On May 7, 2009, WRA biologists documented a single sub-adult CRLF within the Monte Bello Creek Watershed, approximately 2,800 feet (850 meters) upstream from the Property boundary. The frog was in the uplands approximately 17 feet (5 meters) away from the stream channel on the south bank. A detailed CRLF habitat assessment of Monte Bello Creek was prepared by Dr. Mark Jennings of Rana Resources and is appended to WRAs Biological Resources Assessment report as Appendix D.

Table 11. Presence of Aquatic Amphibian Species by Reach and Lifestage.

Watershed		Permanente													Yellow Creek	Violet Wild Creek	Monte Bello			
Aquatic Survey Reach Number		1	2	3	4	5	6	7	8	9	10	11	12	13	1	1	1	2	3	4
California Red-legged Frog *Rana draytonii*	Adult	■																□		
	Larvae	■																		
	Egg	■																		
Pacific Tree [=Chorus] Frog *Hyla [=Pseudacris] regilla*	Adult	■		■		■	■						■							
	Larvae	■																		
California Giant Salamander *Dicamptodon ensatus*	Adult							■				□	■				■	□		■
	Larvae						■				■	■	■	■	□	□	■	■	■	■
California Newt *Taricha tarosa*	Adult	■		□		■	■	■	■	■	■	■	■	■	□	□	□	■		■
Rough-skinned Newt *Taricha granulosa*	Adult				■	■	■	■	■	■	■	■	■	■				■	■	■

Watershed		Permanente													Yellow Creek	Violet Wild Creek	Monte Bello			
Aquatic Survey Reach Number		1	2	3	4	5	6	7	8	9	10	11	12	13	1	1	1	2	3	4
Western [=Boreal] Toad *Bufo [=Anaxyrus] boreas*	Adult	□																		
	Larvae	■																		

■ - Positive detection made during Visual Encounter Surveys □ - Incidental Detection

Table 12. Presence of Terrestrial Amphibian Species by Reach

Watershed	Permanente													Yellow Creek	Violet Wild Creek	Monte Bello			
Aquatic Survey Reach Number	1	2	3	4	5	6	7	8	9	10	11	12	13	1	1	1	2	3	4
Ensatina Salamander *Ensatina eschscholtzii*	■						■				■	□				■			
Arboreal Salamander *Aneides lugubris*							□												
California Slender Salamander *Batrachoseps attenuatus*	■										■						□	□	■

■ - Positive detection made during Visual Encounter Surveys □ - Incidental Detection

3.3.2 Visual Encounter Survey Results

The following VES results are presented by watershed.

Permanente Creek

Overall, time-weighted detections of amphibians were highest in PASR1. No amphibian detections were made within PASR2. Approximately 50 percent of both PASR8 and PASR9 are dry for all but several weeks during the highest flows of the year.

Figure 25 presents the number of time-weighted amphibian detections by ASR in Permanente Creek. Figure 26 illustrates the species composition as a percentage of detections per reach along Permanente Creek.

Monte Bello Creek

Overall, time-weighted detections were highest in MASR4 with 173 detections, representing 64.1 percent of all amphibian detections within Monte Bello Creek. MASR2 had the second highest number of detections with 53 detections or 19.6 percent. MASR3 had 38 detections representing 14.1 percent, and MASR1 had 6 detections, representing 2.2 percent of all amphibian detections in Monte Bello Creek.

Figure 27 presents the number of time-weighted amphibian detections by ASR in Monte Bello Creek. Figure 28 illustrates the species composition as a percentage of detections per reach along Monte Bello Creek.

3.4 Benthic Macroinvertebrate Results

Physical habitat quality data are presented in Section 3.4.1 below. BMI data are presented in Section 3.4.2.

3.4.1 Physical Habitat Quality

Overall physical habitat quality at all six sample locations is very high (greater that 160). Furthermore, little variation in overall habitat quality is evident from the scores. Several sample locations received low scores in particular categories. Table 13 presents the summary table of the scored physical habitat parameters scored at each BMI sample location.

Table 13. Physical Habitat Quality Scores Based on CSBP Worksheet by Sample Location.

Stream Name	**Permanente**				**Monte Bello**	
Sample Number	**PMBI 1**	**PBMI 2**	**PBMI 3**	**PBMI 4**	**MBMI 1**	**MBMI 2**
Habitat Parameter						
Epifaunal Substrate / Available Cover	18	14	19	19	19	19
Embeddedness	12	13	1	12	13	15

Velocity/Depth Regimes	14	15	14	14	10	14
Sediment Deposition	19	19	18	16	17	18
Channel Flow Status	15	19	19	11	12	15
Channel Alteration	14	15	19	19	20	20
Frequency of Riffles (or bends)	19	19	18	16	19	15
Bank Stability	16	19	20	19	10	12
Vegetative Protection	20	17	20	20	20	20
Riparian Vegetative Zone Width	17	15	19	19	20	20
Physical Habitat Quality Score Total	**164**	**165**	**167**	**165**	**160**	**168**

3.4.2 Benthic Macroinvertebrate Results

Richness Measures

Overall taxa richness, Plecoptera taxa and Trichoptera taxa varied little between sample locations. Both samples taken from Monte Bello Creek had higher Ephemeroptera diversity than samples taken from Permanente Creek. Additionally, both samples collected from Monte Bello Creek and the upstream-most sample from Permanente Creek had high overall EPT diversity with the downstream-most sample in Permanente Creek having the lowest number of EPT taxa. Results of the BMI richness measure by location is presented in Table 14. Figure 29 shows BMI measures by sample location.

Table 14. Benthic Macroinvertebrate Richness Measures by Sample Location.

Stream Name	**Permanente Creek**				**Monte Bello Creek**	
Sample Number	**PMBI1**	**PBMI2**	**PBMI3**	**PBMI4**	**MBMI1**	**MBMI2**
Richness Measures						
Taxa Richness	20	24	24	26	19	26
EPT Taxa	8	11	10	12	12	13
Ephemeroptera Taxa	1	1	3	3	5	5
Plecoptera Taxa	1	1	2	3	1	3
Trichoptera Taxa	6	9	5	6	6	5

Composition Measures

Within Permanente Creek, overall EPT index was higher at sample locations PBMI2 and PBMI4 in comparison to sample locations PBMI1 and PBMI3. Both sample locations within Monte

Bello Creek have a higher composition of EPT taxa than within any sample location on Permanente Creek. However, when the more tolerant Hydropsychid caddisflies and Baetid mayflies are removed from the analysis, modified EPT composition at sample locations PBMI2, PBMI3, and PBMI4 are similar, while lower at PBMI1. Modified EPT composition along Monte Bello Creek remains higher than modified EPT composition along Permanente Creek. Figure 30 shows BMI composition measures by sample location.

Shannon Diversity Index is similar across all sample locations. This mimics the lack of variation observed in taxa richness, suggesting that all BMI samples were relatively uniform in overall diversity and evenness. Figure 31 shows Shannon Diversity Index values by sample location.

Table 15. Benthic Macroinvertebrate Composition Measures by Sample Location.

Stream Name	**Permanente Creek**				**Monte Bello Creek**	
Sample Number	**PMBI1**	**PBMI2**	**PBMI3**	**PBMI4**	**MBMI1**	**MBMI2**
Composition Measures						
EPT Index	40.0	45.8	41.7	46.2	63.2	50
Modified EPT Index	30.0	37.5	37.5	38.5	52.6	42.3
Shannon Diversity Index	1.9	2.0	1.5	2.4	1.4	1.6

Tolerance/intolerance Measures

Tolerance values are all +/- 0.5 of each other, suggesting little difference between sample locations, however tolerant versus intolerant organisms are different across sample locations. The percent of the sample dominated by one taxa was much higher in both of the samples taken in Monte Bello Creek than in Permanente Creek. Results for BMI tolerance measures is presented in Table 16. Figure 32 shows tolerance/intolerance values by sample location.

Table 16. Benthic Macroinvertebrate Tolerance/Intolerance Measures by Sample Location.

Stream Name	**Permanente Creek**				**Monte Bello Creek**	
Sample Number	**PMBI 1**	**PBMI 2**	**PBMI 3**	**PBMI 4**	**MBMI 1**	**MBMI 2**
Tolerance/Intolerance Measures						
Tolerance Value	5.3	5.6	5.7	5.2	5.2	5.2
Percent Intolerant Organisms	1	12	4	14	11	10
Percent Tolerant Organisms	7	24	3	6	0	1
Percent Hydropsychidae	10.2	11.7	0	0.5	3.4	2.0
Percent Baetidae	23.1	6.9	7.2	3.7	3.4	2.6

Percent Dominant Taxa	37	31	49	37	69	67

Functional Feeding Groups

Results of the BMI functional feeding group composition for each sample location is provided in Table 17. Figure 33 shows the composition of functional feeding groups as a percentage of organisms by sample location.

Table 17. Benthic Macroinvertebrate Functional Feeding Group Composition by Sample Location.

Stream Name	**Permanente Creek**				**Monte Bello Creek**	
Sample Number	**PMBI 1**	**PBMI 2**	**PBMI 3**	**PBMI 4**	**MBMI 1**	**MBMI 2**
Functional Feeding Groups						
Percent Gatherer-Collectors	61	41	57	51	79	74
Percent Filterers - Collectors	30	21	30	10	12	9
Percent Scrapers	0	7	0	10	2	5
Percent Predators	8	25	9	18	2	9
Percent Shredders	1	6	2	10	4	4

4.0 SUMMARY

WRA, Inc. collected biological and physical data on Permanente and Monte Bello Creeks and major tributaries within the 3,510-acre Lehigh Permanente Quarry property between January and May, 2009. Physical attributes that relate to habitat quality such as water temperature, frequency of riffles, runs and pools, channel width and depth, in-stream cover, substrate composition etc., were measured. Additionally, fish, amphibian and invertebrate communities that rely on these watersheds were inventoried according to current accepted scientific methods and are replicable over time.

Based on the results of this study, Permanente Creek can be broken into four biologically relevant reaches. The reach of Permanente from the downstream Property boundary to Pond 4A (PASR 8) is marked by an artificial flow regime in addition to groundwater-input base flows (Golder, 2010). While the physical habitat in this reach varies largely from natural to a trapezoidal concrete channel to two large in-stream sedimentation ponds, the aquatic fauna appears to be partially reliant on discharge flows from Pond 4A during the dry season.

The second reach is above the discharge at Pond 4A (PASR 8 - PASR10). This is the dry section of Permanente Creek that is much too ephemeral to allow benthic macroinvertebrates to colonize, or for fish or amphibians to carry out any phase of their life history. This dry section only conveys water during the wettest few weeks of the year, but during that short time, it may serve as a corridor for Rainbow Trout dispersing downstream that are known to breed between the upper end of the dry section and the confluence of Wild Violet Creek with Permanente Creek.

From the dry section to the confluence with Wild Violet Creek (PASR 10 - PASR 13), Permanente is a perennial cold-watered stream that supports a high diversity of benthic macroinvertebrates, a natural and diverse amphibian assemblage and a self-sustaining population of Rainbow Trout.

Above the confluence with Wild Violet Creek (PASR 13 - PASR 15), Permanente Creek becomes ephemeral and intermittent. During high flow periods, this portion of the creek is shallow, has no pools and supports little aquatic life. Only newts were observed above the confluence, no fish were found and very few benthic macroinvertebrates were observed. This section of the creek is high gradient with steep banks.

Monte Bello Creek is not significantly altered within the Study Area, and based on the results of this study, it can be divided into two distinct, biologically relevant reaches.

The Main Stem and South Fork are wholly perennial, and convey a majority of the surface flow through the system. Water temperatures remain consistently cool, although there are no fish in Monte Bello Creek within the Study Area as a result of downstream barriers. Monte Bello Creek supports a robust native amphibian assemblage whose numbers increase along a gradient traveling in a downstream to upstream direction. Furthermore, both benthic macroinvertebrate samples suggest that Monte Bello supports a diverse community of aquatic insects throughout the watershed.

The North Fork of Monte Bello Creek is ephemeral and intermittent. During the wettest periods of the year, it contributes, at most, approximately 10% of the total surface water to the Main Stem. Despite being approximately 2,000 feet long, the North Fork did not convey surface water for more than 300 feet upstream of the confluence with the Main Stem at any point during this study. No aquatic fauna were observed along the North Fork except for newts dispersing overland.

5.0 REFERENCES

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Bulger J. B., J. S. Norman, And R. B. Seymour. 2003. Terrestrial Activity and Conservation Of Adult California Red-Legged Frogs Rana aurora draytonii In Coastal Forests And Grasslands. Biological Conservation, 110:85.-95.

California Department of Fish and Game (CDFG). 1998. California Salmonid Steam Habitat Restoration Manual. Third Edition. California Department of Fish and Game Inland Fisheries Division. Sacramento, California 95814.

California Department of Fish and Game (CDFG). 2003. California Stream Bioassessment Procedure. California Department of Fish and Game Water Pollution Control Laboratory Aquatic Bioassessment Laboratory. Sacramento, California 95814.

Golder Associates. 2010. Hydrologic Investigation - Permanente Quarry Reclamation Plan Update, Santa Clara County, California.

Koehler, Jonathan. 2005. Central Napa River Watershed Project Salmonid Form and Function Final Report. Napa County Resource Conservation District, California.

Leidy, R.A., G.S. Becker, B.N. Harvey. 2005. Historical distribution and current status of steelhead/rainbow trout (*Oncorhynchus mykiss*) in streams of the San Francisco Estuary, California. Center for Ecosystem Management and Restoration, Oakland, CA.

Murphy, B. R., and D.W. Willis, editors. 1996. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Moyle, P. B. 2002. Inland fishes of California, revised and expanded. Berkeley and Los Angeles: University of California Press.

McGinnis, S. M. 2006. Field guide to freshwater fishes. Berkeley and Los Angeles: University of California Press.

Rana Resources. 2006a. California Red-legged Frog (*Rana draytonii*) Monitoring Letter Report Regarding Sediment Removal from Ponds 13A, 13B, and 17 at the Hanson Permanente Cement Plant. Prepared for The Huffman Broadway Group, Inc. San Rafael, CA 94901.

Rana Resources. 2006b. 2006 California Red-legged Frog (*Rana draytonii*) Surveys at the Hanson Permanente Cement Facility, Cupertino, California. Prepared for the Huffman Broadway Group, Inc. San Rafael, CA 94901.

Rana Resources. 2007. 2007 California Red-legged Frog (Rana draytonii) Surveys at the Hanson Permanente Cement Facility, Cupertino, California. Prepared for the Huffman Broadway Group, Inc. San Rafael, CA 94901.

Rana Resources. 2008a. California Red-legged Frog (*Rana draytonii*) July 30, 2008 Preconstruction Survey Letter Report Regarding Sediment Removal from Ponds 9, 13A, 13B, and 17 at the Hanson Permanente Cement Plant. Prepared for The Huffman Broadway Group, Inc. San Rafael, CA 94901.

Rana Resources. 2008b. California Red-legged Frog (*Rana draytonii*) Monitoring Letter Report Regarding Sediment Removal from Ponds 9, 13A, 13B, and 17 at the Hanson Permanente Cement Plant. Prepared for The Huffman Broadway Group, Inc. San Rafael, CA 94901.

Rana Resources. 2008c.California Red-legged Frog (Rana draytonii) Monitoring Letter Report Regarding Sediment Removal from Ponds 9, 13A, 13B, and 17 at the Hanson Permanente Cement Plant. Prepared for The Huffman Broadway Group, Inc. San Rafael, CA 94901.

Rosgen, D.L. 1994. A classification of natural rivers. Catena, Vol 22: 169-199, Elsevier Science, B.V. Amsterdam.

Santa Clara Valley Water District (SCVWD). 2002. Permanente Creek Flood Protection Project history and background. Santa Clara Valley Water District copyright 2002. Accessed online 10/9/2008 at http://www.scvwd.dst.ca.us/Water/Watersheds_-_streams_and_floods/Watershed_info_&_projects/Lower_Peninsula/Permanente_Creek/Project_history.shtm

URS. 2000. Hanson Permanente Cement Company, Inc. Long-term Restoration Plan (Response to RWQCB CAO No. 99-018, Item C.9).

U. S. Fish and Wildlife Service (USFWS). 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, OR.

U. S. Fish and Wildlife Service (USFWS). 2006. Designation of Critical Habitat for the California Red-Legged Frog, and Special Rule Exemption Associated With Final Listing for Existing Routine Ranching Activities; Final Rule. Federal Register 71(71): 19243-19346. April 13.

WRA, Inc. 2008. Delineation of Potential Clean Water Act Section 404 Jurisdiction. Prepared for Hanson Permanente Cement, Cupertino, Santa Clara County, CA 95041.

WRA, Inc. 2009. Biological Resource Assessment of the Hanson Permanente Quarry, Santa Clara County, California. Prepared for Hanson Permanente Cement, Cupertino, CA 95041.

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APPENDIX A. ADDITIONAL HABITAT DATA

Summary of Habitat Elements by Stream Reach for Permanente Creek

PASR1

Channel Types: G4, F4		Canopy Density (%): 70	Pools by Stream Length (%): 31.4
Reach Length (ft): 2,103.2		Hardwood Component (%): 100	Pool Frequency (%): 46.3
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	Residual Pool Depth (%) < 2 ft deep: 80.0 2 to 2.9 ft deep: 20.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 5.8		Vegetation Cover (%): 76.8	
Bankfull Width Range (ft): 6.4 to 22.0 Mean (ft): 10.0		Dominant Shelter: Aquatic Vegetation	Mean Max Residual Pool Depth (ft): 1.1
		Occurrence of Large Woody Debris (%): 0.9	Mean Pool Shelter Rating: 93
Temp	Water (F): 54 to 61	Pool Substrate (%): Sand: 14.3, Gravel: 85.7	
	Air (F): 68 to 77	Embeddedness Value (%): (1) 0.0, (2) 33.3, (3) 66.7, (4) 0.0	

PASR2

Channel Types: N/A		Canopy Density (%): 57.5	Pools by Stream Length (%): 19.1
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 28.6
Dry Channel Length (ft): 0		Dominant Bank Vegetation: No Vegetation	Residual Pool Depth (%) < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 7.5		Vegetation Cover (%): 19.4	
Bankfull Width Range (ft): N/A Dominant (ft): 9.0		Dominant Shelter: Aquatic Vegetation	Mean Max Residual Pool Depth (ft): 0.9
		Occurrence of Large Woody Debris (%): 0.0	Mean Pool Shelter Rating: 20
Temp	Water (F): 61	Pool Substrate (%): Sand: 100.0	
	Air (F): 70	Embeddedness Value (%): (1) 0.0, (2) 0.0, (3) 100.0, (4) 0.0	

PASR3

Channel Types: A4		Canopy Density (%): 82.3	Pools by Stream Length (%): 5.3
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 24.0
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	<u>Residual Pool Depth (%)</u> < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 6.0		Vegetation Cover (%): 70.0	
<u>Bankfull Width</u> Range (ft): N/A Dominant (ft): 12.0		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.1
		Occurrence of Large Woody Debris (%): 0.0	Mean Pool Shelter Rating: 148
Temp	Water (F): 54 to 61	Pool Substrate (%): Gravel: 50.0, Small Cobble: 50.0	
	Air (F): 55 to 57	Embeddedness Value (%): (1) 0.0, (2) 25.0, (3) 25.0, (4) 50.0	

PASR4

Channel Types: A4		Canopy Density (%): 83.4	Pools by Stream Length (%): 9.8
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 28.0
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	<u>Residual Pool Depth (%)</u> < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 6.2		Vegetation Cover (%): 81.4	
<u>Bankfull Width</u> Range (ft): N/A Dominant (ft): 11.0		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.05
		Occurrence of Large Woody Debris (%): 4.3	Mean Pool Shelter Rating: 143
Temp	Water (F): 55	Pool Substrate (%): Small Cobble: 100.0	
	Air (F): 55 to 57	Embeddedness Value (%): (1) 0.0, (2) 50.0, (3) 50.0, (4) 0.0	

PASR5

Channel Types: B4c, A3		Canopy Density (%): 86.1	Pools by Stream Length (%): 18.7
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 30.8
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Hardwood Trees	<u>Residual Pool Depth (%)</u> < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 7.2		Vegetation Cover (%): 62.8	
<u>Bankfull Width</u> Range (ft): 12.5 to 18.0		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.36
Dominant (ft): 18.0		Occurrence of Large Woody Debris (%): 0.0	Mean Pool Shelter Rating: 150
Temp	Water (F): 55 to 57	Pool Substrate (%): Sand: 33.3, Gravel: 33.3, Bedrock: 33.3	
	Air (F): 57 to 59	Embeddedness Value (%): (1) 0.0, (2) 0.0, (3) 33.3, (4) 66.7	

PASR6

Channel Types: A3		Canopy Density (%): 42.6	Pools by Stream Length (%): 24.3
Reach Length (ft): 1,707.3		Hardwood Component (%): 100	Pool Frequency (%): 41.2
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Emergent Macrophytes	<u>Residual Pool Depth (%)</u> < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 7.6		Vegetation Cover (%): 85.0	
<u>Bankfull Width</u> Range (ft): N/A		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.0
Dominant (ft): 11.0		Occurrence of Large Woody Debris (%): 0.0	Mean Pool Shelter Rating: 215
Temp	Water (F): 55 to 57	Pool Substrate (%): Bedrock: 100.0	
	Air (F): 59 to 60	Embeddedness Value (%): (1) 0.0, (2) 0.0, (3) 0.0, (4) 100.0	

PASR7

Channel Types: B2a		Canopy Density (%): 79.4	Pools by Stream Length (%): 39.0
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 43.8
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	<u>Residual Pool Depth (%)</u> < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 8.7		Vegetation Cover (%): 54.5	
<u>Bankfull Width</u> Range (ft): N/A Dominant (ft): 12.5		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.42
		Occurrence of Large Woody Debris (%): 1.9	Mean Pool Shelter Rating: 144
Temp	Water (F): 57 to 59	Pool Substrate (%): Gravel: 16.7, Bedrock: 83.3	
	Air (F): 55 to 57	Embeddedness Value (%): (1) 0.0, (2) 0.0, (3) 0.0, (4) 100.0	

PASR8

Channel Types: B3		Canopy Density (%): 78.6	Pools by Stream Length (%): 12.2
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 31.6
Dry Channel Length (ft): 775.7		Dominant Bank Vegetation: Blackberry/poison oak	<u>Residual Pool Depth (%)</u> < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 7.0		Vegetation Cover (%): 71.4	
<u>Bankfull Width</u> Range (ft): N/A Dominant (ft): 15.0		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.25
		Occurrence of Large Woody Debris (%): 0.0	Mean Pool Shelter Rating: 145
Temp	Water (F): 57	Pool Substrate (%): Silt/Clay: 50.0, Bedrock: 50.0	
	Air (F): 50 to 53	Embeddedness Value (%): (1) 0.0, (2) 0.0, (3) 0.0, (4) 100.0	

PASR9

Channel Types: B3/B3a, B4c		Canopy Density (%): 78.3	Pools by Stream Length (%): 1.1
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 25.0
Dry Channel Length (ft): 1,070.0		Dominant Bank Vegetation: Blackberry/poison oak	Residual Pool Depth (%) < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 7.0		Vegetation Cover (%): 71.7	
Bankfull Width Range (ft): 14.0 to 16.0		Dominant Shelter: Terrestrial Vegetation	Mean Max Residual Pool Depth (ft): 0.7
Dominant (ft): 16.0		Occurrence of Large Woody Debris (%): 16.7	Mean Pool Shelter Rating: 120
Temp	Water (F): 57	Pool Substrate (%): Gravel: 100.0	
	Air (F): 53	Embeddedness Value (%): (1) 0.0, (2) 100.0, (3) 0.0, (4) 0.0	

PASR10

Channel Types: D4/6		Canopy Density (%): 78.3	Pools by Stream Length (%): 3.5
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 22.2
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	Residual Pool Depth (%) < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 10.0		Vegetation Cover (%): 71.7	
Bankfull Width Range (ft): N/A		Dominant Shelter: Terrestrial Vegetation	Mean Max Residual Pool Depth (ft): 1.3
Dominant (ft): 85.0		Occurrence of Large Woody Debris (%): 16.7	Mean Pool Shelter Rating: 105
Temp	Water (F): 50 to 57	Pool Substrate (%): Gravel: 100.0	
	Air (F): 52 to 53	Embeddedness Value (%): (1) 0.0, (2) 100.0, (3) 0.0, (4) 0.0	

PASR11

Channel Types: A4		Canopy Density (%): 83.6	Pools by Stream Length (%): 3.5
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 22.2
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	Residual Pool Depth (%) < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 5.1		Vegetation Cover (%): 42.9	
Bankfull Width Range (ft): N/A Dominant (ft): 8.7		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.3
		Occurrence of Large Woody Debris (%): 7.9	Mean Pool Shelter Rating: 105
Temp	Water (F): 50	Pool Substrate (%): Gravel: 66.7, Bedrock: 33.3	
	Air (F): 50 to 52	Embeddedness Value (%): (1) 0.0, (2) 33.3, (3) 33.3, (4) 33.3	

PASR12

Channel Types: B4		Canopy Density (%): 82.5	Pools by Stream Length (%): 19.3
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 27.3
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	Residual Pool Depth (%) < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 6.7		Vegetation Cover (%): 56.7	
Bankfull Width Range (ft): N/A Dominant (ft): 10.5		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 0.8
		Occurrence of Large Woody Debris (%): 0.0	Mean Pool Shelter Rating: 120
Temp	Water (F): 50	Pool Substrate (%): Gravel: 50.0, Small Cobble: 50.0	
	Air (F): 50 to 52	Embeddedness Value (%): (1) 0.0, (2) 50.0, (3) 50.0, (4) 0.0	

PASR13

Channel Types: A4		Canopy Density (%): 88.0	Pools by Stream Length (%): 19.3
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 27.3
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	Residual Pool Depth (%) < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 3.1		Vegetation Cover (%): 25.5	
Bankfull Width Range (ft): N/A Dominant (ft): 3.5		Dominant Shelter: Terrestrial Vegetation	Mean Max Residual Pool Depth (ft): 0.8
		Occurrence of Large Woody Debris (%): 0.0	Mean Pool Shelter Rating: 120
Temp	Water (F): 46 to 48	Pool Substrate (%): Sand: 50.0, Gravel: 50.0	
	Air (F): 49 to 51	Embeddedness Value (%): (1) 0.0, (2) 0.0, (3) 100.0, (4) 0.0	

Summary of Habitat Elements by Stream Reach for Monte Bello Creek

MASR1

Channel Types: B4		Canopy Density (%): 79.9	Pools by Stream Length (%): 35.4
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 42.9
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	Residual Pool Depth (%) < 2 ft deep: 83.3 2 to 2.9 ft deep: 16.7 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 7.0		Vegetation Cover (%): 20.0	
Bankfull Width Range (ft): N/A Dominant (ft): 9.1		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.3
		Occurrence of Large Woody Debris (%): 0.0	Mean Pool Shelter Rating: 124
Temp	Water (F): 44 to 48	Pool Substrate (%): Sand: 50.0, Gravel: 33.3, Small Cobble: 16.7	
	Air (F): 52 to 53	Embeddedness Value (%): (1) 16.7, (2) 16.7, (3) 66.7, (4) 0.0	

MASR2

Channel Types: B3		Canopy Density (%): 84.9	Pools by Stream Length (%): 28.0
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 36.4
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Leaf Litter	Residual Pool Depth (%) < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 6.8		Vegetation Cover (%): 0.6	
Bankfull Width Range (ft): N/A Dominant (ft): 9.1		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.02
		Occurrence of Large Woody Debris (%): 1.3	Mean Pool Shelter Rating: 51
Temp	Water (F): 48 to 50	Pool Substrate (%): Sand: 50.0, Gravel: 33.3, Small Cobble: 16.7	
	Air (F): 53 to 54	Embeddedness Value (%): (1) 0.0, (2) 16.7, (3) 83.3, (4) 0.0	

MASR3

Channel Types: A2/B2		Canopy Density (%): 88.9	Pools by Stream Length (%): 26.1
Reach Length (ft): 1,640.4		Hardwood Component (%): 100	Pool Frequency (%): 39.0
Dry Channel Length (ft): 0		Dominant Bank Vegetation: Blackberry/poison oak	Residual Pool Depth (%) < 2 ft deep: 100.0 2 to 2.9 ft deep: 0.0 3 to 3.9 ft deep: 0.0 >=4 ft deep: 0.0
Riffle/Flatwater Mean Width (ft): 6.7		Vegetation Cover (%): 12.3	
Bankfull Width Range (ft): N/A Dominant (ft):7.0		Dominant Shelter: Bubble Curtain	Mean Max Residual Pool Depth (ft): 1.12
		Occurrence of Large Woody Debris (%): 4.1	Mean Pool Shelter Rating: 65
Temp	Water (F): 49 to 50	Pool Substrate (%): Gravel: 75.0, Small Cobble: 25.0	
	Air (F): 52 to 54	Embeddedness Value (%): (1) 0.0, (2) 25.0, (3) 75.0, (4) 0.0	

MASR4

<table>
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<tr><td colspan="2">Reach Length (ft): 1,743.1</td><td>Hardwood Component (%): 100</td><td>Pool Frequency (%): 43.8</td></tr>
<tr><td colspan="2">Dry Channel Length (ft): 0</td><td>Dominant Bank Vegetation: Leaf Litter</td><td rowspan="2"><u>Residual Pool Depth (%)</u>
< 2 ft deep: 100.0
2 to 2.9 ft deep: 0.0
3 to 3.9 ft deep: 0.0
>=4 ft deep: 0.0</td></tr>
<tr><td colspan="2">Riffle/Flatwater Mean Width (ft): 6.3</td><td>Vegetation Cover (%): 13.9</td></tr>
<tr><td colspan="2" rowspan="2"><u>Bankfull Width</u>
Range (ft): N/A

Dominant (ft):7.4</td><td>Dominant Shelter: Bubble Curtain</td><td>Mean Max Residual Pool Depth (ft): 1.57</td></tr>
<tr><td>Occurrence of Large Woody Debris (%): 0.0</td><td>Mean Pool Shelter Rating: 59</td></tr>
<tr><td rowspan="2">Temp</td><td>Water (F): 48 to 50</td><td colspan="2">Pool Substrate (%): Gravel: 80.0, Bedrock: 20.0</td></tr>
<tr><td>Air (F): 51 to 52</td><td colspan="2">Embeddedness Value (%): (1) 0.0, (2) 0.0, (3) 80.0, (4) 20.0</td></tr>
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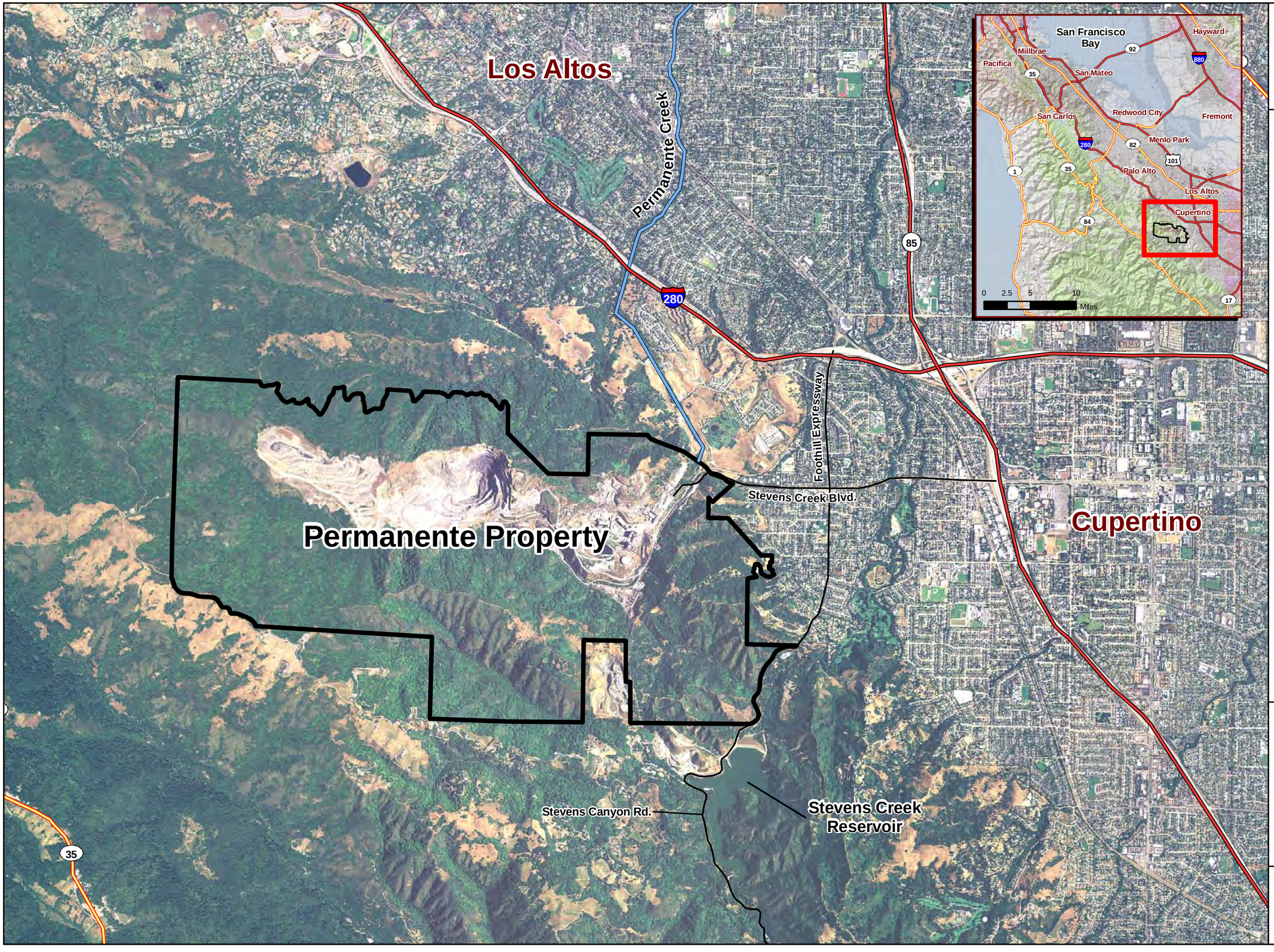
APPENDIX B. FIGURES REFERENCED IN REPORT



wra
ENVIRONMENTAL CONSULTANTS

Lehigh Permanente Quarry
Santa Clara County, CA

Figure 1.

Permanente Property Location Map

N
W E
S

0 0.25 0.5 1
Miles

Date: May 2010
Map By: Michael Rochelle
Image: 2005 NAIP
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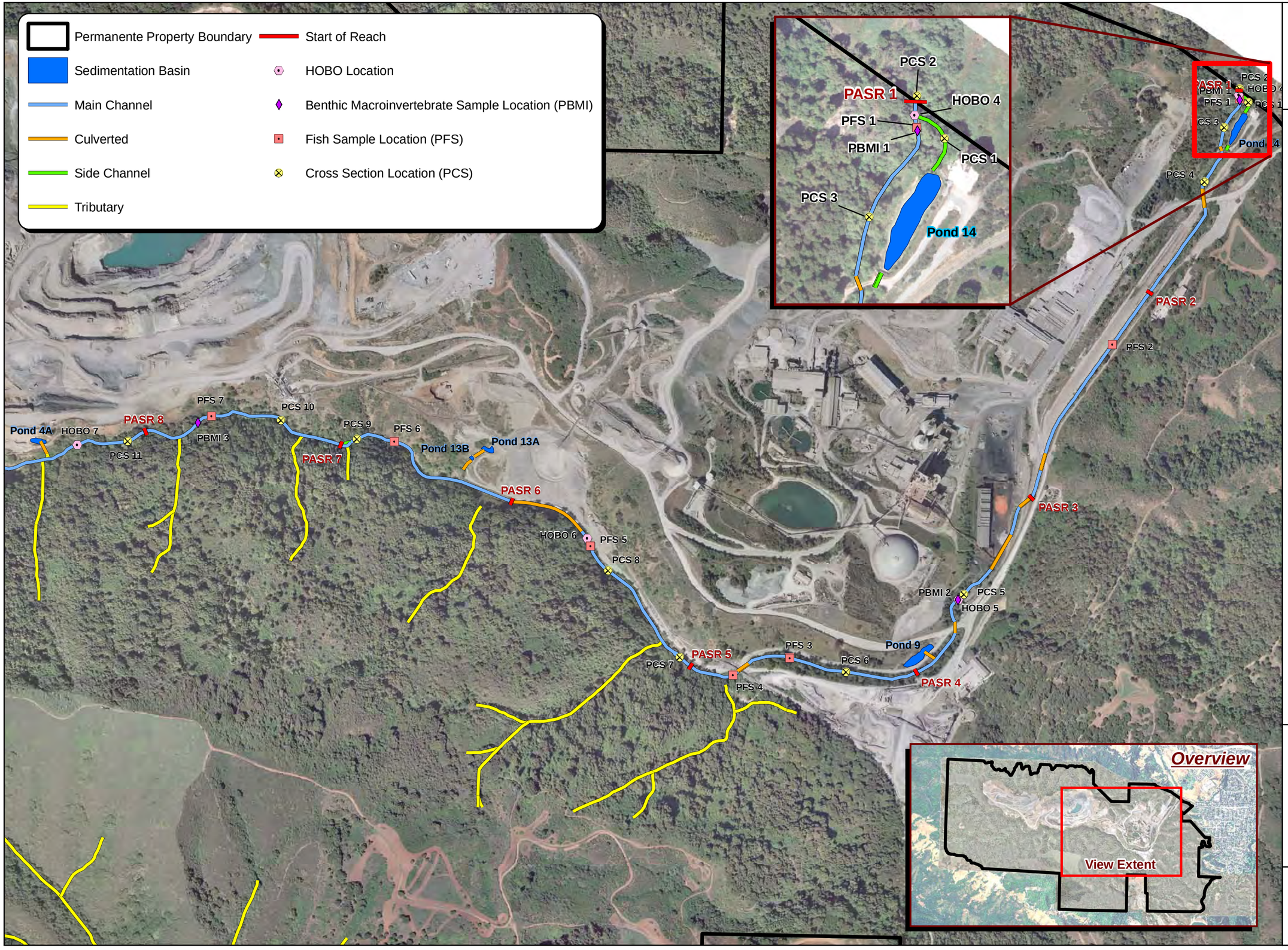


wra
ENVIRONMENTAL CONSULTANTS

Lehigh Permanente Quarry
Santa Clara County, California

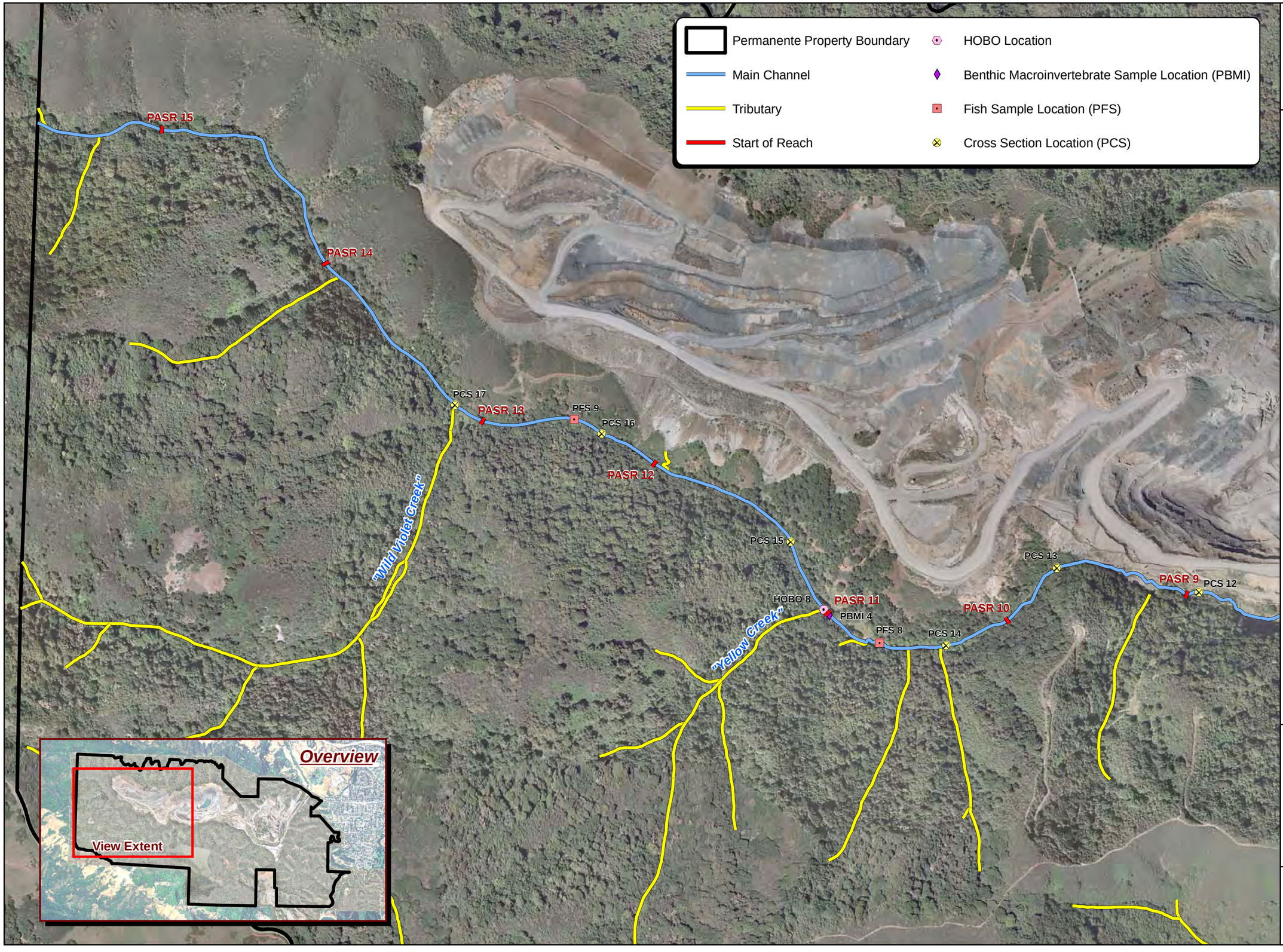
Figure 2a.

Permanente Creek Aquatic Baseline Study Areas

N
W E
S

0 250 500 1,000
Feet

Date: May 2010
Map By: Michael Rochelle
Aerial: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\AquaticPermAquaticAssessment1.mxd



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ENVIRONMENTAL CONSULTANTS

Lehigh Permanente Quarry
Santa Clara County, California

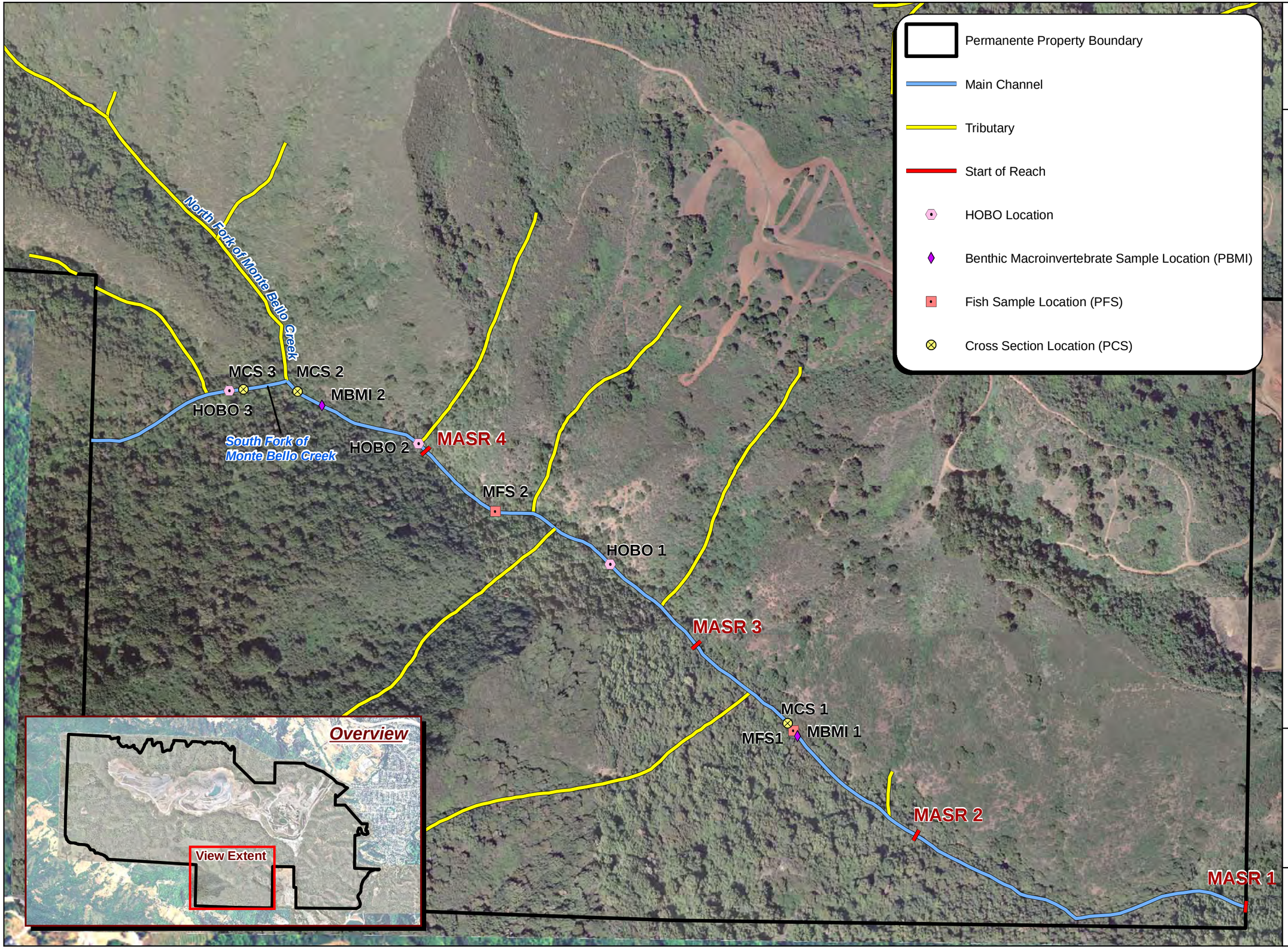
Figure 2b.

Permanente Creek Aquatic Baseline Study Areas

N
W E
S

0 250 500 1,000
Feet

Date: May 2010
Map By: Michael Rochelle
Aerial: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\AquaticPermAquaticAssessment2.mxd



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ENVIRONMENTAL CONSULTANTS

Lehigh Permanente Quarry
Santa Clara County, California

Figure 2c.

Monte Bello Creek Aquatic Baseline Study Areas

N
W E
S

0 150 300 600
Feet

Date: May 2010
Map By: Michael Rochelle
Aeiral: April 2007
Filepath: I:\Acad2000\16000\16143\gis\Arcmap\MontebelloAquaticAssessment.mxd

Figure 3. Mean daily temperatures at five (5) Hobo locations along Permanente Creek overlaid with atmospheric data collected at California Weather Database Station CIMIS #69 in San Jose, California.

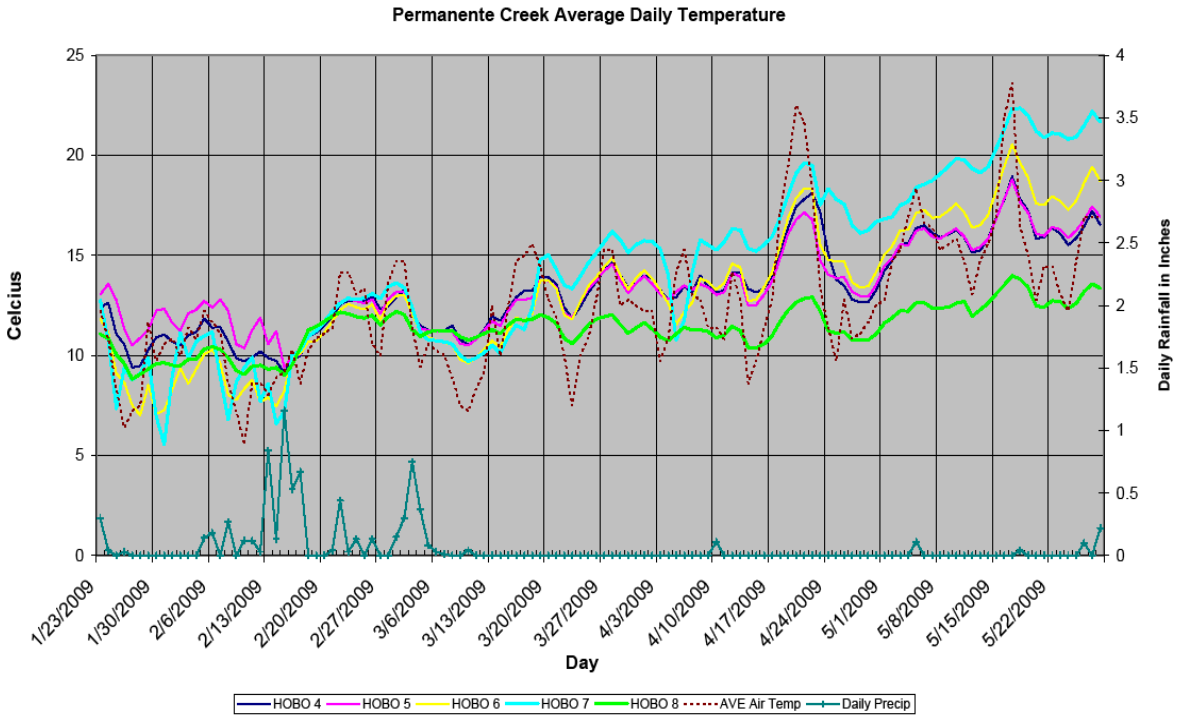

Figure 4. Mean daily temperatures at three Hobo locations along Monte Bello Creek overlaid with atmospheric data collected at California Weather Database Station CIMIS #69 in San Jose, California.

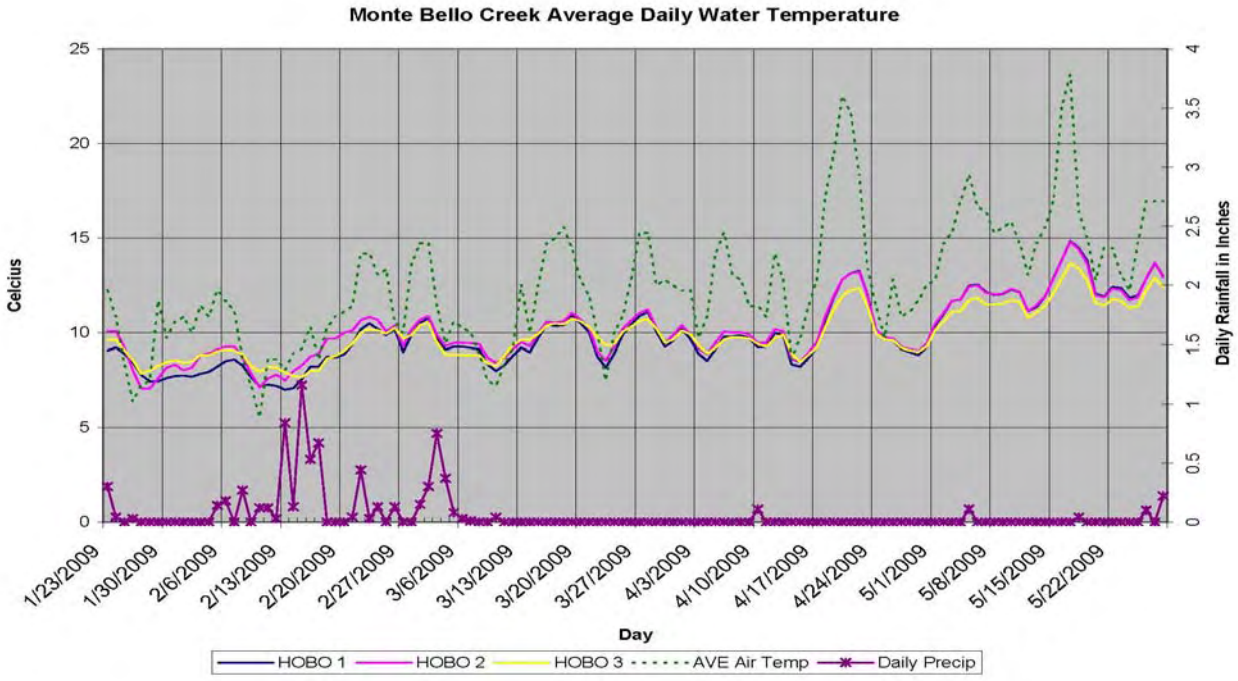

Figure 5. Percent composition of Level II habitat types by frequency along Permanente Creek.

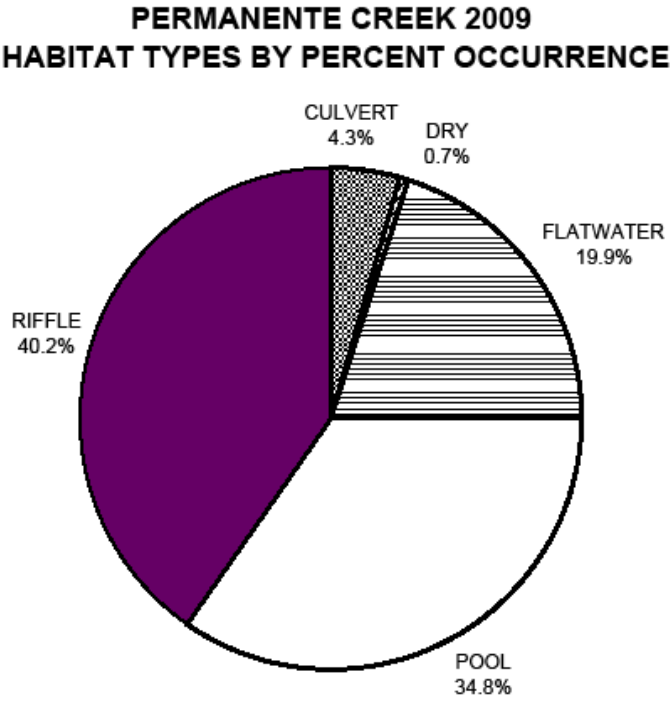

Figure 6. Percent composition of Level II habitat types by length along Permanente Creek.

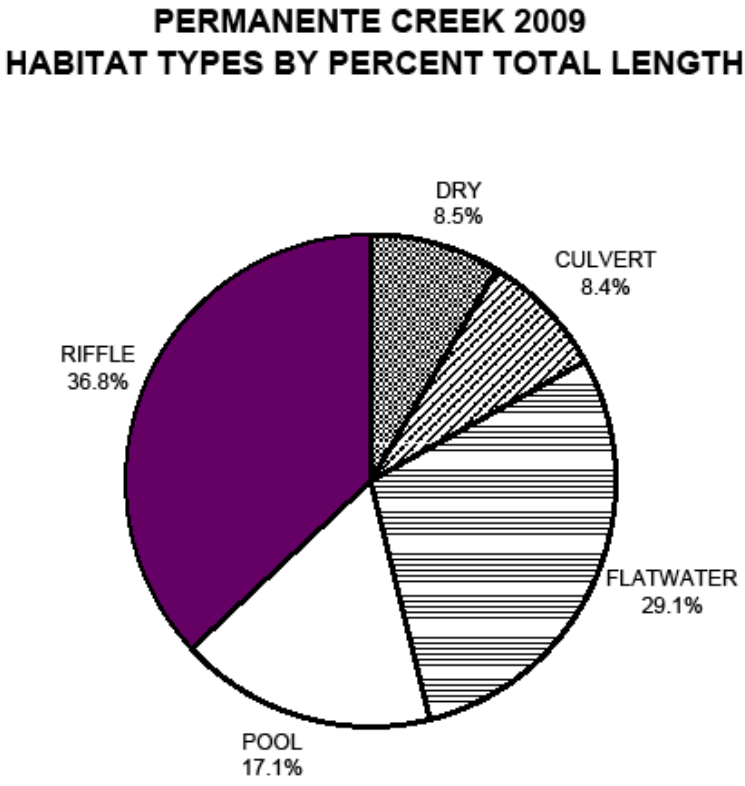

Figure 7. Percent composition of Level IV habitat types by frequency along Permanente Creek.

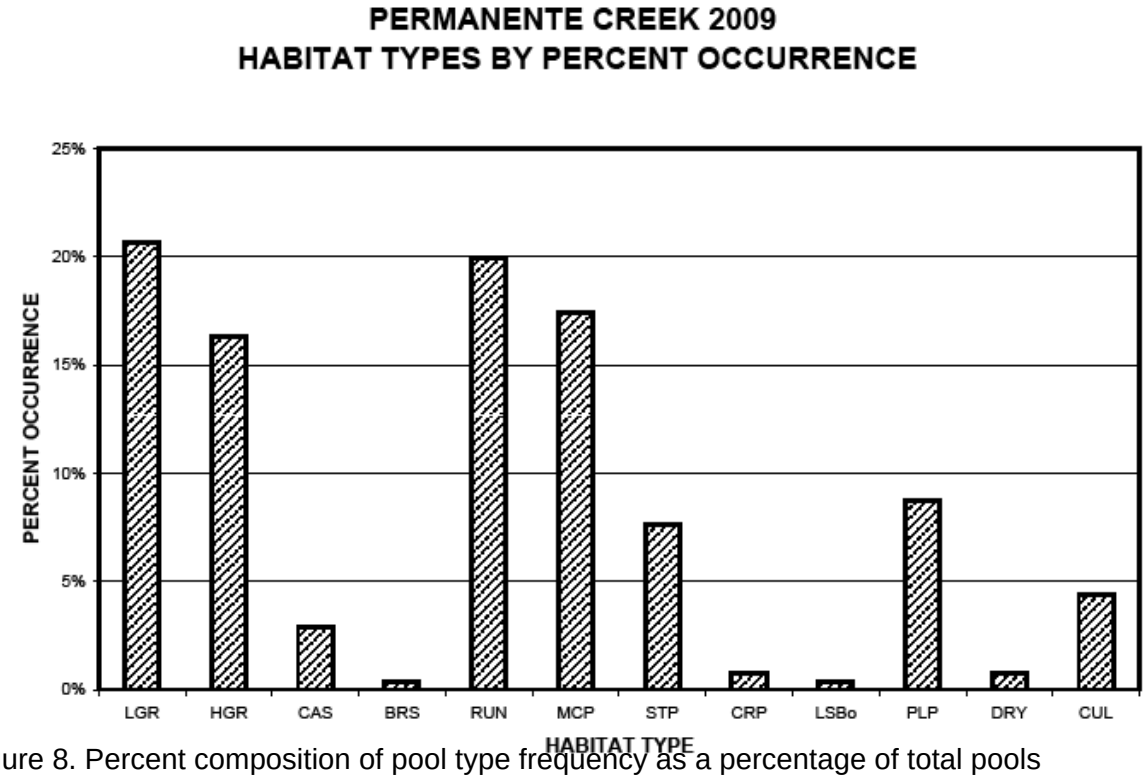

Figure 8. Percent composition of pool type frequency as a percentage of total pools encountered along Permanente Creek.

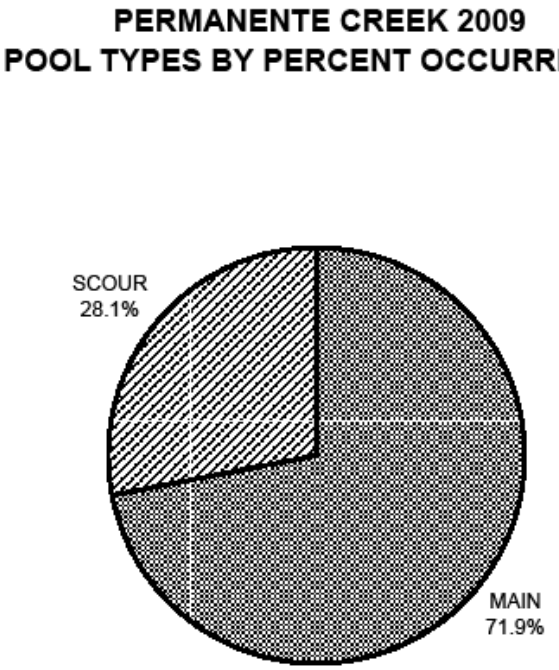

Figure 9. Composition of pool cover along Permanente Creek.

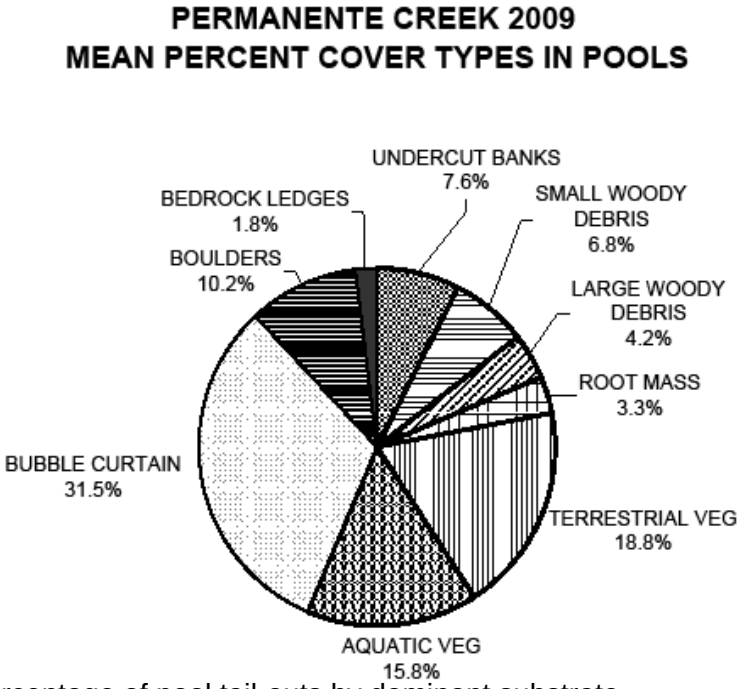

Figure 10. Percentage of pool tail-outs by dominant substrate.

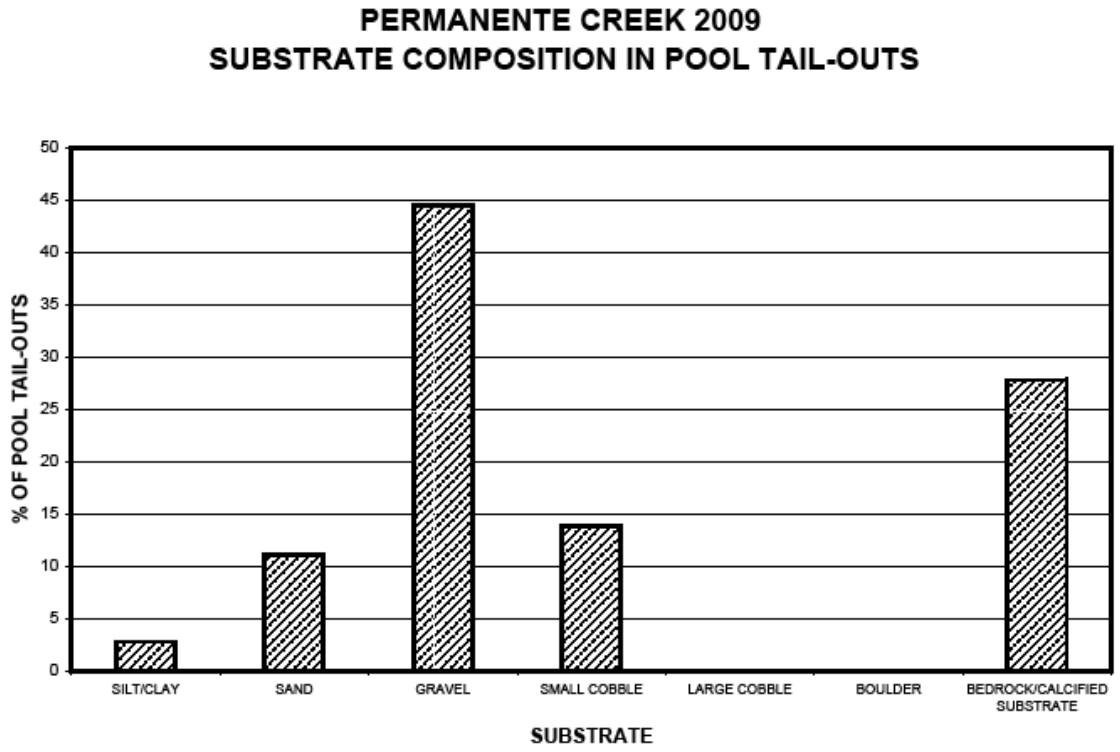

Figure 11. Composition of canopy cover along Permanente Creek.

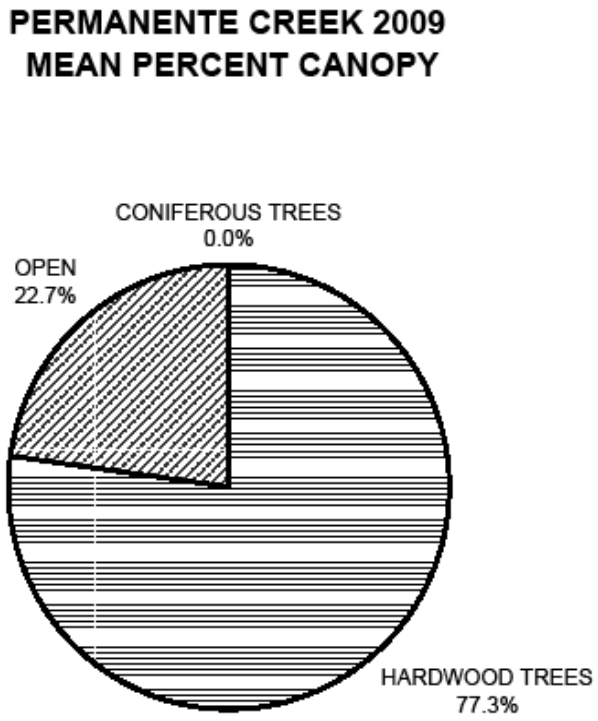

Figure 12. Percent composition of Level II habitat types by frequency along Monte Bello Creek.

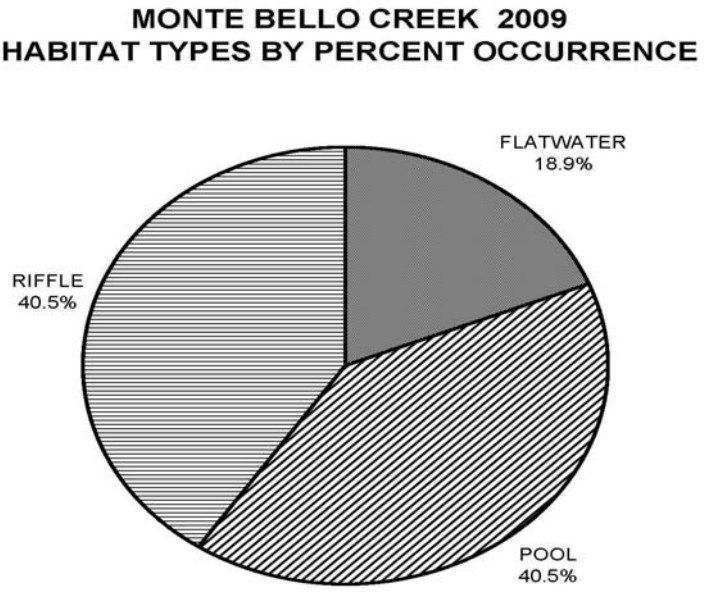

Figure 13. Percent composition of Level II habitat types by length along Monte Bello Creek.

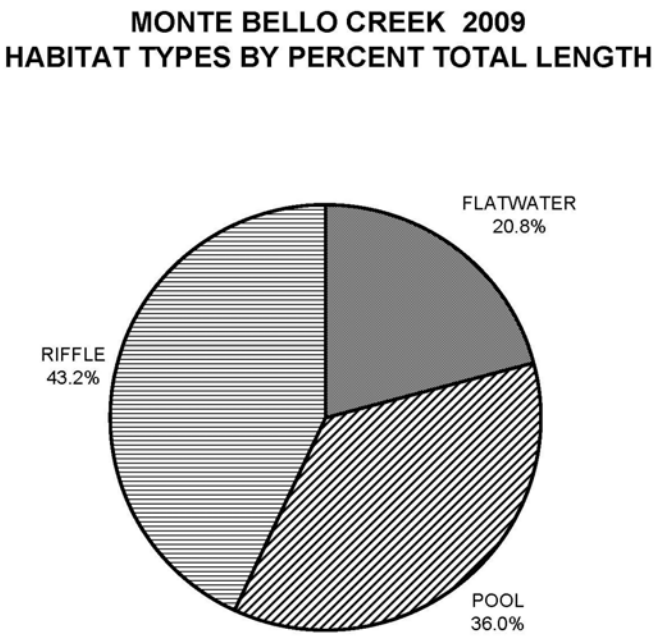

Figure 14. Percent composition of Level IV habitat types by frequency along Monte Bello Creek.

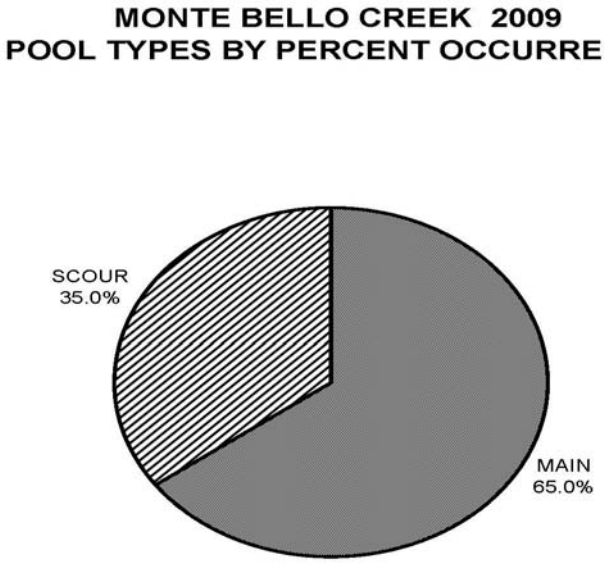

Figure 15. Percent composition of pool type frequency as a percentage of total pools encountered along Monte Bello Creek.

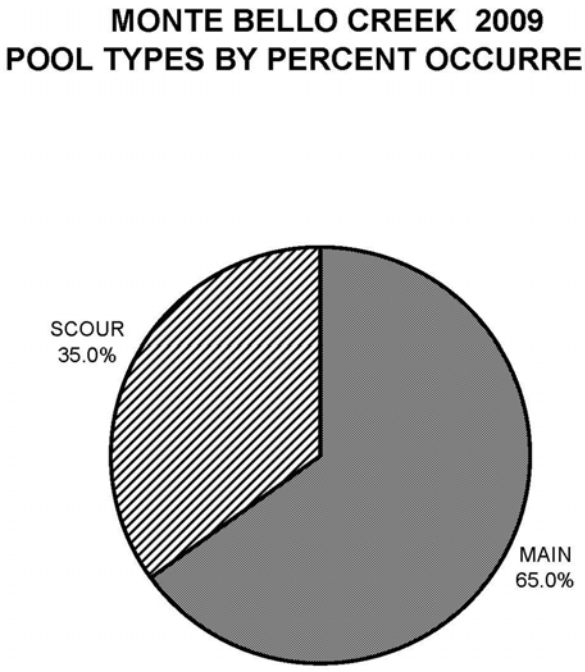

Figure 16. Composition of pool cover along Monte Bello Creek.

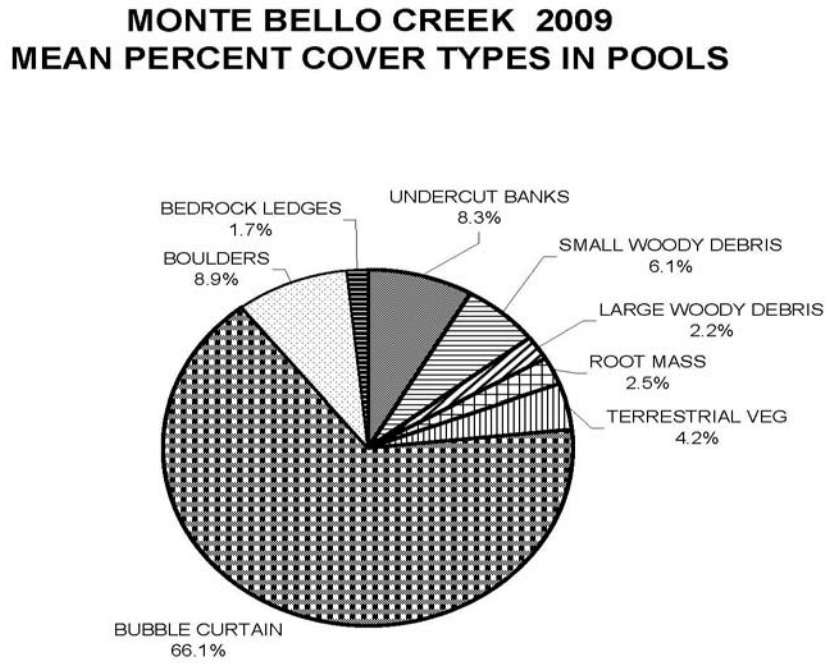

Figure 17. Percentage of pool tail-outs by dominant substrate along Monte Bello Creek.

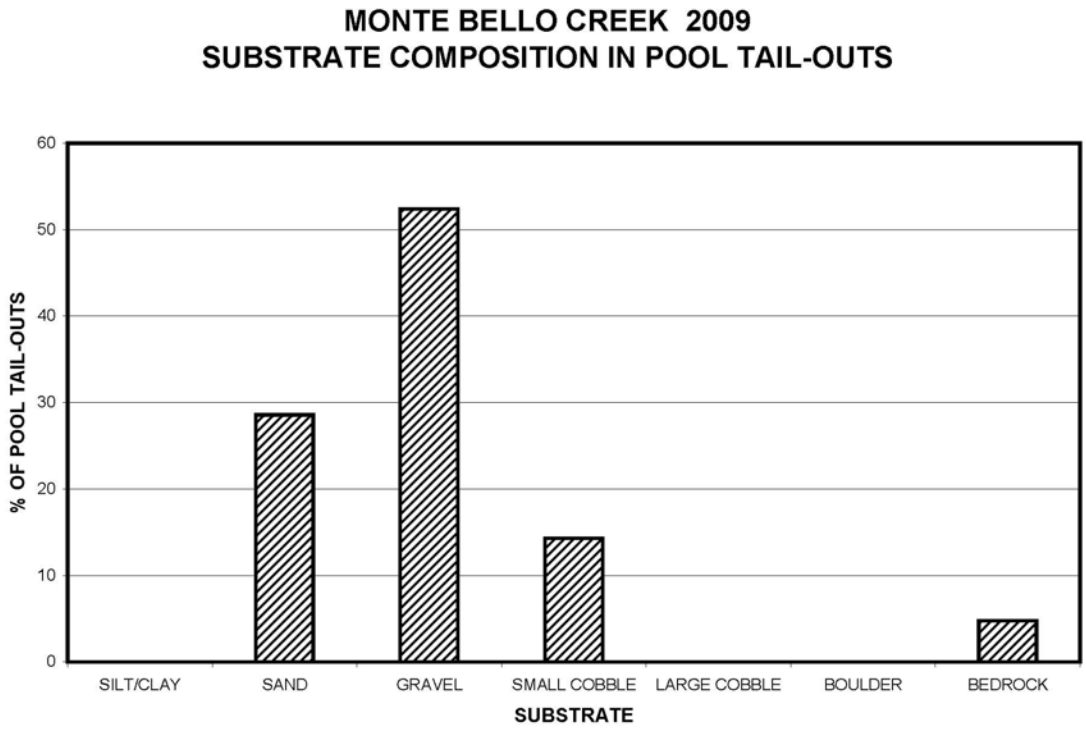

Figure 18. Composition of canopy cover along Monte Bello Creek.

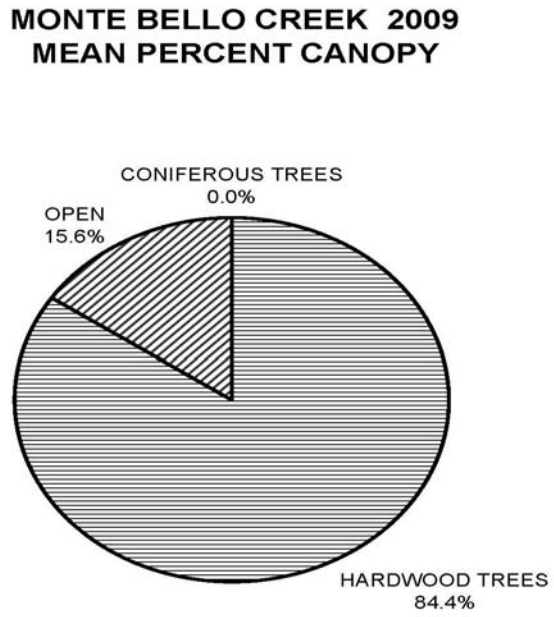

Figure 19. Fish sample results by reach and species for Monte Bello and Permanente Creeks.

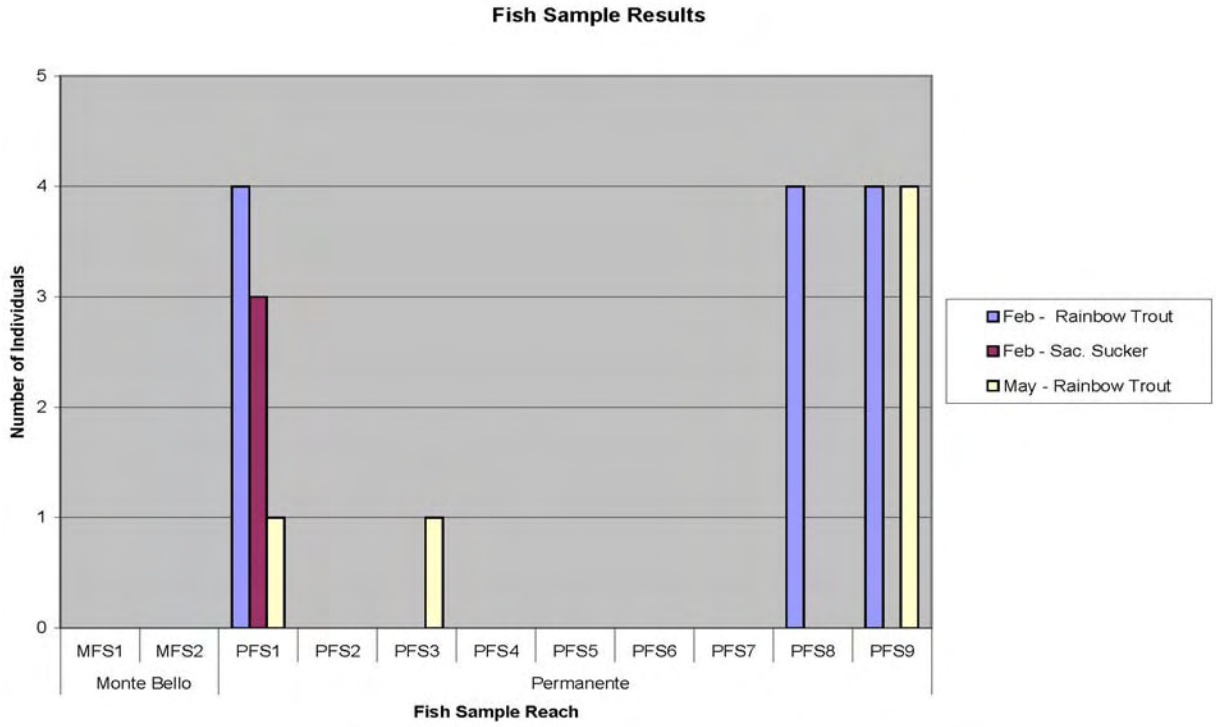

Figure 20. Breakdown of Rainbow Trout size classes captured during fish sample surveys in Monte Bello and Permanente Creeks.

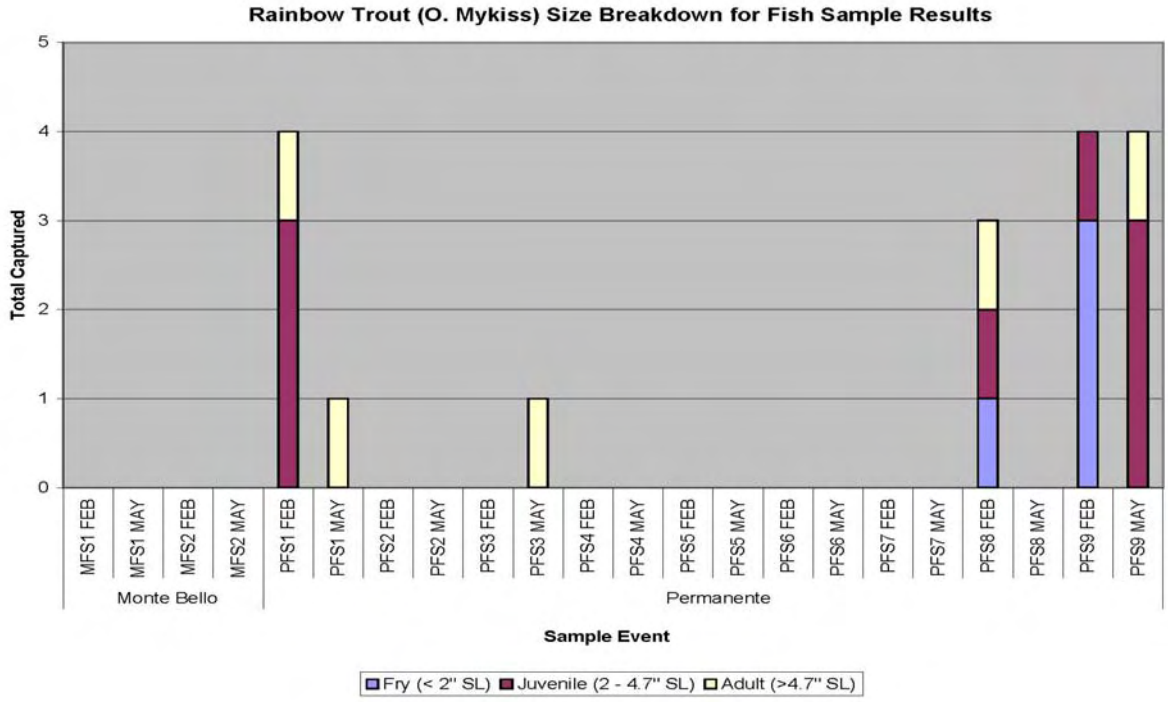

Figure 21. Breakdown of Rainbow Trout size classes as percent of total catch.

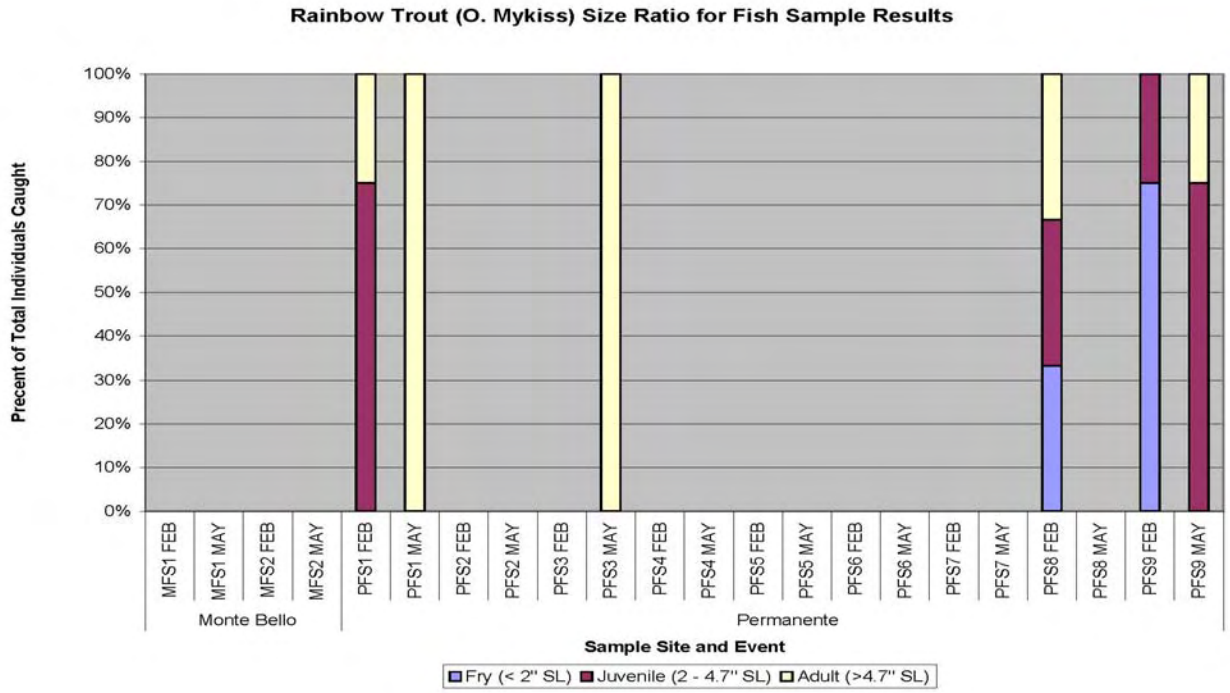

Figure 22. Results of the snorkel surveys by reach in Permanente Creek.

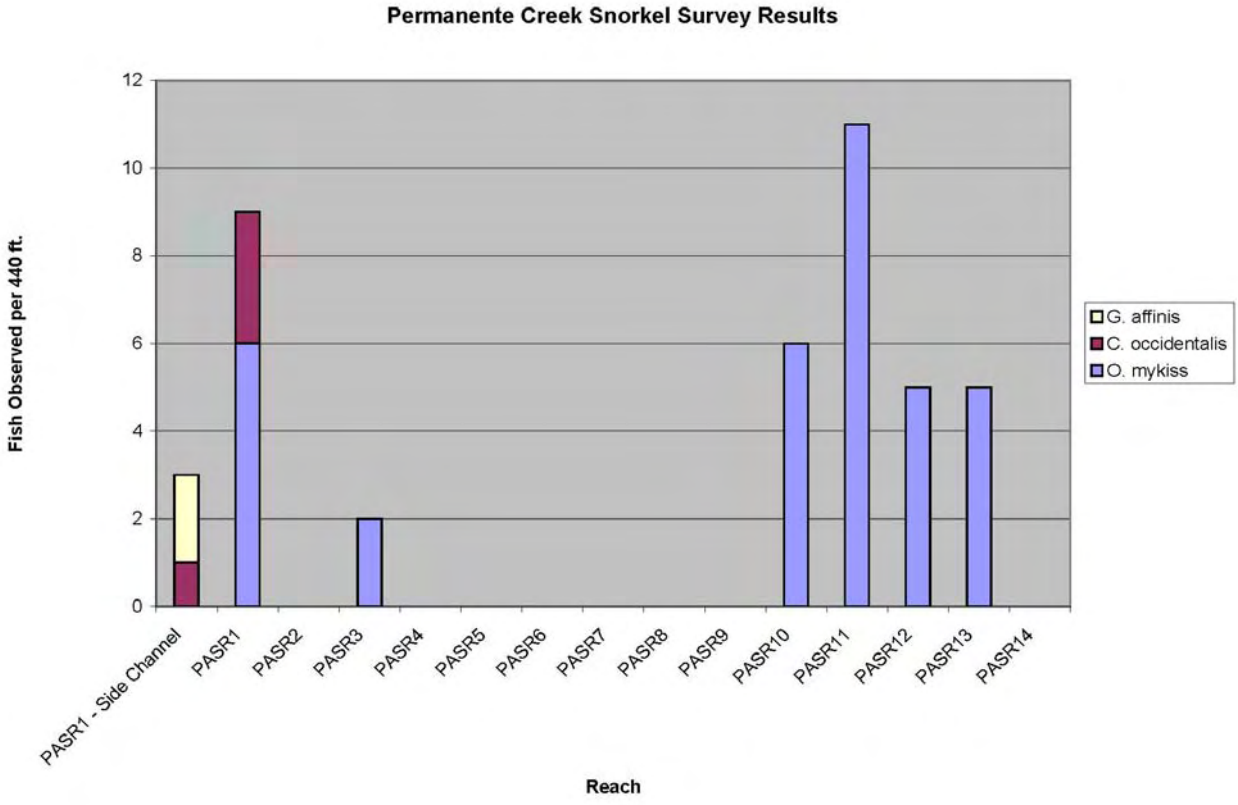

Figure 23. Breakdown of Rainbow Trout size classes observed during snorkel surveys in Permanente Creek.

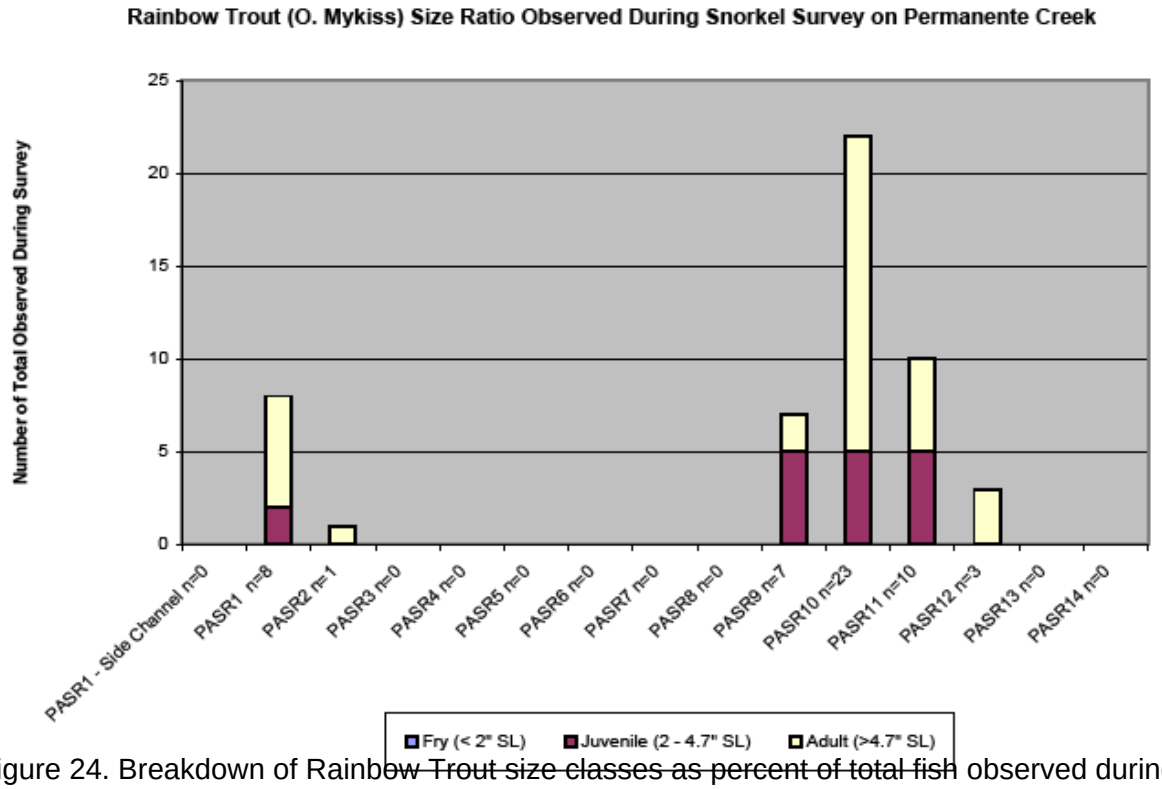

Figure 24. Breakdown of Rainbow Trout size classes as percent of total fish observed during snorkel surveys.

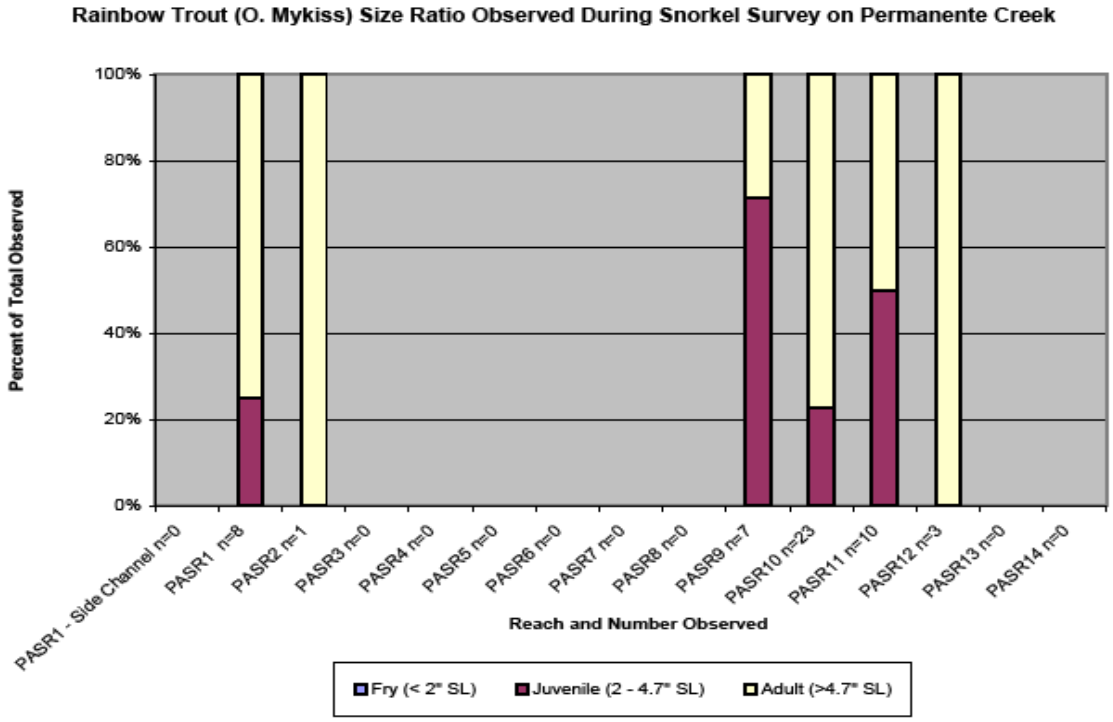

Figure 25. Time-weighted amphibian detections by Aquatic Survey Reach in Permanente Creek.

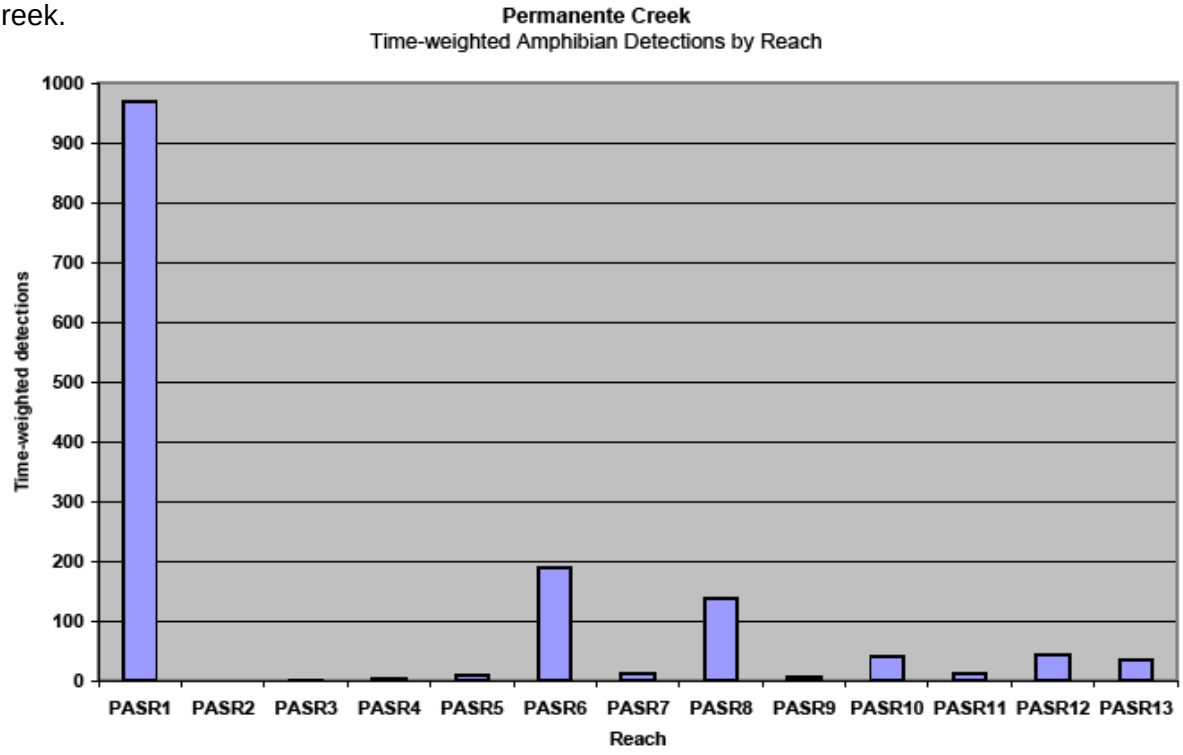

Figure 26. Species composition of amphibian detections as a percentage of detections per reach along Permanente Creek. n=total amphibian detections in each ASR.

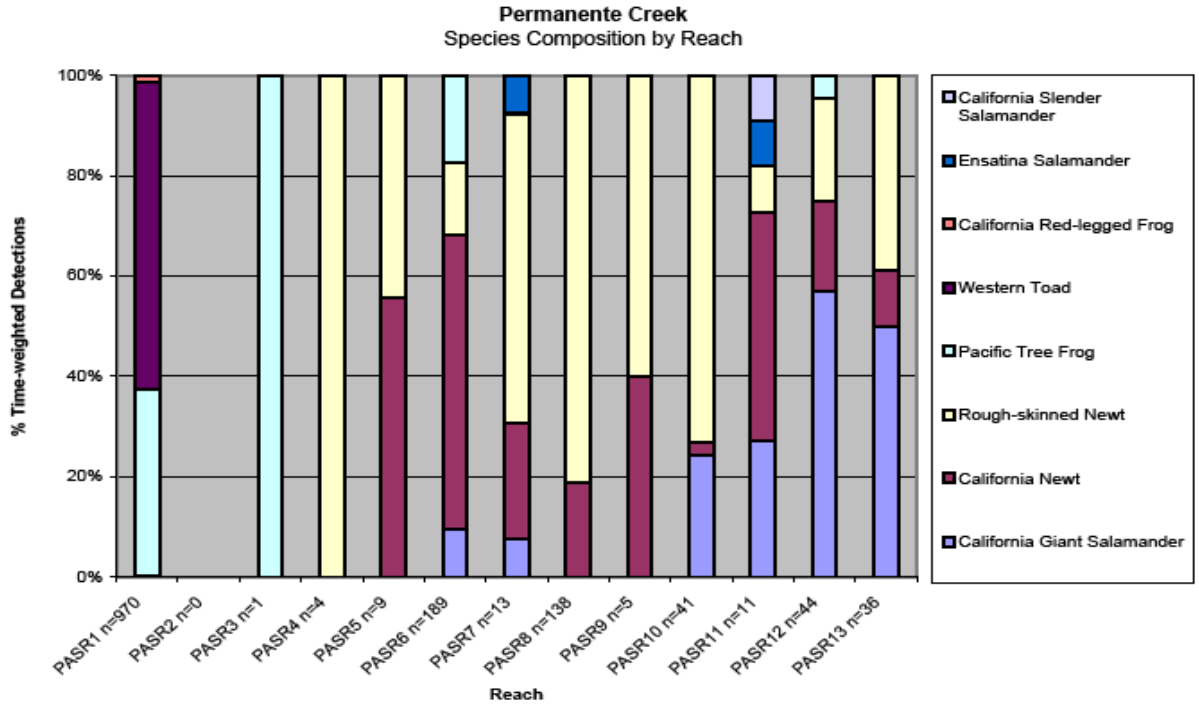

Figure 27. Time-weighted detections of amphibian species by Aquatic Survey Reach along Monte Bello Creek.

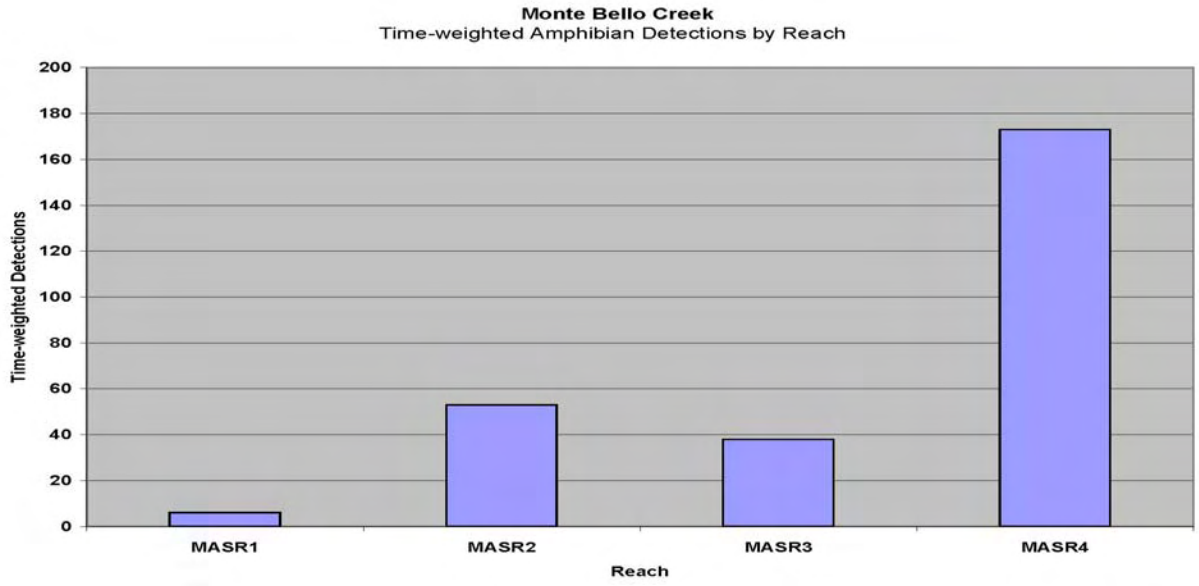

Figure 28. Species composition of amphibian detections as a percentage of detections per reach along Monte Bello Creek. n=total amphibian detections in each ASR.

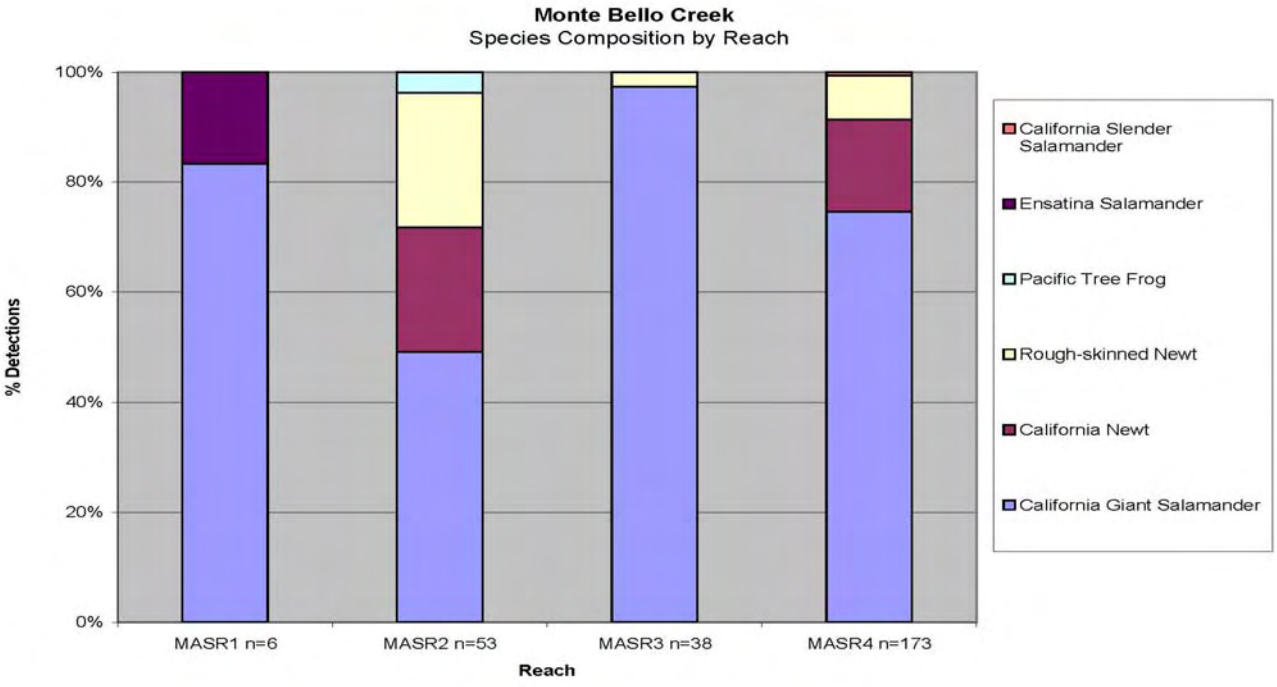

Figure 29. Benthic macroinvertebrate richness measures by sample location.

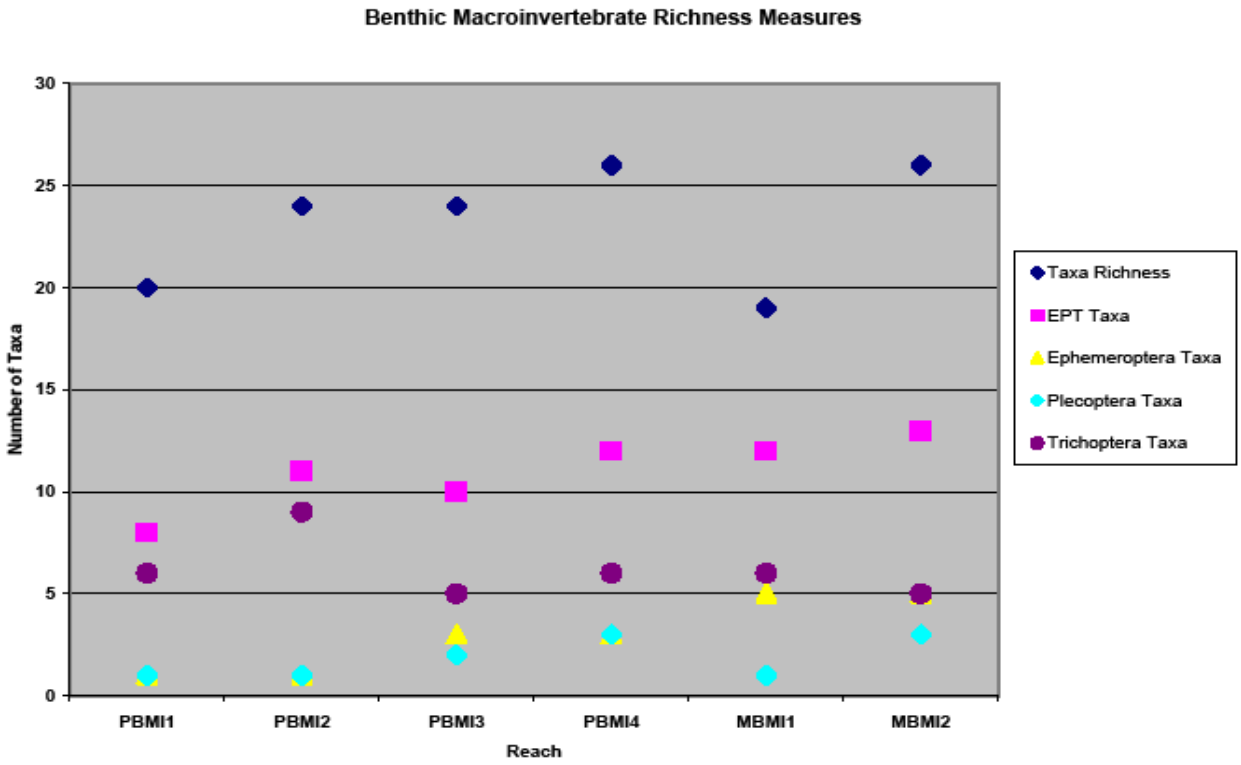

Figure 30. Benthic macroinvertebrate composition measures by sample location.

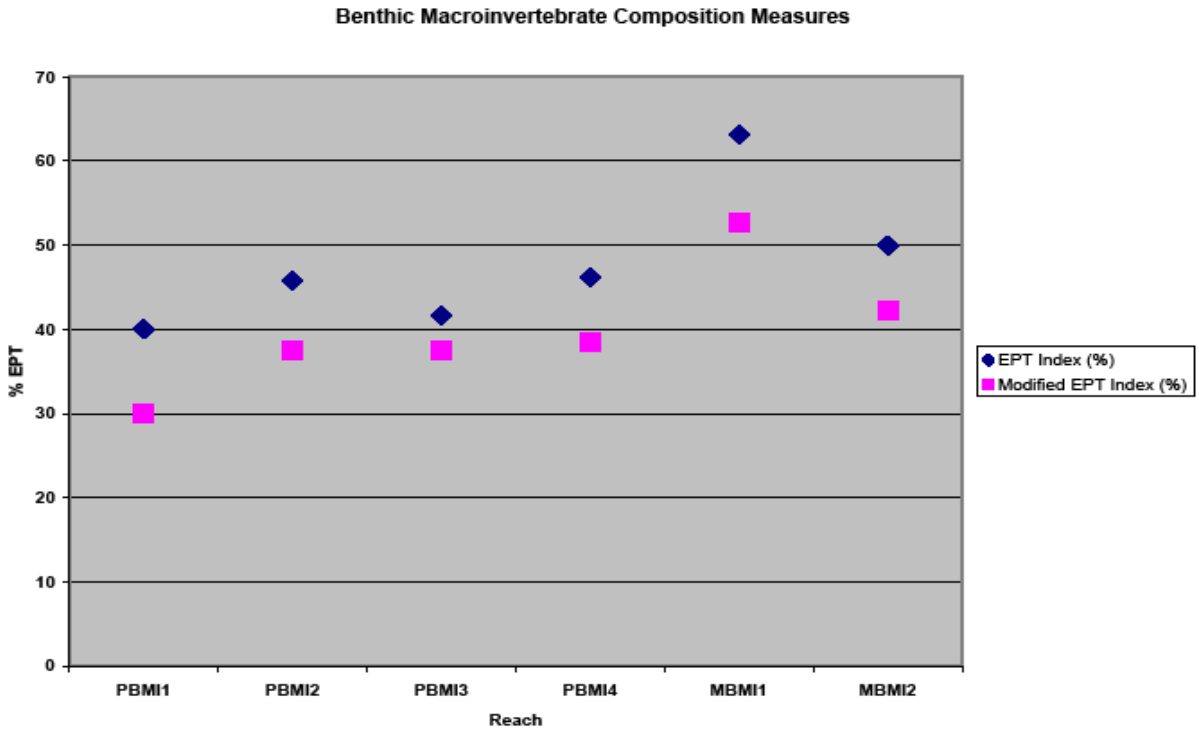

Figure 31. Shannon Diversity Index values by sample location.

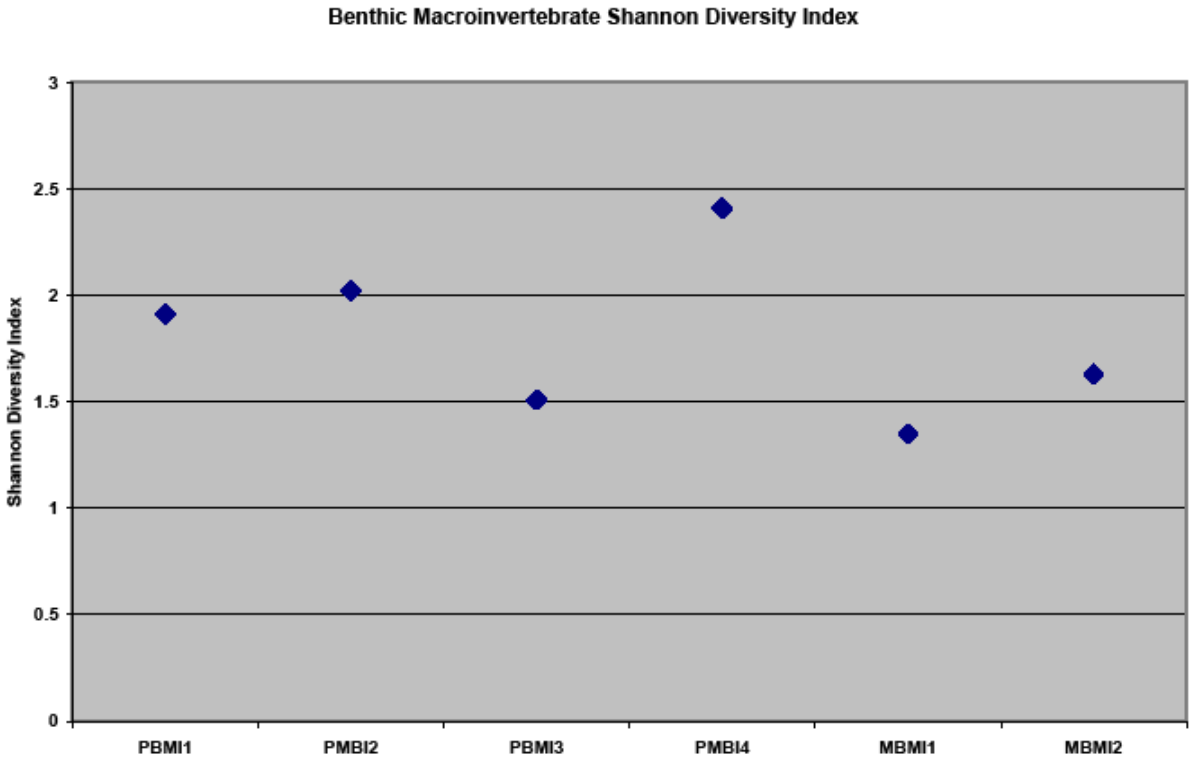

Figure 32. Tolerance/intolerance values by sample location.

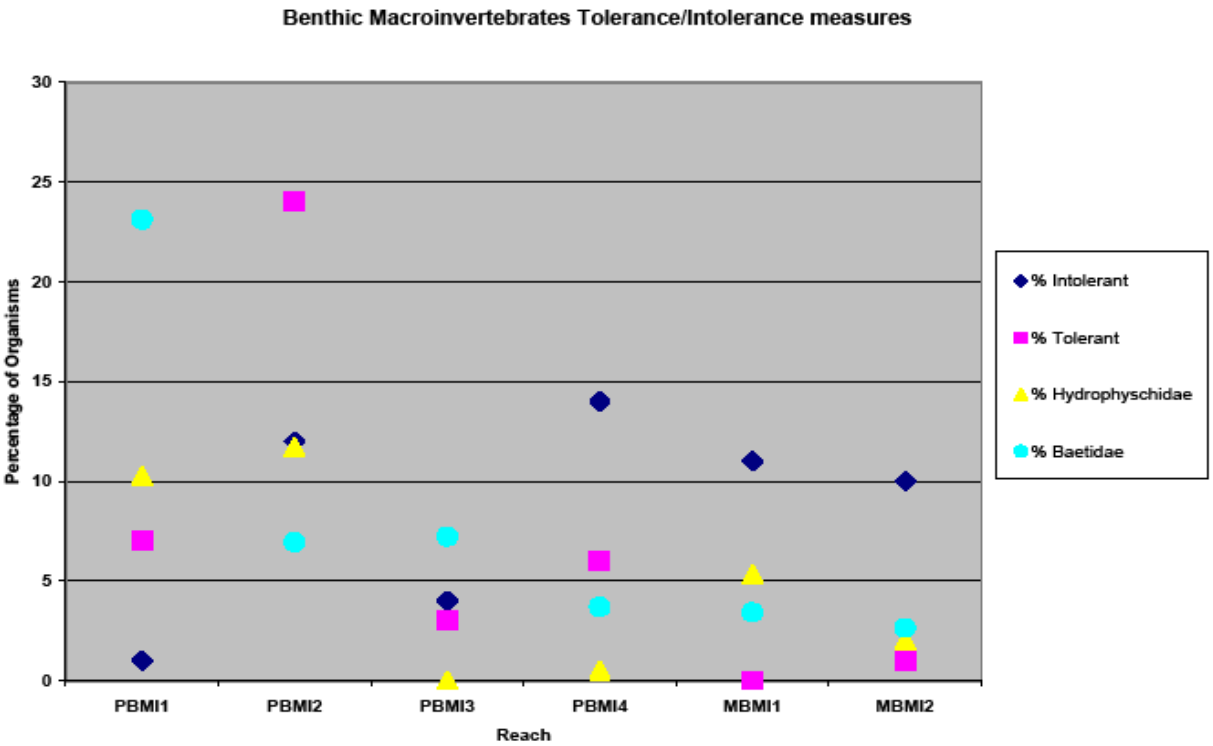

Figure 33. Composition of functional feeding groups as a percentage of organisms by sample location.