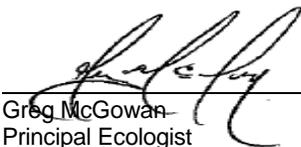


## **The Termo Company**

### **Significant Ecological Areas Biota Report**

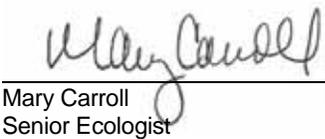
**Termo Well Pads  
Aliso Canyon and Oat Mountain Oil  
Fields, Santa Susana Mountains,  
California**

**August 2010, revised December 2013**



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**Significant Ecological Areas  
Biota Report**

Terro Aliso Canyon and Oat  
Mountain Oil Fields, Santa  
Susana Mountains, California

Prepared for:  
The Terro Company

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Date:  
June, 2010, revised December 2013

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**Acronyms and Abbreviations**

ARCADIS	ARCADIS U.S., Inc.
CDFW	California Department of Fish and Wildlife
CE	California Endangered Species
CEQA	California Environmental Quality Act
cm	centimeter
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	Army Corps of Engineers
CSC	California Special Concern Species
CT	California Threatened Species
°F	degrees Fahrenheit
ESH	environmentally sensitive habitat
ESU	evolutionarily significant unit
FACW	facultative wetland plants
FE	Federally Endangered Species
FSC	Federal Special Concern Species
FT	Federally Threatened Species
ha	hectare
MBTA	Migratory Bird Treaty Act
m	meter
mm	millimeter
msl	mean sea level
OBL	obligate wetland species
RWQCB	California Regional Water Quality Control Board
SEA	Significant Ecological Area
SEATAC	Significant Ecological Areas Technical Advisory Committee

USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey

## 1. Introduction

This report presents the findings of biological surveys conducted to assess the potential environmental impacts associated with the installation of three well pads, along with short associated access roads in a portion of the existing Termo Aliso Canyon and Oat Mountain Oilfields located in the Santa Susana Mountains in Los Angeles County, California (Figures 1 - 5). The general project area is located at the eastern end of the Santa Susana Mountains, north of the City of Chatsworth and west of Interstate 5, just inside the boundary of one of the Significant Ecological Areas (SEA) established by the Los Angeles County Board of Supervisors in 1981 (SEA20); see Figure 4. The SEA20 - Santa Susana Mountains extends from the Ventura County line eastwards along the northern slopes and nearby ridgetop of the Santa Susana Mountains. The project proponent is The Termo Company. The Termo Company leases the portion of the oilfield proposed for the three new pads. Oil production has occurred continuously in the area since the 1930s. There is an extensive network of existing access roads and well pads throughout the project area. The proposed pads have been located adjacent to existing roads, though in some cases, short extensions are required to access suitable flatter areas and minimize grading requirements.

The proposed project consists of the installation of three well pads and associated oil drilling infrastructure in three discrete areas (Site 1, Site 2 and Site 3), along with limited access roads or improvements to the existing roads. Each proposed drilling site was studied in detail, including the proposed pads and access roads as well as suitable buffer areas. At each location, field surveys encompassed a larger area than that proposed for development. Buffers extending approximately 100 feet (30 meters [m]) beyond the mapped boundaries of each disturbance area were formally assessed. It is assumed that all access roads will be 15 feet (5 m) in width; areas of temporary disturbance resulting from cut and fill to widen certain sections of existing roads are included in this assessment. A larger study area extending 1,000 feet (305 m) beyond each proposed drilling site was also assessed using aerial photographs and subsequent field surveys to validate findings from the photo-review and when the potential for sensitive resources was indicated.

Proposed Drilling Site 1 would encompass a total of 1.4 acres (0.6 ha), along with 0.2 acres (0.1 ha) of additional access road installation and/or widening. Proposed Drilling Site 2 would cover a total of 0.8 acres (0.3 ha), along with 1.1 acres (0.4 ha) of additional access road installation and/or widening. Proposed Drilling Site 3 would encompass a total of 0.8 acres (0.3 ha), along with 1.0 acres (0.4 ha) of additional access road installation and/or widening.

The total area of permanent impacts associated with the proposed project is 5.3 acres (2.1 ha). The permanent impacts include 3.0 acres (1.2 ha) for the three proposed well pads and new access roads and an additional permanent impact area of 2.3 acres (0.9 ha) from improvements (primarily widening corners) of existing road. Because of the slopes along the road, widening will require small

areas of cut and fill. These areas will be revegetated with appropriate native plantings and are quantified as temporary impacts. Temporary impacts will total 1.5 acres (0.6 ha). The total area of all planned ground impacts (permanent and temporary) is 6.8 acres (2.7 ha). The larger study area, including the 1000-foot (305-m) surrounding buffer zone, encompasses 414 acres (167 ha).

Electrical power and project pipelines will be extended from the existing oilfield infrastructure along the existing paved main road to each of the three pads as shown on Figure 9. Infrastructure will be installed on the ground resting on concrete sleepers. No trenching, surface grading, or tree impacts is required.

This Biota Report identifies sensitive botanical and wildlife resources, sensitive habitats, and other environmental issues of concern occurring in the project area. The report focuses primarily on the sites that would be disturbed for creation of three oil well pads and associated access roads, identifying potential ecological impacts associated with development, and feasible measures for consideration to avoid and minimize potential project impacts.

This report has been prepared in accordance with the procedures and guidelines outlined by the Los Angeles County Department of Regional Planning and the Significant Ecological Areas Technical Advisory Committee (SEATAC). ARCADIS conducted sensitive species and habitat surveys on March 23, June 1, and August 10, 2010 and on April 16, September 3, September 17, September 24, and October 3, 2013. This Biota Report is based on field surveys and background research. The personnel conducting the surveys consisted of ARCADIS Principal Ecologist Greg McGowan, ARCADIS Senior Ecologist Mary Carroll, ARCADIS Project Scientist Dr. Doug Fischer, ARCADIS Project Scientist Wayne Ferren, and ARCADIS Wildlife Biologist Mitch Siemens. ARCADIS subcontracted with David Magney Environmental Consulting (DMEC) for this project; David Magney and David Brown of DMEC also conducted field surveys with the team.

## **2. Methodology**

ARCADIS utilized a variety of study methods to complete this analysis. These are described in more detail below.

### **2.1 Literature Search**

Prior to performing the fieldwork, ARCADIS conducted a review of documents concerning the site and the surrounding areas, including a search of the California Natural Diversity Database (CNDDB; California Department of Fish and Wildlife [CDFW] 2013) for the U.S. Geological Survey (USGS) 7.5-minute series for Oat Mountain, as well as the surrounding topographic quadrangles: Calabasas, Canoga Park, Mint Canyon, Newhall, San Fernando, Santa Susana, Val Verde, and

Van Nuys. The California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants (CNPS 2013) was also queried for appropriate habitat within the Oat Mountain Quadrangle and adjacent quadrangles. The project area is located in unincorporated Los Angeles County and included in the Santa Susana Significant Ecological Area. The Los Angeles Draft County General Plan (2008) and the Los Angeles Oak Tree Ordinance (2009) were reviewed. Other resources utilized for this assessment included various county, state, and federal regulations, review of other recent ecological reports completed in and around the area, and ARCADIS' (and DMEC's) direct experience in the region.

The target sensitive wildlife investigations for the site were primarily, but not entirely, based upon wildlife species reported in the CNDDDB and on the direct experience of the biologists conducting the surveys. The database was queried for a baseline list of sensitive wildlife species reported from locations in the extended site vicinity. From there, specific species habitat requirements were compared with conditions existing at the site to determine which species potentially occur in the project area and which species might be eliminated from further examination due to lack of suitable habitat. Additional detailed biological information (e.g., typically habitat preference) was obtained from review of internet and literature sources targeting specific species of interest. Species location coordinates provided in the CNDDDB list of sensitive species were utilized to assess their proximity to the project area and to facilitate site-specific review of habitat similarities that might be revealed through aerial imagery and during field surveys. ARCADIS' familiarity with habitat requirements for species included in the CNDDDB inventory and with the existing habitat conditions on and around the Site also aided in compilation of data, in conjunction with review of other ecological documents from nearby locations.

## **2.2 Field Surveys**

The ARCADIS field surveys focused primarily on the disturbance areas for the proposed drilling sites and associated access routes, along with existing natural habitat adjacent to the proposed development areas and the surrounding buffer area. At each location, formal field surveys encompassed a larger area than currently proposed for development, extending approximately 100 feet (30 m) beyond the mapped boundaries for each disturbance area. Detailed mapping was performed within 25 feet (8 m) beyond mapped boundaries for each drilling Site. Additionally, a larger study area of 1000 feet (305 m) surrounding each proposed drilling site was examined from aerial figures and checked on the ground when the potential for sensitive resources was indicated. A broader watershed level assessment was also conducted, as discussed in Section 3.2.

Botanical Surveys: ARCADIS plant surveys encompass the gathering of information on species composition, abundance, relative distribution, and community composition (including dominants, associates, and uncommon elements), covering all areas in the project area on foot at least twice.

Physiographic features are noted and correlated with plant distribution, with special attention paid to accessible drainages and wetlands, rocky/exposed outcrops, changes in soil type, and native communities existing on the property. Surveys were conducted during different flowering seasons for special-status species known from the area, included comprehensive information on species locations and estimated abundance, were designed to systematically cover all habitat types onsite, and were consistent with conservation ethics. Locations of potential special-status species were noted on field maps and global positioning system (GPS) coordinates were obtained, along with population size estimates and phenological development. The survey results characterize and map the plant communities in the project area, record all plant species observed (common and sensitive), and ascertain the likelihood for the occurrence of any sensitive species potentially occurring onsite but not observed.

All plant species found to be in a recognizable condition during the ARCADIS surveys were recorded and are listed in Table 1. Nomenclature follows the Jepson Online Interchange (Baldwin et al. 2010), which lists updates based on *The Jepson Manual* (Hickman 1993). In addition, pertinent volumes of the *Flora of North America* were utilized for plant identification (Flora of North America Editorial Committee, eds. 1993+). It is important to note that while surveys were conducted during different seasons and the findings are considered thorough and complete, the list of vascular plant species presented in this report may not be comprehensive. Plants that bloom earlier or later in the year or that do not bloom every year may not have been in recognizable condition during the 2010 spring and summer surveys. This does not reflect a deficiency in the fieldwork or the reporting, rather, it is in recognition of the limitations of all biological field surveys.

Sensitive Species Surveys: Prior to the initial site visit, a review of all sensitive species reported in the Oat Mountain and adjacent quadrangles was conducted utilizing CNDDDB (2010) and CNPS (2010) and other literature sources. The data reviewed included known locations, habitats, soil or other environmental preferences, elevational range, and other pertinent information. This information was employed to focus the field surveys and increase the likelihood of identifying sensitive species in the project area. During field surveys ARCADIS records field data for any identified sensitive species including location (GPS coordinates), elevation, slope exposure, soil type, habitat type, associated species, population size, phenology, and other relevant data for each location and species. In addition, a field survey form would be submitted to CNDDDB documenting the data on the sensitive species.

Native Tree Assessments (2010): Native tree assessments around two of the proposed drilling sites were performed by Mr. Dave Magney and Ms. Mary Carroll. Both Mr. Magney and Ms. Carroll are certified by the International Society of Arboriculture as Certified Arborists. Initial measurements were made on all trees greater than six feet (2 m) in height located within the footprints of Proposed Drilling Sites 2 and 3 as well as along the drilling site perimeters. Measurements include tree

number (designated by the arborists), species, location coordinates, diameter at breast height (dbh), height, condition, and associated plant species. ARCADIS then developed a GIS database that includes these data. Preliminary tree surveys at Site 1 and along the access roads were conducted WM Surveys, Inc.

Native Tree Assessments (2013): ARCADIS met with representatives of Los Angeles County Regional Planning and the Forestry Division of the Los Angeles Fire Department on September 3, 2013 to refine the focus of tree surveys. In order for drill equipment to access new well pads, access roads need to be 12 to 15 feet (3.6 – 4.6 m) wide and clearance for transported drill equipment would be a maximum of 18 vertical feet (5.5 m). Trees along proposed access routes were then mapped based on the following criteria and methods:

- Each tree with one or more branches extending over the roadway was given a numbered aluminum tag if one or more branch or branches was less than 18 vertical feet (5.5 m) from the ground in any location across the width of the road; each tag was attached to the tree with an aluminum nail. An 18-foot expanding stadia rod was placed on the road in various locations by each tree and extended up into the branches in order to assess tree impacts.
- The tag number for each tree was recorded and correlated with previously mapped tree numbers by using print maps of previously numbered tree locations coupled with GPS coordinates. New data collected for each tree include species, dbh (if not previously recorded), tree health, and the diameter of any branches over 2 inches to be removed.
- Trees were also tagged if the tree canopy was greater than 18 feet from the ground but with branches that extended up to the edge and/or over the road in order to monitor tree health; tree roots tend to follow the drip line of the tree canopy and may be subject to damage as a result of compaction during drill rig transport.
- Trees were not tagged if they occurred upslope or downslope of the road with no branches or evidence of roots in the road area. Occasional dead trees were tagged that were out of the road margin when there might be a question concerning tree health and mortality.

Tree data are summarized in Tables 5 and 6 and mapped trees are shown in Figure 8.

Vegetation Mapping: ARCADIS mapped and characterized all vegetation in the study areas based on direct field observations and with aerial photograph interpretation for surrounding buffer areas. Existing vegetation within the vicinity of the proposed project was mapped in detail, including some areas farther north and west. For this report, vegetation analysis was limited to the surrounding area within 1,000 feet (305 m) of the proposed impact areas. The total area analyzed was 414 acres (167 ha), of which 408 acres (165 ha) were outside of proposed impact areas. The total combined disturbance area including temporary and permanent impacts is 6.8 acres (2.7 ha).

Vegetation was mapped at the both the community and alliance level, according to CNPS/CDFW mapping protocols described in the CNPS *A Manual of California Vegetation* (Sawyer, Keeler-Wolf, and Evens 2009) and digitized using ArcGIS software. Preliminary vegetation maps were verified in the field for accuracy, and modified as appropriate (Figures 6a, 6b, 7).

Wildlife Surveys: All wildlife species observed in the project area or assumed present from sign (e.g., tracks, burrows, scat, and nests) during the surveys are discussed in Section 3.5 and listed in Table 2. ARCADIS wildlife surveys are intended to identify all wildlife utilizing a site or as many species as can be inferred from direct observation or from various sign. Active searches for birds and mammals included direct observation, auditory recognition, and diagnostic sign (prints, sounds, burrows, trails, nests, prey remains, foraging and other impacts to vegetation, etc.). For reptiles and amphibians, the search was also expanded to include lifting/turning and carefully replacing cover structures such as rocks and debris.

Wildlife surveys emphasize the characterization of existing habitat in terms of suitability and value for both known and potentially occurring sensitive wildlife species and seek to determine the extent to which wildlife species utilize existing habitat for different life cycle and behavioral needs (e.g., breeding, foraging, dispersal, and cover). Although all wildlife species observed or indicated in the field during surveys are recorded, a primary focus of the wildlife surveys is to determine the presence or potential for the presence of sensitive and rare species. The list of wildlife species presented in this report may not be comprehensive. In order to create a comprehensive wildlife census, multiple surveys over multiple years would be required to enable observation of species during the day and at night, during different seasons, and during different weather conditions when some species are more likely to be detected. The current findings are considered thorough and appropriate for this assessment.

Potentially occurring sensitive ecological resources identified during the database and background search are listed in Table 3. Sensitive habitats observed in the project area during the investigation are shown in Figure 7.

### **2.3 Weather during Field Surveys**

Formal surveys were conducted by two to four person survey teams on March 23, June 1, and August 10, 2010 and on April 16, September 3, September 17, September 24, and October 3, 2013. Weather data based on ARCADIS field notes and historic climate information from Weather Underground for Porter Ranch North, CA at 1,640 feet (500 m) above msl (wunderground.com) is provided below, as well as Oat Mountain at 3,747 feet (1,142 m).



**The Termo Company  
Significant Ecological Areas  
Biota Report**

Aliso Canyon and Oat Mountain Oilfields,  
Santa Susana Mountains, California

March 23, 2010 (spring):

Precipitation and cloud cover: No precipitation; clear. Humidity average of 47% with range of 9 to 93%.

Temperature: high: 75.6°F, low: 46.6 °F, average: 61.1°F

Wind: breezy; average - 5-10 mph, range – 0 mph to gusts from 20 – 30 mph

June 1, 2010 (late spring/early summer):

Precipitation and cloud cover: No precipitation; initially foggy, then clearing. Humidity average of 83% with range of 79 to 89%.

Temperature: high: 57.6°F, low: 53.8 °F, average: 55.7°F

Wind: Calm with occasional breezes; average - 0 mph, range – 0 to gusts of 2 mph

August 10, 2010 (mid-summer):

Precipitation and cloud cover: No precipitation; clear during site visit. Humidity average of 51% with range of 18 to 65%.

Temperature: high: 77.9°F, low: 61.3 °F, average: 68.8°F

Wind: Calm with occasional breezes in early afternoon; average – 0.7 mph, range – 0 to gusts of 20 mph

April 16, 2013 (spring):

Precipitation and cloud cover: No precipitation; clear. Humidity average of 40% with range of 19 to 76%.

Temperature: high: 69°F, low: 50 °F, average: 58°F

Wind: Breezy; average – 8 mph, range – 0 mph to 38 mph gusts

September 3, 2013 (late summer):

Precipitation and cloud cover: No precipitation; clear. Humidity average of 44% with range of 20 to 73%.

Temperature: high: 100°F, low: 73 °F, average: 86°F

Wind: Calm with occasional breezes; average – 3 mph, range – 0 mph to 10 mph gusts

September 17, 2013 (late summer):

Precipitation and cloud cover: No precipitation; clear. Humidity average of 56% with range of 32 to 78%.

Temperature: high: 86°F, low: 63 °F, average: 74°F

Wind: Calm with occasional breezes; average – 4 mph, range – 0 mph to 12 mph gusts

September 24, 2013 (early autumn):

Precipitation and cloud cover: No precipitation; clear. Humidity average of 37% with range of 13 to 62%.

Temperature: high: 91°F, low: 60 °F, average: 76°F

Wind: Calm with occasional breezes; average – 3 mph, range – 0 mph to 10 mph gusts

October 3, 2013 (early autumn):

Precipitation and cloud cover: No precipitation; clear. Humidity average of 69% with range of 43 to 88%.

Temperature: high: 77°F, low: 60 °F, average: 68°F

Wind: Calm with occasional breezes; average – 3 mph, range – 0 mph to 20 mph gusts

In general, recorded temperatures for the top of Oat Mountain vary from an average maximum of 75.4 degrees Fahrenheit [°F] in July to an average minimum temperature of 31.8 °F in January. The mean annual temperature is 57.6 °F. Average yearly precipitation is estimated at 20.23 inches (51.4 cm), falling primarily between October and late April (wunderground.com, 2010). The local weather pattern of mild, wet winters and warm, dry summers is characteristic of Mediterranean-climate regions. Annual rainfall figures can vary dramatically from season to season, having a profound influence on ecosystems, fire frequency, and water availability.

### **3. Site Characteristics**

The Termo Aliso Canyon and Oat Mountain Oilfields occur in the eastern portion of the Santa Susana Mountains, one of several east-west trending mountain ranges comprising the Transverse Ranges of southern California (Figures 2 and 3). Biologically, the Santa Susana Mountains link the project area to the coastal plain near Oxnard and Ventura to the west and to the San Gabriel Mountains to the east. Although the regional context is discussed in more detail in the next section (Section 4.0), the unusual confluence of northern and southern biological influences in the site vicinity are one of the reasons that the site has been designated as a Significant Ecological Area (SEA 20- Santa Monica Mountains) by Los Angeles County (Figure 4).

The Aliso Canyon Oilfield covers approximately 3,200 acres (7,908 ha) and was discovered by the Tidewater Associated Oil Company in 1938. Since then, over 60 million barrels of oil and 80 billion cubic feet of natural gas have been produced. Several companies operate in the area, including The Termo Company, Vintage Petroleum, and Southern California Gas. Infrastructure includes paved and unpaved access roads along with a central compressor station, substations, pipelines, transmission lines, and drilling units. The maximum elevation in the Santa Susana Mountains is Oat Mountain 3,747 feet (1,142 m) above mean sea level (msl) and the lowest elevation is approximately 800 feet (243 m) in the vicinity of Northridge.

Portions of the Aliso Canyon and Oat Mountain Oilfields last burned in the Sesnon Fire, which scorched 14,703 acres (36,332 ha) over a five-day period in the Santa Susana Mountains before being contained on October 18, 2008.

The current project entails the installation of three approximately half-acre (0.2 ha) well pads, along with associated access roads that connect to the existing primary access road, Oat Mountain Way, which generally follows the crest of the range in the project area.

Proposed Drilling Site 1, the easternmost site, is located at approximately 3,000 feet (915 m) above msl on a relatively flat ridge near the crest of the range. An existing dirt road will provide vehicle access to Oat Mountain Way with little change in grade and will require no modifications. This area is surrounded by a mixture of grassland and oak woodland vegetation on all sides, with the exception of existing dirt roads and an abandoned corral.

Proposed Drilling Site 2 occurs at approximately 2,800 feet (854 m) above msl on a small ridge between the western fork of Rice Canyon Creek and a smaller tributary (see Figure 5). The proposed drilling site is located approximately 250 feet (76 m) below the elevation of Oat Mountain Way; the proposed access route follows an existing driveway that winds down the densely wooded slope over a distance of approximately 0.45 mile (0.7 km). The driveway would require widening as part of the project, along with appropriate tree pruning to prevent the loss of branches or damage to trees or vehicles. Several structures are present to the northwest of the proposed drilling area, including an existing residence, barns, corrals, and other accessory structures. The general drilling pad area has been used as a trash dump, with scattered debris and rusting vehicles. Oak woodland and savanna vegetation predominates, along with grasslands, ruderal areas, and riparian forests in the drainages.

Proposed Drilling Site 3 is located at approximately 3,200 feet (975 m). The proposed site is located in an undeveloped grassy opening surrounded by oak woodland and wooded areas dominated by California walnut, western chokecherry, and other species. The existing access road linking the site with Oat Mountain Way is approximately 3,185 feet (970 m) long and will require widening, additional vegetation clearing for grading, and appropriate tree pruning to prevent the loss of branches or damage to trees or vehicles.

A total of seven general habitat types were identified at and surrounding the proposed drilling sites during the 2010 ARCADIS surveys. These include coast live oak woodland, valley oak woodland and savanna, California walnut woodland, southern mixed evergreen forest, native grassland, annual grassland, and ruderal vegetation. These are described in more detail in Section 3.4, with details on community structure and floristic alliances. Vegetation communities are mapped on Figures 6 and 7. Habitat types found in the immediate surrounding area not observed within the

proposed limits of disturbance are discussed in Section 4.2. Photographs provided in Appendix A offer views of the communities observed in the project area.

A total of 147 species of plants were recorded by ARCADIS; these encompass 100 species of native plants and 47 species of non-native plants.

### **3.1 SEA Boundaries**

The three proposed drilling sites and associated access roads are located within the Santa Susana Mountains Significant Ecological Area 20 (SEA-20, see Figure 4). SEA-20 is approximately 18,410 acres (7,450 ha) in size. To the northwest, SEA-20 abuts SEA-23 (Santa Clara River) along a small portion of the southern side of the Santa Clara River watershed; SEA-20, then trends to the southeast, occurring west and south of the communities of Valencia and Stevenson Ranch, as well as SEA-63 (Lyon Canyon) until it intersects Interstate 5 to the northwest. To the southwest, SEA-20 shares a portion of its southern perimeter with the Santa Susana Pass SEA (SEA-21) near the Los Angeles County-Ventura County line. The southern SEA-20 boundary follows the ridgeline of the Santa Susana Mountains, with the bulk of the Termo Aliso Canyon Oilfield on the south-facing slopes and the SEA on the north-facing slopes. To the east along the southern perimeter of SEA-20, its perimeter skirts the Sunshine Canyon Landfill and the northern edge of Granada Hills. The three proposed drilling sites and associated access roads are all located along the boundary but entirely within SEA-20 and permanent impacts will cover approximately 5.1 acres (2.1 ha).

### **3.2 Watershed Boundaries at the Site**

The three proposed drilling sites are located on the north side of the main ridgeline topping the Santa Susana Mountains in this area (Figure 5). All proposed drilling sites are located within the Newhall Creek watershed locally (USGS EDNA 2010), which includes the South Fork of the Santa Clara River; all sites are encompassed in the larger Santa Clara River watershed. The Santa Clara River originates in Soledad Canyon between the Sierra Pelona Mountains to the north and the San Gabriel Mountains in Los Angeles County and flows westwards for 116 miles (187 km) to the Pacific Ocean at the Santa Clara River Estuary Natural Reserve in Oxnard, encompassing a watershed over 1,600 square miles (414,400 ha) in size.

Drainages to the south of the ridgeline in the project area are part of the Los Angeles River watershed, which encompasses 834 square miles (216,000 ha) and flows for 51 miles (82 km) to its mouth in Long Beach. Headwaters of the Los Angeles River drain the south- and east-facing slopes of the Simi Hills, the south-facing slopes of the Santa Susana Mountains, and the north-facing slopes of the Santa Monica Mountains. These drainages flow easterly through the San Fernando Valley, around the northeast side of the Santa Monica Mountains, and then south to southeast to

the mouth of the Los Angeles River in San Pedro Bay near Long Beach. Tributaries in the project area include Limekiln Canyon, which is located south of the ridgeline near Proposed Drilling Sites 1 and 2, and Mormon Canyon and Browns Canyon, which are located south of the ridgeline near Proposed Drilling Site 3. These drainages are not in the watershed for the project area and no project impacts are expected to any of these south-facing drainages.

Proposed Drilling Site 1, the easternmost site, is located at approximately 3,000 feet (915 m) above msl on a flat ridge above the primary eastern tributary of Rice Canyon Creek, which drains to the northeast to Gavin Canyon, where it flows into the South Fork of the Santa Clara River. Drainages in the immediate vicinity of Proposed Drilling Site 1 were dry at the time of the ARCADIS 2010 and 2013 surveys and are ephemeral in nature.

Proposed Drilling Site 2 occurs at approximately 2,800 feet (854 m) above msl on a ridge between the western fork of Rice Canyon Creek and a smaller tributary; both tributaries drain northwards to Gavin Canyon, which flows into the South Fork of the Santa Clara River. Water was flowing in both of the two flanking steep drainages surrounding Proposed Drilling Site 2 during the ARCADIS 2010 and 2013 surveys, and these streams are mapped as blue-line drainages on the USGS Oat Mountain quadrangle. A small drainage culvert along the west side of the proposed access road carried running water during the March visit but was drying out by June 2010.

Proposed Drilling Site 3 is located at approximately 3,200 feet (975 m) above msl above the main eastern tributary of Towsley Canyon Creek. Like Rice Canyon, Towsley Canyon Creek flows into Gavin Canyon before joining the South Fork of the Santa Clara River. Drainages in the immediate vicinity of Proposed Drilling Site 3 were dry during the ARCADIS 2010 and 2013 surveys and are ephemeral in nature.

### **3.3 Site Geology and Landforms**

The Santa Susana Mountains comprise a relatively young mountain range uplifted by tectonic activity centered on a number of fault segments and zones, especially the Santa Susana Fault Zone. Key landform features in the project area are the east-west trending ridgetop along which the three proposed drilling sites are located, as well as the Oat Mountain Syncline and the Pico Anticline to the north. The Santa Susana Fault is located along the southern boundary of the Santa Susana Mountains, dipping steeply below the project area. The thrust is folded along an east-west axis and is mapped in a complex, overlapping, and lobed pattern (Dibblee 1988). The Santa Susana Mountains encompass Oak Ridge and South Mountain to the west before descending to the Oxnard plain. Surrounding topography and vegetation are discussed further in Section 4.

The maximum elevation in the project area is at Oat Mountain 3,747 feet (1,142 m) above msl, with Mission Point to its east at 2,771 feet (845 m) above msl. Topography varies from steep, rugged slopes and incised drainages to narrow ridgetops and alluvial terraces. The predominant geological formation in the project area is Monterey shale, which covers a large portion of the south-facing slopes of the Santa Susana Mountains. Sisquoc shale abuts the Monterey formation along the ridgetop, with the Towsley and Pico formations to the north of the project area; the Towsley formation also occurs in disjunct locations on the lower slopes of the Santa Susana Mountains outside of the project area.

Monterey shale is characterized as a marine biogenic formation comprised of thin-bedded siliceous shale of middle to late Miocene age that can reach 2,000 feet (610 m) in depth in the project area. In general, Monterey shales are dark gray-brown but weather to cream-white, and are described as hard, brittle, locally cherty, and easily fractured. The Monterey formation originated from organically-rich muds, including marine diatom remains, and often contains pockets of bituminous material, which when buried and fractured, can serve as a reservoir for gas and oil. Monterey shale at the site is steeply tilted and folded and is exposed as bedrock at Oat Mountain and over much of the Aliso Canyon Oil field on the south-facing slopes of the Santa Susana Mountains (Norris and Webb 1990).

Sisquoc shale is also a marine formation of Miocene age, but unlike Monterey shale, is comprised of clastic sediments that tend to be dark gray to brownish-gray clay, bleaching to light gray. Sediments are crumbly with spherical to flattened and layered fractures and may contain gypsum and tan dolomitic concretions and semi-siliceous layers. A band of Sisquoc shale lays on top of Monterey shale along the ridgetop, dipping to the north due to folding of the Oat Mountain syncline in this location. Sites 1 and 3 are located in areas mapped as Sisquoc shale mudstones, and a thin band of Sisquoc shale comprised of friable sandstone is exposed in the vicinity of Sites 1 and 3 (Dibblee 1988). Site 2 is mapped as landslide debris, and is surrounded upslope by Monterey shale.

Soils in the project area for Sites 1, 2, and 3 are mapped as the Gazos series. The Gazos series consists of moderately deep, well drained soils that form from weathered shale and sandstone. Gazos soils mapped in the project area include Gazos clay loam (30 to 50% slopes); Gazos silty clay loam (15 to 30% slopes); and Gazos silty clay loam (30 to 50% slopes). Depth to bedrock is approximately 20 to 40 inches (51 to 102 cm). The soil between depths of about 5 and 15 inches (13 to 30 cm) is usually from late April or May until November or early December and is moist in some or all parts all through April. Rock fragments of shale usually make up 0 to 10 percent of the soil profile but range to as much as 35 percent in some areas. The surface layers tend to be 0 to 22 inches (0 to 56 cm) thick and are comprised of dark grayish brown (10YR 4/2) heavy silt loam when dry, or very dark grayish-brown (10YR 3/2) when moist. Soils exhibit an angular blocky structure and can be hard, friable, sticky, plastic, and slightly acidic (pH 6.5). Subsurface layers are brown (10YR

5/3) silty clay loams when dry, or dark brown (10YR 3/3) when moist, and occur approximately 22 to 29 inches (56 to 74 cm) deep. Subsurface layers exhibit a slightly angular blocky structure and are hard, friable, sticky, plastic, and slightly acid (pH 6.5). Subsoils range from 29 to 36 inches (74 to 91 cm) in depth and are very pale brown (10YR 7/4), weathered, slightly acid (pH 6.5) sandstone (USDA 2010). Fertility is relatively low, with 1 to 5 percent organic matter to a depth of more than 20 inches (51 cm). Subsoils are well-drained with low water-holding capacity.

### **3.4 Vegetation in the Project Area**

The project area supports a mosaic of native, weedy, and planted vegetation described more fully in the ensuing sections. The distribution of vegetation types is determined by topography, soils and geology, hydrology, slope exposure, climate, land use history, and fire history. The vegetation types in and around the proposed disturbance areas are primarily upland communities, sometimes partially dissected by dirt roadways or developed areas where all or most of the natural vegetation has been removed.

Three broad categories of vegetation types currently exist in the immediate vicinity of the proposed drilling sites, including forest and woodland, shrubland, and grassland, in addition to disturbed habitat. Each of the proposed drilling sites has been located in an opening in the woodland or forest supporting primarily annual grassland. The existing access routes frequently occur under the tree canopy. The proposed new access routes avoid trees to the maximum extent feasible. Project impacts are discussed in Section 5.

This section introduces the vegetation classification system used in this report and then provides more detail on the plant communities and individual floristic alliances. No wetland communities occur within the proposed disturbance envelopes; as a result wetland habitats are not discussed in this section, but are covered in Section 4.2.

Seven upland plant communities were identified on or near the project area during the ARCADIS surveys, four woodland/forest communities: coast live oak woodland, valley oak woodland, California walnut woodland, and southern mixed evergreen forest; one shrubland community: montane deciduous scrub; and two grassland communities: native perennial grassland and annual grassland (Figure 6).

#### **3.4.1 Vegetation Classification System for Project Area**

Vegetation classification for the project area is hierarchical, beginning with general vegetation types, then plant communities within the general vegetation types, and finally individual floristic alliances within these plant communities. An overview of the classification system used in this report is

provided in this section, followed by discussions of observed vegetation types, plant communities, and alliances mapped in the project area. Vegetation types, plant communities, and alliances that are present in the surrounding area are discussed in Section 4.

The vegetation for the project area is classified according to the National Vegetation Classification system developed by NatureServe and expanded and applied to California by the California Native Plant Society and CDFW (Sawyer, Keeler-Wolf, and Evens 2009). As mentioned, the classification system is hierarchical, consisting of classes, subclasses, formations, divisions, macrogroups, groups, alliances, and associations. The basic plant community types are found at the Alliance level, which uses the dominant characteristic plant species for the alliance name. Descriptions are provided in the following subsections for the following habitat classifications:

- Class: Mesomorphic Tree Vegetation (Forest and Woodland)
  - Subclass: Temperate Forest
    - Formation: Warm Temperate Forest
      - Division: Madrean Forest and Woodland
        - Macrogroup: California Forest and Woodland
          - Group: Californian Broadleaf Forest and Woodland
            - *Juglans californica* Alliance \*
            - *Quercus agrifolia* Alliance \*
            - *Quercus lobata* Alliance \*
    - Formation: Cool Temperate Forest
      - Division: Western North America Cool Temperate Forest
        - Macrogroup: California-Vancouverian Montane and Foothill Forest
          - Group: Californian Montane Conifer Forest
            - *Pseudotsuga macrocarpa* Alliance
    - Formation: Temperate Flooded and Swamp Forest
      - Division: Western North America Warm Temperate Flooded and Swamp Forest
        - Macrogroup: Southwestern North American Riparian, Flooded and Swamp Forest/Scrubland
          - Group: Southwestern North American Riparian/Wash Scrub
            - *Sambucus nigra* Alliance
- Class: Mesomorphic Shrub and Herb Vegetation (Shrubland and Grassland)
  - Subclass: Mediterranean Scrub and Grassland
    - Formation: Mediterranean Scrub
      - Division: California Scrub
        - Macrogroup: California Chaparral
          - Group: Californian Xeric Chaparral
            - *Adenostoma fasciculatum* Alliance
            - *Adenostoma fasciculatum-Salvia apiana* Alliance
            - *Ceanothus cuneatus* Alliance
            - *Eriodictyon crassifolium* var. *nigrescens* Provisional Alliance

- *Malosma laurina* Alliance
  - Group: Californian Mesic Chaparral
    - *Ceanothus spinosus* Alliance
    - *Heteromeles arbutifolia* Alliance \*
  - Group: Californian Pre-montane Chaparral
    - *Ceanothus oliganthus* Alliance
  - Macrogroup: California Coastal Scrub
    - Group: Central and Southern Californian Coastal Sage Scrub
      - *Artemisia californica* Alliance
      - *Artemisia californica-Eriogonum fasciculatum* Alliance
      - *Artemisia californica-Salvia mellifera* Alliance
      - *Artemisia californica-Salvia leucophylla* Alliance
      - *Eriogonum fasciculatum* Alliance
      - *Eriogonum fasciculatum-Salvia apiana* Alliance
      - *Salvia apiana* Alliance
      - *Salvia leucophylla* Alliance
      - *Salvia mellifera* Alliance
- Formation: Mediterranean Grassland and Forb Meadow
  - Division: California Grassland and Meadow
    - Macrogroup: California Annual and Perennial Grassland
      - Group: Californian Annual Forb/Grass Vegetation
        - *Amsinckia menziesii* Alliance \*
        - *Lasthenia gracilis* Alliance
        - *Plagiobothrys nothofulvus* Alliance \*
      - Group: California Perennial Grassland
        - *Elymus condensatus* Alliance
        - *Stipa cernua* Alliance \*
      - Group: Mediterranean California Naturalized Annual and Perennial Grassland
        - *Avena barbata* Semi-natural Stands
        - *Brassica nigra* Semi-natural Stands
        - *Bromus* subsp. Semi-natural Stands \*
  - Subclass: Temperate and Boreal Shrubland and Grassland
    - Formation: Temperate Grassland, Meadow, and Shrubland
      - Division: Vancouverian and Rocky Mountain Grassland and Shrubland
        - Macrogroup: Western North American Temperate Grassland and Meadow
          - Group: Western Dry Upland Perennial Grassland
            - *Elymus glaucus* Alliance \*
            - *Poa secunda* Alliance \*
  - Subclass: Temperate and Boreal Shrubland and Grassland
    - Formation: Temperate Grassland, Meadow, and Shrubland
      - Division: Vancourvian and Rocky Mountain Grassland and Shrubland
        - Macrogroup: Western Cordilleran Montaine Shrubland and Grassland
          - Group: Western Cordilleran Montane Deciduous Scrub

- *Prunus virginiana* Provisional Alliance
- Class: Lithomorphic Vegetation (Nonvascular and Sparse Vascular Rock Vegetation)
  - Subclass: Mediterranean, Temperate, and Boreal Nonvascular and Sparse Vegetation
    - Formation: Mediterranean Cliff, Scree, and Rock Vegetation
      - Division: North American Mediterranean Rock Outcrop, Scree, and Talus Nonvascular and Sparse Vascular Vegetation
        - Macrogroup: California Cliff, Scree, and Other Rock Vegetation
          - Group: “Southern” California Coast Ranges Cliff and Canyon
            - *Selaginella bigelovii* Alliance
            - Lichen Alliance
- Unvegetated/Altered
  - Road/Disturbed \*
  - Developed \*

### 3.4.2 Forest, Woodland, and Savanna Vegetation

Woodland and forest vegetation predominates on the moist north-facing slopes of the project area and in drainages, especially woodlands dominated by one or more species of oak (*Quercus*). Also present are California walnut (*Juglans californica*) and, in moist drainages, bigcone-spruce (*Pseudotsuga macrocarpa*).

In general, forest vegetation is comprised of densely spaced trees with a closed canopy and extensive and nearly continuous shade; woodland vegetation is characterized by closely spaced trees with adjacent tree canopies touching but not usually overlapping and moderate shade. Savanna vegetation consists of widely scattered trees amongst other vegetation, such as grassland or shrubland.

Forest and woodland vegetation on Oat Mountain consists of warm and cool temperate forests, originating from north and south of Oat Mountain, respectively. The warm temperate forest communities are grouped in the vegetation classification for the project area under Californian Broadleaf Forest and Woodland of the Madrean Forest and Woodland division. The cool temperate forest community is grouped under the Californian Montane Conifer Forest of the Western North America Cool Temperate Forest division (Sawyer, Keeler-Wolf, and Evens 2009).

Californian Broadleaf Forest and Woodland represents a vegetation type dominated by woody trees and tall scrub species with a Madrean (subtropical) origin. This Madrean Woodland and Forest Group forms a continuous canopy over a variety of low shrubs and a variable grassy ground layer. Some woodlands may not contain any shrub layer, and may only form a canopy over annual or perennial grasslands. The understory of woodlands is directly related to the density of the woodland and the cover of its canopy, as well as land use history. Typically, if a woodland is dense, then

understory species diversity is low. The woodland and forest floristic alliances observed Oat Mountain include coast live oak woodland/forest (*Quercus agrifolia* Alliance), valley oak woodland and savanna (*Quercus lobata* Alliance), California walnut woodland (*Juglans californica* Alliance), and bigcone-spruce-canyon oak forest (*Pseudotsuga menziesii* and *Quercus chrysolepis* Alliance), which are discussed below.

#### 3.4.2.1 Coast Live Oak Woodland/Forest

Coast live oak woodlands and forests predominate at the project area, forming the dominant vegetation on the north-facing slopes of Oat Mountain. Coast live oak (*Quercus agrifolia*) is an evergreen tree ranging from 40 to 75 feet (12 to 23 m) in height, with a spreading crown, many massive branches, a dense canopy of thick, waxy, spine-toothed, convex leaves, and a massive root system consisting of both deeply penetrating roots and widely spreading lateral roots (Pavlik, 1991; Hickman, 1993). Although seemingly ubiquitous in the hills surrounding Oat Mountain, coast live oaks are restricted to an approximately fifty-mile wide swath along the coast from Mendocino County south to northern Baja California. They are completely absent in the Sierra Nevada and other interior ranges; rather, they tend to occur in the maritime belt that receives fog during the summer months. Coast live oak woodland is most well developed between sea level and 5,000 feet (1,525 m) on north-facing slopes, in canyons, and along rolling foothills and alluvial terraces adjacent to water courses.

These trees can easily live for 300 years or more. Most healthy stands contain mixed age classes of oak trees, saplings, and seedlings. Although considered drought-tolerant due to its ability to survive the hot dry summer months without rain, coast live oak tends to occur in areas that receive at least 15 or more inches (38 or more cm) of rain or have suitable microenvironments with moisture available to its roots at depth. Recent studies describe the water-acquiring capacity of mycorrhizae associated with the roots of coast live oak, especially in non-clay soils, which enhance moisture uptake during dry summer months (Bornyasz, Graham, and Allen 2001); mycorrhizal fungi also aid in nutrient uptake (Pavlik 1991).

Scientific studies suggest a positive correlation between oak tree density and deep soils that foster root growth and water uptake year-round (Barbour and Major 1977; Holland and Keil 1995). In the project area, oaks may be observed growing in mesic, non-saturated environments: north-facing slopes, upper margins of riparian forest, the bottoms of ephemeral drainages, and on the slopes and ridges where sufficient moisture is present.

In deep soils, valley oak (*Quercus lobata*) occurs in association with coast live oak; valley oak is discussed more in the next section (Section 3.3.3). California walnut is also a common associate and is discussed further in Section 3.3.4. Also present, especially in moist locations near or in

drainages, are canyon oak (*Quercus chrysolepis*), bigcone-spruce, and California bay (*Umbellularia californica*).

In dense undisturbed coast live oak woodlands and forests in the project area, the environment under the oak canopy is very shady. Shade-tolerant shrubs such as upright snowberry (*Symphoricarpos albus* var. *laevigatus*) and California gooseberry (*Ribes californicum* var. *hesperium*) are common, along with occasional blue elderberry (*Sambucus nigra* subsp. *caerulea*), poison-oak (*Toxicodendron diversilobum*), western choke cherry (*Prunus virginiana* var. *demissa*), jim brush (*Ceanothus oliganthus* var. *sorediatus*), toyon (*Heteromeles arbutifolia*), chaparral currant (*Ribes malvaceum*), climbing penstemon (*Keckiella cordifolia*), and others, depending on the location. Herbaceous perennials occasionally found in the oak woodland understory include coastal wood fern (*Dryopteris arguta*), California sweet cicely (*Osmorhiza brachypoda*), species of sanicle (*Sanicula bipinnata*, *Sanicula crassicaulis*), big-fruited wild cucumber (*Marah macrocarpus* var. *macrocarpus*), and others. Native perennial grasses present in oak woodland include California brome (*Bromus carinatus*), blue wildrye (*Elymus glaucus*), nodding needlegrass (*Poa secunda* subsp. *secunda*), and coast range melic (*Melica imperfecta*). Annuals are infrequent in deep shade and more common at the margins of trees and shrubs, such as fiesta flower (*Pholistoma auritum*), baby blue eyes (*Nemophila menziesii* var. *integrifolia*), miner's lettuce (*Claytonia parviflora* and *C. perfoliata*), common bedstraw (*Galium aparine*), and many other species associated with adjacent grassland and savanna vegetation.

Where the understory has been cleared under the oak canopy, weedy non-native annual species predominate, especially ripgut brome (*Bromus diandrus*) and Italian thistle (*Carduus pycnocephalus*).

Coast live oaks vary in density from continuous stands on north-facing slopes to scattered trees in grassland habitats on a variety of slope exposures. Along some moist drainages, concentrated bands of oaks may form the dominant riparian vegetation; this mesic vegetation type is often referred to as coast live oak riparian forest and is discussed further in Section 4.2.3.1.

Coast live oak woodland is characterized as the Coast Live Oak Woodland Community in the CNDDDB community classification system (Holland 1986), and as the *Quercus agrifolia* Woodland Alliance in the CNPS Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009). Coast Live Oak Woodland has a global rank of G4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat) and a state rank of S4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat), as listed in the CNDDDB (2013). *Quercus agrifolia* Woodland Alliance has a G5 global rarity ranking (demonstrably secure because of its worldwide occurrence) and an S4 state rarity ranking (greater than 100 viable occurrences statewide, and/or more than 31,110 acres

[12,950 hectares]); some associations within the *Quercus agrifolia* Woodland Alliance have G3 and S3 rankings (21-100 viable occurrences worldwide/statewide, and/or more 6,400-31,110 acres [2,590-12,950 hectares]), according to Sawyer, Keeler-Wolf, and Evens (2009).

*Quercus agrifolia* Woodland Alliance in the project area forms a continuous to open 100-foot (30 m) tall canopy, growing over an understory of occasional shrubs and an herbaceous ground layer. *Quercus agrifolia* Alliance often requires sandstone or shale-derived soils (Sawyer, Keeler-Wolf, and Evens 2009). A form of the *Quercus agrifolia* Woodland Alliance, the *Quercus agrifolia* Alliance Savanna, is occasionally present in which *Q. agrifolia* forms an open canopy with a ground layer understory of predominantly California Grassland contributors.

The *Quercus agrifolia* Woodland Alliance is the predominant plant community on Oat Mountain, particularly in the project area. It occupies approximately 136 acres (55 ha) of the mapped area, and is present at or near to all three proposed drilling sites.

#### 3.4.2.2 Valley Oak Woodland and Savanna

Valley oak (*Quercus lobata*) is endemic to California, where it forms extensive savannas and woodlands in deep alluvial soils and on slopes and ridgetops where sufficient moisture is available. Valley oaks are considered to be the largest North American oak, reaching 100 feet (30 m) in height at maturity, with a rounded crown and massive spreading branches. Smaller branches may droop at the tips and bear winter-deciduous, flat, lobed leaves. The bark is gray and deeply fissured, often with a checkered pattern. The roots of valley oaks are often tiered, with feeder and “sinker” roots that reach different levels in the soil profile typically two to ten feet (0.6 to 3 m) below the soil surface (Thomas 1980). Some roots, especially of young trees, can reach 10 - 60 feet (3 to 18 m) in depth, but most roots spread outwards just below the soil surface, often twice as far as the edge of the canopy (Thomas 1980).

In pre-European California prior to agricultural and urban development, extensive swaths of valley oak woodland and savanna covered interior valley bottoms and slopes, and were especially common in deep alluvial soils adjacent to water courses. From the Sacramento River south through the Great Central Valley and up valley corridors in the Sierra Nevada and Coast and Transverse Ranges, valley oak woodland and savanna was a signature California community indicating deep rich soil in valley bottoms between 100 and 2,000 feet (30 and 610 m) elevation, rarely to as high as 5,000 feet (1,524 m) elevation. Typically, valley oak tree density is highest near water courses and lower slopes.

In the Los Angeles County area, valley oaks occur in the Santa Monica Mountains and the Santa Susana Mountains, with outlying individuals historically collected in Santa Monica, Chatsworth

reservoir, and Griffith Park (Consortium of California Herbaria 2013). Griffin and Critchfield (1972) specifically note that the southernmost distribution of the main population of valley oak in California terminates in the project vicinity in the San Fernando Valley. Populations near the margins of the central distribution of a species are often of special note and treated as sensitive by biologists due to the potentially unique genetic makeup of the marginal population, which may be important in species survival during global climate shifts and other environmental changes.

After valley oaks lose their leaves in autumn, light reaches the ground, facilitating germination of winter annuals under the canopy before leaves emerge in spring. Depending on the tree density, valley oaks may occur in woodlands or savannas, with additional trees and shrubs as associates and an understory of grassland or shrubland vegetation.

In the project area, valley oak woodland and coast live oak woodland frequently intergrade, with coast live oak woodland on steeper slopes and valley oak woodland in deeper soils. Valley oak woodland and savanna were noted to be particularly common in areas mapped as landslides by Dibblee (1992). Common associated woody species in valley oak woodland in the project area include trees such as coast live oak, blue elderberry, and California walnut, as well as shrubs such as upright snowberry, California gooseberry, toyon, and poison-oak. Herbaceous species include native grasses, especially California brome, blue wildrye, and nodding bluegrass, and broadleaf perennials such as California sweet-cicely, Johnny jump-up (*Viola pedunculata*), blue dicks (*Dichelostemma capitatum*), and with many other annual and herbaceous perennials that comprise the California grassland alliance. Non-native species such as ripgut brome are also common, especially in previously disturbed habitats adjacent to roads, well pads, structures, and livestock facilities.

Valley oak woodland and savanna is characterized as the Valley Oak Woodland Community in the CNDDDB community classification system (Holland 1986), and as the *Quercus lobata* Woodland Alliance in the CNPS Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009). Valley oak woodland has a global rank of G3 (10,000-50,000 [4,050-20,235 ha] acres worldwide) and a state rank of S2.1 (2,000-10,000 acres [809 to 4,050 ha]; very threatened statewide), as listed in the CNDDDB (2013). *Quercus lobata* Woodland Alliance has a G3 global rarity ranking (21-100 viable occurrences worldwide, and/or more 6,400-31,110 acres [2,590-12,950 ha] worldwide) and an S3 state rarity ranking (greater than 100 viable occurrences worldwide/statewide (21-100 viable occurrences statewide; and/or more 6,400-31,110 acres [2,590-12,950 ha] statewide), according to Sawyer, Keeler-Wolf, and Evens (2009).

The *Quercus lobata* Woodland Alliance occurs in moist valley and deep soils on slopes and ridgetops on Oat Mountain and in the project area. Associated canopy contributors include California walnut, coast live oak, and blue elderberry. Valley oak also occurs in the project area as a

scattered associate species to the *Quercus agrifolia* Alliance plant communities. The understory is variable, including many associated shrub species found in coastal sage scrub, California chaparral, and grasslands. It occupies approximately 74 acres (30 ha) of the mapped area, and is present at or adjacent to all three proposed drilling sites and represents a sensitive habitat type.

### 3.4.2.3 California Walnut Woodland

California walnut woodland is dominated by Southern California black walnut, a deciduous large shrub to small tree in the Walnut Family (Juglandaceae); woodlands dominated by Southern California black walnut occur primarily on slopes up to 3,000 feet (900 m) above msl between Santa Barbara and San Diego Counties. Southern California black walnut has a spreading habit, often with multiple trunks arising from near the base and numerous long branches; trees can reach 50 feet (15 m) at maturity. The bark is gray brown, with a slight silvery wash on the surface, and deep flattened fissures on older trunks. California walnut woodland is characterized by an open to closed canopy growing with woodland shrub and grassland associates. Like valley oak, Southern California black walnut is winter deciduous, enabling a diverse understory of winter-active shrubs and herbaceous species to develop before the walnuts leaf out in spring. Soils are frequently moist and fine-textured; this walnut species has a wetland indicator status of FAC (USACE 2013).

California walnut woodland in the project area produces an open canopy consisting of numerous large, mature trees growing over an understory of associated shrubs and herbs; it frequently forms a mosaic with coast live oak woodland and valley oak woodland, depending on which species is dominant. Associated woody species occurring in California walnut woodland in the project area include coast live oak, valley oak, California gooseberry, upright snowberry, and thickets of western choke cherry. Dense patches of perennial native grasses sometimes occur in the understory of Southern California black walnut, especially one-sided bluegrass, blue wild rye, and California brome. Native annuals such as miner's lettuce, baby blue-eyes, fiesta flower, and common bedstraw are also frequent associates.

California walnut woodland is characterized as the California Walnut Woodland Community in the CNDDDB community classification system (Holland 1986), and as the *Juglans californica* Woodland Alliance in the CNPS Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009). California walnut woodland has a global rank of G2 (2,000-10,000 acres [809 to 4,050 ha]; very threatened worldwide) and a state rank of S2.1 (2,000-10,000 acres [809 to 4,050 ha]; very threatened statewide), as listed in the CNDDDB (2013). *Juglans californica* Woodland Alliance has a G3 global rarity ranking (21-100 viable occurrences worldwide, and/or more 6,400-31,110 acres [2,590-12,950 ha]) and an S3.2 state rarity ranking (21-100 viable occurrences statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]; threatened), according to Sawyer, Keeler-Wolf, and Evens (2009).

*Juglans californica* Woodland Alliance occurs scattered along the top and slopes of Oat Mountain, including Proposed Drilling Site 3. *Juglans californica* Woodland Alliance occupies approximately 11 acres (4.5 ha) of the mapped area and represents a sensitive habitat type. No walnut tree removal is proposed as part of the project.

#### 3.4.2.4 Southern Mixed Evergreen Forest

Mixed evergreen forests are dominated by one or more evergreen waxy-leaved tree species that sprout vigorously after fires. In northern California, mixed evergreen forests are dominated by Douglas-fir (*Pseudotsuga menziesii*), madrone (*Arbutus menziesii*), tanbark oak (*Lithocarpus densiflora*), coast live oak, California bay, and above 2,500 feet (762 m), canyon oak; mixed evergreen forests occur inland from redwood forests in drier sites in northern California. In southern California, southern mixed evergreen forests tend to be confined to steep, moist canyons and north-facing slopes, generally above 1,000 feet (304 m) above msl and frequently above 3,000 feet (912 m) above msl. Bigcone-spruce (*Pseudotsuga macrocarpa*) replaces the closely-related Douglas-fir in southern mixed evergreen forests, and associated trees include canyon oak, California bay, and coast live oak. Although a range of shrubs and herbs occur as associated species in this community, southern mixed evergreen forest is noted for its lack of a dense herbaceous understory.

Bigcone-spruce is an evergreen conifer with long spreading branches, each bearing drooping branchlets clothed with dark green one-inch to two-inch long (2 to 4 cm) needles. Like many conifers, bigcone-spruce trees are pyramidal when young, but as they age they become strongly tapered and may become lopsided as a result of wind-pruning. They retain large branches low on the trunk, and mature branches bear distinctive cones over 3 inches (9-20 cm) in length that bear elongate three-pronged bracts between scales. The bark is dark brown and deeply fissured in age.

Bigcone-spruce individuals reach 100 to 164 feet (30 to 50 m) in height at maturity, towering over associated trees. This species is noted for its unusual ability to sprout from the trunk after a fire, and fire-blackened trees crowned by green branches are frequent in the in some locations around the project sites. Trees can live to be over 700 years (Lanner 1999). Bigcone-spruce is narrowly distributed in southern California from Santa Barbara County south through southern Kern, Ventura, Los Angeles, southwestern San Bernardino, western Riverside, Orange, and San Diego Counties.

In the project area, southern mixed evergreen forest was noted in moist drainages on the north-facing slopes of the Santa Susana Mountains, along with clusters of trees in sheltered high-elevation sites. In these areas, bigcone-spruce is commonly associated with canyon oak, California bay, coast live oak, and occasional valley oak and interior live oak. Some native herbaceous perennial associates, such as rock phacelia (*Phacelia egeana*) and woodland star (*Lithophragma*

*cymbalaria*) were only observed in the southern mixed evergreen forest vegetation type during the 2010 and 2013 ARCADIS surveys.

Southern mixed evergreen forest is characterized as the Bigcone-spruce – Canyon Oak Community in the CNDDDB community classification system (Holland 1986), and as the *Pseudotsuga macrocarpa* Forest Alliance in the CNPS Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009). Bigcone-spruce – Canyon Oak Community has a global rank of G3 (10,000-50,000 [4,050-20,235 ha] acres worldwide) and a state rank of S3.2 (10,000-50,000 [4,050-20,235 ha] acres; threatened statewide), as listed in the CNDDDB (2013). *Pseudotsuga macrocarpa* Alliance has a G3 global rarity ranking (21-100 viable occurrences worldwide, and/or more 6,400-31,110 acres [2,590-12,950 ha]) and an S3.2 state rarity ranking (21-100 viable occurrences statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]; threatened), according to Sawyer, Keeler-Wolf, and Evens 2009.

*Pseudotsuga macrocarpa* Forest Alliance occurs on the north slopes and ridgetop of Oat Mountain. Associated canopy contributors include coast live oak, canyon oak, and California bay. The understory is variable, including many of those associated shrub species listed above under the *Quercus agrifolia* Alliance, such as California gooseberry, upright snowberry, toyon, poison-oak, California brome, western wildrye, and California sweet-cicely.

*Pseudotsuga macrocarpa* Forest Alliance is a characteristic plant community of steep north-facing slopes and drainages on Oat Mountain. It occupies approximately 47 acres (19 ha) of the mapped area, and is a sensitive habitat type.

### 3.4.3 Shrubland Vegetation

Shrubs are defined as woody plants less than 20 feet (6 m) in height at maturity that usually bear multiple trunks. Typical shrublands in southern California include coastal sage scrub and chaparral vegetation, which occur at Oat Mountain but not in the immediate project area. The shrubland vegetation of Oat Mountain consists of the Mediterranean Scrub and Grassland subclass, Mediterranean Scrub formation, and California Scrub division. The California Scrub division is further divided and represented on Oat Mountain by California Chaparral and California Coastal Scrub macrogroups. These are discussed in Section 4.2.1. The only shrubland vegetation located in the immediate project vicinity is montane deciduous scrub, occurring in a small area near Drilling Site 3.

Montane deciduous scrub is dominated by western choke cherry (*Prunus virginiana* var. *demissa*), a large, broadleaved winter-deciduous shrub to small tree that reaches 30 feet (9 m) in favorable sites but generally is less than 20 feet (7 m) tall. Western choke cherry, also called bitter cherry,

produces green, ovate, pointed leaves with small serrations along the margins; they are winter deciduous. White to cream-colored flowers appear on terminal racemes in late spring, followed by dark red to blackish drupes. Western choke cherry is widespread in western mountainous areas, and appears adjacent to Proposed Drilling Site 3 with other deciduous woody species such as Southern California black walnut, upright snowberry, and bigleaf maple (*Acer macrophyllum*). Herbaceous species include chaparral clematis (*Clematis lasiantha*) and sticky cinquefoil (*Potentilla glandulosa* var. *glandulosa*).

Montane deciduous scrub is characterized as the Mixed Montane Chaparral in the CNDDDB community classification system (Holland 1986), and as the *Prunus virginiana* Provisional Shrubland Alliance in the CNPS Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009). Mixed montane chaparral has a global rank of G4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat) and a state rank of S4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat), as listed in the CNDDDB (2013). *Prunus virginiana* Provisional Shrubland has a G4 global rarity ranking (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres (12,950 ha); and an S2? state rarity ranking (6-20 viable occurrences statewide, and/or more 1,280-6,400 acres [518-2,590 ha]), according to Sawyer, Keeler-Wolf, and Evens 2009.

*Prunus virginiana* Provisional Shrubland Alliance commonly occurs on mesic slopes and canyons that are scattered throughout foothills and mountains. This scrub type prefers loamy soils on north-facing slopes at elevations between 300 and 8,900 feet (100 and 2,700 m), according to Sawyer, Keeler-Wolf, and Evens (2009). *Prunus virginiana* Provisional Shrubland Alliance was found adjacent to Proposed Drilling Site 3, and it is present on the north-facing slopes of Oat Mountain elsewhere. *Prunus virginiana* Provisional Alliance occupies approximately 0.8 acre (0.3 ha) of the project area and represents a sensitive habitat type.

#### 3.4.4 Grassland and Herbaceous Vegetation Communities

Grassland communities are dominated by perennial or annual species of grasses with a range of associated broad-leaved forbs and occasional shrubs and trees. Native grasslands in California tend to be dominated by clumps of tufted or spreading perennial grasses, whereas annual grasslands are often dominated by non-native Mediterranean grasses. Similarly, more native forb species are associated with native grasslands and non-native forbs with annual grasslands. Stands with a higher cover of annual or perennial forbs than grasses are also a component of these herbaceous communities.

The grassland and herbaceous floristic alliances observed Oat Mountain include native grasslands (*Elymus glaucus* Alliance, *Poa secunda* Alliance, *Stipa cernua* Alliance), annual grasslands (*Avena*

*barbata* Alliance, *Bromus diandrus* Alliance), native annual forb communities (*Amsinckia menziesii* Alliance, *Plagiobothrys nothofulvus* Alliance), and one non-native annual forb community (*Brassica nigra* Alliance). These alliances are discussed below.

#### 3.4.4.1 Native Grassland

Native grasslands are dominated by clumps of tufted or spreading perennial grasses ranging from one to four feet (0.3 to 1.2 m) in height and interspersed with native forbs and occasional shrubs and trees. Native grasses include needlegrass (*Stipa* species), native bluegrass species (*Poa* species), coast range melic grass (*Melica imperfecta*), wildrye (*Elymus* species), and others (Barbour and Major, 1977; Barbour et al., 1993; Holland and Keil, 1995). These grasses vary in habit. Needlegrass, bluegrass, melic grass, and blue wildrye are all tufted grasses, which are often termed bunchgrasses.

Unlike annual grasslands in California, which are dominated by non-native annual species that go to seed and die completely in summer, most native perennial grasses do not completely die back in summer. A well-developed root system up to seven or more feet (2.1 or more m) deep allows them to persist during the hot dry months and to continue to survive the same location from year to year (Stromberg and Kephart, 2004). In patches between the bunchgrasses, annual forbs such as lupines (*Lupinus* species) and farewell-to spring (*Clarkia* species) bloom in spring or summer, depending on the species. Herbaceous perennial species are also scattered in native grasslands, including blue-eyed grass (*Sisyrinchium bellum*) and blue dicks (*Dichelostemma capitatum*). Summer-active annuals and herbaceous perennials such as tarweeds (*Madia*, *Hemizonia*, and *Deinandra* species) are also present among the grasses, along with patches of scrub species.

Areas of Oat Mountain that are dominated by native perennial bunchgrasses occur sporadically. The associated grass species observed growing with *Stipa cernua* at Oat Mountain include blue wildrye (*Elymus glaucus*), alkali rye (*Elymus triticoides*), and annual grasses typical of California Annual Grassland Alliance. On Oat Mountain, the native annual and perennial forbs generally found in association with these grasslands include white yarrow (*Achillea millefolium*), narrow-leaved milkweed (*Asclepias fascicularis*), Santa Barbara milkvetch (*Astragalus trichopodus* var. *phoxus*), butterfly mariposa lily (*Calochortus venustus*), farewell-to-spring (*Clarkia cylindrica*, *C. epilobioides*, and *C. purpurea*), dark-tipped rigid bird's beak (*Cordylanthus rigidus* subsp. *setigerus*), California cudweed-aster (*Corethrogyne filaginifolia*), green everlasting (*Pseudognaphalium californicum*), and Pacific sanicle (*Sanicula crassicaulis*).

The native grassland community dominated by native perennial grasses would be classified as Native Grassland in the CNDDDB community classification system (Holland 1986). Native Grassland

has a global rank of G3 (10,000-50,000 [4,050-20,235 ha] acres worldwide) and a state rank of S3.1 (10,000-50,000 [4,050-20,235 ha] acres; very threatened statewide), as listed in the CNDDDB (2013).

In the project area, native grassland is mapped in a relatively small area near the access road to Proposed Drilling Site 2. Three species of native grasses form perennial grassland alliances in different locations: blue wildrye (*Elymus glaucus*), one-sided bluegrass (*Poa secunda*), and nodding needlegrass (*Stipa cernua*).

#### 3.4.4.1.1 *Elymus glaucus* Herbaceous Alliance

Native grassland dominated by the tufted blue wildrye and associated native grasses and forbs is sometimes called blue wildrye meadows. Blue wildrye meadows occur on all slope aspects in deep, well-developed, and seasonally saturated soils at elevations below 8,000 feet (2,500 m) above msl. Species composition varies among stands, as the associated species may consist of several native forbs; however, at least one variety of *Elymus glaucus* is dominant.

The associated herbaceous plant species observed contributing to the *Elymus glaucus* Herbaceous Alliance in the project area include one-sided bluegrass (*Poa secunda*), miniature lupine (*Lupinus bicolor*), grape soda lupine (*Lupinus excubitus* var. *austromontanus*), succulent lupine (*L. succulentus*), slender madia (*Madia gracilis*), western verbena (*Verbena lasiostachys*), Johnny jump-up (*Viola pedunculata*), horseweed (*Conyza canadensis*), and many others.

*Elymus glaucus* Herbaceous Alliance is scattered in patches in the project area. It is also present on the south-facing slopes of Oat Mountain. *Elymus glaucus* Herbaceous Alliance has G3 and S3 rankings (21-100 viable occurrences worldwide/statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 3.4.4.1.2 *Poa secunda* Herbaceous Alliance

Native grassland dominated by one-sided bluegrass is sometimes called curly bluegrass grassland by CNPS (2013). It is comprised of perennial grassland dominated by one-sided bluegrass clumps and associated native grasses and forbs. Curly bluegrass grassland occurs on all slope aspects in deep, well-developed soils at elevations below 12,500 feet (3,800 m) above msl. Species composition varies among stands, as the associated species may consist of several native forbs; however, at least one variety of *Poa secunda* is dominant in the spring. Associated herbaceous plant species in curly bluegrass grassland are similar to those in blue wildrye meadows.

*Poa secunda* Herbaceous Alliance is scattered in patches in the project area. It is also present on the north-facing slopes of Oat Mountain. *Poa secunda* Herbaceous Alliance has a G4 global rarity ranking (greater than 100 viable occurrences worldwide, and/or more than 31,110 acres [12,950

ha]) and a S3? state ranking (21-100 viable occurrences statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 3.4.4.1.3 *Stipa cernua* Herbaceous Alliance

Nodding needlegrass perennial grassland, dominated by nodding needlegrass (*Stipa cernua*), is dominated by dense clumps of nodding needlegrass growing in gaps made by open perennial grassland cover. Nodding needlegrass and foothill needlegrass (*Stipa lepida*) are the native perennial bunchgrass species in the genus *Stipa* known to occur on Oat Mountain. Although these species may grow sympatrically, they do not typically mix, especially in southern California, and segregate based on substrate and slope factors.

*Stipa cernua* Herbaceous Alliance is dominated by the tussock-forming nodding needlegrass. It is often found as small, open pockets within coastal sage scrub and oak savanna or intergrading with chaparral and woodland communities. This plant community prefers sites with fine-textured soils that are moist during winter and very dry during summer. *Stipa cernua* Herbaceous Alliance occurs on coastal terraces, foothills, and valleys of southern California.

*Stipa cernua* Herbaceous Alliance occurs in one small area near Proposed Drilling Site 2 along with rusty popcorn flower (*Plagiobothrys nothofulvus*) and hairy gumplant (*Grindelia hirsutula*).

Sawyer, Keeler-Wolf, and Evens (2009) describe this plant community as *Stipa* [*Nassella*] *cernua* Herbaceous Alliance, in which nodding needlegrass is the sole or dominant grass in the ground layer. This alliance occurs on all topographic locations in deep, high clay content soils, and grows at elevations between sea level and (4,300 feet) 1,300 m. Stands of this once extensive alliance now typically include non-native annual species mixed with the perennial grasses and forbs. *Stipa cernua* Herbaceous Alliance has a G4 global rarity ranking (greater than 100 viable occurrences worldwide, and/or more than 31,110 acres [12,950 ha]) and a S3? state ranking (21-100 viable occurrences statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 3.4.4.2 Annual Grassland and Herbaceous Alliances

In general, annual grassland is dominated by a mixture of non-native, often Mediterranean, annual grasses and native and weedy herbaceous species. The presence of annual grassland often suggests prior clearing of native perennial vegetation (e.g., native grasses such as *Stipa* and/or native shrubs and trees), which then is largely replaced by invasive non-native grasses and forbs, although some native species may persist. The three Drilling Site locations have been located primarily in annual grassland areas to avoid impacts to native resources.

Among the non-native grasses observed at the Drilling Sites are invasive annual Mediterranean grasses such as slender wild oats (*Avena barbata*), riggut brome, soft chess (*Bromus hordeaceus*), foxtail barley (*Hordeum murinum*), and annual fescues (*Vulpia* species). Associated with these grasses are weedy mustards (*Brassica nigra* and *Hirschfeldia incana*) and filaree (*Erodium cicutarium*, *E. moschatum*) along with patches of Italian thistle, milk thistle (*Silybum marianum*), hedge-parsley (*Torilis arvensis*), and others. The thistles are most abundant in low-lying drainages and under coast live oak trees that have been cleared of understory vegetation mechanically or by ongoing livestock activity.

Many native annual and perennial grassland herbs have been documented in the project area, and these are included in Table 1. Native forbs identified to date include baby blue-eyes, fiddleneck (*Amsinckia menziesii* var. *intermedia*), butterfly mariposa lily, blue dicks, lupine species (*Lupinus bicolor*, *L. excubitus* var. *austromontanus*, *L. succulentus*), fare-well to spring, red maids (*Calandrinia ciliata*), *Leptosiphon bicolor* and *L. parviflorus*, slender tarweed (*Madia gracilis*), California chicory (*Rafinesquia californica*), and many other native wildflowers scattered in the annual grassland vegetation. In moister soils, rusty popcorn flower and hairy gumplant become more common.

In general, the grassland areas would be classified as Non-Native Grasslands in the CNDDDB community classification system (Holland 1986) and as California Annual Grassland Series within the CNPS Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009). Non-native Grassland has a global rank of G4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat) and a state rank of S4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat), as listed in the CNDDDB (2013).

In the project area, two species of non-native grasses predominate in annual grasslands (*Avena barbata* Alliance, *Bromus diandrus* Alliance), two species of native herbaceous annual forbs form unique alliances (*Amsinckia menziesii* Alliance, *Plagiobothrys nothofulvus* Alliance), and one non-native herbaceous annual forb forms large patches (*Brassica nigra* Alliance); these are discussed below. Because introduced annual grass species have irreversibly invaded the once native perennial grasslands, they are often referred to as naturalized, and are now considered important components of annual grassland vegetation (Zedler et al. 1997).

Due to the patchy species composition of the annual grassland and herbaceous alliances in the project area, they have not been mapped separately. Annual grassland and herbaceous alliances predominate in all three proposed drilling sites and cover approximately 116 acres (47 ha) of the mapped project area.

#### 3.4.4.2.1 *Avena barbata* Semi-natural Stands

*Avena barbata* Semi-natural Stands represent an herbaceous annual grassland community that, due to soil disturbance and native vegetation removal, tends to be dominated by naturalized pioneering non-native grasses and forbs that readily colonize disturbed ground. The ability of exotic species to invade disturbed areas arises from their close relationship to ancestral old world species that have co-existed with humans for millennia in agricultural settings; thus, these exotics are more adapted to exploit disturbed land. Non-native communities are typically a threat to regional biodiversity since they continually distribute invasive propagules into native plant communities. These exotic species can also colonize natural disturbances, such as burns, and sometimes can successfully outcompete with native species (Zedler et al. 1997).

*Avena barbata* Semi-natural Stands are found on most level areas and overgrown roads in the project area especially in full sun. Many of the same grass species of California Annual Grassland Alliance are often abundant in *Avena barbata* Semi-natural Stands; however, *Avena barbata* Semi-natural Stands are dominated by introduced and often invasive plant species. Common associated naturalized species with *Avena barbata* Semi-natural Stands include: black mustard (*Brassica nigra*), ripgut brome, soft chess, tocalote (*Centaurea melitensis*), lamb's quarters (*Chenopodium album*), bull thistle (*Cirsium vulgare*), filaree (*Erodium* species), summer mustard (*Hirschfeldia incana*), prickly-lettuce (*Lactuca serriola*), cheeseweed (*Malva parviflora*), bur-clover (*Medicago polymorpha*), bristly ox-tongue (*Helminthotheca echioides*), and sow-thistles (*Sonchus* species). Native forb species are also often found in *Avena barbata* Semi-natural Stands.

*Avena barbata* Semi-natural Stands are especially common on the south-facing slopes of Oat Mountain and are scattered in the project area in patches. They are not given a rank by CNPS due to the predominance of non-native species.

#### 3.4.4.2.2 *Bromus diandrus* Semi-natural Stands

Like *Avena barbata* Semi-natural Stands, *Bromus diandrus* Semi-natural Stands represent an herbaceous annual grassland community that tends to be dominated by naturalized pioneering non-native grasses, in this case, ripgut brome. *Bromus diandrus* Semi-natural Stands are found on most level areas and overgrown roads on the project Site. Ripgut brome is also more tolerant of shade than slender wild oat, so this grassland type also appears in disturbed areas near trees and woodlands and shrublands.

Many of the same grass species of California Annual Grassland Alliance are often abundant in *Bromus diandrus* Semi-natural Stands; however, *Bromus diandrus* Semi-natural Stands is dominated by introduced and often invasive plant species. Common species associated with ripgut brome include milk thistle, tumbleweed amaranth (*Amaranthus albus*), black mustard, Italian thistle (*Carduus pycnocephalus*), tocalote, bull thistle, lamb's quarters, filaree, sweet fennel (*Foeniculum*

*vulgare*), summer mustard, prickly lettuce, cheeseweed, bur-clover, bristly ox-tongue, and sow thistle.

*Bromus diandrus* Semi-natural Stands are especially common on the south-facing slopes of Oat Mountain, as well as under oak trees in grazed areas; they are scattered in the project area in patches. They are not given a rank by CNPS due to the predominance of non-native species.

#### 3.4.4.2.3 *Amsinckia menziesii* Herbaceous Alliance

*Amsinckia menziesii* Herbaceous Alliance (fiddleneck fields) consists of low herbaceous vegetation that is dominated by native annual forbs and native and naturalized grasses. *Amsinckia menziesii* Herbaceous Alliance is typically dominated by common fiddleneck (*Amsinckia menziesii* var. *menziesii* and var. *intermedia*), a native annual, as well as various species of native and naturalized grasses and forbs, including the non-native grasses -- wild oats, rippgut brome, soft chess, and foxtail barley (*Hordeum murinum*).

*Amsinckia menziesii* Herbaceous Alliance occurs on varied topography, especially gradual slopes, and on all slope aspects, in deep, well-developed soils at elevations below 4,000 feet (1,200 m) above msl (Sawyer, Keeler-Wolf, and Evens 2009). Species composition varies among stands, as the associated species may consist of several native forbs; however, at least one variety of *Amsinckia menziesii* is dominant in the spring. These wildflowers are important contributors to the ground layer, while emergent trees and shrubs may be also present.

The associated herbaceous plant species observed contributing to *Amsinckia menziesii* Herbaceous Alliance in the project area include: common horseweed, jimson weed (*Datura wrightii*), doveweed (*Croton setigerus*), common eucrypta (*Eucrypta chrysanthemifolia* var. *chrysanthemifolia*), telegraph weed (*Heterotheca grandiflora*), American clover (*Acemison americanus*), miniature lupine, grape soda lupine, succulent lupine slender madia, and western verbena.

*Amsinckia menziesii* Herbaceous Alliance also typically includes scattered nonnative forbs, such as those listed in the *Bromus diandrus* Semi-natural Stands description. This plant community has a significant component of native herbs that provides functional habitat for many wildlife species.

*Amsinckia menziesii* Herbaceous Alliance occurs in patches in annual grassland vegetation in many locations in the project area. *Amsinckia menziesii* Herbaceous Alliance has G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 3.4.4.2.4 *Plagiobothrys nothofulvus* Herbaceous Alliance

*Plagiobothrys nothofulvus* Herbaceous Alliance (popcorn flower fields) consists of low herbaceous vegetation that is dominated by native annual forbs and native and naturalized grasses.

*Plagiobothrys nothofulvus* Herbaceous Alliance is typically dominated (>1% cover) by rusty popcorn flower, a native annual, as well as various species of native and naturalized grasses and forbs, including ripgut brome and soft chess.

*Plagiobothrys nothofulvus* Herbaceous Alliance occurs generally on more level topographic locations, especially gradual slopes, and on all slope aspects in deep, well-developed soils at elevations below 2,500 feet (800 m) above msl, according to Sawyer, Keeler-Wolf, and Evens 2009. Species composition varies among stands, as the associated species may consist of several native forbs; however, at least one variety of *Plagiobothrys nothofulvus* is dominant in the spring. These wildflowers are important contributors to the ground layer, and emergent trees and shrubs may be present.

The associated herbaceous plant species observed contributing to *Plagiobothrys nothofulvus* Herbaceous Alliance in the project area include: fiddleneck, slender wild oats, purple owl's clover (*Castilleja exserta*), fare-well to spring, rattlesnake weed (*Daucus pusillus*), blue dicks, filaree, doveweed, California poppy (*Eschscholzia californica*), gold fields (*Lasthenia gracilis*), and lupines. Rusty popcorn flower was only observed on a portion of Proposed Drilling Site # 2 in moist soil, along with bicolored lupine and hairy gumplant.

*Plagiobothrys nothofulvus* Herbaceous Alliance also typically includes scattered nonnative forbs, such as those found in *Bromus diandrus* Semi-natural Stands. This plant community has a significant component of native herbs that provides functional habitat for many wildlife species.

*Plagiobothrys nothofulvus* Herbaceous Alliance occurs at Proposed Drilling Site #2 occurs in small patches in annual grassland vegetation in moist locations in the project area.. *Plagiobothrys nothofulvus* Herbaceous Alliance has G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 3.4.3.6 *Brassica nigra* Semi-natural Stands

*Brassica nigra* Semi-natural Stands is an herbaceous community that predominates in areas where natural vegetation has been cleared. It is dominated by the invasive Mediterranean annual, black mustard, which can grow to 10 feet (3 m) tall; black mustard stands are conspicuous in spring due to the profusion of bright yellow flowers on mustard plants that can cover large areas.

*Brassica nigra* Semi-natural Stands are found on most level areas and overgrown roads on the project Site. Many of the same grass species of *Avena barbata* and *Bromus diandrus* Semi-natural Stands are often abundant in *Brassica nigra* Semi-natural Stands; however, *Bromus diandrus* Semi-natural Stands is dominated by introduced and often invasive plant species with few native species present. Common associated species with *Brassica nigra* Semi-natural Stands include milk thistle, tumbleweed amaranth, Italian thistle, tocalote, lamb's quarters, bull thistle, filaree, sweet fennel, summer mustard, prickly lettuce, cheeseweed, bur-clover, bristly ox-tongue, and sow-thistle, all non-native invasive species.

*Brassica nigra* Semi-natural Stands occur occurs in patches in annual grassland vegetation in many locations in the project area. They are not given a rank by CNPS due to the predominance of non-native species.

### 3.4.5 Unvegetated/Altered

Unvegetated/Altered areas are often not vegetated due to human alterations, including commercial, industrial, and residential development; agricultural practices or other plantings; livestock grazing; and other disturbances. These areas are delineated and mapped for informational purposes. Unvegetated/Altered areas in the project area include the Road/Developed areas (including the pump station on the southern edge of the project area, a dirt road on the western edge, and paved roads on the southern and eastern boundary) and ornamental species that have been planted. These cover types are discussed below.

#### 3.4.5.1 Road/Disturbed

As mentioned, disturbed areas include land or habitat that has been altered, usually by human activities; sometimes natural causes such as fires or landslides also create disturbed conditions. Disturbed land is generally bare ground after disturbance until either natural succession or development is initiated. Habitat succession is a slow process of reestablishing original plant communities, but the initial stages of succession leave disturbed habitats open to invasion by non-native grass and forb species.

Ruderal vegetation is generally confined to continuously disturbed, compacted ground such as roadsides and parking areas. Ruderal species in the project area include weedy non-native grasses, as well as weedy forbs such as common knotweed (*Polygonum aviculare*), red spurrey (*Spergularia rubra*), and others.

Disturbed areas in the project area exist primarily along the margins of dirt roads, where a number of weedy species occur, including invasive species such as tocalote, milk thistle, summer mustard, common knotweed, and red spurrey.

### 3.4.6 Wetland Habitats

Areas with standing or flowing water or with seasonally or permanently saturated soils commonly support wetland communities. Freshwater wetlands are complex and variable, and their species composition and overall structure are dependent on a number of factors. Water depth, seasonal fluctuations in water levels, rate of water movement, water and sediment chemistry (including salinity, pH, and quantity of organic matter), depth and texture of bottom sediments, amount of sunlight, and water and air temperatures are among the most important variables affecting overall wetland dynamics. Along rivers and streams, fine-grained alluvial soils settle in the bottom of the drainages, and annual inundation after rains provide a significant load of nutrients, soil, and new germination sites.

Wetland communities support an abundant variety of wildlife and often form the most productive habitats among the world's ecosystems. Numerous animal species depend on wetlands for critical parts of their life cycles. The wetland habitat and relatively narrow drainage corridor in the project area described in the following sections may provide potential nesting and foraging habitat for various resident and migrating passerine birds and likely serves as a movement corridor for opossums, raccoons, skunks, and other common wildlife species.

Wetland communities often represent important habitat for amphibians including but not limited to Pacific treefrogs (*Hyla regila*) and western toads, and may provide protection and cover for fish species including steelhead trout (*Oncorhynchus mykiss*). Willow riparian corridors are commonly frequented by raptors including red-shouldered hawks (*Buteo lineatus*) and Cooper's hawks (*Accipiter cooperii*); depending upon the presence or absence of water and the degree of canopy cover, these corridors may also provide foraging opportunities for wading birds including great and snowy egrets (*Ardea alba* and *Egretta thula*, respectively) and great blue and green herons (*Ardea herodias* and *Butorides virescens*, respectively).

The following wetland habitats were observed in the general project vicinity.

#### 3.4.6.1 Coast Live Oak Riparian Forest

Many ravines descending from ridges at the Site support coast live oak riparian forest along the drainages. Although contiguous with coast live oak woodland on nearby slopes, this vegetation can be characterized as coast live oak riparian forest due to the dense cover of oaks along with riparian

associates such as arroyo willow, occasional cottonwood and sycamore clusters, mulefat (*Baccharis salicifolia*), mugwort (*Artemisia douglasiana*), California blackberry (*Rubus ursinus*), poison-oak, and other species that favor mesic habitats. At higher elevations, canyon oak and bigcone-spruce are present as well.

In the CNDDDB community classification system (Holland 1986), the vegetation in some of the north-facing drainages at the Site is part of the Southern Coast Live Oak Riparian Forest Community. Southern Coast Live Oak Riparian Forest has G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to CNDDDB (2013). However, it is treated as a sensitive habitat since it supports wetland vegetation.

These would be treated as the *Quercus agrifolia* (Riparian) Alliance in Sawyer, Keeler-Wolf, and Evens (2009). *Quercus agrifolia* (Riparian) Alliance was observed near Sites 2 and 3, dominated by coast live oak, canyon oak, big-cone spruce, valley oak, and other species.

There are approximately 10 acres (4 ha) of *Quercus agrifolia* (Riparian) Alliance in the project area (Table 4).

### 3.4.7 Jurisdictional Waters

As described above and as shown on the project figures, the project occurs in an area with numerous topographic features that convey or retain moisture such that they support a riparian plant community (live oak riparian forest). However, the proposed pads and access roads do not impact any natural drainages anticipated to be subject to state or federal jurisdiction. The mapped riparian areas do not support bed, bank, and channel features, or show evidence of an Ordinary High Water Mark developed through surface water conveyance. Limited stormwater and erosion control work (e.g., culvert replacement) may occur within an existing man-made drainage ditch along the existing access road to Site 2. This artificial feature does support a defined channel and may be subject to state jurisdiction pursuant to Section 1600 of the California Fish and Game Code. Any activities proposed within this area will be addressed with the California Department of Fish and Wildlife prior to implementation, and approval pursuant to Section 1602 (Lake and Streambed Alteration Agreements) will be garnered in advance of construction if required. No impacts to federally jurisdictional Waters of the US are anticipated.

### 3.5 Wildlife Observed or Expected in the Project Area

The project area provides suitable habitat for a variety of bird species, such as the house finch (*Carpodacus mexicanus*), dark-eyed junco (*Junco hyemalis*), house wren (*Troglodytes aedon*), and oak titmouse (*Baeolophus inornatus*); several raptor species may also utilize the area. These

include but are not limited to the red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), great horned owl (*Bubo virginianus*), and American kestrel (*Falco sparverius*). Nocturnal raptors such as the barn owl (*Tyto alba*) and western screech owl (*Otus kennicotti*) are also expected to occur in the project area on a regular basis. The white-tailed kite (*Elanus leucurus*), golden eagle (*Aquila chrysaetos*), merlin (*Falco columbarius*), red-shouldered hawk (*Buteo lineatus*), and prairie falcon (*Falco mexicanus*) may also occur but on a less frequent basis. All raptors and their active nests are protected under the California Fish and Wildlife code (Section 3503.5) and under the federal Migratory Bird Treaty Act (MBTA). Other relevant regulatory protections of birds also apply including Section 3800 of the California Fish and Game Code.

The project area offers suitable foraging habitat and potential roosting locations for bat species known to occur in the region. In particular, dense tree canopies and large dead tree snags provide potential roosting locations for bats. Several sensitive bat species including the California leaf-nosed bat (*Macrotus californicus*), hoary bat (*Lasiurus cinereus*), pallid bat (*Antrozous pallidus*), silver haired bat (*Lasionycteris noctivagans*), spotted bat (*Euderma maculatum*) and western mastiff bat (*Eumops perotis californicus*) are listed in the CNDDDB as occurring within the Oat Mountain and/or surrounding quadrangles.

In addition to the sensitive and rare wildlife species, it is important to consider that the three proposed drill sites provide foraging, breeding, and living space for a number of common wildlife species. While these species are not afforded the legal protection of those species classified as sensitive or rare, they play an integral role both as individual species and collectively in the local ecosystem. Species like the big-eared woodrat (*Neotoma fuscipes*), long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), common gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), black-tailed deer (*Odocoileus hemionus*), western and side-blotched lizards (*Uta stansburiana*), gopher snake (*Pituophis melanoleucus*), common king snake (*Lampropeltis getulus*), yellow-bellied racer (*Coluber constrictor*), Pacific treefrog (*Hyla regilla*), western toad (*Bufo boreas*), numerous butterfly species, and countless numbers of other invertebrates are examples of common organisms that are likely to occur in the project area. In addition to protecting the sensitive and listed species, efforts should be made where feasible to protect and promote the ability of the project area to continue to support the rich diversity of common wildlife species currently occurring there to the greatest extent possible, including maintaining contiguous habitat corridors for species movement.

### **3.6 Sensitive Resources Present or Potentially Present in the Project Area**

The Sections below describe the habitat and species-specific findings of the field surveys.

### 3.6.1 Sensitive Habitat

The following plant communities observed onsite have a California state ranking of S3 or higher (S1, S2), which are considered to be “threat” ranks by the CDFW Natural Diversity Database (CDFG 2013). The state ranking system for S3 and above includes the estimated number of existing acres for the sensitive habitat, as well as a threat ranking from .1 (very threatened) to .3 (no current threats known). Sensitive habitats for the purpose of this report are defined as S3.2 and above (S1.1, S1.2, S1.3, S2.1, S2.2, S2.3, S3.1, and S3.2) for habitats with an identified threat.

- Valley Oak Woodland (S2.1 -- 2,000-10,000 acres [809 to 4,050 ha]; very threatened)
- California Walnut Woodland (S2.1 -- 2,000-10,000 acres [809 to 4,050 ha]; very threatened)
- Montane Deciduous Scrub (not given a threat rank by CNFG, but included here due to common association with Southern California black walnut)
- Bigcone-spruce Canyon Oak Forest (S3.2 --10,000-50,000 [4,050-20,235 ha] acres; threatened)
- Native Grassland (S3.1 -- 10,000-50,000 [4,050-20,235 ha] acres; very threatened)

In addition, Southern Coast Live Oak Riparian Forest is being treated as a sensitive habitat due to its occurrence in blue-line drainages and wet canyons in the project area.

### 3.6.2 Sensitive Plants Observed

No state or federally listed threatened or endangered botanical species were observed in the project area during the ARCADIS 2010 and 2013 surveys. One sensitive plant species was observed in the project area, Southern California Black Walnut (*Juglans californica* var. *californica*).

In addition, the County of Los Angeles has developed an Oak Tree Permits Ordinance, which protects native oak trees in unincorporated Los Angeles County. Trees protected by this ordinance include any individual in the genus *Quercus* that is 8 inches (20 cm) or more in diameter at breast height; for oaks with multiple trunks, the combined diameter of two large trunks equaling 12 inches (31 cm) or more qualifies. The protected zone for oaks is defined as the area beneath the dripline or canopy of the tree plus five or more feet (1.5 m or more) beyond the drip line or 15 feet (5 m) from the trunk, whichever distance is greater. Impacts include pruning or cutting and require an oak tree permit from the County Department of Regional Planning (County of Los Angeles 2009). The

removal of one oak tree may be required and selective limbing would be required to provide access to the proposed drilling sites.

The discussion below addresses the one CNPS sensitive plant species observed in the project area. Species that were not observed but that are known from the general area are discussed in Section 3.6.3. The CNDDDB and CNPS Electronic Inventory search point to a larger list of plant species whose presence has been reported in the Oat Mountain vicinity and adjacent quadrangles, or that may potentially occur in the habitat present in the project area. All sensitive species observed or which have been reported in the area using the CNDDDB and CNPS Electronic Inventory search are included in Table 3.

### 3.6.2.1 Southern California Black Walnut (*Juglans californica*)

Southern California black walnut is a deciduous large shrub to small tree in the Walnut Family (Juglandaceae) that is endemic to a small portion of California. It has a spreading habit, often with more than multiple trunks arising from near the base and numerous branches; trees can reach 50 feet (15 m) at maturity. The bark is gray brown, with a slight silvery wash on the surface, and deep flattened fissures on older trunks. The compound leaves are alternately placed on stout twigs, each leaf with 11 to 19 lanceolate to ovate leaflets. These leaves are drought-deciduous, so may drop from mid-summer into late fall. Plants leaf out in spring and were completely leafless at the time of the ARCADIS March 2010 survey. Flowers appear in spring, often with emerging leaves; male flowers descend in axillary catkins and female flowers produce a nut enclosed in a leathery husk.

Southern California black walnut is closely related to Northern California black walnut (*Juglans hindsii*), which has been cultivated by Native Americans and used as the rootstock for English walnut (*Juglans regia*) in much of California. Southern California black walnut most commonly occurs in association with oak woodland vegetation, although it is also present in coastal scrub and chaparral vegetation, as well as in riparian habitats along drainages up to 3,000 feet (900 m) above msl. It is categorized as CNPS 4.2, a plant of limited distribution that is fairly endangered in California. It is a Central and Southern California endemic, restricted to specific habitats from Santa Barbara County south to Orange County and inland along the southern base of the San Bernardino Mountains to Millard Canyon near Banning Pass (Madroño 2009). It is also reported from San Luis Creek and Atascadero Creek in San Luis Obispo County (Hoover 1970) and in San Diego County at Bonsall, Cottonwood Canyon, de Luz, and other localities (Beauchamp 1986); these populations may originate from cultivated specimens.

**Presence at the Site:** Southern California black walnut occurs in the project area, especially on the north-facing slopes to the north of Oat Mountain Way. It is a common component of oak woodland vegetation, Southern California walnut woodland, and riparian vegetation. It is present in

varying densities near all three proposed drilling sites. No walnut tree removal is proposed as part of the project.

### 3.6.3 Sensitive Plant Species in Surrounding Area *Not Observed*

The following species were not found in the project area by ARCADIS in 2010 or 2013 but have reported as historic or extant occurrences in the Oat Mountain quadrangle and are discussed here due to their potential to occur in the project area. They are organized by rarity (the most rare first), and then alphabetically by scientific name. Table 3 includes results of the CNDDDB and CNPS Electronic Inventory search for species whose presence has been reported in the Oat Mountain and surrounding quadrangles.

#### 3.6.3.1 San Fernando Valley Spineflower (*Chorizanthe parryi* var. *fernandina*)

San Fernando Valley spineflower is an annual herb in the Buckwheat Family (Polygonaceae) with a low spreading habit reaching 12 in (30 cm) in height when in bloom. Initially, plants produce a basal rosette of oblong hairy leaves that narrow slightly at the base. Flower clusters arise at the end of leafy stalks in late spring and early summer. Unlike some species of *Chorizanthe*, there is no thin membrane along the margins of the awn-tipped involucre. The involucre awns are straight, and the whitish perianth consists of six equal lobes that are slightly hairy. There are nine stamens.

San Fernando Valley spineflower was thought to be extinct until its rediscovery in 1999 and is now known from only three occurrences. Historically, it was found in coastal scrub and grassland vegetation in eastern Ventura County, Los Angeles County, and Orange County.

San Fernando Valley spineflower is listed as a federal candidate species and a state endangered species, and is on the CNPS List 1B.1 for species that are rare or endangered in California or elsewhere and are seriously endangered in California. It is seriously threatened by residential and commercial development, grazing, and competition with non-native plants. It is endemic to a small portion of southern California, eastern Ventura County, Los Angeles County, and Orange County.

San Fernando Valley spineflower was not observed during the ARCADIS 2010 and 2013 field surveys. The project area supports grassland vegetation, but no coastal scrub vegetation occurs within the project area. Grassland soils in the project area are generally deep, unlike the thinner soils typical of coastal scrub habitat. San Fernando Valley spineflower was documented in Chatsworth Park in 1901 at about 1,000 feet (305 m), the only recorded location in the Oat Mountain quadrangle. It presently occurs in the Newhall Ranch area, where over 1,000,000 individuals were reported in 2003 (CNDDDB 2013). All reported observations of this rare plant in the project vicinity

have been made at elevations below 1,500 feet (457 m). The three proposed drilling sites are located between 2,800 and 3,200 feet (854 to 975 m) above msl.

### 3.6.3.2 Slender-horned Spineflower (*Dodecahema leptoceras*)

Slender-horned spineflower is a diminutive annual member of the Buckwheat Family (Polygonaceae) that reaches up to four inches (10 cm) high when in bloom. The basal leaves are linear to oblanceolate and lack hairs, and are one to three inches (2 to 6 cm) long. Unlike the San Fernando Valley spineflower, slender horned spineflower has three flowers per involucre, not one; and six hooked spines at the base of each glandular involucre along with a straight awn at the tip of each of six involucral bracts. The small perianth is white to pink with six hairy lobes. There are nine stamens.

Slender-horned spineflower occurs in coastal scrub, chaparral, and woodland vegetation in Los Angeles, Riverside, and San Bernardino Counties between 650 and 2,500 feet (200 to 760 m) above msl.

Slender-horned spineflower is listed as a federal endangered species, a state endangered species, and is on the CNPS List 1B.1 for species that are rare or endangered in California or elsewhere and are seriously endangered in California. It is seriously threatened by residential and commercial development, gravel mining, flood control, foot traffic, proposed reservoir construction, recreational activities, and competition with non-native plants. It is endemic to a small portion of southern California in Los Angeles, Riverside, and San Bernardino Counties.

Slender-horned spineflower was not observed during the ARCADIS 2010 and 2013 field surveys. The site supports suitable woodland vegetation, but no coastal scrub or chaparral vegetation is found within the project area. It was reported from Newhall in 1893 and from Pacoima Wash in San Fernando in 1937; this location has been mistakenly labeled as Limekiln Canyon Wash in the Oat Mountain quadrangle, according to CNDDDB (2013). Locations supporting existing populations in Los Angeles County in the general project vicinity include Bee Canyon Wash (1,000 individuals in 1993) and Big Tujunga Wash near Sunland (1,577 individuals in 1998), according to CNDDDB (2013). All reported observations of this rare plant in the project vicinity have been made at elevations below 1,800 feet (549 m). The three proposed drilling sites are located between 2,800 and 3,200 feet (854 to 975 m) above msl.

### 3.6.3.3 California Orcutt Grass (*Orcuttia californica*)

California Orcutt grass is a small sparsely hairy annual grass with a prostrate habit that reaches 2 to 7 inches (5 to 20 cm) when flowering in spring through summer. The small green spikelets are

crowded at the tips of culms, each two-ranked and compressed, with distinctive five-toothed lemmas.

California Orcutt grass is restricted to vernal pools, seasonal pools that fill with rainfall during the fall, winter, and spring rainy season. It occurs primarily between 50 and 2,200 feet (15 to 660 m) above msl in Ventura County, Los Angeles County, Riverside County, San Diego County and Baja California. It is categorized as CNPS 4.2, a plant of limited distribution that is fairly endangered in California.

California Orcutt grass is listed as a federal endangered species, a state endangered species, and is on the CNPS List 1B.1 for species that are rare or endangered in California or elsewhere and are seriously endangered in California. It is seriously threatened by agriculture, residential and commercial development, grazing, vehicles, and competition with non-native plants.

California Orcutt grass was not observed during the ARCADIS 2010 and 2013 field surveys. There is a report of this rare plant in the Newhall area, but the exact location of this reported population is unknown (CNDDDB 2013). The approximate elevation of the Newhall California Orcutt grass population is 1,300 feet (400 m). The three proposed drilling sites are located between 2,800 and 3,200 feet (854 to 975 m) above msl.

#### **3.6.3.4 Club-haired Mariposa Lily (*Calochortus clavatus*)**

Slender mariposa lily is a slender herbaceous perennial in the Lily Family (Liliaceae) that arises from bulbs each winter, reaching one-half to three feet (20 to 100 cm) in height by late spring or early summer. The basal leaves are about four to eight inches long (10 to 20 cm) and often are withered by the time the plant produces flowers in late spring. The flower stalk is slender and, depending on the subspecies, varies in height and form. Each flower consists of three one to one and one-half inch (2 to 4 cm) sepals that are generally red-brown near the base and three one-inch to two-inch (3 to 5 cm) yellow petals that form a bell-shaped flower. Each petal has a distinctive rounded and slightly sunken nectary covered with short knobby hairs; there are associated dark color bands above the nectary along with club-shaped hairs. The linear, angular fruits are two inches or more (6 to 9 cm) long. There are two subspecies of slender mariposa lily reported from the project region, each of them a sensitive subspecies.

Slender mariposa lily (*Calochortus clavatus* var. *gracilis*) produces a straight flowering stem that reaches about 8 to 12 (20 to 30 cm) at maturity. Flowers appear between March and May and bear petals that are 1.2 – 1.6 inches (30 – 40 mm) long and sparsely hairy, with a reddish-brown line above the small shallow nectary. The anthers are 0.2 to 0.4 inches (4-7 mm) long. It occurs in grasslands and openings in coastal scrub, chaparral, and woodlands, mostly between 1,000 to 3,280

feet (320 and 1,000 m) above msl. It is categorized as CNPS 1B.2 for species that are rare or endangered in California or elsewhere and, within California, are fairly endangered. It is endemic to Los Angeles County and eastern Ventura County.

Slender mariposa lily was not observed during the ARCADIS 2010 and 2013 field surveys. The project area was specifically searched for *Calochortus* species, and where leaves were noted, those locations were revisited when plants were in bloom. All *Calochortus* observed in the project area were *Calochortus venustus*, a non-sensitive species. The project area supports suitable grassland vegetation but lacks coastal scrub or chaparral in the immediate vicinity of the project area. Twenty-six individuals of slender mariposa lily have been reported north of the project area at Lyon Canyon and just west of the Old Road (DMEC 2006). It has also been documented in the Browns Canyon area (transplants from Deer Lake Ranch Development in 2005), near "Sunshine Canyon" southwest of the Interstate 5/Highway 14 junction (55 plants in 1995), and near Newhall Creek west of Highway 14 (one plant in 2007), according to CNDDDB (2013). Reports from the Newhall Ranch area indicate this species ranges up to 2,800 feet (853 m) above msl in the Santa Susana Mountains.

Club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*) is larger than slender mariposa lily, with a flowering stem from 20 to 40 inches (50 to 100 cm) in length that is coarse and has a zigzag pattern. Petals are 1.6 to 2 inches (40 to 50 mm) long and deep yellow, and anthers are 0.3 to 0.4 inches (8-10 mm) long and deep purple. Plants tend to bloom in May and June. Club-haired mariposa lily occurs in grasslands and openings in coastal scrub, chaparral, and woodlands from Los Angeles County north to Monterey County, as well as San Benito County and is the more common of the two subspecies. It is generally found on rocky and clay soils derived from serpentine, mostly between 245 and 4,000 feet (75 and 1,200 m) above msl. It is categorized as CNPS 4.2, a plant of limited distribution that is fairly endangered in California and is endemic to portions of Central and Southern California.

Club-haired mariposa lily was not observed during the ARCADIS 2010 and 2013 field surveys. The project area was specifically searched for *Calochortus* species, and where leaves were noted, those locations were revisited when plants were in bloom. All *Calochortus* observed in the project area were *Calochortus venustus*, a non-sensitive species. The project area supports suitable grassland and woodland vegetation but lacks serpentine soils that this plant often favors. Approximately 600 hybrids between club-haired mariposa lily and slender mariposa lily (*Calochortus clavatus* var. *clavatus* X *Calochortus clavatus* var. *gracilis*) have been reported from Lyon Canyon, which occurs north of the site at lower elevations (DMEC 2006). It has been reported (CCH 2013) from Pico Canyon to the north of the Site as well as near Piru at elevations below 2,000 feet (609 m).

### 3.6.3.5 Plummer's mariposa lily (*Calochortus plummerae*)

Plummer's mariposa is a bulb-producing member of the Lily Family (Liliaceae) with slender branched stems supporting inrolled leaves that wither as the plants come into bloom from May through July. The showy flowers include narrow tapered sepals and pink to rose petals reaching up to 1 ¼ inches (40 mm) long. A distinctive central band of yellow hairs is visible in the center of the petal above the nectary, which is sometimes fringed by dense orange hairs. The linear capsules follow in late summer and at maturity are about 3 inches (8 cm) long.

Plummer's mariposa lily is endemic to Southern California, and found in scrub, chaparral, woodlands, grasslands, and lower montane coniferous forests in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties, usually between 300 and 6,000 feet (100 to 1700 m) elevation. Its range has been significantly reduced by development. It is listed on CNPS List 1B.2 for species that are fairly endangered in California.

Plummer's mariposa lily was not observed during the ARCADIS 2010 and 2013 field surveys. The project area was specifically searched for *Calochortus* species, and where leaves were noted, those locations were revisited when plants were in bloom. All *Calochortus* observed in the project area were *Calochortus venustus*, a non-sensitive species. The project area supports suitable grassland and woodland vegetation. Plummer's mariposa lily has been reported from Lyon Canyon, which occurs north of the Site at lower elevations and where over 1,100 individuals have been observed (DMEC 2006), north of the Browns Canyon (nine colonies in 2005) and Devil Canyon (dozens to hundreds in 2004) confluence, as well as at the head of Chivo Canyon (five colonies in 2006); the Chivo Canyon population occurred at 2,800 feet (854 m) above msl (CNDDDB 2013).

### 3.6.3.6 Santa Susana Tarplant (*Deinandra minthornii*)

Santa Susana tarplant is glandular shrub in the Sunflower Family (Asteraceae) with many branches, primarily from the plant base. Plants reach two to three feet (0.5 to 1 m) in height and are densely covered with linear, summer-deciduous leaves; axillary leaf clusters arise from the base of most leaves. The bright yellow flowers appear from summer through fall and have strongly keeled phyllaries, eight ray flowers, 18-23 disk flowers, and yellow anthers.

Santa Susana tarplant is endemic to the Santa Susana and Santa Monica Mountains, where it occurs in coastal scrub and chaparral vegetation, often in thin soils or among rocky outcrops between 900 and 2,500 feet (280 to 760 m) above msl. Its range has been significantly reduced by development. It is categorized as state rare (as *Hemizonia minthornii*) and is on the CNPS List 1B.2 for species that are fairly endangered in California.

Santa Susana tarplant was not observed during the ARCADIS 2010 and 2013 field surveys. Suitable coastal scrub and chaparral vegetation is absent in the immediate project area. It has been observed nearby north of Chatsworth near Fern Ann Falls (250 individuals in 1986 prior to transplanting), between Fern Ann Falls and Devil Canyon (no population data), near Hialeah Springs (no population data), near junction of Highway 118 and Santa Susana Avenue (500 individuals in 1985), and south of Highway 118 near West Topanga Canyon Boulevard (no population data), according to CNDDDB (2010). All reported observations of this rare plant in the project vicinity have been made at elevations below 2,200 feet (670 m). The three proposed drilling sites are located between 2,800 and 3,200 feet (854 to 975 m) above msl.

#### **3.6.3.7 Palmer's Grappling Hook (*Harpagonella palmeri*)**

Palmer's grappling hook is a slender annual herb in the Borage Family (Boraginaceae) with branching stems arising from the base of the plant. Plants reach 12 inches (30 cm) in height when flowering; the small white flowers have five fused petals. The most distinctive features of this often-overlooked species are the unequal sepals in fruit, with the two upper sepals fused, arching over one nutlet and covered with five to ten stout spines, each hooked with bristles. At maturity, the fruit consists of two spreading nutlets that are dissimilar and bear small hooks on the surface.

Palmer's grappling hook occurs in grassland and openings in coastal scrub and chaparral vegetation between 65 and 3,100 feet (20 to 955 m) above msl from Los Angeles County south to Baja California and Sonora, Mexico and east to Arizona. It is categorized as CNPS 4.2, a plant of limited distribution that is fairly endangered in California.

Palmer's grappling hook was not observed during the ARCADIS 2010 and 2013 field surveys. Suitable grassland vegetation is present but coastal scrub and chaparral vegetation is absent in the immediate project area. It has been reported from Newhall Ranch, according to CNDDDB (2013) and CCH (2013). All reported observations of this rare plant in the project vicinity have been made at elevations below 1,600 feet (488 m). The three proposed drilling sites are located between 2,800 and 3,200 feet (854 to 975 m) above msl.

#### **3.6.3.8 Peirson's Morning-glory (*Calystegia peirsonii*)**

Peirson's morning-glory is a rhizomatous perennial herb in the Morning-glory Family (Convolvulaceae) that is endemic to Los Angeles County. It produces many stems from the base and along short rhizomes, each reaching 1.3 feet (0.4 m) in length. Leaves lack hairs but are covered with a whitish wax, and are triangular in shape, with distinctly two-tipped basal lobes. White funnel-shaped flowers appear in May and June and have distinctive elliptical bracts about 3 mm (0.1 in) below the flower base.

Peirson's morning-glory occurs in chaparral, coastal scrub, chenopod scrub, creosote bush scrub, Joshua tree woodland, and grassland vegetation between 100 and 5,000 feet (30 to 1,500 m) above msl in the San Gabriel and Liebre Mountains and Antelope Valley. It is categorized as CNPS 4.2, a plant of limited distribution that is fairly endangered in California.

Peirson's morning-glory was not observed during the ARCADIS 2010 and 2013 field surveys. Suitable grassland vegetation is present. It has been reported from Lyon Canyon nearby (DMEC 2006).

#### **3.6.4 Sensitive Wildlife Species**

The following is a summary of sensitive wildlife species that are present or have the potential to occur in the project area based on known ranges and habitat requirements. Many of the sensitive species listed in the CNDDDB for the Oat Mountain and surrounding quadrangles and included in Table 3 of this report are not discussed below primarily because suitable/ required habitat conditions such as aquatic environments, or extensive riparian habitat are not found within the survey area.

In addition, ARCADIS reviewed the lists of sensitive bird species for Los Angeles County published by the Los Angeles Chapter of the Audubon Society (Western Tanager 2009; includes 70 taxa) and have included in discussion those sensitive avian species on the list considered to have a moderate to good chance of occurring with some regularity on the Site. Several species that are not included on the Los Angeles County Sensitive Bird Species list but that are listed on the cautionary Los Angeles County Bird Watchlist (includes a total of 31 taxa), and that were detected during ARCADIS field surveys are also included in discussion below. Please note that many species on the Audubon Society sensitive bird species list for Los Angeles County are not discussed herein because habitat conditions present at the Site do not match those typically associated with these birds.

The sensitivity status of each species is provided through the use of codes, defined as the following:

#### **United States Fish and Wildlife Service**

- FE – Federally Endangered Species
- FT – Federally Threatened Species
- FSC – Federal Special Concern Species

#### **California Department of Fish and Wildlife**

- CE – California Endangered Species
- CT – California Threatened Species

- CSC – California Species of Concern
- FP – Fully Protected

#### Los Angeles County Audubon Society

- S- Sensitive Species
- W - Watchlist

##### 3.6.4.1 White-tailed Kite (*Elanus leucurus*)

The white-tailed kite ( - / FP / S ) requires large open fields and relatively undisturbed oak woodland, grassland, and/or coastal sage scrub for successful breeding. Small mammals are the normal prey item of this species. Eggs are laid as early as mid-March and as late as the end of May. White-tailed kite habitat usually requires a stretch of riparian corridor in which to nest (particularly cottonwoods, but including eucalyptus, willows, and live oaks) and adjacent fields in which to hunt. Nests are usually well hidden in the tree canopy (Dixon et al. 1957).

White-tailed kites are known to occur in nearby open areas in the open terrain of grassland, oak woodland, and coastal scrub. Habitat existing in the project area is considered potential foraging and nesting habitat for the white-tailed kite.

**Potential Presence at the Site:** The white-tailed kite was not observed in the project area during ARCADIS surveys. The area has suitable foraging and nesting habitat for the white-tailed kite.

##### 3.6.4.2 Grasshopper sparrow (*Ammodramus savannarum*)

The grasshopper sparrow ( - / CSC / S ) is a small secretive sparrow that favors dense grassland habitats in open fields, prairies, pastures, and foothills. It has a thin complete eye-ring, white median crown-stripe and unmarked buffy chin and breast. It has an intricate pattern of rufous spots on the back and has a relatively large head and short tail, as is typical for birds in the genus *Ammodramus* (Sibley 2000). The grasshopper sparrow typically lays four to five creamy white, dark speckled eggs in a cup-shaped nest constructed on the ground, often at the base of a clump of grass. Incubation lasts from 11 to 12 days, and the young fledge approximately 9 days after hatching. Several pairs may nest together in a loose colony. Grasshopper sparrow populations winter in southeastern portions of the United States as well as in Central and South America; they occur in most of the lower 48 states in appropriate habitat during the spring and summer months. Their numbers have been steadily decreasing throughout their range (Stokes 1996).

Grassland habitat present at Proposed Drilling Sites 1, 2, and 3 is considered suitable for the grasshopper sparrow.

**Potential Presence at the Site:** The grasshopper sparrow was not observed during surveys by ARCADIS. Existing habitat containing open uninterrupted grassland at Proposed Drilling Sites #1, 2, and 3 appears to be suitable for this species, both as foraging and nesting habitat, however, these areas provide suitable habitat of quite limited acreage within the surrounding dominant woodland habitat.

#### 3.6.4.3 Cooper's Hawk (*Accipiter cooperii*)

The Cooper's hawk ( - / CSC ) is a crow-sized raptor with relatively short-rounded wings and a long tail. It feeds predominantly on small to medium-sized birds, but will also take mammals such as wood rats, small rabbits, and reptiles. The breeding season for the Cooper's hawk begins in mid-March to early April. Nests are typically built in the upper canopy of a dense stand of trees such as live oak or cottonwood. Nests are occasionally built atop a wood rat or squirrel nest (Meng & Rosenfield 1988, Roberson and Tenney 1993). The Cooper's hawk is generally considered a secretive species, but commonly breeds within urban settings.

**Potential Presence at the Site:** The Cooper's hawk was not observed during the survey by ARCADIS. The project area offers excellent foraging and nesting habitat for the Cooper's hawk and the species is assumed to be present.

#### 3.6.4.4 Olive-sided Flycatcher (*Contopus cooperi*)

The olive-sided flycatcher ( - / CSC / S {breeding} ) is a large flycatcher with a large head, pointed wings, short tail, and obvious dark "vest". It has a conspicuous white throat and belly. The olive-sided flycatcher is typically found in mixed coniferous forest habitat and is often observed hunting for flying insects from the tallest most conspicuous treetop perch, often a dead tree snag in the middle of a clearing. It has a far reaching diagnostic song often referred to as "quick, three beers" or "whip WEEDEEER" (Sibley 2000). The olive-sided flycatcher is a migratory species occurring in California in the spring and summer. The olive-sided flycatcher builds a cup shaped nest out of twigs, rootlets, lichen, and pine needles. Typically, three to four eggs are laid and incubation lasts for approximately two weeks. Young fledge in 21 to 23 days (Ehrlich 1988).

**Potential Presence at the Site:** The olive-sided flycatcher was observed during the survey by ARCADIS. The project area offers excellent foraging and potential nesting habitat for the olive-sided flycatcher. The olive-sided flycatcher is a migratory species that winters in central and South America and is most likely to be observed as a spring migrant through the Site.

#### 3.6.4.5 Oak Titmouse (*Baeolophus inornatus*)

The oak titmouse ( - / - / W ) is a small passerine with plain drab plumage, plain face and short crest. The oak titmouse inhabits both coniferous forests and open, dry woods. Its constant call and song make it a rather conspicuous vocal species that is often first detected audibly when it is heard issuing repeated phrases as it moves through the forest canopy. This species is a year round resident in California. The oak titmouse is a cavity nester and readily uses nest boxes. They typically lay from 6-8 eggs that hatch in 14 to 16 days and fledge in from 16 to 21 days (Ehrlich 1988).

**Potential Presence at the Site:** The oak titmouse was observed during the survey by ARCADIS. The project area offers excellent foraging and nesting habitat for the oak titmouse and the species is expected to be present year round on the Site.

#### 3.6.4.6 Turkey Vulture (*Cathartes aura*; breeding)

The turkey vulture ( - / - / S {breeding}) is a long-winged, large, dark soaring bird with a somewhat small head and two-toned underwing. Adults have a featherless red head. They are often seen roosting in groups. Turkey vultures feed on carrion that they locate by both site and smell while soaring over the countryside. This species is a year round resident in California. The turkey vulture typically lays one to three eggs within a cliff pothole or tree hollow. Incubation lasts approximately 40 days and young fledge the nest in approximately 70 days (Ehrlich et. al 1988).

**Potential Presence at the Site:** The turkey vulture was observed during ARCADIS surveys. Turkey vultures are common in the project vicinity and could nest in tree hollows near the project site if suitable hollows exist. Signs of breeding activity by this species were not observed during the surveys by ARCADIS and observed birds were assumed to be foraging over the Site.

#### 3.6.4.7 Ferruginous Hawk (*Buteo regalis*)

The ferruginous hawk ( FSC / CSC / S ) is a large raptor often observed perched on the ground in open fields, on power poles, or in trees while it searches for prey species (usually small to medium sized mammals). It has longer, more pointed wings than the red-tailed hawk, and its wings form more of a dihedral when soaring. It is not uncommon for this species to hunt from a high soar, or to hover for brief periods when hunting. It is generally found in dry, open fields and grasslands. Adults have rufous colored feathers extending down the tarsi to the ankle, crescent shaped white wing patches on the dorsal surface of the wings, and a large gape to the mouth that extends under the eye. The tail is generally off-white or gray with a faint terminal band. In California, the ferruginous hawk occurs during the fall and winter in the central and southern portions of the state and does not breed in California.

**Potential Presence at the Site:** The ferruginous hawk was not observed during surveys by ARCADIS. The Site contains potential but very limited foraging habitat for the ferruginous hawk.

#### 3.6.4.8 Greater Roadrunner (*Geococcyx californianus*)

The greater roadrunner ( - / - / S ) is a large (length 23 inches {58.4 centimeters [cm]}) bird with a long tail and shaggy, streaked appearance. It has a short crest that is often raised. The greater roadrunner is agile on the ground where it spends much of its time hunting primarily lizards, snakes, and including some small mammals. It frequents dry open habitat including both rocky desert terrain and grassland (Sibley 2000). This species is a year round resident in California. The greater roadrunner builds an open cup shape nest of sticks typically in a shrub or tree and lays four to six eggs. Incubation lasts about 20 days and young fledge in about 18 days (Ehrlich et. al 1988).

**Potential Presence at the Site:** The greater roadrunner was not observed on the Site during ARCADIS field surveys. The Site could potentially provide suitable foraging and nesting habitat for the greater roadrunner.

#### 3.6.4.9 Long-eared owl (*Asio otus*; wintering)

The long-eared owl ( - / CSC / S {wintering} ) is approximately 15 inches ( cm) long with a wingspan of approximately 36 inches ( cm). Adults are plain gray on the back with dark streaking and barring on the chest and belly. The face is tawny orange in color with dark vertical streaks through the eye and long ear tufts (Sibley 2000). The long-eared owl hunts while on the wing and preys on small mammals that it catches while patrolling over open fields and grasslands. The long-eared owl frequents mixed deciduous-coniferous forests and coniferous forests and is a year round resident in California. This owl uses abandoned nests from other birds to raise its young. Typically, 4 to 5 eggs are laid with incubation lasting approximately 27 days. Young owls fledge in between 24 and 26 days (Ehrlich et. al 1988).

**Potential Presence at the Site:** The long-eared owl was not observed on the Site during ARCADIS field surveys. The Site could potentially provide suitable foraging and nesting habitat for the long-eared owl if this species were to occur in the Site vicinity.

#### 3.6.4.10 Western meadowlark (*Sturnella neglecta*)

The western meadowlark ( - / - / S ) is pale gray-brown overall with whitish flanks and yellow breast with dark breast band. The western meadowlark is heavy bodied, short-tailed and long-billed. It has conspicuous outer tail feathers when in flight (Sibley 2000). It is a year round resident in California. The western meadowlark inhabits open, grassy fields where it feeds on seeds and insects.

Typically, five eggs are laid in a cup shaped nest well hidden in the grass. Incubation lasts about two weeks and young fledge in approximately 12 days (Ehrlich et. al 1988).

**Potential Presence at the Site:** The western meadowlark was not observed on the Site during ARCADIS field surveys. The Site could potentially provide suitable foraging and nesting habitat for the western meadowlark and the species almost certainly occurs in the Site vicinity.

#### 3.6.4.11 Western burrowing owl (*Athene cunicularia*)

The western burrowing owl (- / CSC / S ) can be found in dry open grasslands, flat open fields, and desert habitats. Burrowing owls are capable of creating their own burrows, but typically occupy burrows abandoned by ground squirrels, badger and other mammals. They feed on a wide range of animals including insects, small mammals, birds, and reptiles. The breeding season can start as early as late February and is typically over by late August. Up to nine eggs are laid and incubation is complete in 28 to 30 days. Young owls fledge in 44 days (Ehrlich et al. 1988)

**Potential Presence at the Site:** The western burrowing owl or evidence suggesting presence of this species was not observed during field surveys by ARCADIS. ARCADIS found few potential burrows that could provide shelter for burrowing owls and overall, the vegetation cover at the Site was not well suited for the burrowing owl. In general, habitat occurring on the Site is not conducive to occupancy by the western burrowing owl.

#### 3.6.4.12 Golden eagle (*Aquila chrysaetos*)

The golden eagle ( - / - / S ) is a large dark brown raptor with a relatively small head, large feet, and golden nape. This species can occur in a variety of habitat types but typically frequents desert mountains, grassland foothills, and woodlands in mountainous areas. Golden feed primarily upon small to medium sized mammals and birds. The golden eagle builds a stick nest on cliff faces or in large trees and lays two eggs that hatch after approximately 44 days of incubation. Young eagles fledge in approximately 70 days (Ehrlich et al. 1988).

**Potential Presence at the Site:** The golden eagle was not observed during surveys by ARCADIS. The golden eagle is likely to occur in the project vicinity at least periodically and the Site provides suitable foraging habitat for this species.

#### 3.6.4.13 Western wood-pewee (*Contopus sordidulus*; breeding)

The western wood-pewee ( - / - / W {breeding} ) is gray to lite gray overall with a slight crest, relatively long, pointed wings and low contrasting wing bars. This relatively large bird (length 6.25

inches {15.9 cm}) in the family *Tyrannidae* is often found in and along edges of woods perched conspicuously on an exposed tree limb from which it hunts flying insects (Sibley 2000). The western wood-pewee is a migratory species found in North America in spring and summer and wintering in central and South America. The western wood-pewee builds a cup shaped nest in a tree and typically lays three eggs. Incubation lasts 12 to 13 days and young fledge in approximately 16 days (Ehrlich et al. 1988).

**Potential Presence at the Site:** The western wood-pewee was detected during surveys by ARCADIS. Habitat on the Site is suitable to support the western wood-pewee and the species could breed on the Site.

#### 3.6.4.14 Hutton's vireo (*Vireo huttoni*)

The Hutton's vireo ( - / - / W ) is a small (length 5 inches {13 cm}) stocky vireo , drab olive in color overall, with a relatively thick bill, white wing bars, round head and eye ring. It is conspicuously active when foraging in trees as it moves through the forest canopy often in a mixed flock of other bird species. The Hutton's vireo is a year round resident in California. The Hutton's vireo builds a cup shaped nest in a tree in which it typically lays three to five eggs. Incubation last two weeks and young fledge in approximately 14 days.

**Potential Presence at the Site:** The Hutton's vireo was observed during surveys by ARCADIS. Habitat on the Site is suitable to support the Hutton's vireo and the species could potentially breed on the Site.

#### 3.6.4.15 California towhee (*Melospiza crissalis*)

The California towhee ( - / - / W ) is gray-brown overall with cinnamon lores and cinnamon color undertail coverts. It is commonly found in wooded and brushy terrain where it spends a lot of time on the ground and in low shrubs looking for seeds and insects. The California towhee is a year round resident in California. The California towhee builds a cup shaped nest in a tree or shrub in which it typically lays three to four eggs. Incubation last two weeks and young fledge in approximately 14 to 16 days.

**Potential Presence at the Site:** The California towhee was observed during surveys by ARCADIS. Habitat on the Site is suitable to support the California towhee and the species could potentially breed on the Site.

#### 3.6.4.16 Black-headed grosbeak (*Pheucticus melanocephalus*; breeding)

The black-headed grosbeak ( - / - / W {breeding} ) is relatively large (length 8.25 inches { 21.0 cm}) with a large head and large beak. The adult male has a black head and buffy orange breast and collar. It has obvious white markings on black wings and yellow axillaries or “armpit”. The black-headed grosbeak is a migratory species occurring in California in the spring and summer. It typically frequents hardwood forests where it feeds on seeds, berries and insects. It builds a cup shaped nest in a tree or shrub and typically has between two and five eggs. Incubation lasts approximately 12 to 13 days and young fledge in 11 to twelve days (Stokes 1996).

**Potential Presence at the Site:** The black-headed grosbeak was observed during surveys by ARCADIS. Habitat on the Site is suitable to support the black-headed grosbeak and the species could potentially breed on the Site.

#### 3.6.4.17 Coast Horned Lizard (*Phrynosoma blainvillii*)

The coast horned lizard ( - / CSC ) is found in a variety of habitats, including grassland, oak woodland, and maritime chaparral. The coast horned lizard requires loose sandy soils, preferably in the presence of low shrubs that can provide cover from predators. Additional requirements are open areas used for sunning, and the presence of ants and other insect prey. Eggs are laid in sandy soils from April through June (Stebbins 1985).

Proposed Drilling Sites 1, 2 and 3 are not well suited for this species, primarily due to the presence of dense grass and absence of sandy clearings.

**Potential Presence at the Site:** The coast horned lizard was not observed during ARCADIS surveys. The project area has marginal to poor habitat for the coast horned lizard, and, if found, the species would be considered uncommon on the site.

#### 3.6.4.18 Silvery Legless Lizard (*Anniella pulchra* subsp. *pulchra*)

The silvery legless lizard ( - / CSC ) requires habitat similar to that occurring in portions of the project area. This species needs loose soil with plant cover, and can be found in chaparral, pine-oak woodland, and streamside growth of sycamores, cottonwoods, and oaks. The silvery legless lizard favors the loose litter under sycamore, oak, and cottonwood trees (Stebbins 1985). The understory of oak thickets along perennial or temporary streambeds and washes represents prime habitat for this species.

Expanses of dense grass occurring at the proposed drilling sites are not particularly suitable for the silvery legless lizard, as it presumably hinders underground movement by the species. However, the

silvery legless lizard may be found within the interface of grassland and scrub oak or oak woodland communities where clearings of friable soil occur, along with accumulated leaf litter from oaks and other tree and shrub species. Where these conditions occur in the project area, they may accommodate the silvery legless lizard.

**Potential Presence at the Site:** The silvery legless lizard was not observed during ARCADIS surveys. The project area has areas of potentially suitable habitat for the silvery legless lizard.

#### 3.6.4.19 Southern Grasshopper Mouse (*Onychomys torridus* subsp. *ramona*)

The southern grasshopper mouse ( - / CSC ) is common in arid desert habitats of the Mojave Desert and southern Central Valley of California. Alkali desert scrub and desert scrub habitats are preferred, with somewhat lower densities expected in other desert habitats, including succulent shrub, wash, and riparian areas. The southern grasshopper mouse also occurs in coastal scrub, mixed chaparral, sagebrush, low sage, and bitterbrush habitats. It is uncommon in valley foothill and montane riparian areas and various other habitats (CDFW 1999). It is active year round and typically frequents desert areas, especially scrub habitats with friable soils for digging. The southern grasshopper mouse feeds almost exclusively on arthropods, especially scorpions and orthopteran insects (Horner et al. 1964). Both vertebrates and seeds are minor components of the diet. Populations of this species generally are small, with low densities of individuals in a given area. Litter size averages four young, with as many as six litters per year. Peak breeding is from May to July, but may start in January under ideal conditions (Pinter 1970).

Conditions in the project area are generally considered marginal for the southern grasshopper mouse, mainly because of the large expanses of very dense grassland, which does not conform to habitat preferences of the species. The southern grasshopper mouse is typically found in drier and less vegetated communities than that found in the project area.

**Potential Presence on the Site:** The southern grasshopper mouse was not observed during surveys by ARCADIS, which is not surprising as the species is typically nocturnal and spends its time in burrows during the day. Focused small mammal trapping surveys were beyond the scope of initial habitat assessment. In general, habitat existing in the project area is considered to be of marginal to poor quality for the southern grasshopper mouse, which is more commonly found in more arid and less vegetated habitat.

#### 3.6.4.20 Los Angeles Pocket Mouse (*Perognathus longimembris* subsp. *brevinasus*)

The Los Angeles pocket mouse ( - / CSC ) is one of eight subspecies of the little pocket mouse (*P. longimembris*) in California (Hall 1981). Its range historically occurred in the coastal basins of southern California but it is thought to have been extirpated from the San Fernando Valley as a

result of urbanization; it may no longer occur in the San Bernardino Valley either. It typically favors sparsely vegetated open ground of fine sandy soil, which is ideal for burrowing. The Los Angeles pocket mouse occurs primarily in lower elevation grassland and coastal sage scrub communities (Patten et al. 1992). It is a nocturnal rodent, spending daylight hours in burrows and emerging at night to feed on a variety of vegetation and insect species. In the wild, little pocket mice may produce one or two litters per year, with typical litter sizes of 3-4 pups (BayScience Foundation 2009).

Dense grassland found in the project area is ill-suited for the Los Angeles pocket mouse, which is thought to occur more commonly in drier and sparsely vegetated communities. Studies of similar species of pocket mice suggest mice avoid dense grass cover because of difficulty locomoting and finding seeds (M. Pavelka 1998-99; cited in Spencer and Schaefer 2000).

**Potential Presence at the Site:** The Los Angeles pocket mouse was not observed during ARCADIS surveys, which is not surprising as the species is typically nocturnal and spends its time in burrows during the day. Focused small mammal trapping surveys were beyond the scope of initial habitat assessment. In general, habitat existing in the project area is considered to be of marginal to poor quality for the Los Angeles pocket mouse, which is more commonly found in more arid and less vegetated habitat.

#### 3.6.4.21 San Diego Desert Woodrat (*Neotoma lepida* subsp. *intermedia*)

The San Diego desert woodrat ( - / CSC ) inhabits dry desert and scrub habitat and favors rocky outcrops, rocky cliffs, boulder areas, and slopes. It is buff-colored above, grayish below, with white hind feet. The range of the San Diego desert woodrat overlaps with that of the Dusky-footed woodrat (*Neotoma fuscipes*) in central and southern California. The more common dusky-footed woodrat is larger, with dusky ankles (Whitaker 1996). The San Diego desert woodrat can be differentiated from the dusky-footed woodrat by its tendency to stack sticks and other scrub litter at the front of a burrow or crevice among rocks where it nests. The dusky-footed woodrat builds large stick nest mounds on the ground or low in the branches of a tree within dense scrub or riparian habitat.

Wood rat nests were observed in the woodlands surrounding Proposed Drilling Sites 2 and 3 under the dense oak forest canopy. These nests and the associated habitat appeared to be that of the dusky-footed woodrat, based on descriptions of preferred habitat for this species. Habitat in the project area did not match habitat descriptions for nest locations of the San Diego desert woodrat, which indicate that this species prefers drier and more rocky locations.

**Potential Presence at the Site:** The San Diego desert woodrat was not observed during ARCADIS surveys. There are no rock outcrops or rocky slopes or cliffs in the project area. Woodrat nests

observed appeared to be those of the dusky-footed woodrat. There is a low probability that the San Diego desert woodrat occupies the project area.

#### 3.6.4.22 Monarch Butterfly (*Danaus plexippus*)

The monarch butterfly does not have federal or state listing status, but is included as a sensitive species in the CNDDDB (2013). Winter roost sites have been found from northern Mendocino County to Baja California, Mexico, with several known sites on the central coast. The listing by CNDDDB is based on the limited wintering roost sites within the central coast portion of the butterfly's West Coast wintering range. The monarch butterfly can be found in a variety of habitats, especially those supporting milkweed plants (*Asclepias* species), the primary food source of the caterpillars. These butterflies frequent grasslands, prairies, meadows, and wetlands, but avoid dense forests. In the winter, monarchs cluster together in large numbers in eucalyptus, cypress, and Monterey pine trees, often on the edges of open areas.

**Potential Presence at the Site:** Monarch butterflies were not observed during the survey by ARCADIS. The project area (in particular Drilling Site # 1) has large trees within a wind protected setting that could provide potential roost sites for wintering monarch butterflies. However, the distance of the Site from the coast likely precludes overwintering by concentrated numbers of adult monarch butterflies. No wintering roosts have been recorded in the project area. The project area may provide habitat for foraging and breeding by this butterfly species.

#### 4. Characteristics of the Surrounding Area

This section places the project area within the context of the larger biogeographic region, including biological and physiographic features, species population sizes, migration corridors, regional biological resources, and habitat and species population fragmentation.

Generally speaking, the project area occurs on the spine of the eastern end of the Santa Susana Mountains. Physiographically, the project area occurs in the Transverse Range Province, a conspicuously east-west trending series of ranges that extend from Santa Barbara County (Point Arguello) eastward to San Bernardino County, and only as far south as northern Orange and Riverside Counties.

The Santa Susana Mountains are centered in the confluence of several geographic and biological provinces. The east-west trending range is bordered to the north by the Santa Clara River valley, with headwaters to the northeast of the project area between Sierra Pelona and the San Gabriel Mountains along Soledad Canyon near Palmdale in the Mojave Desert. Canyons on the north side of the Santa Susana Mountains in the Oat Mountain area drain to the north and eventually join the

Santa Clara River. The primary tributaries to the Santa Clara River originating on Site include Rice Canyon and Towsley Canyon, which drain into Gavin Canyon and the south fork of the Santa Clara River near Newhall/Santa Clarita; these tributaries are all part of what is termed the Newhall Creek watershed (USGS EDNA 2010).

To the west, the Santa Susana Mountains encompass Oak Ridge and South Mountain before descending to the Oxnard plain, a broad delta formed in part by the mouth of the Santa Clara River.

San Fernando Pass (also called Newhall Pass) separates the Santa Susana Mountains from the San Gabriel Mountains to the east, which rise to over 10,064 feet (3,068 m) at Mount San Antonio (Mt. Baldy). The San Gabriel Mountains, in turn, connect with the San Bernardino Mountains further east and from there to the desert mountain ranges and the Peninsular Ranges of southern California and northern Baja California. The San Andreas Rift Zone lies to the northeast, along with mountainous terrain and smaller ranges (Sierra Pelona, Liebre Mountains) that link the Sierra Nevada biogeographical province with the project area via the Tehachapi Mountains.

The San Fernando Valley occurs south of the project area and is bounded by the Santa Susana Mountains to the northwest, the San Gabriel Mountains to the northeast, the Simi Hills to the west, and the Santa Monica Mountains to the south. The San Fernando Valley and its associated watersheds form the headwaters of the Los Angeles River, which reaches the Pacific Ocean in San Pedro Bay near Long Beach. Drainages to the south of the sites that feed into the Los Angeles River watershed include Bee Canyon, Aliso Canyon, Limekiln Canyon, Mormon Canyon, Browns Canyon, Ybarra Canyon, and Devil Canyon. To the west of the project area in Ventura County, southerly drainages of the Santa Susana Mountains such as Las Lajas Canyon flow southwesterly into Simi Valley and eventually into the marshes and valleys near Pt. Mugu.

#### **4.1 Existing Land Uses in Surrounding Area**

The three proposed drilling sites are surrounded by contiguous native woodland and grassland vegetation that provides dispersal corridors and habitat linkages for a broad range of species (see Section 4.4 below). As previously mentioned, mostly unpaved access roads such as Oat Mountain Way form a network connecting oil and gas extraction wells and infrastructure through the project area, but have a much smaller footprint than the native vegetation as a whole. Nearby land uses include oil and gas production and distribution operations in the Santa Susana Mountains; roads and highways; residential neighborhoods and communities; landfills; and parks and nature preserves (see Section 4.2).

In Los Angeles County, the Santa Susana Mountains are ringed on three sides by major highways: to the south by State Highway 118, to the east by Interstate Highway 5, and to the north by State

Highway 126. From west to east at the southern base of the Santa Susana Mountains, State Highway 118 serves as a major artery for the communities of Chatsworth, Porter Ranch, Granada Hills, Northridge, Mission Hills, and San Fernando; these communities lay at the base and on the lower slopes of the Santa Susana Mountains and border tributaries to the Los Angeles River. Interstate Highway 5 traverses through San Fernando Pass, which separates the Santa Susana Mountains on the west from the San Gabriel Mountains to the east. To the north, the communities of Stevenson Ranch and Santa Clarita are located on the lower slopes of the Santa Susana Mountains.

The Sunshine Canyon Landfill occupies the southeasternmost slopes of the Santa Susana Mountains near Interstate 5, covering 1,030 acres (417 ha).

## **4.2 Vegetation in the Oat Mountain Area not Present within the Proposed Drilling Sites**

Oat Mountain supports shrubland, rocky habitat, and wetland habitat not observed within the proposed drilling sites, although these habitats occur nearby.

### **4.2.1 Nearby Shrubland Vegetation**

The shrubland vegetation of the Oat Mountain area consists of the Mediterranean Scrub and Grassland subclass, Mediterranean Scrub formation, and California Scrub division. The California Scrub division is further divided and represented on Oat Mountain by the California Chaparral and California Coastal Scrub macrogroups. This vegetation is described further in this section and also shown on Figure 6.

Some vegetation types discussed below were mapped from aerial figures but excluded from Figure 6 due to their distribution outside the 1000-foot buffer area around the proposed drilling sites.

#### **4.2.1.1 California Chaparral**

Chaparral is characterized by dense, evergreen shrub cover that forms almost impenetrable thickets over vast expanses of mountainous areas in southern California. Leaves of chaparral shrubs tend to be small, thick, leathery, and dark green, and they bear internal thick-walled support cells (sclerids) that prevent mechanical damage due to wilting; this leaf type is termed sclerophyllous. Chaparral vegetation ranges from 3 to 14 feet (1 to 4 m) in height, although low-growing annuals and herbaceous perennials are scattered in sunny openings. These evergreen shrubs are also adapted to drought by deep extensive root systems. California Chaparral typically occurs on moderate to steep south-facing slopes with dry, rocky, shallow soils, becoming more abundant at higher elevations where temperatures are lower and moisture supplies are more ample.

Chaparral shrubs are adapted to periodic wildfires, recolonizing a burned area by stump-sprouting or by germination from a dormant seed bank. Many typical coastal sage scrub species also grow intermixed as associates with chaparral species. The number of native plants that comprise these shrublands in the Los Angeles County region is extraordinary, with over 200 potentially occurring native plant species.

The California chaparral plant communities observed on Oat Mountain are further divided into the Californian Xeric Chaparral and Californian Mesic Chaparral groups. Californian Xeric Chaparral is represented by: *Adenostoma fasciculatum* Shrubland Alliance, which is discussed below.

#### 4.2.1.1.1 *Adenostoma fasciculatum* Shrubland Alliance (Chamise Chaparral)

*Adenostoma fasciculatum* Shrubland Alliance (chamise chaparral) is dominated by the evergreen shrub, chamise (*Adenostoma fasciculatum*), which is the most abundant species in the non-desert shrublands of California. Mature chamise shrubs bear a stump-sprouting basal burl that produces many branches, each covered with gray-brown trunk bark and clustered, small, linear leaves and tiny white flowers at branch tips. Chamise is adapted to California's Mediterranean climate by a dual root system that has both deep and shallow roots. *Adenostoma fasciculatum* individuals recover from fire by both resprouting and seedling recruitment (Zedler et al. 1997).

*Adenostoma fasciculatum* Shrubland Alliance forms an intermittent to continuous canopy that is often less than 10 feet (3 m) tall and grows over a sparse herbaceous layer, especially in older stands. *Adenostoma fasciculatum* can occur on all slope aspects, but is commonly found on the drier south- and west-facing slopes and ridges, growing in very shallow soils (mafic-derived). To be classified as *Adenostoma fasciculatum* Shrubland Alliance, the stand must have at least 60% cover by *A. fasciculatum* (Sawyer, Keeler-Wolf, and Evens 2009).

The shrub canopy associated species observed as important contributors to *Adenostoma fasciculatum* Shrubland Alliance in the Oat Mountain region include bigberry manzanita (*Arctostaphylos glauca*), thicketleaf yerba santa (*Eriodictyon crassifolium* var. *nigrescens*), California buckwheat (*Eriogonum fasciculatum* var. *polifolium*), chaparral yucca (*Hesperoyucca whipplei*), toyon, deerweed (*Lotus scoparius* var. *scoparius*), chaparral mallow (*Malacothamnus fasciculatus*), laurel sumac (*Malosma laurina*), scrub oak (*Quercus berberidifolia*), holly-leaved coffeeberry, sugarbush (*Rhus ovata*), blue elderberry, purple sage (*Salvia leucophylla*), and black sage (*S. mellifera*). Several understory herbs listed above for Coastal Sage Scrub are expected as associates in Chaparral plant communities; see Section 4.2.2 below.

In addition to the *Adenostoma fasciculatum* Shrubland Alliance on the south-facing slopes of Oat Mountain, several related alliances are known to occur in Lyon Canyon a few miles north of Oat Mountain: *Adenostoma fasciculatum*-*Salvia mellifera* Shrubland Alliance (chamise-black sage

chaparral), and *Adenostoma fasciculatum-Sambucus nigra* Shrubland Alliance (chamise-elderberry chaparral), according to DMEC (2006).

*Adenostoma fasciculatum* Shrubland Alliance occurs on steep slopes south of Proposed Drilling Site 3, and is present on Oat Mountain in the general area. *Adenostoma fasciculatum* Shrubland Alliance occupies approximately 13 acres (5 hectares) of the project area. *Adenostoma fasciculatum* Shrubland Alliance has a G5 global rarity ranking (demonstrably secure because of its worldwide occurrence) and an S5 state rarity ranking (demonstrably secure because of its statewide occurrence), according to Sawyer, Keeler-Wolf, and Evens (2009).

Californian Mesic Chaparral is represented on Oat Mountain by *Ceanothus oliganthus* Shrubland Alliance, *Heteromeles arbutifolia* Shrubland Alliance, and *Prunus virginiana* Provisional Shrubland Alliance (discussed in Section 3.4.3).

#### 4.2.1.1.2 *Ceanothus oliganthus* Alliance (Hoaryleaf Ceanothus Chaparral)

*Ceanothus oliganthus* Shrubland Alliance (hoaryleaf ceanothus chaparral) is dominated by at least 60% cover by jim brush (*Ceanothus oliganthus* var. *soridiatus*). Jim brush is a large evergreen shrub with pubescent twigs and leaves; leaves are oval to ovate, dark green, and tomentose on the lower surface. Jim brush produces pale to dark blue flowers in dense terminal panicles in spring, followed by globose and shiny capsules. Jim brush commonly occurs on mesic (moist) slopes, washes, and canyons in foothills and mountains. *Ceanothus oliganthus* Shrubland Alliance forms a dense shrub canopy less than 20 feet (6 m) tall. This species prefers shallow and rocky soils at elevations between 1,000 feet and 5,000 feet (300 and 1,500 m), according to Sawyer, Keeler-Wolf, and Evens 2009.

*Ceanothus oliganthus* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, this alliance is present on the north-facing slopes of Oat Mountain and individuals of jim brush were found in a small canyon near Proposed Drilling Site 3. *Ceanothus oliganthus* Shrubland Alliance occupies approximately 8 acres (3 ha) of the surrounding project area. *Ceanothus oliganthus* Shrubland Alliance has G3 and S3 rankings (21-100 viable occurrences worldwide/statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.1.3 *Heteromeles arbutifolia* Shrubland Alliance (Toyon Chaparral)

*Heteromeles arbutifolia* Shrubland Alliance (toyon chaparral) is dominated by toyon (*Heteromeles arbutifolia*), a large evergreen shrub to small tree with lanceolate, deep green, serrated leaves. Toyon produces terminal panicles of white to cream-colored flowers in summer followed by bright red berries. *Heteromeles arbutifolia* Alliance commonly occurs on mesic to dry slopes, washes, and canyons that are scattered throughout foothills and mountains. *Heteromeles arbutifolia* Shrubland

Alliance forms a shrub canopy that is often less than 23 feet (7 m) tall, and forms an intermittent canopy over a variable or grassy ground layer. Associated species on Oat Mountain include California buckwheat, chaparral honeysuckle (*Lonicera subspicata*), laurel sumac, hollyleaf cherry (*Prunus ilicifolia*), hollyleaf redberry, black sage, and blue elderberry. Coast live oak and Southern California black walnut are sometimes emergent trees in this chaparral alliance. This scrub type prefers loamy to somewhat rocky soils on north-facing slopes at elevations between sea level and 3,000 feet (915 m), according to Sawyer, Keeler-Wolf, and Evens 2009.

*Heteromeles arbutifolia* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites but is found nearby on the north-facing slopes of Oat Mountain. *Heteromeles arbutifolia* Shrubland Alliance has a G5 global rarity ranking (demonstrably secure because of its worldwide occurrence) and an S3 state rarity ranking (21-100 viable occurrences statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2 California Coastal Scrub (Diegan Coastal Sage Scrub)

California coastal scrub on Oat Mountain is represented by the central and southern Californian coastal sage scrub group. This group is a shrubland dominated by drought-deciduous, low-growing, soft-leaved, and grayish-green shrubs and subshrubs, typically referred to as coastal sage scrub south of Point Conception. In the project area, the coastal scrub vegetation is sometimes referred to as Diegan coastal sage scrub.

Diegan coastal sage scrub is dominated by drought-tolerant, soft-leaved shrubs from 3 to 6 feet (1 to 2 m) tall that are summer dormant and winter active, exhibiting considerable growth in the winter and spring months. Many species are partially or completely summer deciduous. Bare ground is common beneath and between shrubs, although herbaceous annuals, perennials, and grasses may occupy these openings, especially in wet rainfall years.

Diegan coastal sage scrub is especially abundant on well drained substrates such as sandstones and alluvial deposits, but may also occur in thin shales and on fine-grained clays as well. In general, moisture is available primarily during the winter months, with subsequent drying of surface soils during summer and autumn. Coastal sage scrub plant alliances typically exhibit a patchy distribution along the drier margins of chaparral habitats, and form denser cover at lower elevations or on thin soils.

Fire plays an important role in recycling nutrients in coastal scrub communities, and many native species exhibit crown-sprouting and enhanced seed germination after a fire. Legumes with nitrogen-fixing root nodules are particularly abundant after fires, along with an array of fire-following annuals and perennials.

Due to stand variations, Diegan coastal sage scrub is often considered part of a collection of species-specific plant series (Sawyer, Keeler-Wolf, and Evens 2009). The five most common sage and sagebrush scrub alliances described for the Oat Mountain area include *Artemisia californica* Shrubland Alliance (California sagebrush scrub), *Salvia mellifera* Shrubland Alliance (black sage scrub), *Salvia leucophylla* Shrubland Alliance (purple sage scrub), *Salvia apiana* Shrubland Alliance (white sage scrub), and Mixed Sage Shrubland Alliance (Boyd 1999). The majority of coastal sage scrub in the project area occurs along the lower southern slopes of Oat Mountain. While coastal sage scrub was not observed at any of the proposed drilling sites, species associated with coastal sage scrub in the general project area include *Eriogonum fasciculatum* Shrubland Alliance (California buckwheat scrub), *Sambucus nigra-Salvia leucophylla* Shrubland Alliance (elderberry-purple sage scrub), *Salvia leucophylla* Shrubland Alliance (purple sage scrub), *Salvia apiana* Shrubland Alliance (white sage scrub), and *Hesperoyucca whipplei* Shrubland Alliance (our lord's candle sandstone cliff). These floristic alliances are described below.

Coastal sage scrub is a community at risk, with approximately 90 percent already lost to development (urban and agriculture); very little Coastal Sage Scrub has been protected by any mechanisms, such as enforceable conservation easements (Davis et al. 1985, Boyd 1999). This community would be classified as the Diegan Coastal Sage Scrub in the CNDDDB community classification system (Holland 1986). Diegan Coastal Sage Scrub has a global rank of G3 (21-100 viable occurrences worldwide/statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha] and a state rank of S3.1 (10,000-50,000 acres [4,050-20,235 ha] statewide; very threatened), as listed in the CNDDDB (2013).

#### 4.2.1.2.1 *Artemisia californica* Shrubland Alliance

*Artemisia californica* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, coastal scrub dominated by California sagebrush (*Artemisia californica*) is present on the south-facing slopes of Oat Mountain.. *Artemisia californica* Shrubland Alliance has G5 and S5 rarity rankings (demonstrably secure because of its worldwide/statewide occurrence), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2.2 *Artemisia californica-Eriogonum fasciculatum* Shrubland Alliance

*Artemisia californica-Eriogonum fasciculatum* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, it is present on the south-facing slopes of Oat Mountain. *Artemisia californica-Eriogonum fasciculatum* Shrubland Alliance has G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2.3 *Artemisia californica-Salvia leucophylla* Shrubland Alliance

*Artemisia californica-Salvia leucophylla* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, it is present on the south-facing slopes of Oat Mountain. *Artemisia californica-Salvia leucophylla* Shrubland Alliance has G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2.4 *Artemisia californica-Salvia mellifera* Shrubland Alliance

*Artemisia californica-Salvia mellifera* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, it is present on the south-facing slopes of Oat Mountain. *Artemisia californica-Salvia mellifera* Shrubland Alliance has G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2.5 *Eriogonum fasciculatum* Shrubland Alliance

*Eriogonum fasciculatum* Shrubland Alliance (California buckwheat scrub) is dominated by California buckwheat (*Eriogonum fasciculatum* var. *polifolium*), a densely branching shrub bearing fascicled, narrow, revolute leaves with hairy undersides and clusters of small white to pinkish flowers in spring and summer. California buckwheat commonly occurs on dry slopes, washes, and canyons that are scattered throughout foothills and mountains. It is most often found on slopes that have been disturbed within the last ten years. *Eriogonum fasciculatum* Shrubland Alliance forms a shrub canopy that is often less than 3 feet (1 m) tall and forms an intermittent canopy over a variable or grassy ground layer. This scrub type prefers shallow and rocky soils at elevations between sea level and 4,000 feet (1,200 m), according to Sawyer, Keeler-Wolf, and Evens (2009).

*Eriogonum fasciculatum* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, it is present on the south-facing slopes of Oat Mountain. *Eriogonum fasciculatum* Shrubland Alliance has G5 and S5 rarity rankings (demonstrably secure because of its worldwide/statewide occurrence), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2.6 *Salvia apiana* Shrubland Alliance

*Salvia apiana* Shrubland Alliance (white sage scrub) is dominated by white sage (*Salvia apiana*), a very aromatic shrub with white-gray summer-deciduous leaves and whitish flowers scattered on a long tomentose panicle extending well above the leaves. *Salvia apiana* Shrubland Alliance exists when *white sage* is the sole, dominant, or important shrub growing with California sagebrush in the canopy over a variable ground layer. *Salvia apiana* Shrubland Alliance grows on dry slopes, or in rarely flooded, low-gradient deposits along streams. It requires shallow soils, and occurs at elevations between sea level and 5,250 feet (1,600 m).

Important shrub canopy contributors observed in the project region include California sagebrush, hairy golden aster (*Heterotheca sessiliflora* subsp. *echioides*), laurel sumac, and blue elderberry. Emergent coast live oak and valley oak trees may also be present.

*Salvia apiana* Shrubland Alliance occurs on south-facing slopes near Proposed Drilling Site 1. *Salvia apiana* Shrubland Alliance occupies approximately 7 acres (3 ha) in the mapped area. *Salvia apiana* Shrubland Alliance has a G4 global rarity ranking (greater than 100 viable occurrences worldwide/, and/or more than 31,110 acres [12,950 ha] and a S3 state ranking (21-100 viable occurrences statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2.7 *Salvia apiana-Eriogonum fasciculatum* Shrubland Alliance

*Salvia apiana-Eriogonum fasciculatum* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, it is present on the south-facing slopes of Oat Mountain. *Salvia apiana-Eriogonum fasciculatum na* Shrubland Alliance occupies approximately 1 acres (0.4 ha) of the mapped area. *Salvia apiana-Eriogonum fasciculatum* Shrubland Alliance has a G4 global rarity ranking (greater than 100 viable occurrences worldwide/, and/or more than 12,950 hectares [31,110 acres] and a S3 state ranking (21-100 viable occurrences statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2.8 *Salvia leucophylla* Shrubland Alliance

*Salvia leucophylla* Shrubland Alliance (purple sage scrub) is dominated by purple sage (*Salvia leucophylla*). Purple sage and California sagebrush often occur as dominants in coastal sage scrub habitats. Purple sage typically forms a continuous to intermittent canopy over a variable ground layer. *Salvia leucophylla* Shrubland Alliance grows on steeper north-facing slopes in colluvial-derived, rocky soils. It is considered part of the California Sage Scrub alliance group, and mosaics of purple sage often occur within woodlands dominated by coast live oak and/or Southern California black walnut.

*Salvia leucophylla* Shrubland Alliance was observed as an important component of California Sage Scrub within the project area. Several associated native species contribute to the canopy of *Salvia leucophylla* Shrubland Alliance onsite, including: California sagebrush, coyote bush (*Baccharis pilularis* subsp. *consanguinea*), chaparral sunflower (*Encelia californica*), California Buckwheat, chaparral yucca, climbing penstemon, deerweed, California peony (*Paeonia californica*), chaparral currant, black sage, poison-oak, and the fire-following annual, whispering bells (*Emmenanthe penduliflora* var. *penduliflora*).

*Salvia leucophylla* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, it is present on the south-facing slopes of Oat Mountain. *Salvia leucophylla*

Shrubland Alliance G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.1.2.9 *Salvia mellifera* Shrubland Alliance

*Salvia mellifera* Shrubland Alliance does not occur at or adjacent to any of the three proposed drilling sites; however, it is present on the south-facing slopes of Oat Mountain. *Salvia mellifera* Shrubland Alliance has G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

### 4.2.2 Nearby Rocky Outcrop Habitats

#### 4.2.2.1 *Selaginella bigelovii* Alliance

*Selaginella bigelovii* Alliance (bushy spikemoss mats) occurs on boulders and rock outcrops in isolated patches in the project region, but was not observed near any of the proposed drilling sites. *Selaginella bigelovii* Alliance has a G4 worldwide rarity ranking (greater than 100 viable occurrences worldwide/statewide, and/or more than 12,950 hectares [31,110 acres]) and a S3 state ranking (21-100 viable occurrences statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.2.2 Lichen Alliance

Lichen Alliance in isolated patches in the project region, but was not observed near any of the proposed drilling sites. Lichen Alliance has a G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

### 4.2.3 Nearby Wetland Habitats

The following wetland habitats were observed in the general project vicinity, although none were observed within the proposed Drilling Site envelopes and no direct impacts are anticipated.

#### 4.2.3.1 Southwestern North American Riparian/Wash Scrub

Southwestern North American Riparian/Wash Scrub group includes the plant communities often associated with intermittent and seasonal streams and washes and hillside seeps, with plants with temperate origins. Oat Mountain provides habitat for several alliances associated with this scrub

group, including *Baccharis salicifolia* Alliance, *Sambucus nigra* Alliance, and *Salix lasiolepis* Alliance.

#### 4.2.3.2.1 *Baccharis salicifolia* Shrubland Alliance

*Baccharis salicifolia* Shrubland Alliance (mulefat scrub) is dominated by mulefat (*Baccharis salicifolia*), which is a native shrub or small tree that is found at elevations below 4,000 feet (1,250 m) above msl. The National Wetland Plant List for the Arid West Region (USACE 2013) lists *Baccharis salicifolia* with a wetland indicator status of FAC, meaning that it usually occurs in wetlands (33-67% of the time), but is occasionally found in non-wetlands.

*Baccharis salicifolia* Shrubland Alliance forms a continuous scrub canopy that is often less than 12 feet (4 m) tall, growing over a sparse ground layer. This plant community requires seasonally flooded or saturated freshwater wetland conditions, such as canyon bottoms, irrigation ditches, and moist streamsides or channels. Mulefat often occurs in pure stands or may mix, at a fine scale, with other wetland series. Mulefat may form ecotonal transitions between riparian and upland scrub communities (Sawyer, Keeler-Wolf, and Evens 2009).

*Baccharis salicifolia* Shrubland Alliance occurs along several of the named and unnamed drainages of Oat Mountain, primarily on the south-facing slopes, entirely outside any of the three proposed drilling sites. Often, *Baccharis salicifolia* Shrubland Alliance includes blue elderberry as a major contributor to the shrub canopy. In addition to blue elderberry, other scattered associated species to *Baccharis salicifolia* Shrubland Alliance include fiddleneck, mulefat, coyote bush, common eucrypta, giant wildrye, big-fruited wild cucumber, and non-natives such as scarlet pimpernel (*Anagallis arvensis*), poison-hemlock (*Conium maculatum*), redstem filaree (*Erodium cicutarium*), summer mustard, and tree tobacco (*Nicotiana glauca*).

*Baccharis salicifolia* Shrubland Alliance is not present at or adjacent to any of the proposed drilling sites. *Baccharis salicifolia* Alliance has a G5 global rarity ranking G5 global rarity ranking (demonstrably secure because of its worldwide occurrence) and a S4 state rarity ranking (greater than 100 viable occurrences worldwide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.3.2.2 *Salix lasiolepis* Woodland Alliance

*Salix lasiolepis* Woodland Alliance (arroyo willow woodland) is dominated by arroyo willow (*Salix lasiolepis* var. *lasiolepis*), with mulefat as an important contributor. Arroyo willow is a winter-deciduous large shrub to small tree with shiny dark green oblanceolate leaves bearing a grayish undersurface; unisexual flowers lacking sepals and petals appear in late winter before the plants leaf out. The National Wetland Plant List for the Arid West Region (USACE 2013) lists *Salix*

*lasiolepis* with a wetland indicator status of FACW, meaning that it usually occurs in wetlands (67-99% of the time), but is occasionally found in non-wetlands.

*Salix lasiolepis* Woodland Alliance occurs in seasonally flooded or saturated freshwater wetland habitats, such as floodplains and low-gradient depositions along rivers and streams, and is abundant in marshes, meadows, and springs, at elevations below 6,000 feet (1,800 m) above msl. This woodland community forms an intermittent to open canopy less than 32 feet (10 m) tall, growing over a patchy shrub layer of predominantly mulefat and variable ground layer.

*Salix lasiolepis* Woodland Alliance occurs at scattered locations along selected intermittent streams draining Oat Mountain, all outside the proposed drilling sites. Associated species of *Salix lasiolepis* Woodland Alliance onsite include mugwort, emergent coast live oak, and blue elderberry.

*Salix lasiolepis* Woodland Alliance is not present at or adjacent to any of the proposed drilling sites. *Salix lasiolepis* Woodland Alliance has G4 and S4 rarity rankings (greater than 100 viable occurrences worldwide/statewide, and/or more than 31,110 acres [12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

#### 4.2.3.2.3 *Sambucus nigra* Shrubland Alliance

The *Sambucus nigra* Shrubland Alliance (blue elderberry scrub) observed onsite is dominated by blue elderberry, a large shrub with opposite, pinnately-compound leaves bearing 5 to 7 leaflets with serrated leaf margins and umbels of cream-colored flowers in late spring and early summer, followed by bluish-black berries. This species grows along streams or in floodplains in California at elevations below 10,000 feet (3,000 m) above msl (Hickman 1993); it also occurs on moist slopes and floodplains of coastal mountains of southern California in many areas. *Sambucus nigra* subsp. *caerulea* is listed with a wetland indicator status of FAC, or a facultative species that is equally likely to occur in wetlands as in non-wetlands (USACE 2013).

*Sambucus nigra* Shrubland Alliance is not present at or adjacent to any of the proposed drilling sites. *Sambucus nigra* Shrubland Alliance has G3 and S3 rankings (21-100 viable occurrences worldwide/statewide, and/or more 6,400-31,110 acres [2,590-12,950 ha]), according to Sawyer, Keeler-Wolf, and Evens (2009).

### 4.3 Open Space Reserves in the Surrounding Region

Several open space reserves surround the area adjacent to the Aliso and Oat Mountain Old Fields. To the southwest of the project area, the Michael D. Antonovich Regional Park at Joughin Ranch covers 2,326 acres (941 ha) and includes the headwaters of Devil, Ybarra, and Browns Canyons,

which feed into the Los Angeles River. The park supports native vegetation, including oak and walnut woodlands, chaparral, grasslands, and perennial streams dominated by riparian trees. Sensitive species at this park include slender mariposa lily (*Calochortus gracile* var. *gracile*) and Santa Susana tarplant (*Deinandra minthornii*), along with raptors such as golden eagle, great horned owl, northern harrier, red-tailed hawk, prairie hawk, and Cooper's hawk (Santa Monica Mountains Conservancy 2010). Contiguous native vegetation is protected to the west, since this park abuts Rocky Peak Park in Ventura County, a wilderness park covering 4,815 acres (1,948 ha).

To the east and north of the project area, Santa Clarita Woodlands Park covers 4,000 acres (1,618 ha) on the north-facing slopes of eastern Santa Susana Mountains. The park supports a number of preserves, including Ed Davis Park in Towsley Canyon, Michael D. Antonovich Open Space, East and Rice Canyons, along with historic sites preserving the region's oil exploration history at Pico Canyon and Mentryville. Native vegetation includes Bigcone-spruce – canyon oak forest, oak and walnut woodlands, chaparral, coastal sage scrub, grasslands, and riparian habitat.

The 672-acre (272 ha) O'Melveny Park occurs to the southeast of the project area in the Granada Hills, and is considered the second largest urban park in Los Angeles after Griffith Park. Native vegetation preserved includes chaparral, coastal scrub, oak and walnut woodlands, and riparian habitat.

Other open space preserves are located in riparian areas descending from the south-facing slopes of the Santa Susana Mountains such as Aliso Canyon Park (350 acres, 142 ha) in Granada Hills, Limekiln Canyon Park in Northridge (350 acres, 142 ha), Palisades Park in Porter Ranch (117 acres, 47 ha), Stony Point Park in Chatsworth (76 acres, 31 ha), and other small neighborhood parks.

These parks are considered key elements of the Rim of the Valley Corridor Master Plan (Santa Monica Mountains Conservancy 1990), a plan for preserving native species diversity and providing habitat continuity by encircling the San Fernando, La Crescenta, and Simi Valleys.

#### **4.4 The Site in Context of Biological Resources of Surrounding Area**

The three proposed drilling sites locations and associated access routes collectively encompass a total of approximately four to five acres (1.6 to 2.0 ha) within a far larger area comprising thousands of acres (hectares) of predominantly undeveloped natural open space exhibiting relatively low human disturbance. The Santa Susana Mountains as a whole, including the Termo Aliso Canyon and Oat Mountain Oilfields, are for the most part unfragmented and provide a large expanse of habitat types that support a wide diversity of plant and wildlife species. In contrast to the total acreage of the Termo Aliso Canyon and Oat Mountain Oilfields, the three proposed drilling locations represent a very small percentage of the total available habitat potentially utilized by regional biota.

The proposed drilling locations are potentially valuable to local plant and wildlife species in that the existing habitat occurring on these three sites provides food, cover, and space for species interactions within a functioning ecosystem. While the proposed development includes direct impacts to botanical resources and ecosystem functions, the relatively low level of long-term human activity facilitates continued usage and in some biological areas by many wildlife species (e.g., dispersal, foraging, etc.).

In general, species exist within a range of environmental tolerances, often reaching their maximum population size in favorable habitats that reflect those tolerances. Unlike an isolated mountain, which may support a variety of native communities but lack habitat continuity with the surrounding area, the project area is part of a larger series of interfacing mountain ranges that provide environmental, topographical, and biological links that extend far beyond the region. Migration corridors for plants and wildlife extend northwards along the Coast Ranges and Sierra Nevada and southwards and eastwards to other contiguous components of the Transverse and Peninsular Ranges. Coastal influences from the Oxnard and Los Angeles areas and desert influences from the Mojave Desert near the head of Soledad Canyon also contribute to the existing biota of the project region.

Thus, the project area is linked to surrounding habitats to the north, south, west, and east as a resulting of contiguous mountain ranges and valleys that cover considerable area, elevations, and latitudes. The Santa Susana Mountains and the Oat Mountain area include large expanses of native vegetation. Residential and community development and agricultural lands encroach on the native habitat along the lower slopes, and major roadways ring the area on three sides, potentially impeding wildlife and plant propagule movement to nearby native habitats. Nonetheless, the steep slopes, coupled with ridges of varying elevations and canyon lowlands, provide significant topographic, and therefore, habitat diversity.

#### **4.4.1 Habitat Types in the Project and Surrounding Areas**

All of the vegetation types observed in the project area also occur commonly in the surrounding areas including: Bigcone-spruce – canyon oak forest, coast live oak woodland, valley oak and coast live oak woodland and savannah, California walnut woodland, native grassland associations, annual grassland, coast live oak riparian forest, and riparian forest/scrub. Vegetation types absent from the project area but reported nearby include: coastal sage scrub, chaparral, Riversidian alluvial fan sage scrub, California juniper woodland, pinyon-juniper woodland, southern sycamore-alder woodland, southern willow scrub, and vernal pools (CNDDDB 2013). Some vegetation types lacking from the immediate project area such as coastal sage scrub and chaparral are found nearby on drier south-facing slopes. Some vegetation types are characteristic of areas that are drier than the site, such as Riversidian alluvial fan sage scrub, California juniper woodland, and pinyon-juniper woodland and occur further to the east. Other vegetation types are found under certain hydrological, topographical,

and geomorphological conditions, such as vernal pools and certain types of riparian woodlands and scrubs.

#### **4.4.2 Potential for Additional Species on Site**

Species with large home ranges that may utilize the project area include mountain lion, black bear, various raptors, owls, and bats. Since the project area is located mostly along the spine of the eastern Santa Susana Mountains, riparian vegetation is primarily located downslope along drainages and streams. As a result, some sensitive wildlife typically occurring in riparian systems may be present nearby but are not likely to occur in the project area. These include but are not limited to such species as the southwestern willow flycatcher, least Bell's vireo, unarmored three-spine stickleback, yellow-breasted chat, western yellow-billed cuckoo, and yellow warbler.

Similarly, many plant species are found nearby in riparian and wetland areas that were not observed in the project area. Dry south-facing slopes also support coastal sage scrub and chaparral vegetation and associated species (see Figures 6a and 6b), but the project area is confined to north-facing slopes and ridgetops.

Sensitive plant and wildlife species with a potential to occur in the project area are discussed in Section 3.6 and on Table 3.

#### **4.5 Overall Biological Value of Area**

As previously mentioned, the project area occurs in an existing active oilfield. A substantial portion of the area surrounding the project area is undeveloped or developed supporting industrial activities with relatively limited footprints and human activities. These areas support native plant and animal species and communities. Upland communities are adapted to a Mediterranean climate regime, with cool, moist winters and dry hot summers. Predominant upland vegetation types in the project region include native and annual grassland, coastal sage scrub, desert scrub, chaparral, coast live oak woodland, valley oak woodland, and bigcone spruce-canyon live oak forest. Other vegetation types in the larger surrounding region include California juniper woodland, pinyon-juniper woodland, and alluvial fan sage scrub. Several wetland communities in the surrounding region have perennial moisture available year-round, releasing species from the severe drought stress associated with Mediterranean habitats, especially southern sycamore alder woodland, southern cottonwood willow riparian forest, southern willow scrub, and coastal and valley freshwater marsh. Ephemeral streams and vernal pools are intermediate between the two, often retaining moisture for longer portions of the year.

Sensitive terrestrial communities in the region include southern coast live oak woodland; valley oak woodland; Riversidean sage scrub; mainland cherry woodland; California walnut woodland; valley needlegrass grassland; sycamore alder riparian woodland; southern cottonwood-willow riparian forests; southern mixed riparian woodland/forest; southern riparian scrub; southern coast live oak riparian forest; and southern willow scrub (CNDDDB 2013). Vernal pools have been identified on Cruzan Mesa, Plum Canyon, and Fair Oaks Ranch (DMEC 2006).

A number of sensitive bird species, including the federally endangered Least Bell's Vireo and Southwestern Willow Flycatcher, depend on nesting and foraging habitat provided by vegetation communities (most importantly riparian communities) found within the region. Other sensitive wildlife within the region potentially includes at least eighteen plants, two fish, two amphibians, seven reptiles, twenty-five birds, seven mammals, and an invertebrate species (Table 3).

The following list indicates important habitats and biological resources in the broad regional context of the project area, though these important resources are generally outside the impact area of the proposed project:

- The Angeles and Los Padres National Forests;
- Canyon areas, including Aliso, Limekiln, Mormon, Browns, Newhall, Whitney, Elsmere, Wiley, East, Towsley, Rice, San Francisquito, and all other canyons which provide important habitat (water, food, shelter, and movement corridors);
- Wildlife corridors between the Santa Susana Mountains and the San Gabriel Mountains;
- SEA 22 (Santa Susana Mountains) and habitat and associated biological resources in this and contiguous SEAs designated by the County of Los Angeles;
- Biological resources that add to the viewshed of the Santa Clara and San Fernando Valleys;
- Habitat for federally listed endangered, threatened, or rare plant and animal species associated with the riparian woodlands in the Santa Clara River and Los Angeles River watersheds;
- State-listed endangered and threatened plant and wildlife species associated with riparian woodlands in the Santa Clara River;

- Open water habitats provided by Castaic Lake, Castaic Lagoon, and isolated locations along the Santa Clara River;
- Habitat for state and federally endangered and threatened plant and wildlife species found in chaparral and coastal sage scrub;
- Area to northeast of the site between Highway 14 and Sand Canyon Road provides critical habitat for the arroyo toad (*Anaxyrus californicus*), a federal endangered species;
- Area to the southwest of the site in the Simi Hills provides critical habitat for the California red-legged frog (*Rana draytonii*), a federal threatened and California species of concern;
- The south-facing slopes of the Santa Susana Mountains below the site have been mapped as critical habitat for the Coastal California gnatcatcher (*Polioptila californica californica*), a federal threatened and California species of concern;
- Area to the southeast of the site in Big Tujunga Wash has been mapped as critical habitat for the Santa Ana sucker (*Catostomus santaanae*), a federal threatened species;
- Area to the southwest of the site in the Simi Hills provides critical habitat for Braunton's milkvetch (*Astragalus brauntonii*);
- Area to the southeast of the site in Big Tujunga Wash and Lopez Canyon supports Nevin's barberry (*Berberis nevinii*), a federal and state endangered species;
- Area to northwest of the site in the Newhall Ranch area on Oak Ridge supports San Fernando spineflower (*Chorizanthe parryi* var. *fernandina*), a federal species of concern and state endangered species;
- Area to the west and south of the site near Chatsworth, Hialeah Springs, Fern Ann Falls, and Devil Canyon supports Santa Susana tarplant (*Deinandra minthornii*), a state rare species;
- Area to the southeast of the site in Big Tujunga Wash and northeast of the site in Bee Canyon off of Soledad Canyon supports slender horned spineflower (*Dodecahema leptoceras*), a federal and state endangered species;
- Area to northeast in Mint Canyon supports critical habitat for Moran's nosegay (*Navarretia fossalis*), a federal threatened species;

- Area to the northeast of the Site in Newhall and Mint Canyon supports California Orcutt's grass (*Orcuttia californica*), a federal and state endangered species;
- Oak, sycamore, cottonwood, and willow trees are located within neighboring communities and along associated drainages.

Although the overall biological value of the area is high, a number of factors have contributed to the reduction in species diversity within the region, the single most important of which is human encroachment on and development of natural landscapes. Those contributing factors include:

- Roads and highways increase road kill, pollution, noise, light, and wildfire, as well as spread exotic species and disrupt movement of animals and plant propagules;
- Urbanization, which removes native vegetation, exacerbates spread of invasive species, introduces non-native pets that kill and harass wildlife; blocks corridors for movement of animals and plant propagules; introduces pesticides, rodenticides, herbicides, and pollutants; disrupts fire regimes; presents conflicts between humans and wild animals that utilize domestic plants and animals for food and habitat; and alters water movement and stream and wetland ecology;
- Artificial nighttime lighting has an adverse affect on wildlife movement and ecology;
- Encroachment from development into wildlife corridors impacts on wildlife movement and reproductive capabilities as a result of such encroachment have not been studied in depth.

There are few mitigation banks within the region. Currently, the 210-acre (85-ha) Big Tujunga Wash Mitigation Bank is the only mitigation bank in the project area. Lack of planned mitigation banks that conserve habitat continuity can result in a net loss of habitat and species within the region. Non-contiguous areas greatly reduce species diversity, population size, propagule and wildlife corridors, and larger animal migration. The Santa Clara River Enhancement and Management Plan Study (SCREMP), the South Coast Missing Linkages program (South Coast Wildlands 2009), and the California Essential Habitat Connectivity Project through the California Department of Transportation and CDFW (CDFW 2013) are examples of programs designed to address the need for habitat connectivity in California in general and the project region specifically.

Wildlife movement corridors are generally located in undisturbed canyon and riverine stream habitat areas. These corridors include tributaries to the Santa Clara River, Elsmere Canyon, Towsley Canyon, Weldon/Bee Canyon and crossings along Highway 14 near Whitney Canyon and crossings

between Canyon Country and Sulphur Springs. Elsmere Canyon is an integral part of the Rim of the Valley Trail Corridor and Wildlife Corridor, linking the Santa Clarita Woodlands, Whitney, and Placerita Canyons. The Rim of the Valley Trail Corridor traverses the Santa Monica, Santa Susana, and San Gabriel Mountains. As mitigation to a major transportation project, the San Gabriel/Santa Susana Wildlife Corridor and Open Space Acquisition Project identified key wildlife linkage corridors within the mountainous areas that lay along the high occupancy vehicle lanes proposed along Highway 14 between San Fernando Road and Sand Canyon Road. The corridors include the Whitney Canyon Movement Route and the highway underpass known as the Los Pinetos undercrossing. These corridors link significant coastal sage scrub, oak woodland, and riparian woodland and scrub habitats.

## **5. Project Impacts and Constraints**

The areas of permanent project impacts include 4.1 acres (1.7 ha) of new access road and drill pads and repairs and/or modifications to 2.7 acres ( 1.1 ha) of existing road. The total area of permanent impacts will be 5.3 acres (2.1 ha). The project will include temporary impacts where slopes are cut or filled for required road widening and then revegetated with appropriate native plantings, which total 1.5 acres (0.6 ha). The total area of all planned ground impacts (permanent and temporary) is 6.8 acres (2.7 ha). The larger study area, including the 1000-foot (305-m) surrounding buffer zone, totals 414 acres (168 ha). In addition, there may be unplanned temporary impacts around the planned ground impact areas. Any such disturbances will be restored with appropriate native plantings. For this report the study area was limited to the proposed drilling pads and access roads (direct disturbance areas) plus an area of 1000 feet beyond the proposed impact areas. The total area analyzed was 414 acres (168 ha), of which 408 acres (165 ha) were outside of planned impact areas.

All construction plans benefit from offering a variety of measures to effectively avoid, minimize, and mitigate potential impacts associated with the project. Several of these are described below for consideration during the development of subsequent environmental review documents.

No direct impacts to state or federally-listed threatened or endangered species are anticipated as a result of this project. One plant species listed by CNPS with a rare plant rank of 4.2 occurs onsite, Southern California black walnut. No individuals of this sensitive species will be removed as a result of the project.

In addition, the County of Los Angeles has implemented an Oak Tree Permits Ordinance, which protects native oak trees in unincorporated Los Angeles County. Trees protected by this ordinance include any individual in the genus *Quercus* that is 8 inches (20 cm) or more in diameter at breast height; for oaks with multiple trunks, the combined diameter of two large trunks equaling 12 inches

(31 cm) or more qualifies. The protected zone for oaks is defined as the area beneath the dripline or canopy of the tree plus five or more feet (1.5 m or more) beyond the drip line or 15 feet (5 m) from the trunk, whichever distance is greater. Impacts include pruning or cutting and require an oak tree permit from the County Department of Regional Planning (County of Los Angeles 2009).

One canyon oak with a dbh of 8 inches (20 cm) may be removed if an access road is rerouted to avoid impacts to large valley oak trees. The project area supports many oaks and selective pruning and/or trimming to 103 trees may be required to provide access to the proposed drilling sites.

With careful placement of access roads and drilling sites, most development can occur outside sensitive habitat and include a protective buffer zone. Expected direct impacts associated with the project involve the loss of scattered individual native plants in addition to loss of open foraging ground for wildlife and loss of fossorial wildlife species present during clearing.

The following sections describe the general types of impacts to ecological resources potentially occurring in association with oil development at this site. Both potential impacts and potential impact avoidance and minimization measures are broadly discussed below. Additional survey work may be required to assess potential impacts based on a final plan that defines limits of disturbance, access routes, post-project grades, buffer areas, and other potential issues if they are changed from what was studied for this report. However, for general planning purposes, both potential impacts and potential impact avoidance and minimization measures are discussed in the sections that follow.

## **5.1 Habitat Impacts**

During the design phase of the project, planners specifically placed the footprints for the three proposed drilling sites in previously disturbed grassland areas that were already accessible by existing access roads in order to reduce impacts to native trees. Some of these grasslands occur within 100-foot buffer areas around sensitive woodlands (Table 4). The proposed project would result in direct impacts to 4.6 acres (1.9 ha) of annual grassland and herbaceous vegetation and 1.7 acres (0.7 ha) of existing roads and other existing developed areas (Table 4). Of the 4.6 acres of annual grassland and herbaceous vegetation, 4.0 (1.6 ha) acres are located within sensitive woodland 100-foot (30-m) buffer areas.

Access roads from Oat Mountain Way to each proposed drilling site are lined with one or more native trees along the road margin or forming a canopy over the road. Every effort is being made to preserve native trees in the project area, and the project footprints have been adjusted on several occasions to date in order to preserve existing trees. For this analysis, ARCADIS assumes that all access roads will be widened to at least 15 feet (4.6 m) in order to accommodate the passage of

drilling equipment (see Section 2.2). The actual final width of access roads may be narrower in locations adjacent to mature native trees in order to avoid tree removal.

Impacts to woodland and forest communities as a result of proposed road widening are included in Table 4.

These impacts are:

- Valley oak woodland and savanna – 0.3 acres (0.12 ha); additional impacts to 4.0 acres (1.6 ha) of surrounding grassland vegetation within 100-foot woodland buffer
- California walnut woodland – 0.1 acres (0.05 ha)
- Montane deciduous scrub– 0.07 acres (0.03ha)
- Coast live oak woodland/forest– 0.59 acres (0.24 ha)

## **5.2 Tree Impacts**

A total of 509 individual trees or clusters of trees have been mapped within 25 feet of the three proposed drilling sites and associated access routes by WM Surveys, Inc, and ARCADIS, as shown in Figure 8. The majority of these will not be impacted by project activities, but up to 130 trees may be impacted during road widening and pruning and/or trimming to allow drill rig access.

Of the 509 trees, 262 were tagged with a numbered aluminum tag if one or more trunks and/or branches were touching or overhanging the roadway or potentially subject to root damage from surface activities. During the 2013 tree surveys, each tagged tree was documented with GPS coordinates, species, dbh, and tree health. Additionally, each tree was assessed for any required pruning of branches within 18 vertical feet (4.5 m) of the roadway (Table 5). These data suggest that 61 trees will require pruning of at least one branch that is 2 inches (5 cm) thick or more; 42 additional trees may require minor foliage trimming, for a total of 103 trees. An additional 28 trees may be pruned or trimmed, depending on exact road alignment and potential avoidance. A certified arborist will be on Site during road improvements and drill rig transport, and a final count of trees that are pruned or trimmed will be recorded and provided to the County as a component of an as-built plan; this as-built plan will detail actual encroachments as a result of final road configuration and equipment access requirements.

## 5.2 Wildlife Impacts

An initial assessment based upon observed conditions and species-specific habitat requirements suggests that no impacts to state or federally listed threatened or endangered species will result from the proposed project activities. The locations of the proposed drilling sites are not expected to block important dispersal routes or present an impassible barrier to wildlife. The drilling sites are limited in size and are surrounded by natural open space that is anticipated to provide adequate room for movement from one area to another by wildlife species occurring in the vicinity.

The project could, however, impact certain wildlife species of concern whose habitat requirements more closely align with conditions in the project area. For example, while habitat conditions are not optimal for the grasshopper sparrow (*Ammodramus savannarum*) or the silvery legless lizard (*Anniella pulchra*), these species could potentially occur in the area and at one or more of the Drilling Site locations, in which case development could impact these individuals. Pre-construction surveys immediately prior to construction can help avoid and minimize the risk of impacts to all species potentially occurring in the area.

Several other sensitive wildlife species may potentially occur in the project area. For some species, focused pre-construction surveys should be able to confirm presence or absence at the time of construction, such as the grasshopper sparrow. However, presence or absence of certain other species like the silvery legless lizard may prove difficult, even with more detailed survey efforts, due to the reclusive and fossorial nature of this species. Pre-construction wildlife surveys and construction monitoring during clearing activities are recommended to increase the chances of identifying the presence of sensitive wildlife species and providing protection by means of avoidance or relocation of these species, should they be discovered in the project area.

Nesting birds are an obvious ecological constraints issue associated with the project. Several species of birds are likely to nest on or in close proximity to the proposed drill sites. In addition to expected species such as the house finch (*Carpodacus mexicanus*), dark-eyed junco (*Junco hyemalis*), house wren (*Troglodytes aedon*), and oak titmouse (*Baeolophus inornatus*), to name a few, several raptor species may utilize the Site. These include but are not limited to the red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), great horned owl (*Bubo virginianus*), and american kestrel (*Falco sparverious*). Nocturnal raptors such as the great horned owl (*Bubo virginianus*), barn owl (*Tyto alba*), and western screech owl (*Otus kennicotti*) are also expected to occur in the project area on a regular basis. The white-tailed kite (*Elanus leucurus*), golden eagle (*Aquila chrysaetos*), merlin (*Falco columbarius*), red-shouldered hawk (*Buteo lineatus*), and prairie falcon (*Falco mexicanus*) may also occur in the project area but on a less frequent basis. All raptors and their active nests are protected under the California Fish and Wildlife code (Section 3503.5) and under the federal Migratory Bird Treaty Act (MBTA). All birds included on the federal list of migratory

non-game birds, and their active nests are protected by law under the federal MBTA as well as Section 3800 of the California Fish and Game Code. This includes all of the birds observed in the project area with the exception of the European starling (*Sturnus vulgaris*).

The project area offers suitable foraging habitat and potential roosting locations for bat species known to occur in the region. In particular, dense tree canopies and large dead tree snags may provide potential roosting locations for bats. Several sensitive bat species, including the California leaf-nosed bat (*Macrotus californicus*), hoary bat (*Lasiurus cinereus*), pallid bat (*Antrozous pallidus*), silver haired bat (*Lasionycteris noctivagans*), spotted bat (*Euderma maculatum*) and western mastiff bat (*Eumops perotis californicus*), are recorded in CNDDDB (2013) as occurring within the Oat Mountain or surrounding quadrangles. Any bat roosts or indications of concentrated bat activity should be reported to CDFW and protected from disturbance until such time as procedures can be implemented that offer long term protection for these species.

In addition to sensitive and rare species, it is important to consider that the three proposed drill sites provide foraging, breeding, and living space for a number of common wildlife species. While these species are not afforded the legal protection of those species classified as sensitive or rare, they never the less play an integral role both as individual species and collectively in the local ecosystem. Species like the dusky-footed woodrat (*Neotoma fuscipes*), long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), common gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), black-tailed deer (*Odocoileus hemionus*), western fence lizard (*Sceloporus occidentalis*), and side-blotched lizards (*Uta stansburiana*), gopher snake (*Pituophis melanoleucus*), Common king snake (*Lampropeltis getulus*), western rattlesnake (*Crotalus viridis*), pacific treefrog (*Hyla regilla*), western toad (*Bufo boreas*), and numerous butterfly species and countless numbers of invertebrates are examples of common organisms that are likely to occur in the project area. In addition to protecting the sensitive and listed species, efforts should be made where feasible to protect and promote the ability of the project area to continue to support the rich diversity of common wildlife species currently occurring there to the greatest extent possible.

### 5.3 Indirect Impacts to Vegetation and Wildlife Habitat

An increase in noise, artificial light, human activity, vehicle traffic, and weed invasion may result from this project. These changes diminish the ability of existing natural habitat to support wildlife, and typically lead to a reduction in the carrying capacity of the habitats, resulting in the decline or potential extirpation of local populations of certain native plant and wildlife species.

The effects of many of the issues described in this section can be ameliorated through development designs such as screening of light from open space areas, appropriate fencing, and other measures, as discussed in Section 6.

## **6. Potential Impact Avoidance and Minimization Measures**

All land use plans benefit from offering a variety of measures to effectively avoid, minimize, and mitigate potential ecological impacts associated with the proposed project activities. Shrublands, woodlands, grasslands, and riparian corridors located near, but outside, planned disturbance areas should be protected from inadvertent disturbance. Degradation of these habitats may result from a number of construction-related activities, including vehicle passage, material stockpiling, parking or turnaround, equipment storage, and accidental over-grading. These disturbances, even if temporary, can significantly degrade native habitats.

Native trees, shrubs, and herbaceous species occurring immediately adjacent but outside the disturbance area shall be protected from inadvertent disturbance. Complete construction protection measures for wildlife are described in Section 6.4.1 and for native trees in Section 6.4.2.

The following general measures are described for consideration during the development of subsequent design, environmental review, and project implementation documents. It is anticipated that measures such as these will be included in a formal resource protection plan to be prepared and submitted to the County of Los Angeles for approval prior to construction.

- Limit disturbance of upland habitat – To the extent feasible, the disturbance areas shall be minimized to impact the smallest area necessary for the project.
- Limit disturbance of riparian and other wetland habitats – Construction activities shall be kept as far back from drainages as possible. The hydrologic regimen of these areas shall be protected to avoid changes in the volume or duration of flooding, and to maintain or improve habitat and water quality conditions if feasible. The proposed buffer of 100 feet (30 m) is suitable for drainages in the project area.
- Construction protection plan – A concise plan that details the resource protection measures and provides maps of protected areas shall be prepared prior to the start of construction. The plan shall be specifically written for the construction personnel.
- Temporary fencing and work site delineation - The boundaries of all work areas, including access roads and staging areas, shall be delineated on the grading plans. Sensitive habitats and resources adjacent to work areas shall be clearly delineated for avoidance on grading plans and in the field. All disturbance areas shall be clearly delineated in the field

with fencing prior to any disturbance activities, including grading, grubbing, and clearing. Any native shrublands, woodlands, and grasslands located within 25 feet (8 m) of proposed disturbance shall be temporarily fenced prior to any ground disturbance and such fencing is to remain in place throughout all grading and construction. Fencing shall be supported by posts on minimum six-foot centers or equivalent. Fencing shall be shown on all grading plans. No boring activities or earth disturbance shall occur outside of the approved construction activities envelope.

- Stormwater pollution prevention and associated erosion control - A stormwater pollution prevention plan (SWPPP) shall be prepared to protect nearby drainages from impacts resulting from construction activities. Best Management Practices to control silt migration during construction and proper stormwater management during and following construction shall be required in order to protect the water quality in the drainages and the watershed.

Erosion control monitoring shall take place in accordance with the SWPPP and Environmental Quality Assurance Plan (EQAP) developed for the project. Entry of run-off and sediment resulting from construction into drainage courses shall be managed under a SWPPP and follow Regional Water Quality Control Board specifications. The plan shall detail site-specific temporary erosion control measures to reduce discharge of any sediment from construction activities into drainages in the project area, such as installation of wattles, silt fences, and straw bales. Strategic placement of temporary runoff-retaining structures such as silt fences and hay bales must be in place by October 1<sup>st</sup> during construction. If erosion control material is moved during the day, it must be properly replaced before leaving the site. Sediment shall be trapped before it enters drainages, collected by hand and re-spread in appropriate locations previously approved by the project biologist and prior to project completion. On-site control of sediment and pollution will help ensure that sediments generated during construction of the proposed project will remain in the construction areas and will not migrate into sensitive areas where they can degrade native habitats. Fencing can also help prevent some reptiles and amphibians from entering the work area and delineate the work area for construction personnel.

- Staging and stockpiling - All staging and stockpiling shall be limited to the existing paved or disturbed surfaces to the maximum extent feasible. No staging shall occur within the sensitive habitats or the designated buffer zones.
- Equipment maintenance – Equipment/vehicle maintenance/repairs shall be performed off-site or restricted to pre-designated areas.

- Oil spill protection measures – Engineering design shall include measures for spill containment such as berms and other structures to contain any released fluids or combinations of released fluids and stormwater.
- Restoration plan - Any native trees or other sensitive resources that are disturbed during construction will be restored using appropriate native species in consultation with a qualified restoration manager. These restoration measures will be implemented in areas subjected to temporary impacts, such as cut and fill slopes, as well as any accidental disturbance to native vegetation. A written restoration plan shall be prepared detailing the steps, methodology, and performance criteria for the passive or active restoration. Active restoration efforts shall be overseen by a qualified restoration manager. All seed and/or propagules shall be locally collected from sources as close to the project area as possible and limited to the Santa Susana Mountain area. Applicable restoration techniques may include weed abatement and natural recruitment of natives in some areas and may require active planting in others. Appropriate erosion control measures will be utilized for slope stabilization where necessary.

## 6.1 Measures to Protect Wildlife

Activities associated with construction activities in the project area may bring construction personnel and equipment within close proximity to many wildlife species at one time or another during the construction phase. In general, construction personnel shall avoid interactions with any wildlife species encountered on the job site. In cases where wildlife species may be injured or killed by project activities, construction personnel shall divert work to another area, refer the issue to the attending biologist, and continue working in the area only after the animal has been relocated by a qualified biologist or has left the work area on its own.

These wildlife protection measures are intended to reduce potential impacts to both common and sensitive wildlife species to a less than significant level and to prevent impacts to these species whenever possible.

- Pre-construction surveys - To help protect wildlife and plant species in the vicinity of the project, pre-construction biological surveys shall occur prior to initial clearing for the construction activities. The pre-construction surveys shall occur no more than two weeks prior to initial clearing activity and shall allow sufficient time for work schedule changes or addition of protection measures (i.e. additional fencing, wildlife exclusion measures) that may be necessary to avoid impacting common and sensitive wildlife. Wildlife surveys shall consist of canvassing the project area scheduled for clearing on foot while looking for signs (burrows, nests, tracks, etc.) or direct observation of special status wildlife species. The

goal of the surveys shall be to identify common or sensitive status wildlife and plant species in the work area and, if possible, determine methods by which impacts to these species can be further avoided.

In particular, areas that would be disturbed by proposed grading operations shall be marked in the field and surveyed by a qualified biologist for the presence of California horned lizards and California legless lizards. Potential burrows shall be identified and examined. If horned lizards or silvery legless lizards are found, they shall be relocated to similar undisturbed habitat.

Pre-construction wildlife surveys shall occur prior to initial clearing activity for each phase of construction. The Construction Monitor shall conduct pre-construction reconnaissance level surveys of the disturbance area during each phase of the construction project to determine the presence of common species, the potential capture and relocation of individual animals, and to determine a likely escape route for these species.

It is critical that all construction personnel involved in clearing activities are aware that pre-construction wildlife surveys must be completed prior to each and every phase of initial clearing associated with the project. Good communication between the project manager and the project biologist is essential to ensure that surveys are conducted at the proper time.

- Pre-construction training - A qualified biologist familiar with the project area shall conduct a training session for project personnel prior to implementation of construction activities. At a minimum, the training shall include: a description of sensitive habitat, plants, and wildlife on in the area; the provisions of the Endangered Species Act; the necessity for adhering to the provisions of the Act; the penalties associated with violating the provisions of the Act; the specific measures that are being implemented to conserve sensitive resources while construction is occurring; and the boundaries within which the project activities are to be accomplished.
- Construction monitoring - A Construction Monitor who is a qualified biologist familiar with the project area shall be present during initial site preparation and ground disturbance activities, such as vegetation removal and grading, as well as for each phase of the project to ensure that sensitive species are not present in the project area. See Section 6.3 for more details.
- Capture and release of wildlife during construction - Whenever possible, common wildlife and wildlife species of special concern may be captured and immediately re-located to

similar habitat outside the working area by a qualified biologist. If federal or state-listed species are identified, then work shall cease in that location until the agencies can be contacted for further instruction.

In addition to the measures discussed above, the following measures are also intended to avoid impacts to sensitive wildlife species during construction.

- Restricted lighting – In recognition of the continued long-term use of the area by wildlife, oil operation restrictions shall require screening of lights to prevent glare into natural areas. Motion sensor lights shall only cover areas immediately adjacent to structures and shall also be shielded from shining into open space areas.
- Installation of wildlife barriers - Appropriate barriers (i.e., silt fencing) shall be established to minimize the movement of wildlife into the construction zone. The Construction Monitor shall make regular scheduled visits during the construction phases to implement measures to reduce or eliminate injury and mortality of resident wildlife species.
- Sensitive species consultations - The presence of any state or federally-listed species within the work area would require consultation with the CDFW or the USFWS, respectively, before capture and relocation could occur. Biologist handling or surveying for listed species shall have all necessary Endangered Species Act permits or authorizations.
- Bat roosts - Any bat roosts or indications of concentrated bat activity in or adjacent to the disturbance area should be reported to the CDFW and protected from disturbance until such time as procedures can be implemented that offer long term protection for these species.
- Avoid impacts to nesting birds - Where feasible, initial ground disturbances (i.e., grading, clearing, grubbing, and/or shrub removal) within woodland, forest, and native grassland habitats shall avoid the bird breeding season between February 1 and August 15. Prior to any initial ground disturbances occurring between February 1 and August 15, a pre-construction survey for nesting birds shall be completed two weeks before initial ground disturbing activities to provide specific information on any nesting activities and to ensure that no nesting birds are impacted by project activities. A construction avoidance zone of 500 feet (152 m) from any bird nests shall be established and maintained during construction activities within this time frame.

- Communications with the County - Results of pre-construction surveys, locations of protective fencing, and the name of the on-site biologist must be delivered to the County before initial grading or any clearing of vegetation.

## **6.2 Measures to Protect Native Trees**

Preliminary mapping of native trees within 25 feet (8 m) of any proposed disturbance has been conducted and is discussed in Section 5.1 and shown on Figure 8.

Salvaging of mature native trees and saplings is not recommended for this project. The following measures are designed to protect native trees throughout the project construction activities and provide guidance for replacement of native trees, if required.

- Native tree protection plan and native tree mapping – All native trees located within 25 feet (8 m) of any proposed disturbance area shall be included in a tree protection plan, as described herein. The location of each tree within these areas shall be shown on construction plans and include a five-foot buffer from the dripline around each tree.
- Construction fencing around native trees - Temporary fencing (e.g., orange construction fencing) shall be installed outside the five-foot buffer from the dripline of each native tree prior to initiation of any project activities and shall remain in place for the duration of grading and construction activities. Fencing shall be supported by posts on minimum six-foot centers or equivalent. Fencing shall be shown on all grading plans. Where construction activities must occur within a given native tree buffer area, fencing shall be installed at the edge of the construction area, and will be shown on approved plans.
- Pre-construction training – A qualified biologist shall conduct a training session for project personnel prior to construction activities. At a minimum, the training shall include: a description of the native trees and buffer zones; the necessity for adhering to the provisions of these native tree protection measures; the penalties associated with violating these measures; and the boundaries within which the project activities are to be accomplished.
- Construction monitoring - A Construction Monitor who is a qualified biologist and/or arborist familiar with the project area shall inspect the sites during construction activities to ensure that native trees are protected and maintained in good health. The biologist shall also inspect any native trees that are not fenced due to access conflicts and work with the construction crew to implement protection measures, including limited access, prohibition of staging or storage under native trees or other such uses.

Native tree avoidance shall be monitored in the field by the Construction Monitor. The Construction Monitor shall work with the construction personnel to develop alternatives to preserve trees where possible. The Construction Monitor shall maintain a record of all trees that have been removed and avoided, and provide this information to the County.

- Material and equipment staging and prevention of soil compaction: All staging and stockpiling shall be limited to existing roads or disturbed areas outside the canopy plus five feet of any native tree. Construction equipment or materials shall not be driven or parked under native tree canopies or within the five-foot buffer areas of native trees, as delineated by the fencing. Storage or staging of fill soil, rocks, or construction material within these areas is prohibited. Due to the quantity of mature trees forming a canopy over access roads and the perimeters of proposed drilling sites, special measures shall be implemented to protect the soil under native trees from compaction. Where encroachment into the five-foot buffer around native trees is required for access, heavy metal cover plates or similar material shall be placed over the soil to distribute the weight of heavy equipment and lessen soil disturbance and/or compaction.
- Maintain surface hydrology around native trees - Grading and site drainage shall be designed to properly drain tree trunk areas and avoid water ponding or any changes in grade, including excavation or accumulation of soil due to grading or sedimentation. Drainage shall direct water flow or spray to fall no closer than six feet (2 m) from native driplines.
- Minor native tree impacts - Native trees that have incurred ground disturbance within the five-foot buffer from the dripline shall receive deep feeding one year after construction activities are completed. Deep feeding shall be performed by a certified arborist or tree maintenance firm experienced in deep feeding native trees.
- Major native tree impacts - If any native tree is damaged (roots within five-foot buffer from the dripline disturbed and/or more than 25 percent of the canopy disturbed) as a result of construction activities, it shall be mitigated in a manner approved by the County. A qualified arborist shall be hired to assess the damage and recommend mitigation that may include but is not limited to posting of a performance security bond and tree replacement. The required mitigation shall commence immediately under the direction of the County.
- Native Tree Mitigation Plan - If replacement and mitigation for individual native trees is required due to unanticipated impacts, details on their replacement shall be incorporated into a Restoration Plan to address the loss of native trees greater than 6 inches (15 cm) in diameter at breast height (DBH) as a result of construction activities. The restoration plan

shall detail the steps, methodology, monitoring, quantifiable performance criteria, and reporting to the County for restoration at the Site.

The plan shall identify the number of natives required to establish equivalent habitat or canopy area impacted by the project. Native tree and/or associated plantings shall be obtained from propagules collected and grown by a qualified nursery or botanist / arborist from local sources (i.e., within the Santa Susana Mountains). The native species shall be planted, protected with gopher baskets, if needed, protected from deer browsing for two years, irrigated (drip irrigation on a timer), and shall survive in good health through the first three years of the maintenance period. During the final two years, plantings shall receive reduced maintenance and no irrigation to determine the ability of the plantings to survive unaided. Habitat establishment dictated by survival of at least 50 percent of the plantings shall be determined after a five-year period by the project biologist. In addition to survival, native tree success criteria shall also include evidence of good health (as evidenced by measurable annual growth, lack of predation or disease, and survival of the primary growth leader stem) and trees shall be a minimum of five feet (1.5 m) tall and/or minimum basal diameter of two inches (5 cm).

### **6.3 Construction Monitoring and Reporting**

Construction monitoring during initial disturbance is required to protect resources during construction and to identify any feasible impact avoidance, minimization, and erosion control measures that may be implemented in addition to the existing requirements. Details regarding construction monitoring have been provided above in Sections 6.1 and 6.2.

To ensure that the minimum amount of habitat is disturbed during construction, initial flagging, fencing, and grading shall be inspected by the Construction Monitor. The Construction Monitor shall be on site to sufficiently monitor the protection measures detailed in this document. It is anticipated that monitoring will be most frequent during preparatory and initial site clearing work then will decrease in frequency once the mass grading has disturbed all of the topsoil within the construction activities area or a particular phase of work. The monitor shall be on-site (or shall spot check) during initial site-walks with contractors and crew orientation meeting(s) and during oak tree/native habitat/sensitive species protective fence installation. The Construction Monitor will also identify and mark trees that are to be protected and mark all trees within 25 feet (8 m) of grading to monitor their condition during construction. The Construction Monitor will be consulted regarding any necessary modifications to protection measures or modifications to grading design or infrastructure alignment.

Monthly and quarterly reports shall be prepared by the Construction Monitor throughout the construction project to document the status of construction activities, status of conditions, incidents of non-compliance (if any) and their results, as well as any other pertinent or requested data.

## **7. Conclusions**

No state or federally listed threatened or endangered species were observed in the project area during the ARCADIS 2010 and 2013 surveys.

The proposed drilling sites occur just within the boundaries of one SEA (SEA 20). One sensitive species, six sensitive habitat types, and numerous oak trees and oak woodland occur within the overall project area (the disturbance areas plus 1000 feet). The project area as a whole includes a diversity of habitats and species and contiguous wildlife and propagules corridors to neighboring undeveloped areas.

Sensitive habitat types found in the project area include: valley oak woodland, California walnut woodland, bigcone-spruce canyon oak forest, montane deciduous scrub, native grassland, and southern coast live oak riparian forest.

Impacts to sensitive habitat types have been limited by design and include the following:

- Valley oak woodland and savanna – 0.3 acres (0.12 ha); additional impacts to 4.0 acres (1.6 ha) of adjacent grassland vegetation within a 100-foot woodland buffer
- California walnut woodland – 0.1 acres (0.05 ha)
- Montane deciduous scrub– 0.07 acres (0.03ha)
- Coast live oak woodland/forest– 0.59 acres (0.24 ha)

No impacts to wetland habitats are proposed or anticipated in association with the project except for the potential stormwater/erosion control work in the existing man-made channel along the access road to Site 2 where culvert replacement and other minor modifications may occur. Any such work would be conducted only after review and approval by the California Department of Fish and Wildlife. In all other areas, the project design incorporates an appropriate setback from riparian corridors that is considered protective of wetland and riparian ecological resources.

The proposed project would result in direct impacts to 4.6 acres (1.9 ha) of annual grassland and herbaceous vegetation and 1.7 acres (0.7 ha) of existing roads and other existing developed areas

(Table 4). Of the 4.6 acres of annual grassland and herbaceous vegetation, 4.0 (1.6 ha) acres are located within oak woodland 100-foot (30-m) buffer areas.

Southern California black walnut, which has a CNPS California rare plant rank of 4.2 (CNPS 2013), was observed present in varying densities near all three proposed drilling sites, but no walnut tree removal will result from this project.

The project area supports many native trees and while the design was specifically developed to avoid removal of native trees, selective pruning and/or trimming of trees may be required to provide access to the proposed drilling sites and one canyon oak tree may need to be removed. A total of 509 individual trees or clusters of trees have been mapped within 25 feet of the three proposed drilling sites and associated access routes by WM Surveys, Inc, and ARCADIS, as shown in Figure 8. The majority of these will not be impacted by project activities, but approximately 103 trees may be impacted (e.g., ground disturbance within canopy area) by road widening and pruning and/or trimming to allow drill rig access. One canyon oak with a dbh of 8 inches (20 cm) may be removed if an access road is rerouted to avoid impacts to large valley oak trees.

Although impacts will include relatively small areas of the sensitive habitats as a result of construction activities, plant and wildlife species diversity and richness is not expected to be reduced as a result of the project. Implementation of the recommended impact avoidance and minimization measures is expected to result in avoidance of significant impacts to biotic resources and ecological functions.

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**The Termo Company  
Significant Ecological Areas  
Biota Report**

Aliso Canyon and Oat Mountain Oilfields,  
Santa Susana Mountains, California

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ARCADIS

Tables

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Appendix A

Site Photographs

Tables

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<b>PTERIDOPHYTES - FERNS &amp; ALLIES</b>						
<b>Dryopteridaceae - Wood Fern Family</b>						
<i>Dryopteris arguta</i>	coastal wood fern	perennial herb			scarce along road and in surrounding drainages	
<b>GYMNOSPERMS - DIVISION CONIFEROPHYTA (CONE-BEARING PLANTS)</b>						
<b>Pinaceae - Pine Family</b>						
<i>Cedrus deodara</i>	Deodar cedar	tree			planted by abandoned dwelling	
<i>Pseudotsuga macrocarpa</i>	Bigcone-spruce, Bigcone-Douglas-fir	tree		scarce in surrounding area	scarce along road and in surrounding drainages	scarce in drainages below access road
<b>ANGIOSPERMS - DIVISION MAGNOLIOPHYTA (FLOWERING PLANTS)</b>						
<b>Class Magnoliopsida - Dicotyledons</b>						
<b>Adoxaceae - Muskroot Family</b>						
<i>Sambucus nigra</i> subsp. <i>caerulea</i>	blue elderberry	shrub	FAC	scarce	occasional	occasional
<b>Amaranthaceae - Amaranth Family</b>						
<i>Amaranthus albus</i>	tumbleweed amaranth	annual herb	FACU			scarce
<b>Anacardiaceae - Sumac Family</b>						
<i>Toxicodendron diversilobum</i>	poison-oak	shrub			scarce	uncommon
<b>Apiaceae - Celery Family</b>						
<i>Apiastrum angustifolium</i>	wild celery	annual herb			scarce	
<i>Lomatium c.f. utriculatum</i>	common lomatium, bladder-parsnip	perennial herb		scarce		
<i>Osmorhiza brachypoda</i>	California sweet-cicely	perennial herb			uncommon	
<i>Sanicula bipinnata</i>	poison sanicle	perennial herb		scarce		uncommon
<i>Sanicula crassicaulis</i>	Pacific sanicle	perennial herb			scarce	uncommon
<i>Tauschia arguta</i>	southern tauschia	perennial herb				scarce
<i>Torilis arvensis</i>	hedge-parsley	annual herb			scarce	

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<b>Asclepiadaceae - Milkweed Family</b>						
<i>Asclepias eriocarpa</i>	Indian milkweed	perennial herb			scarce	
<i>Asclepias fascicularis</i>	narrowleaf milkweed	perennial herb		uncommon		scarce
<b>Asteraceae - Sunflower Family</b>						
<i>Agoseris retrosa</i>	spearleaf mountain dandelion	perennial herb		scarce		uncommon
<i>Artemisia californica</i>	California sagebrush	shrub			visible in coastal scrub near site within 1000-foot buffer	
<i>Baccharis pilularis</i> subsp. <i>consanguinea</i>	coyote bush	shrub				scarce
<i>Carduus pycnocephalus</i>	Italian thistle	annual herb		common		
<i>Centaurea melitensis</i>	tocalote	annual herb			scarce	
<i>Cirsium vulgare</i>	bull thistle	annual herb	FACU	scarce		scarce
<i>Corethrogyne filaginifolia</i>	California cudweed-aster	perennial herb			scarce	occasional along access road
<i>Erigeron canadensis</i>	horseweed	annual herb	FAC		uncommon	
<i>Erigeron foliosus</i> subsp. <i>foliosus</i>	leafy daisy	perennial herb				scarce
<i>Eriophyllum confertiflorum</i> var. <i>confertiflorum</i>	golden yarrow	subshrub		scarce		scarce
<i>Grindelia hirsutula</i>	hairy gumplant	perennial herb	FACW	scarce	uncommon	scattered along access road
<i>Hypochaeris glabra</i>	smooth cat's ears	annual herb			scattered in grassland by site	
<i>Isocoma menziesii</i> var. <i>menziesii</i>	Menzies' goldenbush	shrub			scarce	
<i>Lactuca serriola</i>	prickly lettuce	annual herb	FAC			uncommon
<i>Madia gracilis</i>	slender tarweed	annual herb			scarce	
<i>Malacothrix saxatilis</i> var. <i>tenuifolia</i>	cliff-aster	perennial herb			scarce along road to site	
<i>Pseudognaphalium microcephalum</i>	white everlasting	perennial herb			scarce	
<i>Rafinesquia californica</i>	California chichory	annual herb			scarce	scarce
<i>Silybum marianum</i>	milk thistle	annual herb		common	scattered	uncommon

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<i>Solidago californica</i>	California goldenrod	perennial herb				
<i>Taraxacum officinale</i>	common dandelion	perennial herb	FACU		scattered	
<b>Boraginaceae - Borage Family</b>						
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	fiddleneck, rancher's fire	annual herb		common	scattered	scattered
<i>Plagiobothrys nothofulvus</i>	rusty popcorn flower	annual herb	FAC		scarce	
<b>Brassicaceae - Mustard Family</b>						
<i>Brassica nigra</i>	black mustard	annual herb		occasional	occasional	
<i>Capsella bursa-pastoris</i>	shepherd's purse	annual herb	FAC-		uncommon in grassland by site	
<i>Erysimum capitatum</i> subsp. <i>capitatum</i>	western wallflower	perennial herb			scarce along road to site	scarce along road to site
<i>Hirschfeldia incana</i>	summer mustard	annual herb		scattered	scattered	occasional
<i>Sisymbrium irio</i>	London rocket	annual herb			scattered	
<i>Thysanocarpus laciniatus</i>	narrow-leaved lacepod	annual herb			scarce	
<b>Caprifoliaceae - Honeysuckle Family</b>						
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	upright snowberry	shrub	FACU		scattered	common
<b>Caryophyllaceae - Pink Family</b>						
<i>Stellaria media</i>	common chickweed	annual herb	FACU		common	common
<b>Chenopodiaceae - Goosefoot Family</b>						
<i>Chenopodium album</i>	lamb's quarters	annual herb	FAC			common at pond along access road to proposed site
<i>Salsola tragus</i>	Russian-thistle	annual herb	FACU+	scarce		
<b>Cucurbitaceae - Cucumber Family</b>						
<i>Cucurbita foetidissima</i>	calabazilla	perennial vine				scarce
<i>Marah macrocarpus</i> var. <i>macrocarpus</i>	chilicothe, wild cucumber	perennial vine				scarce
<b>Euphorbiaceae - Spurge Family</b>						
<i>Croton setigerus</i>	doveweed	annual herb		uncommon	uncommon	uncommon
<b>Fabaceae - Pea Family</b>						
<i>Acmispon americanus</i> var. <i>americanus</i> [ <i>Lotus purshianus</i> ]	American clover	annual herb			scattered	

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<i>Acmispon glaber</i> var. <i>glaber</i>	deer weed	perennial herb, subshrub				uncommon
<i>Acmispon strigosus</i>	strigose lotus	annual herb				
<i>Lathyrus vestitus</i> subsp. <i>vestitus</i>	Pacific sweet pea	perennial vine			uncommon along road	scarce
<i>Lupinus bicolor</i>	bicolored lupine, miniature lupine	annual herb		scattered	scattered	scattered
<i>Lupinus excubitus</i> var. <i>austromontanus</i>	grape soda lupine	subshrub		uncommon by road		uncommon
<i>Lupinus succulentus</i>	succulent lupine	annual herb		uncommon by road		
<i>Medicago polymorpha</i>	burclover	annual herb		scattered		
<i>Trifolium albopurpureum</i>	rancheria clover	annual herb				scarce
<i>Trifolium hirtum</i>	rose clover	annual herb			scarce	
<i>Trifolium wilddenovii</i>	tomcat clover	annual herb				scarce
<i>Vicia sativa</i> subsp. <i>nigra</i>	common vetch	annual herb				uncommon
<i>Vicia villosa</i> subsp. <i>varia</i>	hairy vetch	annual herb		scattered	scattered	common
<b>Fagaceae - Oak Family</b>						
<i>Quercus agrifolia</i> var. <i>agrifolia</i>	coast live oak	tree		uncommon within site boundary, but scattered in adjacent woodland	scattered	scattered
<i>Quercus berberidifolia</i>	scrub oak	shrub		scarce	scarce	
<i>Quercus chrysolepis</i>	canyon oak	tree			uncommon along road to site and surrounding areas	uncommon
<i>Quercus lobata</i>	valley oak	tree	FAC*	uncommon in adjacent woodland	uncommon	uncommon
<i>Quercus wislizenii</i>	interior live oak	tree				uncommon along Oat Mountain Way between proposed sites 2 and 3
<b>Geraniaceae - Geranium Family</b>						
<i>Erodium cicutarium</i>	red-stemmed filaree	annual herb		scattered	scattered	

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<i>Erodium moschatum</i>	white-stemmed filaree	annual herb		uncommon		
<b>Grossulariaceae - Gooseberry Family</b>						
<i>Ribes californicum</i> var. <i>hesperium</i>	California gooseberry	shrub		scattered	scattered	scattered
<i>Ribes malvaceum</i>	chaparral currant	shrub				uncommon
<b>Hydrophyllaceae - Waterleaf Family</b>						
<i>Nemophila menziesii</i> var. <i>integrifolia</i>	baby blue-eyes	annual herb		scattered	scattered	scattered
<i>Phacelia egea</i>	rock phacelia	perennial herb			occasional, along road to site	uncommon, along road to site
<i>Pholistoma auritum</i>	fiesta flower	annual herb		common	scattered	common
<b>Juglandaceae - Walnut Family</b>						
<i>Juglans californica</i> var. <i>californica</i>	Southern California black walnut	tree	FAC	uncommon	uncommon by road to site	uncommon
<b>Lamiaceae - Mint Family</b>						
<i>Marrubium vulgare</i>	common horehound	perennial herb	FAC		uncommon	uncommon
<i>Salvia apiana</i>	white sage	shrub		scattered on south-facing slopes immediately to south of proposed site		scarce

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<b>Lauraceae - Laurel Family</b>						
<i>Umbellularia californica</i>	California bay	tree	FAC	uncommon	uncommon along road to site and surrounding areas	uncommon
<b>Malvaceae - Mallow Family</b>						
<i>Alcea rosea</i>	hollyhock	perennial herb			scarce	
<i>Malva parviflora</i>	cheeseweed	annual herb			scarce along road to site	
<b>Oleaceae - Olive Family</b>						
<i>Fraxinus dipetala</i>	foothill ash, flowering ash	shrub to small tree			occasional	uncommon
<b>Onagraceae - Evening-primrose Family</b>						
<i>Clarkia dudleyana</i>	Dudley's clarkia	annual herb			scattered along road to site and surrounding areas	scattered along road to site and surrounding areas
<i>Clarkia purpurea</i> subsp. <i>quadrivulnera</i>	farewell-to-spring	annual herb			uncommon	uncommon
<i>Clarkia unguiculata</i>	elegant clarkia	annual herb			scarce	
<i>Epilobium canum</i>	California-fuchsia	perennial herb		scarce		uncommon
<b>Paeoniaceae - Peony Family</b>						
<i>Paeonia californica</i>	California peony	perennial herb				scarce
<b>Papaveraceae - Poppy Family</b>						
<i>Eschscholzia californica</i>	California poppy	annual herb				scarce
<b>Plantaginaceae - Plantain Family</b>						
<i>Keckiella cordifolia</i>	heart-leaved climbing penstemon	shrub			occasional	occasional
<i>Plantago lanceolata</i>	English plantain	perennial herb	FAC-		uncommon	
<b>Polemoniaceae - Phlox Family</b>						
<i>Leptosiphon bicolor</i>	bicolor linanthus	annual herb				
<i>Leptosiphon parviflorus</i>	variable linanthus	annual herb				scattered

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<b>Polygonaceae - Buckwheat Family</b>						
<i>Eriogonum elongatum</i>	long-stemmed buckwheat	perennial herb		scarce on south-facing slopes		scarce by road
<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	California buckwheat	shrub			visible in coastal scrub near site within 1000-foot buffer	
<i>Polygonum aviculare</i>	knotweed	annual herb				common in pond along access road and nearby
<i>Rumex crispus</i>	curly dock	perennial herb	FACW-		scarce	
<b>Portulacaceae - Purslane Family</b>						
<i>Calandrinia ciliata</i>	red maids	annual herb	FAC	uncommon		
<i>Claytonia parviflora</i>	small-flowered miner's lettuce	annual herb	FAC	scattered	uncommon in grassland by site	scattered
<i>Claytonia perfoliata</i> subsp. <i>mexicana</i>	Mexican miner's lettuce	annual herb	FAC	common	common	common
<b>Primulaceae - Primrose Family</b>						
<i>Anagallis arvensis</i>	scarlet pimpernel	annual			scarce	
<b>Ranunculaceae - Buttercup Family</b>						
<i>Clematis lasiantha</i>	chaparral clematis	perennial vine			scarce	uncommon
<b>Rhamaceae - Coffeeberry Family</b>						
<i>Ceanothus oliganthus</i> var. <i>sorediatus</i>	jim brush	shrub				scarce at margin of site, more common in chaparral upslope
<i>Rhamnus ilicifolia</i>	holly-leaf coffeeberry	shrub			scattered	occasional
<b>Rosaceae - Rose Family</b>						
<i>Adenostoma fasciculatum</i>	chamise	shrub				present in chaparral within 1,000 foot buffer area
<i>Drymocallis glandulosa</i> subsp. <i>glandulosa</i>	sticky cinquefoil	perennial herb	FAC			scarce
<i>Heteromeles arbutifolia</i>	toyon	shrub			scarce	
<i>Prunus virginiana</i> var. <i>demissa</i>	western choke cherry	shrub to small tree	FAC-			scattered

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<b>Rubiaceae - Madder Family</b>						
<i>Galium aparine</i>	common bedstraw, cleavers	annual herb		common	common	common
<i>Galium nuttallii</i> subsp. <i>nuttallii</i>	climbing bedstraw	perennial herb				uncommon
<b>Sapindaceae - Soapberry Family</b>						
<i>Acer macrophyllum</i>	big-leaf maple	tree	FAC		scarce by road and in nearby drainages	scarce
<b>Saxifragaceae - Saxifrage Family</b>						
<i>Lithophragma cymbalaria</i>	woodland star	perennial herb			scarce by road	
<b>Solanaceae - Nightshade Family</b>						
<i>Datura wrightii</i>	toluaca, jimsonweed	perennial herb		scarce		
<i>Solanum xanti</i> var. <i>xanti</i>	purple nightshade	shrub				scarce
<b>Urticaceae - Nettle Family</b>						
<i>Urtica urens</i>	dwarf nettle	annual herb			scarce	
<b>Verbenaceae - Verbena Family</b>						
<i>Verbena lasiostachys</i>	western verbena	perennial herb	FAC-	uncommon	scattered	uncommon
<b>Viscaceae - Mistletoe Family</b>						
<i>Phoradendron villosum</i>	oak mistletoe	perennial herb		scarce		
<b>Violaceae - Violet Family</b>						
<i>Viola pedunculata</i>	Johnny jump-up	perennial herb		uncommon		scattered
<b>Class Liliopsida - Monocotyledons</b>						
<b>Agavaceae - Agave Family</b>						
<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	soap root lily	perennial herb				
<i>Hesperoyucca whipplei</i>	chaparral yucca	shrub		scarce on south- facing slopes		
<b>Iridaceae - Lily Family</b>						
<i>Sisyrinchium bellum</i>	blue-eyed grass	perennial herb	FAC		scarce	
<b>Liliaceae - Lily Family</b>						
<i>Calochortus venustus</i>	butterfly mariposa lily	perennial herb		scarce	scarce along roadway	

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<b>Poaceae - Grass Family</b>						
<i>Avena barbata</i>	slender wild oat	annual grass		common	common	common
<i>Avena fatua</i>	wild oat	annual grass		common	common	common
		<b>annual/ perennial grass</b>		<b>scarce</b>		<b>occasional</b>
<b><i>Bromus carinatus</i> var. <i>carinatus</i></b>	<b>California brome</b>					
<i>Bromus diandrus</i>	ripgut brome	annual grass		common	common	common
<i>Bromus hordeaceus</i>	soft chess	annual grass	FACU-		scattered	
<i>Crypsis schoenoides</i>	swamp pricklegrass	annual grass	OBL			scarce in pond near access road
<i>Cynodon dactylon</i>	Bermuda grass	perennial grass	FAC	scarce		
<i>Dactylis glomerata</i>	orchard grass	perennial grass			uncommon	
<b><i>Elymus condensatus</i></b>	<b>giant rye</b>	<b>perennial grass</b>	<b>FACU</b>		<b>scarce along road to site</b>	
<b><i>Elymus elymoides</i> subsp. <i>elymoides</i></b>	<b>bottlebrush squirreltail</b>	<b>perennial grass</b>	<b>FACU-</b>	<b>scarce</b>		<b>scarce</b>
<b><i>Elymus glaucus</i> subsp. <i>glaucus</i></b>	<b>blue wildrye</b>	<b>perennial grass</b>	<b>FACU</b>	<b>scattered</b>	<b>scattered</b>	<b>common</b>
<b><i>Elymus glaucus</i> subsp. <i>virescens</i></b>	<b>blue wildrye</b>	<b>perennial grass</b>	<b>FACU</b>	<b>scattered</b>	<b>scattered</b>	<b>common</b>
<b><i>Elymus triticoides</i> subsp. <i>triticoides</i></b>	<b>alkali rye</b>	<b>perennial grass</b>	<b>FAC+</b>			<b>uncommon</b>
<i>Festuca bromoides</i>	brome fescue	annual grass	FACW-	uncommon		
<b><i>Festuca microstachys</i> var. <i>pauciflora</i></b>	<b>small fescue</b>	<b>annual grass</b>				<b>occasional</b>
<i>Festuca myuros</i>	rattail fescue	annual grass	FACU*	uncommon		occasional
<i>Festuca perenne</i>	perennial rye	annual grass	FAC*			scarce
<i>Hordeum marinum</i> subsp. <i>gussoneanum</i>	Mediterranean barley	annual grass	FAC		uncommon	occasional
<i>Hordeum murinum</i> subsp. <i>glaucum</i>	smooth barley	annual grass		scattered	scattered	common
<i>Hordeum murinum</i> subsp. <i>leporinum</i>	foxtail barley	annual grass		scattered	scattered	
		<b>perennial grass</b>		<b>scarce</b>		<b>occasional</b>
<b><i>Melica imperfecta</i></b>	<b>coast range melic</b>	<b>grass</b>		<b>scarce</b>		<b>occasional</b>
<i>Poa annua</i>	annual bluegrass	annual	FACW-		uncommon	

TABLE 1  
OBSERVED VASCULAR PLANT SPECIES AT TERMO ALISO SITES

Scientific Name	Common Name	Habit	Wetland Indicator Status	Abundance Area 1	Abundance Area 2	Abundance Area 3
<i>Poa secunda</i> subsp. <i>secunda</i>	nodding bluegrass	perennial grass		scattered	uncommon along road to site	
<i>Stipa cernua</i>	nodding needlegrass	perennial grass		scarce	scarce	
<i>Stipa miliacea</i>	smilo	perennial grass		occasional		uncommon
<b>Themidaceae - Brodiaea Family</b>						
<i>Bloomeria crocea</i> var. <i>crocea</i>	golden stars	perennial herb		scarce	scarce	uncommon
<i>Dichelostemma capitatum</i> subsp. <i>capitatum</i>	blue dicks, wild hyacinth	perennial herb		scarce		

**Notes:**

Native species are in **bold** print

Wetland indicator status (USDA, 2010) -- OBL: obligate wetland species, occurs almost always in wetlands (99% of time or more); FACW: facultative

Common = consistently or often present in given community on Site in survey area, 1,000 individuals or more; Scattered = found in various numbers in given community on Site in survey area, but not consistently distributed, 500 to 1,000 individuals; Uncommon = infrequently observed on Site in survey area, 100 to 500 individuals; Scarce = unusual observation on Site in survey area, less than 100 individuals

TABLE 2  
OBSERVED WILDLIFE SPECIES AT TERMO ALISO CANYON AND OAT MOUNTAIN SITES

Scientific Name	Common Name	Abundance Site 1	Abundance Site 2	Abundance Site 3
<b>Birds</b>				
<b>Family - Accipitridae</b>				
<i>Buteo jamaicensis</i>	Red-tailed hawk	common	occasional	common
<b>Family - Cardinalidae</b>				
<i>Pheucticus melanocephalus</i>	Black-headed grosbeak	occasional	occasional	occasional
<b>Family - Cathartidae</b>				
<i>Cathartes aura</i>	Turkey vulture	occasional	occasional	occasional
<b>Family - Columbidae</b>				
<i>Zenaida macroura</i>	Mourning dove	common	common	common
<b>Family - Corvidae</b>				
<i>Aphelocoma californica</i>	Western scrub jay	common	common	common
<i>Corvus corax</i>	Common raven	common	common	common
<i>Cyanocitta stelleri</i>	Steller's Jay	occasional	occasional	occasional
<b>Family - Emberizidae</b>				
<i>Junco hyemalis</i>	Dark-eyed junco	common	common	common
<i>Melospiza crissalis</i>	California towhee	occasional	occasional	common
<i>Pipilo maculatus</i>	Spotted towhee	common	occasional	common
<b>Family - Fringillidae</b>				
<i>Carduelis psaltria</i>	Lesser goldfinch	common	common	common
<i>Carpodacus mexicanus</i>	House finch	common	common	common
<i>Carpodacus purpureus</i>	Purple finch	occasional	occasional	occasional
<b>Family - Icteridae</b>				
<i>Icterus bullockii</i>	Bullock's oriole	occasional	occasional	occasional
<b>Family - Mimidae</b>				
<i>Toxostoma redivivum</i>	California thrasher	occasional	occasional	occasional
<b>Family - Odontophoridae</b>				
<i>Callipepla californica</i>	California quail	common	occasional	common
<b>Family - Paridae</b>				
<i>Baeolophus inornatus</i>	Oak titmouse	common	common	common
<b>Family - Parulidae</b>				
<i>Vermivora celata</i>	Orange-crowned warbler	occasional	occasional	occasional
<b>Family - Picidae</b>				
<i>Colaptes chrysoides</i>	Northern flicker	common	common	common
<i>Melanerpes formicivorus</i>	Acorn woodpecker	common	common	common
<i>Picoides nuttallii</i>	Nuttall's woodpecker	occasional	occasional	occasional
<b>Family - Sittidae</b>				
<i>Sitta carolinensis</i>	White-breasted nuthatch	common	occasional	common
<b>Family - Strigidae</b>				
<i>Bubo virginianus</i>	Great horned owl	common	occasional	occasional
<b>Family - Sturnidae</b>				
<i>Sturnus vulgaris</i>	European starling	common	common	common
<b>Family - Trochilidae</b>				
<i>Calypte anna</i>	Anna's hummingbird	common	occasional	common
<b>Family - Troglodytidae</b>				
<i>Thryomanes bewickii</i>	Bewick's wren	common	occasional	common
<b>Family - Turdidae</b>				
<i>Sialia mexicana</i>	Western bluebird	common	common	occasional
<b>Family - Tyrannidae</b>				
<i>Contopus cooperi</i>	Olive-sided flycatcher	occasional	occasional	occasional
<i>Contopus sordidulus</i>	Western wood-pewee	occasional	occasional	occasional
<i>Myiarchus cinerascens</i>	Ash-throated flycatcher	occasional	occasional	occasional
<i>Sayornis nigricans</i>	Black phoebe	common	common	common
<b>Family - Vireonidae</b>				
<i>Vireo gilvus</i>	Warbling vireo	occasional	occasional	occasional
<i>Vireo huttoni</i>	Hutton's vireo	common	common	common

TABLE 2  
OBSERVED WILDLIFE SPECIES AT TERMO ALISO CANYON AND OAT MOUNTAIN SITES

Scientific Name	Common Name	Abundance Site 1	Abundance Site 2	Abundance Site 3
<b>Mammals</b>				
<b>Family - Canidae</b>				
<i>Canis latrans</i>	Coyote	common	common	common
<b>Family - Cervidae</b>				
<i>Odocoileus hemionus</i>	Mule deer	occasional	occasional	occasional
<b>Family - Geomyidae</b>				
<i>Thomomys bottae</i>	Botta's pocket gopher	common	common	common
<b>Family - Muridae</b>				
<i>Neotoma fuscipes</i>	Dusky-footed woodrat	common	uncommon	common
<i>Peromyscus maniculatus</i>	Deer mouse	common	common	common
<b>Family - Sciuridae</b>				
<i>Sciurus griseus</i>	Western gray squirrel	occasional	occasional	occasional
<i>Spermophilus beecheyi</i>	California ground squirrel	common	uncommon	uncommon
<i>Tamias merriami</i>	Merriam's chipmunk	uncommon	uncommon	uncommon
<b>Reptiles and Amphibians</b>				
<b>Family - Phrynosomatidae</b>				
<i>Sceloporus occidentalis</i>	Western fence lizard	common	occasional	common
<b>Family - Viperidae</b>				
<i>Crotalus viridis</i>	Western rattlesnake	occasional	occasional	occasional
<b>Invertebrates</b>				
<b>Family - Lycaenidae</b>				
<i>Plebejus icarioides</i>	Boisduval's Blue butterfly	occasional	occasional	occasional
<b>Family - Nymphalidae</b>				
<i>Adelpha bredowii</i>	California sister	occasional	occasional	occasional
<i>Coenenympha tullia</i>	Common ringlet	occasional	occasional	occasional
<i>Speyeria spp.</i>	Coronis and/or Callippe fritillary	occasional	occasional	occasional
<b>Family - Pieridae</b>				
<i>Anthocharis sara</i>	Sara orangetip	occasional	occasional	occasional
<i>Colias alexandra harfordii</i>	Harford's sulphur	occasional	occasional	occasional
<i>Pieris rapae</i>	Cabbage white	common	common	common

**Notes:**

**Common** = consistently or normally observed on Site in survey area during appropriate time of year and/or during appropriate weather conditions, **Occasional** = inconsistently observed on Site in survey area during appropriate time of year and/or during appropriate weather conditions, **Uncommon** = Seldom observed on Site in survey area even during appropriate time of year and/or weather conditions, **Scarce** = unusual observation on Site in survey area at any time

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Based on CNPS Inventory of Rare and Endangered Plants (2013) and CNDDDB (2013) search results for the Oat Mountain quadrangle in which Site occurs, as well as surrounding quadrangles: Calabasas, Canoga Park, Mint Canyon, Newhall, San Fernando, Santa Susana, Val Verde, and Van Nuys. Review of Los Angeles County Audubon Sensitive Bird Species list and Watchlist.

Natural Communities	Natural Alliances Observed on Site	CNDDDB (G rank, S rank)	Occurrence of Element on Project Site
<b>Bigcone-Spruce Canyon Oak Forest</b>	<i>Pseudotsuga macrocarpa-Quercus chrysolepis</i> Association	<b>G3, S3.2, threatened</b>	<b>Present on Site</b>
<b>California Walnut Woodland</b>	<i>Juglans californica</i> Alliance	<b>G2, S2.1, very threatened</b>	<b>Present on Site</b>
Cismontane Alkali Marsh		G1, S1.1, very threatened	Not observed, not likely on Site in survey area
Mainland Cherry Forest		G1, S1.1, very threatened	Not observed, not likely on Site in survey area
<b>Montane Deciduous Scrub</b>	<i>Prunus virginiana-Juglans californica</i> Association	<b>G2, S2.1, very threatened</b>	<b>Present on Site</b>
<b>Native Grassland</b>	<i>Poa secunda</i> Alliance, <i>Elymus glaucus</i> Alliance	<b>G3, S3.1</b>	<b>Present on Site</b>
Riversidian Alluvial Fan Sage Scrub		G1, S1.1, very threatened	Not observed, not likely on Site in survey area
Southern California Threespine Stickleback Stream			Not observed, not likely on Site in survey area
<b>Southern Coast Live Oak Riparian Forest</b>	<i>Quercus agrifolia</i> Alliance	<b>G4, S4</b>	<b>Present on Site</b>
Southern Cottonwood Willow Riparian Forest		G3, S3.2, threatened	Not observed in survey area on Site
Southern Mixed Riparian Forest		G2, S2.1, very threatened	Not observed in survey area on Site
Southern Riparian Scrub		G3, S3.2, threatened	Not observed in survey area on Site
Southern Sycamore Alder Riparian Woodland		G4, S4	Not observed in survey area on Site
Southern Willow Scrub		G3, S2.1	Not observed in survey area on Site
<b>Valley Oak Woodland and Savanna</b>	<i>Quercus lobata</i> Alliance	<b>G3, S2.1, very threatened</b>	<b>Present on Site</b>

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<b>Amphibians</b>				
<i>Anaxyrus californicus</i>	Arroyo toad	FE / -	Riparian, river and stream courses and adjacent areas	Not observed; suitable riverine and wash habitat absent in the survey area.
<i>Rana draytonii</i>	California red-legged frog	FT / CSC	Ponds, streams, aquatic systems	Not observed; suitable freshwater habitat absent in the survey area.
<i>Rana muscosa</i>	Sierra Madre yellow-legged frog	FE / - / CSC	foothill and lowland freshwater streams, rivers	Not observed, no suitable aquatic habitat present in the survey area.
<i>Spea hammondi</i>	Western spadefoot toad	- / CSC	grassland, scrub and woodland habitats	Not observed, marginally suitable upland habitat present. No suitable aquatic habitat to support breeding found in the survey area.
<b>Birds</b>				
<i>Accipiter cooperii</i>	Cooper's hawk	- / CSC	Oak woodland/ may utilize many habitat types	Not observed, suitable foraging and nesting habitat present. Species expected to occur on site year round.
<i>Agelaius tricolor</i>	Tricolored Blackbird	SOC / CSC / S	Ponds, lakes, marshland	Not observed, no suitable marsh or lake habitat present in the survey area.
<i>Aimophila ruficeps canescens</i>	Southern California rufous-crowned sparrow	- / -	Brush or grass covered rocky hillsides	Not observed, no suitable habitat present.
<i>Ammodramus savannarum (breeding)</i>	Grasshopper sparrow	- / CSC / S	Open grassland, fields with low sparse vegetation	Not observed, suitable but somewhat limited grassland habitat present in the survey area.
<i>Aquila chrysaetos</i>	Golden eagle	- / - / S	Variety of habitats including chaparral, oak woodland, grassland and coastal scrub	Not observed, suitable foraging habitat present in the survey area
<i>Asio otus (wintering)</i>	Long-eared owl	- / - / S	Woodlands near open fields, grasslands	Not observed, limited habitat of marginal quality present for this species.

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<i>Athene cunicularia</i>	Western burrowing owl	FSC, MNBMC / CSC / S	Open grassland, fields with low sparse vegetation, friable soils, and small mammal burrows	Not observed, limited and poor to marginally suitable habitat present.
<i>Baeolophus inornatus</i>	Oak titmouse	- / CSC nesting / W	Oak woodland, forest	Observed, suitable nesting habitat present. Species expected to occur on site year round.
<i>Buteo regalis</i>	Ferruginous hawk	- / - / S	Open grasslands, fields, foothills	Not observed, limited habitat of poor to marginal quality present for this species.
<i>Cathartes aura (breeding)</i>	Turkey vulture	- / - / S	Cliff faces with potholes and tree hollows for nesting	Observed, Cliff faces with potholes for nesting not present on Site. Large tree hollows if present could provide potential nesting locations.
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	FC / SE / S	Willow riparian and riparian systems	Not observed, no suitable habitat present.
<i>Contopus cooperi (nesting)</i>	Olive-sided flycatcher	- / CSC / S	Mixed coniferous - deciduous forest, coniferous forests	Observed, suitable habitat present
<i>Contopus sordidulus (nesting)</i>	Western wood-pewee	- / - / W	Mixed coniferous - deciduous forest, coniferous forests	Observed, suitable habitat present
<i>Dendroica petechia brewsteri (breeding)</i>	Yellow warbler	- / CSC / S	Willow riparian and riparian systems	Not observed, marginally suitable habitat present.
<i>Elanus leucurus</i>	White-tailed kite	MNBMC / CSC, nesting (fully protected) / S	Oak woodland, coastal scrub, grasslands, open fields	Not observed, suitable foraging and nesting habitat present.

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<i>Falco mexicanus (breeding)</i>	Prairie falcon	- / - / S	Deserts, grasslands, scrublands; cliff faces for nesting	Not observed, no suitable nesting habitat present on site.
<i>Geococcyx californianus</i>	Greater roadrunner	- / - / S	Deserts, grasslands, open fields	Not observed, limited habitat of marginal quality present for this species.
<i>Gymnogyps californianus</i>	California condor	E / E / S	Multiple habitat types; cliff faces, rock outcrops and Sequoia trees for nesting	Not observed, potentially suitable foraging habitat present but limited size of project area likely to preclude this species from occurring on the Site.
<i>Icteria virens</i>	Yellow-breasted chat	- / CSC / S	Willow riparian and riparian systems	Not observed, marginally suitable habitat present.
<i>Melospiza crissalis</i>	California towhee	- / - / W	Oak woodland, coastal scrub, deciduous forest	Observed, suitable foraging and nesting habitat present
<i>Pheucticus melanocephalus (breeding)</i>	Black-headed grosbeak	- / - / W	Oak woodland, deciduous and coniferous forest, riparian corridors	Observed, suitable foraging and nesting habitat present
<i>Polioptila californica californica</i>	Coastal California gnatcatcher	FT / CSC / S	Coastal sage scrub	Not observed, no suitable habitat present in the survey area.
<i>Sturnella neglecta</i>	Western meadowlark	- / - / S	Grasslands, open fields, foothills	Not observed, the site provides suitable foraging and nesting habitat for this species.
<i>Vireo bellii pusillus</i>	Least Bell's vireo	FE / SE / S	Willow riparian and riparian systems	Not observed, no suitable habitat present.
<i>Vireo huttoni</i>	Hutton's vireo	- / - / W	Oak woodland, deciduous and coniferous forest	Observed, suitable foraging and nesting habitat present

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<b>Mammals</b>				
<i>Antrozous pallidus</i>	Pallid bat	- / CSC	Rock crevices, caves, buildings, mine shafts in grasslands, shrublands, forests, primarily in dry habitats for roosting.	Not observed, marginally suitable habitat present.
<i>Euderma maculatum</i>	Spotted bat	- / CSC	Mountainous regions with ponderosa pines. Rocky cliffs, canyons	Not observed, no suitable habitat present.
<i>Eumops perotis californicus</i>	Western mastiff bat	- / CSC	Coastal sage scrub, chaparral, grasslands, forests and woodlands	Not observed, marginally suitable habitat present.
<i>Lasioncycteris noctivagans</i>	Silver-haired bat	- / -	woodlands, forests	Not observed, suitable habitat present.
<i>Lasiurus cinereus</i>	Hoary bat	- / -	woodlands, forests, desert canyons	Not observed, suitable habitat present.
<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit	- / CSC	Coastal sage scrub and neighboring habitats	Not observed, marginally suitable habitat present.
<i>Macrotis californicus</i>	California leaf-nosed bat	- / CSC	Sonoran and Mojave desert scrub	Not observed, no suitable habitat present.
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	- / CSC	coastal and desert scrub habitat preferentially including rock outcroppings and boulder covered landscapes	Not observed, marginally suitable habitat present.
<i>Onychomys torridus ramona</i>	Southern grasshopper mouse	- / CSC	Low arid scrub and semi-scrub vegetation	Not observed, marginally suitable habitat present.
<i>Perognathus longimembris brevinasus</i>	Los Angeles pocket mouse	- / CSC	lower elevation grassland, alluvial sage scrub, coastal sage scrub	Not observed, marginally suitable habitat present.

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<b>Reptiles</b>				
<i>Actinemys marmorata pallida</i>	Southwestern pond turtle	FSC / CSC	Ponds, lakes, streams	Not observed; suitable freshwater habitat absent from the survey area
<i>Anneilla pulchra pulchra</i>	Silvery legless lizard	- / CSC	Coastal dunes, coastal scrub, chaparral, woodlands, riparian margins	Not observed, marginally suitable habitat present
<i>Aspidoscelis tigris stejnegeri</i>	Coastal whiptail	- / -	Coastal dunes, coastal scrub, chaparral, woodlands, riparian margins	Not observed, marginally suitable habitat present
<i>Phrynosoma coronatum (blainvillii population)</i>	Coast (San Diego) horned lizard	- / CSC	Coastal dunes, coastal scrub, chaparral	Not observed, limited and marginally suitable habitat present,
<i>Thamnophis hammondi</i>	Two-striped garter snake	- / CSC	Ponds, lakes , streams	Not observed; suitable freshwater habitat absent from the survey area
<b>Invertebrates</b>				
<i>Danaus plexippus</i>	Monarch butterfly	- / -	Open fields, woodlands	Not observed, marginally suitable habitat present.
<i>Socalchemmis gertschi</i>	Gertsch's socalchemmis spider	- / -	L.A. area - Brentwood and Topanga Canyon - limited information	Not observed, potentially suitable habitat present
<b>Fish</b>				
<i>Catostomus santaanae</i>	Santa Ana sucker	FT / --	Rivers, streams	Not observed, no suitable habitat present.
<i>Gasterosteus aculeatus williamsoni</i>	Unarmored threespine stickleback	FE / SE	Coastal freshwater rivers and streams	Not observed, no suitable habitat present.
<i>Gila orcuttii</i>	Arroyo chub	- / CSC	Rivers, streams with slow water movement and mud or sandy bottoms	Not observed, no suitable habitat present.

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<b>Plants</b>				
<i>Astragalus brauntonii</i>	Braunton's milk-vetch	FE/--/1B.1	Coastal scrub, chaparral, grasslands, especially in recently burned or disturbed areas underlain by sandstone with carbonate layers.	Not observed; grassland habitat present but sandstone with carbonate layers absent from survey area. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Endemic to Los Angeles, Orange, and Ventura Counties.
<i>Berberis nevinii</i>	Nevin's barberry	FE/SE/1B.1	Coastal scrub, chaparral, woodlands, riparian scrub	Not observed; suitable woodland and grassland habitat present. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Endemic to Los Angeles, Riverside, San Bernardino, and San Diego Counties.
<i>California macrophylla</i>	Round-leaved filaree	- / - / 1B.1	Woodlands and grasslands	Not observed; suitable habitat present. Not reported from Oat Mountain quadrangle by CNDDDB (2013).
<i>Calochortus clavatus</i> var. <i>clavatus</i>	Club-haired mariposa lily	- / - / 4.3	Coastal scrub, chaparral, valley and foothill grassland, coastal woodlands; often on serpentinite, clay, rocky soils	Not observed; suitable habitat present, although serpentinite soils absent. Hybrids between <i>Calochortus clavatus</i> var. <i>clavatus</i> and <i>C. clavatus</i> var. <i>gracilis</i> reported in Lyons Canyon to north (DMEC, 2005). Endemic to San Benito, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties.
<i>Calochortus clavatus</i> var. <i>gracilis</i>	Slender mariposa lily	- / - / 1B.2	Coastal scrub, chaparral, grasslands	Not observed; suitable habitat present. Known from nearby Lyons Canyon to north (DMEC 2006), as well as near intersection of Interstate 5 and State Highway 14 (CNDDDB, 2013). Endemic to Los Angeles and Ventura Counties.

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<i>Calochortus fimbriatus</i>	Late-flowering mariposa lily	- / - / 1B.2	Chaparral, woodlands, ultrar	Not observed; suitable habitat present. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Regional endemic (San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties).
<i>Calochortus plummerae</i>	Plummer's mariposa lily	- / - / 4.2	Coastal scrub, chaparral, valley grassland, coastal woodlands, lower montane coniferous forest	Not observed; suitable habitat present. Reported from area near confluence of Brown's and Devil Canyons to west (CNDDDB 2013) as well as by Lyons Canyon to north (DMEC 2006). Endemic to Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties.
<i>Calystegia peirsonii</i>	Peirson's morning-glory	- / - / 4.2	Coastal scrub, chenopod scrub, chaparral, valley and foothill grasslands, coastal woodlands, lower montane coniferous forest	Not observed; suitable habitat present. Reported from Lyons Canyon to north (DMEC 2006). Endemic to Los Angeles County.
<i>Chorizanthe parryi</i> var. <i>fernandina</i>	San Fernando Valley spineflower	FC / SE / 1B.1	Coastal scrub, valley and foothill grassland	Not observed; suitable grassland habitat present. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Reported historically (1901) from Chatsworth (CNDDDB 2013). Endemic to Ventura, Los Angeles, and Orange Counties.
<i>Deinandra minthornii</i>	Santa Susana tarplant	- / Rare / 1B.2	Coastal scrub, chaparral	Not observed; suitable coastal scrub and chaparral habitats with sandstone bluffs absent from survey area, although present nearby. Present to west near Chatsworth, Hialeah Springs, Fern Ann Falls, and Devil Canyon (CNDDDB 2013). Endemic to Santa Susanna and Santa Monica Mountains, Ventura and Los Angeles Counties.

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<i>Dodecahema leptoceras</i>	Slender-horned spineflower	FE/SE/1B.1	Coastal scrub, chaparral, woodlands	Not observed; potential suitable habitat present. Reported from Newhall in 1893; from Pacoima Wash in San Fernando in 1937; this location has been mistakenly labeled as Limekiln Canyon Wash in the Oat Mountain quadrangle according to CNDDDB (2013). Endemic to Los Angeles, Riverside, and San Bernardino Counties.
<i>Dudleya blochmaniae subsp. blochmaniae</i>	Blochman's dudleya	- / - / 1B.1	Chaparral, coastal scrub, grasslands, often on clay or serpentinite soils in bare rocky places	Not observed; suitable grassland habitat present, but serpentinite soils absent. Not reported from Oat Mountain quadrangle. Occurs primarily below 450 meters from San Luis Obispo Counties south to northern Baja California.
<i>Dudleya multicaulis</i>	Many-stemmed dudleya	- / - / 1B.2	Coastal scrub, chaparral, and valley and foothill grasslands, often on clay soils	Not observed; grassland habitat present. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Endemic to Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties.
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	- / - / 4.2	Coastal scrub, chaparral, grasslands, especially in clay soils	Not observed; suitable grassland habitat present. Reported from Newhall (CNDDDB, 2013). Not reported from Oat Mountain quadrangle by CNDDDB (2013).
<i>Helianthus inexpectatus</i>	Newhall sunflower	- / - / 1B.1	Freshwater marsh and swamps, riparian woodland, seeps	Not observed. Known from a single occurrence in Los Angeles County with fewer than 10 individuals in the nearby Newhall Quadrangle. Not reported from Oat Mountain quadrangle by CNDDDB (2013).

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<i>Horkelia cuneata</i> subsp. <i>puberula</i>	Mesa horkelia	- / - / 1B.1	Chaparral, coastal scrub, and woodlands, especially in sandy or gravelly soils	Not observed; suitable habitat present. Not reported from Oat Mountain quadrangle by CNDDDB (2013).
<b><i>Juglans californica</i> var. <i>californica</i></b>	<b>Southern California black walnut</b>	<b>- / - / 4.2</b>	<b>Coastal scrub, chaparral, woodlands, riparian habitats</b>	<b>Present in woodlands and drainages on Site. Restricted to southern California.</b>
<i>Lepidium virginicum</i> var. <i>robinsonii</i>	Robinson's pepper-grass	- / - / 4.3	Chaparral, coastal scrub	Not observed; suitable habitat absent in survey area. Not reported from Oat Mountain quadrangle by CNDDDB (2013).
<i>Malacothamnus davidsonii</i>	Davidson's bush-mallow	- / - / 1B.2	Coastal scrub, chaparral, woodlands, riparian woodland	Not observed; suitable woodlands present in survey area. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Known from Santa Clara, San Mateo, Monterey, San Luis Obispo, and Los Angeles Counties.
<i>Navarretia fossalis</i>	Moran's nosegay	FT / - / 1B.1	Chenopod scrub, playas, vernal pools, and shallow freshwater marshes	Not observed; suitable habitat absent in survey area. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Reported from San Luis Obispo, Los Angeles, Riverside, and San Diego Counties south into Baja California.

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<i>Navarretia setiloba</i>	Piute Mountains navarretia	- / - / 1B.1	Cismontane woodlands and grassland, pinyon juniper woodland in clay or gravelly loam	Not observed; suitable habitat present in survey area. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Endemic to Los Angeles, Kern, and Tulare Counties.
<i>Nolina cismontana</i>	Peninsular nolina	- / - / 1B.2	Coastal scrub and chaparral, on sandstone or gabbro substrates	Not observed; suitable habitat absent in survey area. Not reported from Los Angeles County by CNDDDB (2013). Endemic to Ventura, Orange, Riverside, and San Diego Counties.
<i>Opuntia basilaris</i> var. <i>brachyclada</i>	Short-joint beavertail	- / - / 1B.2	Chaparral, Mojavean desert scrub, Joshua tree woodland, pinyon juniper woodland	Not observed; suitable habitat absent in survey area. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Endemic to Los Angeles and San Bernardino Counties.
<i>Orcuttia californica</i>	California Orcutt grass	FE / SE / 1B.1	Vernal pools	Not observed; suitable habitat absent in survey area. Reported from Newhall by CNDDDB (2013). Not reported from Oat Mountain quadrangle by CNDDDB (2013). Reported from Ventura County south to Baja California.
<i>Senecio aphanactis</i>	chaparral ragwort	- / - / 2B.2	Coastal scrub, chaparral, woodlands, sometimes alkaline	Not observed; suitable woodland habitat present. Not reported from Oat Mountain quadrangle by CNDDDB (2013).

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			
<i>Symphotrichum greatae</i>	Greata's aster	- / - / 1B.3	Chaparral, woodlands, forests, riparian woodland	Not observed; suitable woodland and riparian habitat present. Not reported from Oat Mountain quadrangle by CNDDDB (2013). Endemic to Ventura, Los Angeles, and San Bernardino Counties, primarily in San Gabriel and Liebre Mountains.

Natural Communities -- from Holland (1986) and CNDDDB (201 Natural Alliances and Associations -- from Sawyer, Keeler-Wolf, and Evans (2009)

**CNDDDB Element Ranking System:**

- G = Global, S = State
- 1 - less than 6 viable element occurrences OR less than 1,000 individuals, or < 810 hectares (2,000 acres)
  - 2 - 6 to 20 element occurrences OR 810 to 4,050 hectares (2,000 to 10,000 acres)
  - 3 - 21 to 100 element occurrences OR 4,050 to 20,235 hectares (10,000 to 50,000 acres)
  - 4 - apparently secure, but factors exist to cause some concern (i.e. there is some threat or somewhat narrow habitat)

**Extensions to Ranking Categories**

- .1 - very threatened
- .2 - threatened
- .3 - no current threats known

**United States Fish and Wildlife Service (USFWS)**

FE Federal Endangered

FT Federal Threatened

FC Federal Candidate

SOC Species of Concern as listed by Sacramento Office (USFWS, 2004)

MNBMC Migratory nongame bird of management concern

FSC Federal special concern species

BCC Birds of Conservation Concern

**California Department of Fish and Game (CDFG)**

CE California Endangered

CT California Threatened

CR California Rare

CSC California Species of Concern

**California Native Plant Society (CNPS) Rare Plant Ranks (RPR)**

RPR 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere

RPR 2A: Plants Presumed Extirpated in California, but More Common Elsewhere

RPR 2B: Plants Rare, Threatened, or Endangered in California, but More Common

RPR 3: Plants About Which More Information is Needed- A Review List

**Extensions to List Categories**

- .1 - Seriously threatened in California (over 80% of occurrences threatened /
- .2 - Moderately threatened in California (20-80% occurrences threatened /
- .3 - Not very endangered in California (<20% of occurrences threatened /

TABLE 3  
PRESENT OR CNDDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY FOR SITE AND SURROUNDING AREAS

Sensitive Species		Status (USFWS/CDFG/CNPS)	Habitat	Occurrence of Element on Project Site
Name	Common Name			

RPR 4: Plants of Limited Distribution - A Watch List



TABLE 4  
APPROXIMATE ACREAGE OF HABITATS AND ASSOCIATED DIRECT IMPACTS FROM PROPOSED PROJECT

Termo Aliso Canyon Oil Field Project Area	SITE 1 IMPACT AREA <sup>1</sup> (acres)		SITE 2 IMPACT AREA <sup>1</sup> (acres)		SITE 3 IMPACT AREA <sup>1</sup> (acres)		TOTAL IMPACT AREA AT ALL SITES (acres)	TOTAL HABITAT IN PROJECT AREA, INCLUDING 1000-FT BUFFER <sup>2</sup> (acres)
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts		
<b>SENSITIVE HABITAT TOTALS, INCLUDING 100-FOOT BUFFERS</b>	0.5	1.2	0.3	1.1	0.4	0.9	4.8	313.6
<b>NON-SENSITIVE HABITAT TOTALS</b>	0.0	0.3	0.0	0.0	0.1	0.2	0.6	79.6
<b>TOTAL SENSITIVE AND NON-SENSITIVE HABITAT ACRES</b>	0.5	1.5	0.3	1.1	0.5	1.1	5.4	393.1
<b>Existing Developed Areas</b>								
Agricultural Pond	-	-	-	-	-	-	-	0.3
Well Pads/Roads/Infrastructure	0.0	0.1	-	0.7	0.1	0.8	1.7	21.0
<b>TOTAL EXISTING DEVELOPED AREAS</b>	0.0	0.1	0.0	0.7	0.1	0.8	1.7	21.3
<b>TOTAL HABITAT AND ACRES WITH EXISTING DEVELOPED AREAS</b>	0.5	1.7	0.3	1.9	0.5	1.9	7.1	414.4
New Well Pads	0.5	1.4	0.3	0.8	0.3	0.8	4.1	-
Installation and/or widening of access roads	0.1	0.2	0.0	1.1	0.3	1.0	2.7	-
Total acreage of new development by Site	2.2		2.2		2.4			-

Note 1: Impact assessment calculated based on acreage of proposed drilling pads and access roads (including temporary impacts).

Note 2: Habitat acreages calculated for 1000-foot buffer area extending in all directions from the three proposed disturbance areas.

Note 3: Subtotals may not match exactly due to rounding.

TABLE 5  
 TREE SPECIES, HEALTH, SIZE, PRUNING LOCATIONS AND TAG #S  
 FOR TREES POTENTIALLY IMPACTED BY PROJECT ACTIVITIES

Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
6	1939982	6390983	2	<i>Quercus lobata</i>	48"	Good/fair; major trunk damage	Remove 1 overhanging 8" dead branch
7	1940020	6390997	2	<i>Quercus lobata</i>	24"	Good/fair	None needed
8	1940050	6391016	2	<i>Juglans californica</i>	24"	Good	Canopy reaches almost to edge of road, no pruning needed
9	1940004	6390969	2	<i>Quercus agrifolia</i>	20"	Good, some dead branches	Minor trimming
10	1939997	6390943	2	<i>Quercus agrifolia</i>	28"	Fair, several dead branches	1 hanging live branch with pendant foliage - minor trim
11	1939998	6390922	2	<i>Quercus chrysolepis</i>	24"	Good	3 live branches will require pruning
12	1939966	6390904	2	<i>Umbellularia californica</i>	38"	Fair, trunk damage	None needed
13	1940000	6390870	2	<i>Quercus lobata</i>	24"	Good	Possible trimming
14	1940006	6390879	2	<i>Umbellularia californica</i>	12"	poor, many dead branches	Minor trimming
15	1940008	6390871	2	<i>Quercus agrifolia</i>	18"	Good/fair, one dead trunk	Minor trimming
16	1939978	6390872	2	<i>Juglans californica</i>	4"	poor, many dead branches	None needed
17	1939978	6390869	2	<i>Quercus chrysolepis</i>	4"	Good	None needed
18	1939979	6390862	2	<i>Quercus agrifolia</i>	2"	Good	None needed
19	1940007	6390863	2	<i>Umbellularia californica</i>	10"	Fair/poor, many dead twigs	Minor trimming
20	1940010	6390864	2	<i>Umbellularia californica</i>	8"	Fair/poor	Minor trimming
21	1940011	6390846	2	<i>Umbellularia californica</i>	18"	Good, some dead branches	None needed

TABLE 5  
 TREE SPECIES, HEALTH, SIZE, PRUNING LOCATIONS AND TAG #S  
 FOR TREES POTENTIALLY IMPACTED BY PROJECT ACTIVITIES

Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
22	1940016	6390849	2	<i>Quercus agrifolia</i>	16"	Good	None needed
23	1939980	6390836	2	<i>Quercus agrifolia</i>	24"	Good	Remove 1 overhanging 6" dead branch
24	1939980	6390835	2	<i>Umbellularia californica</i>	4"+7"+ 6"	Good/fair, some dead branches	None needed
25	1939980	6390851	2	<i>Juglans californica</i>	3"+2"	poor	Foliage and small branch trimming
26	1940010	6390819	2	<i>Quercus agrifolia</i>	20"	Good	1 6" branch may require removal
27	1939988	6390805	2	<i>Quercus agrifolia</i>	30"	Good	Possible trimming
28	1940022	6390810	2	<i>Quercus agrifolia</i>	30"	Good	Minor trimming
29	1940028	6390773	2	<i>Umbellularia californica</i>	8"+ 4x6"	Good/fair	Trim few 2" branches
30	1940033	6390761	2	<i>Sambucus nigra</i>	8"	Fair - scraggly	None needed
31	1940031	6390754	2	<i>Umbellularia californica</i>	8"	Good	None needed
32	1940026	6390747	2	<i>Umbellularia californica</i>	12"	Good	Trim few branches
33	1940024	6390717	2	<i>Umbellularia californica</i>	18"	Good	Possible trimming
34	1940023	6390697	2	<i>Umbellularia californica</i>	16"	Good	Possible trimming
35	1940030	6390687	2	<i>Quercus agrifolia</i>	8"	Fair	None needed
36	1940009	6390671	2	<i>Umbellularia californica</i>	24"	Good	Minor trimming
37	1940005	6390638	2	<i>Juglans californica</i>	10"	Good	None needed
38	1940002	6390638	2	<i>Juglans californica</i>	2"+2"+ 2"	Fair, previously cut	None needed
39	1940032	6390580	2	<i>Quercus agrifolia</i>	12"	Good	None needed

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 TREE SPECIES, HEALTH, SIZE, PRUNING LOCATIONS AND TAG #S  
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Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
40	1940043	6390555	2	<i>Pseudotsuga macrocarpa</i>	20"	Good/fair, charred	None needed
41	1940030	6390521	2	<i>Quercus agrifolia</i>	16"	Fair - charred hollow in trunk	Possible trimming
42	1940017	6390499	2	<i>Juglans californica</i>	8"	Fair, previously cut branches	None needed
43	1940020	6390504	2	<i>Juglans californica</i>	8"	Good	Possible trimming
44	1939991	6390506	2	<i>Pseudotsuga macrocarpa</i>	6"	Good, previous cuts	None needed
45	1939989	6390500	2	<i>Pseudotsuga macrocarpa</i>	4"	Good	None needed
46	1940000	6390452	2	<i>Quercus agrifolia</i>	12"	Good/fair, many dead twigs	Cut 1 overhanging 6" branch
47	1939987	6390426	2	<i>Umbellularia californica</i>	12"	Good, burned tree, many vigorous crown sprouts	None needed
48	1939969	6390393	2	<i>Quercus agrifolia</i>	20"	Good, 3 trunks	Trimming
49	1939987	6390418	2	<i>Juglans californica</i>	2"+2"+2"	Good, previously cut	None needed
50	1939961	6390382	2	<i>Quercus lobata</i>	6"	very poor, looks dead, few basal sprouts	None needed
51	1939946	6390362	2	<i>Juglans californica</i>	2"+2"	Fair	None needed
52	1939939	6390349	2	<i>Quercus agrifolia</i>	16"	Good, several large branches previously cut	Remove 2 6-8" branches
53	1939946	6390345	2	<i>Quercus chrysolepis</i>	18"	Good	None needed
54	1939942	6390333	2	<i>Quercus chrysolepis</i>	24"	Good	None needed

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Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
55	1939930	6390328	2	<i>Quercus agrifolia</i>	12"	Good	Cut 3"+3"+4" branches
56	1939921	6390309	2	<i>Quercus agrifolia</i>	20"	Good/fair, previously cut	May not need pruning; worst case - cut 10-12" branch
57	1939908	6390289	2	<i>Quercus agrifolia</i>	18"	Good, previous cuts	Minor trimming
58	1939902	6390236	2	<i>Quercus agrifolia</i>	10"	Good	None needed
59	1939899	6390244	2	<i>Juglans californica</i>	4"	Good	Minor trimming
60	1939898	6390188	2	<i>Quercus lobata</i>	20"	Good/fair	Can be avoided; worst case - light trim
61	1939888	6390167	2	<i>Quercus agrifolia</i>	8"	Good	Can be avoided; worst case - light trim
62	1939894	6390153	2	<i>Quercus agrifolia</i>	24"	Good, previous cuts	Remove 4 4" branches
63	1939895	6390099	2	<i>Quercus agrifolia</i>	20"	Good	None needed
64	1939884	6390091	2	<i>Quercus agrifolia</i>	24"	Good, previous cuts	Remove 1 4" branch
65	1939876	6390065	2	<i>Quercus agrifolia</i>	20"	Good, previous cuts	Remove 1 8" branch
66	1939876	6390055	2	<i>Quercus agrifolia</i>	20"	Good, previous cuts	Minor trimming
67	1940288	6392343	1	<i>Quercus lobata</i>	18"	Good	Canopy reaches almost to edge of road, no pruning if carefully avoided
69	1939977	6390665	2	<i>Umbellularia californica</i>	48"	Good	Foliage trimming plus 2" branch
71	1939965	6390662	2	<i>Pseudotsuga macrocarpa</i>	24"	Good	None needed
73	1939974	6390538	2	<i>Quercus agrifolia</i>	24"	Good	None needed
74	1939973	6390595	2	<i>Pseudotsuga macrocarpa</i>	24"	Fair	None needed
75	1939909	6390351	2	<i>Quercus agrifolia</i>	12"	Good w some branches	Foliage trim, avoid clematis
76	1939979	6390535	2	<i>Quercus lobata</i>	10"	Good	None needed

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Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
77	1939966	6390463	2	<i>Quercus lobata</i>	18"	Good	None needed
78	1939955	6390441	2	<i>Quercus agrifolia</i>	16"	Good/fair, some dead branches	None needed
79	1939932	6390408	2	<i>Quercus agrifolia</i>	20"	Good	None needed
81	1939919	6390387	2	<i>Quercus agrifolia</i>	20"	Good/fair	None needed
82	1939905	6390343	2	<i>Quercus agrifolia</i>	10"	Good	Foliage trim, avoid clematis
83	1939899	6390330	2	<i>Quercus agrifolia</i>	18"	Good	Foliage trim
84	1939866	6390241	2	<i>Pseudotsuga macrocarpa</i>	24"	Good	2" branch and foliage trim
85	1939851	6390175	2	<i>Quercus chrysolepis</i>	4"	Good	None needed
86	1939893	6390324	2	<i>Quercus agrifolia</i>	6"	Good	Foliage trim, avoid clematis
87	1939889	6390309	2	<i>Quercus agrifolia</i>	8"	Good/ fair, some dead branches	None needed
88	1939887	6390298	2	<i>Quercus agrifolia</i>	8"	Good	None needed
89	1939881	6390287	2	<i>Pseudotsuga macrocarpa</i>	5"	Good	Foliage trim
90	1939876	6390267	2	<i>Quercus agrifolia</i>	16"	Fair, hollowed trunk	Foliage trim
91	1939868	6390261	2	<i>Quercus agrifolia</i>	12"	Good	None needed
92	1939867	6390247	2	<i>Quercus agrifolia</i>	16"	Good	Possible foliage trim
93	1939848	6390217	2	<i>Quercus agrifolia</i>	12"	Fair, undercut on 3 sides	None needed
94	1939845	6390203	2	<i>Quercus agrifolia</i>	14"	Fair, undercut	None needed
95	1939850	6390187	2	<i>Quercus agrifolia</i>	12"	Good	None needed
96	1939851	6390182	2	<i>Quercus agrifolia</i>	12"	Good	None needed

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Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
97	1939850	6390151	2	<i>Quercus agrifolia</i>	10"	Fair	None needed
98	1939852	6390144	2	<i>Quercus agrifolia</i>	24"	Good, some dead branches	Foliage trim
99	1939851	6390131	2	<i>Quercus chrysolepis</i>	24"	Good	4" branch or foliage trim
100	1939852	6390118	2	<i>Quercus agrifolia</i>	12"	Fair	Probably can avoid
101	1939851	6390111	2	<i>Quercus agrifolia</i>	12"	Poor, hollowed trunk, many dead branches	Trim dead foliage
102	1939846	6390090	2	<i>Quercus agrifolia</i>	20"	Poor, many dead branches	Trim dead branches
103	1939846	6390064	2	<i>Quercus agrifolia</i>	9"	Fair/good	None needed
104	1939848	6390060	2	<i>Quercus agrifolia</i>	5"	Poor, previously topped	None needed
105	1939873	6389668	2	<i>Quercus agrifolia</i>	20"	Good	Possible foliage trim
106	1939869	6389556	2	<i>Quercus chrysolepis</i>	8"	Good	None needed
107	1939874	6389540	2	<i>Acer macrophyllum</i>	6"	Good	Possible cut 2" branch
108	1939838	6390046	2	<i>Quercus agrifolia</i>	24"	Good	Possible foliage trim
109	1939837	6390026	2	<i>Quercus agrifolia</i>	12"	Poor, many dead branches	None needed
110	1939839	6390007	2	<i>Quercus agrifolia</i>	24"	Fair, previous cut	None needed
112	1939838	6390000	2	<i>Quercus agrifolia</i>	24"	Fair, previous cut	Possible foliage trim
113	1939829	6389938	2	<i>Quercus lobata</i>	36"	Fair/ poor	None needed
114	1939859	6389897	2	<i>Quercus agrifolia</i>	22"	Good	None needed
115	1939861	6389896	2	<i>Quercus agrifolia</i>	22"	Good	Possible foliage trim

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Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
116	1939887	6389802	2	<i>Quercus chrysolepis</i>	8"	Good	None needed
117	1939875	6389720	2	<i>Quercus agrifolia</i>	8"	Good	None needed
118	1939878	6389754	2	<i>Quercus agrifolia</i>	4"	Good	New road alignment will necessitate removal of 3 3" branches
119	1939867	6389734	2	<i>Quercus agrifolia</i>	4"	Good	
120	1939872	6389704	2	<i>Quercus agrifolia</i>	36"	Good, some dead branches	Foliage trim
121	1939870	6389677	2	<i>Quercus agrifolia</i>	20"	Good	2" branch cut
122	1939869	6389671	2	<i>Quercus agrifolia</i>	20"	Good	Prune 4" dead branch
123	1939867	6389634	2	<i>Quercus lobata</i>	36"	Good	Trim dead twigs
124	1939865	6389586	2	<i>Quercus agrifolia</i>	24"	Good	Trim dead branch
125	1939890	6389493	2	<i>Quercus lobata</i>	20"	Good	None needed
126	1939879	6389511	2	<i>Quercus agrifolia</i>	20"	Good	Possible foliage trim
127	1939893	6389481	2	<i>Juglans californica</i>	5"	Good	Leans over ditch
128	1939911	6389458	2	<i>Quercus agrifolia</i>	14"	Fair, foliage over ditch would need to be trimmed with new route	Foliage trim
129	1939966	6389385	2	<i>Quercus lobata</i>	36"	Good/fair with some signs of rot	None needed, previously cut
130	1939992	6389384	2	<i>Quercus lobata</i>	24"	Good, previously cut	Possible minor foliage trim
132	1939907	6389447	2	<i>Quercus chrysolepis</i>	18"	Good	None needed or minor with reroute
133	1939910	6389430	2	<i>Quercus chrysolepis</i>	20"	Good/fair with some dead branches	None needed, or 2" branches with reroute
134	1939918	6389415	2	<i>Quercus agrifolia</i>	6"	Good	None needed

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Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
135	1939915	6389409	2	<i>Quercus agrifolia</i>	20"	Good	None needed
136	1939927	6389400	2	<i>Quercus chrysolepis</i>	20"	Good	None needed, or 3" branch with reroute
137	1939933	6389388	2	<i>Quercus agrifolia</i>	20"	Good	None needed, or foliage trim with reroute
139	1939944	6389379	2	<i>Quercus chrysolepis</i>	8"	Good	Would require removal to reroute to avoid large <i>Quercus lobata</i>
140	1939948	6389367	2	<i>Quercus chrysolepis</i>	10"	Good	None needed, cut 2" branch with reroute
141	1939953	6389360	2	<i>Quercus agrifolia</i>	4"	Fair	None needed, 1" branch with reroute
142	1939957	6389350	2	<i>Quercus chrysolepis</i>	20"	Good/fair with broken branch	None needed, trim dead branch with reroute
143	1940005	6389327	2	<i>Quercus chrysolepis</i>	18"	Good, previously cut	Cut 1 4" dead and 4 2" branches
152	1940011	6389320	2	<i>Umbellularia californica</i>	16"	Good	None needed
153	1940016	6389320	2	<i>Umbellularia californica</i>	20"	Good	Foliage trim
154	1939980	6389324	2	<i>Umbellularia californica</i>	6"	Fair/good, some dead branches	None needed, or trim with reroute
155	1939985	6389313	2	<i>Umbellularia californica</i>	18"	155 and 156 are same tree. Fair, some dead branches	None needed or possible trim with reroute
156	1939985	6389310	2	<i>Umbellularia californica</i>	18"		None needed
157	1940044	6389323	2	<i>Quercus agrifolia</i>	16"	Good	Cut 5 " branch
158	1940053	6389325	2	<i>Quercus chrysolepis</i>	18"	Good, previously cut	Cut 2 4 " branches
159	1940058	6389332	2	<i>Quercus chrysolepis</i>	12"	Good, previously cut	Cut 1 4" branch and foliage

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160	1940068	6389327	2	<i>Quercus chrysolepis</i>	18"	Good, some dead foliage	Trim
161	1940103	6389334	2	<i>Juglans californica</i>	20"	Good	Cut1 3" branch
162	1940071	6389402	2	<i>Quercus chrysolepis</i>	36"	Good	None needed
163	1940229	6389415	2	<i>Quercus lobata</i>	36"	Good	Cut 3 branches as little as possible
164	1940184	6389451	2	<i>Quercus lobata</i>	38"	Good	Try to avoid or cut 2 branches as little as possible
165	1940367	6389462	2	<i>Quercus agrifolia</i>	36"	Poor, rot and crown broken off	None needed
166	1940515	6389530	2	<i>Quercus lobata</i>	48"	Good	Disturbance outside edge of dripline
167	1940629	6389483	2	<i>Quercus agrifolia</i>	36"	Good	Disturbance outside edge of dripline
168	1940657	6389513	2	<i>Quercus chrysolepis</i>	48"	Good	Disturbance outside edge of dripline
169	1940659	6389635	2	<i>Quercus lobata</i>	48"	Good	Disturbance outside edge of dripline
170	1939939	6389479	2	<i>Quercus lobata</i>	48"	Fair, crown broken off	Minor foliage
171	1939931	6389518	2	<i>Quercus chrysolepis</i>	12"	Good	One 1" branch to be cut
172	1939916	6389538	2	<i>Quercus agrifolia</i>	8"	Good	None needed
173	1939917	6389547	2	<i>Quercus agrifolia</i>	36"	Good	Minor foliage trim or one 2" branch may require cutting
174	1939891	6389578	2	<i>Quercus lobata</i>	12"	Fair, dead branches and cuts	None needed
175	1939890	6389596	2	<i>Quercus lobata</i>	24"	Fair, dead branches and cuts	None needed
176	1939904	6389694	2	<i>Quercus agrifolia</i>	36"	Good, previously cut	None needed
177	1939897	6389697	2	<i>Quercus agrifolia</i>	36"	Good, previously cut	None needed

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178	1939915	6389718	2	<i>Quercus agrifolia</i>	24"	Good	Foliage trim
179	1939919	6389742	2	<i>Quercus lobata</i>	28"	Fair	None needed
180	1939922	6389766	2	<i>Quercus lobata</i>	22"	Fair/good	None needed
181	1939943	6389800	2	<i>Quercus agrifolia</i>	20"	Good	None needed or foliage trim
182	1939940	6389862	2	<i>Quercus agrifolia</i>	20"	Good	None needed
183	1939932	6389867	2	<i>Quercus lobata</i>	16"	Good	None needed
184	1939910	6389885	2	<i>Quercus lobata</i>	36"	Good	Foliage trim
185	1939913	6389927	2	<i>Quercus agrifolia</i>	18"	Dying	Foliage trim
186	1939891	6389940	2	<i>Quercus agrifolia</i>	14"	Good, previously cut	Foliage trim
187	1939890	6389942	2	<i>Quercus agrifolia</i>	20"	Good, previously cut	Foliage trim
188	1939877	6389978	2	<i>Quercus agrifolia</i>	18"	Good, previously cut	None needed
189	1939877	6390003	2	<i>Quercus agrifolia</i>	16"	Fair, rot	Possible trim
190	1939908	6390253	2	<i>Quercus agrifolia</i>	24"	Good	Possible trimming
191	1939911	6390260	2	<i>Juglans californica</i>	8"	Fair, previously cut	None needed
192	1941314	6386345	3	<i>Quercus lobata</i>	24"	Good, previously cut	None needed
193	1941195	6386117	3	<i>Quercus lobata</i>	46"	Good, previously cut	None needed
194	1941203	6386038	3	<i>Quercus lobata</i>	36"	Good, previously cut	None needed or minor trimming
195	1941283	6386107	3	<i>Quercus lobata</i>	22"	Good	None needed
196	1941303	6386250	3	<i>Quercus lobata</i>	26"	Good, previously cut	Foliage trim and branch tips
197	1941310	6386295	3	<i>Quercus lobata</i>	12"	Fair	None needed
198	1941342	6386314	3	<i>Quercus lobata</i>	20"	Good, previously cut	Cut 2 6-8" branches overhanging road

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199	1941342	6386346	3	<i>Quercus lobata</i>	6"	Fair	None needed
202	1941346	6386361	3	<i>Quercus lobata</i>	10"	Fair	None needed
203	1941336	6386366	3	<i>Quercus lobata</i>	6"	Fair	Cut 6" branch, smaller 1" branches
204	1941306	6386386	3	<i>Quercus lobata</i>	20"	Good, previously cut, dead branch	None needed
205	1941334	6386386	3	<i>Quercus lobata</i>	16"	Good	None needed
206	1941341	6386380	3	<i>Quercus lobata</i>	14"	Good, previously cut	Cut dead branch
207	1941337	6386386	3	<i>Quercus lobata</i>	6"	Fair	None needed
208	1941335	6386388	3	<i>Quercus lobata</i>	6"	Fair	Cut one 2" and one 4" branch
209	1941337	6386398	3	<i>Quercus lobata</i>	14"	Good/fair	Cut 7" branch overhanging
210	1941365	6386418	3	<i>Quercus lobata</i>	24"	Good/ fair, some dead branches	None needed
211	1941338	6386435	3	<i>Quercus lobata</i>	14"	Good	Cut one 6 " branch
213	1941782	6386792	3	<i>Quercus agrifolia</i>	48"	Good	At edge of pad, will get minor foliage trim as drawn on 10.3.13
214	1941874	6386679	3	<i>Quercus agrifolia</i>	36"	Good, but girdled by barbed wire, some dead branches and signs of rot.	None needed
215	1941878	6386647	3	<i>Quercus agrifolia</i>	32"	Good, some hollowed branches	None needed
216	1941772	6386852	3	<i>Quercus agrifolia</i>	6"	Good	At edge of pad, trimming can be avoided with pad positioning
217	1941751	6386865	3	<i>Quercus agrifolia</i>	8"	Good	At edge of pad, trimming can be avoided with pad positioning

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218	1941644	6386957	3	<i>Quercus lobata</i>	28"	Good	At edge of pad, would require pruning of some 3 inch branches as drawn, which could be avoided by bringing pad out from under canopy
219	1941698	6387038	3	<i>Quercus lobata</i>	24"	Good	At edge of pad, pruning can be avoided
220	1941729	6387085	3	<i>Quercus lobata</i>	32"	Good	At edge of pad, pruning can be avoided
221	1941773	6387117	3	<i>Quercus lobata</i>	42"	Good	At edge of pad, pruning can be avoided
222	1941830	6387089	3	<i>Quercus lobata</i>	28"	Good, fair but dropping some branches of foliage	At edge of pad, may require pruning as drawn unless pad footprint adjusted slightly
223	1941836	6387100	3	<i>Quercus lobata</i>	28"	Fair	At edge of pad, no pruning
224	1941939	6387012	3	<i>Quercus lobata</i>	28"	Good	At edge of pad where fill may be required
225	1941912	6386951	3	<i>Quercus lobata</i>	12"	Fair/poor, broken major branch	At edge of pad where fill may be required
226	1941918	6386948	3	<i>Quercus lobata</i>	30"	Good	At edge of pad where fill may be required
227	1941929	6386897	3	<i>Quercus lobata</i>	24"	Good	At edge of pad, pruning can be avoided
228	1942003	6386157	3	<i>Quercus lobata</i>	24"	Good	At edge of potential road widening
229	1942037	6385949	3	<i>Quercus lobata</i>	20"	Good, few dead and dropped branches	Several branches to be pruned for 18' truck. 6-8", 2", 3" 4"
230	1941959	6385913	3	<i>Quercus chrysolepis</i>	42"	Good	Foliage trim
231	1941930	6385932	3	<i>Quercus agrifolia</i>	36"	Good	Cut branches, 2",3"
232	1941887	6385919	3	<i>Quercus lobata</i>	32"	Good/fair, some dead branches	None needed
233	1941885	6385974	3	<i>Quercus lobata</i>	10"	Fair	Minor foliage trim possibly needed
234	1941868	6385988	3	<i>Quercus lobata</i>	24"	Good/ fair, many dead branches	None needed

TABLE 5  
 TREE SPECIES, HEALTH, SIZE, PRUNING LOCATIONS AND TAG #S  
 FOR TREES POTENTIALLY IMPACTED BY PROJECT ACTIVITIES

Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
235	1941857	6386010	3	<i>Quercus lobata</i>	18"	Good/ fair, many dead branches	None needed
236	1941810	6386043	3	<i>Quercus lobata</i>	36"	Good/fair, some dead branches	None needed
237	1941799	6386076	3	<i>Quercus lobata</i>	20"	Good/fair, some dead branches	None needed
238	1941785	6386111	3	<i>Quercus lobata</i>	4"	Good/fair, some dead branches	Cut 3" branch, overhanging road
239	1941776	6386127	3	<i>Quercus lobata</i>	3"	Good	None needed
240	1941800	6386176	3	<i>Juglans californica</i>	12"	Good	None needed
241	1941797	6386179	3	<i>Juglans californica</i>	12"	Good	None needed
242	1941778	6386221	3	<i>Juglans californica</i>	6"	Good	Possible foliage trim, cut 2" branch
243	1941735	6386248	3	<i>Quercus agrifolia</i>	16"	Good	Minor foliage trim
244	1941716	6386292	3	<i>Quercus agrifolia</i>	12"	Good	Cut two 3" branches
245	1941715	6386290	3	<i>Quercus lobata</i>	6"	Good	Cut one 2" branch
246	1941739	6386316	3	<i>Juglans californica</i>	6"	Good	Minor foliage trim
247	1941687	6386335	3	<i>Quercus agrifolia</i>	12"	Good, previously cut	Minor foliage trim
248	1941695	6386369	3	<i>Sambucus nigra</i>	12"	Good, torn dead branch	Minor foliage trim
249	1941661	6386359	3	<i>Quercus lobata</i>	12"	Good	None needed
250	1941690	6386396	3	<i>Quercus agrifolia</i>	36"	Good	None needed
251	1941569	6386455	3	<i>Quercus lobata</i>	20"	Good/fair, some dead branches	None needed

TABLE 5  
 TREE SPECIES, HEALTH, SIZE, PRUNING LOCATIONS AND TAG #S  
 FOR TREES POTENTIALLY IMPACTED BY PROJECT ACTIVITIES

Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
252	1941529	6386445	3	<i>Quercus agrifolia</i> surrounding <i>Quercus lobata</i> (2 conjoined trees)	30"	Good, but trunk hollow, previously cut	Cut one 8" branch, two 4" branches
253	1941486	6386411	3	<i>Quercus lobata</i>	36"	Good, but large broken branch	None needed if careful
254	1941465	6386494	3	<i>Quercus agrifolia</i>	20"	Good, previously cut	Cut 10" branch
255	1941501	6386521	3	<i>Quercus agrifolia</i>	24"	Good/fair, previously cut, some dead branches	Cut 3 large branches, 12"+, 4" dead, two 6" branches
256	1941498	6386726	3	<i>Fraxinus dipetala</i>	24"	Good	Cut 4", two 2" branches
257	1941394	6386789	3	<i>Quercus lobata</i>	16"	Good	New wide turn, may need pruning
258	1941364	6386778	3	<i>Quercus lobata</i>	12"	Good	New wide turn, cut 3-4 4" branches possibly
259	1941331	6386750	3	<i>Quercus lobata</i>	30"	Good, some dead branches	New wide turn, may need pruning
260	1941374	6386723	3	<i>Quercus agrifolia</i>	8"	Good	Cut two 3" branches
261	1941374	6386684	3	<i>Quercus lobata</i>	36"	Good, some dead branches	None needed
262	1941342	6386621	3	<i>Quercus lobata</i>	14"	Fair, dead branches, sparse foliage	Cut one 4" branch
263	1941298	6386623	3	<i>Quercus lobata</i>	18"	Good, some dead branches	None needed
264	1941325	6386593	3	<i>Quercus lobata</i>	12"	Fair, signs of trunk rot	None needed
265	1941334	6386593	3	<i>Quercus agrifolia</i>	24"	Good, some dead branches, previously cut	Minor trimming
266	1941307	6386573	3	<i>Quercus lobata</i>	16"	Good, some dead branches	Cut dead 2" branch

TABLE 5  
 TREE SPECIES, HEALTH, SIZE, PRUNING LOCATIONS AND TAG #S  
 FOR TREES POTENTIALLY IMPACTED BY PROJECT ACTIVITIES

Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
267	1941326	6386559	3	<i>Quercus lobata</i>	16"	Good, some dead branches	Cut one 5" and two 3" branches
268	1941310	6386549	3	<i>Quercus lobata</i>	20"	Good, some previously cuts	May need minor pruning
269	1941338	6386557	3	<i>Quercus lobata</i>	16"	Good	Cut one 4" branch
270	1941337	6386501	3	<i>Quercus lobata</i>	20"	Good, previously cut	Cut one 6" and 4 3" branches
271	1941342	6386456	3	<i>Quercus lobata</i>	22"	Good, previously cut some dead	Cut one 6" and 4 3" branches
361	1941739	6386241	3	<i>Quercus lobata</i>	14"	Fair, numerous dead branches	Possible foliage trim
365	1941808	6386153	3	<i>Quercus lobata</i>	10"	Good	None needed
366	1941808	6386146	3	<i>Quercus lobata</i>	10"	Good, some dead Branches	None needed
367	1941811	6386140	3	<i>Quercus lobata</i>	14"	Good, some dead branches	Cut one 2" branch
368	1941820	6386130	3	<i>Quercus lobata</i>	20"	Good/fair, some dead branches	Cut 3 2" branches
369	1941835	6386088	3	<i>Quercus lobata</i>	26"	Fair, dead branches and signs of rot	Possibly cut 3" branch
370	1941835	6386070	3	<i>Quercus lobata</i>	20"	Good, some dead branches	Possible foliage trim
371	1941843	6386057	3	<i>Quercus lobata</i>	18"	Good, some dead branches	Cut one 4" branch
375	1941901	6386017	3	<i>Quercus lobata</i>	36"	Good, some dead branches	Cut one dead 10-12" branch, possibly one 6" branch
376	1941895	6386002	3	<i>Quercus lobata</i>	20"	Fair, previously cut, numerous branches dead	None
377	1941916	6385973	3	<i>Quercus lobata</i>	18"	Good/fair	Cut 2 " branch

TABLE 5  
 TREE SPECIES, HEALTH, SIZE, PRUNING LOCATIONS AND TAG #S  
 FOR TREES POTENTIALLY IMPACTED BY PROJECT ACTIVITIES

Tree Tag#	Northing <sup>1</sup>	Easting <sup>1</sup>	Site #	Species	dbh	Tree Health	Pruning/trimming Recommendations
378	1941914	6385994	3	<i>Quercus agrifolia</i>	24"	Good, some dead branches	Cut 6" branch, smaller 1" branches
380	1941974	6385944	3	<i>Quercus lobata</i>	18"	Fair/ poor, sparse foliage	None needed
382	1942063	6386107	3	<i>Quercus lobata</i>	20"	Good/fair, many dead branches	Cut 6 " branch overhanging road, possible other minor pruning

<sup>1</sup> Coordinates are in feet based on California State Plane Zone 5 using NAD 1983

TABLE 6  
 LOCATIONS OF UNTAGGED SURVEYED TREES BASED ON WMH TREE SURVEY

Tree survey # on map	Northing <sup>1</sup>	Easting <sup>1</sup>	dbh
24	1940516	6391794	30"
33	1940557	6391773	62"
34	1940505	6391790	34"
38	1940470	6391802	30"
41	1940397	6391831	22"
42	1940395	6391853	10"
49	1940395	6391900	15"
50	1940383	6391886	18"
51	1940682	6391752	38"
62	1940745	6391720	22"
66	1940838	6391753	22"
81	1940520	6392184	22"
87	1940462	6392166	32"
93	1940421	6392192	20"
110	1940305	6392334	10"
111	1940305	6392341	16"
112	1940310	6392337	12"
113	1940312	6392333	16"
114	1940322	6392319	36"
116	1940606	6392077	48"
126	1940674	6392123	36"
131	1940760	6392090	40"
135	1940788	6392077	24"
136	1940782	6392081	22"
137	1940868	6392009	28"
146	1940905	6391979	36"
153	1940834	6391806	32"
154	1940843	6391831	20"
155	1940850	6391845	32"
162	1940204	6392470	18"
168	1940264	6392410	18"
172	1940285	6392388	16"
176	1941131	6386016	32"
177	1941158	6386018	16"
180	1941269	6386198	10"
185	1941306	6386112	24"
186	1941352	6386190	20"
187	1941366	6386273	22"
188	1941356	6386314	12"
190	1941351	6386332	10"
191	1941344	6386345	8"
194	1941343	6386388	12"

TABLE 6  
LOCATIONS OF UNTAGGED SURVEYED TREES BASED ON WMH TREE SURVEY

196	1941338	6386368	4"
207	1941346	6386447	10"
220	1941307	6386659	14"
228	1941510	6386729	18"
229	1941536	6386708	12"
230	1941550	6386682	14"
231	1941538	6386702	16"
232	1941544	6386651	20"
233	1941579	6386565	20"
234	1941510	6386518	30"
238	1941452	6386470	36"
240	1941522	6386470	18"
244	1941524	6386490	10"
245	1941663	6386440	12"
246	1941640	6386383	6"
248	1941720	6386280	6"
256	1941743	6386316	6"
258	1941749	6386295	10"
259	1941767	6386280	6"
260	1941774	6386234	8"
263	1941735	6386227	14"
266	1941724	6386271	3"
267	1941722	6386277	3"
268	10381	10119	5"
276	1941811	6386137	8"
279	1941839	6386085	26"
281	1941845	6386067	10"
292	1941828	6386024	12"
298	1942082	6386140	18"
300	1942039	6385891	20"
301	1942011	6385880	12"
302	1941973	6385873	10"
303	1941966	6385872	14"
304	1941943	6385905	12"
315	1941778	6386821	14"
326	1941667	6386994	12"
350	1941868	6387109	24"
356	1941969	6387108	36"
357	1941949	6387120	36"
379	1941965	6386894	14"
380	1941978	6386902	42"
381	1941986	6386884	12"
382	1941988	6386845	24"
388	1941995	6386793	42"
389	1941955	6386739	26"

TABLE 6  
LOCATIONS OF UNTAGGED SURVEYED TREES BASED ON WMH TREE SURVEY

392	1941977	6386731	24"
393	1941990	6386737	12"
398	1941896	6386738	24"
413	1940024	6390978	18"
414	1940020	6390959	20"
419	1940017	6390901	24"
430	1940026	6390837	10"
436	1940019	6390822	4"
437	1940021	6390791	4"
445	1940030	6390695	4"
447	1940027	6390683	8"
448	1940022	6390681	8"
450	1939988	6390698	4"
451	1939991	6390712	6"
452	1939988	6390725	8"
453	1939995	6390753	4"
454	1939996	6390758	4"
455	1939993	6390760	6"
456	1939995	6390766	4"
457	1939994	6390769	3"
458	1939993	6390771	6"
462	1939965	6390650	12"
463	1939962	6390633	12"
464	1939969	6390617	4"
465	1939961	6390636	16"
466	1939967	6390609	8"
467	1939968	6390612	6"
468	1939965	6390616	6"
470	1939974	6390597	10"
471	1939978	6390582	10"
472	1940003	6390644	14"
474	1940016	6390607	8"
479	1940045	6390531	20"
481	1940039	6390508	14"
484	1940026	6390474	24"
485	1940016	6390469	20"
491	1939985	6390512	8"
492	1939986	6390516	6"
493	1939985	6390519	4"
496	1939985	6390557	6"
497	1939977	6390563	6"
502	1939954	6390374	4"
503	1939961	6390369	5"
504	1939956	6390364	14"
509	1939922	6390386	6"

TABLE 6  
LOCATIONS OF UNTAGGED SURVEYED TREES BASED ON WMH TREE SURVEY

510	1939923	6390399	16"
513	1939949	6390448	16"
514	1939964	6390493	20"
515	1939962	6390489	12"
519	1939933	6390303	16"
520	1939930	6390291	12"
521	1939928	6390280	8"
522	1939918	6390287	6"
524	1939928	6390317	8"
525	1939926	6390317	6"
526	1939919	6390294	4"
527	1939922	6390294	4"
528	1939922	6390284	4"
530	1939905	6390257	8"
534	1939903	6390237	6"
540	1939872	6390282	14"
541	1939867	6390270	16"
544	1939877	6390294	8"
545	1939895	6390303	4"
546	1939880	6390300	8"
547	1939888	6390304	10"
549	1939883	6390308	8"
550	1939885	6390318	10"
553	1939897	6390337	4"
554	1939898	6390353	4"
557	1939844	6390195	10"
561	1939840	6390171	24"
567	1939900	6390173	10"
568	1939905	6390168	12"
571	1939897	6390124	6"
577	1939887	6390055	6"
578	1939888	6390050	8"
579	1939895	6390036	18"
580	1939886	6390001	10"
582	1939883	6389993	10"
583	1939887	6389990	16"
584	1939873	6389989	24"
588	1939836	6390006	20"
589	1939835	6390016	16"
590	1939834	6390023	20"
592	1939834	6390036	7"
593	1939827	6390035	48"
595	1939835	6390049	4"
598	1939836	6390077	6"
599	1939839	6390081	14"

TABLE 6  
LOCATIONS OF UNTAGGED SURVEYED TREES BASED ON WMH TREE SURVEY

603	1939844	6390114	6"
605	1939838	6389964	8"
609	1939878	6389867	12"
610	1939872	6389805	24"
611	1939859	6389783	36"
615	1939966	6389787	48"
618	1939942	6389866	5"
620	1939917	6389914	14"
621	1939915	6389916	10"
622	1939919	6389919	18"
623	1939924	6389923	22"
628	1939874	6389986	24"
804	1939925	6389624	36"
808	1939923	6389692	14"
809	1939929	6389706	20"
810	1939938	6389734	24"
813	1939875	6389747	6"
814	1939861	6389735	8"
821	1939861	6389666	18"
827	1939929	6389548	24"
829	1939908	6389548	8"
831	1939932	6389532	10"
835	1939860	6389560	8"
837	1939868	6389543	4"
839	1939869	6389529	12"
840	1939872	6389526	10"
841	1939874	6389516	20"
854	1939912	6389404	8"
856	1939905	6389438	8"
859	1939897	6389464	12"
860	1939898	6389470	8"
875	1940028	6389314	4"
877	1940044	6389306	24"
878	1940041	6389299	36"
882	1940069	6389329	6"
883	1940110	6389325	24"
886	1940061	6389307	6"
887	1940062	6389304	18"
889	1940196	6389322	36"
892	1940229	6389318	24"
894	1940404	6389519	40"
895	1940392	6389551	28"
896	1940303	6389559	36"
897	1940264	6389516	48"
898	1940270	6389563	26"

TABLE 6  
LOCATIONS OF UNTAGGED SURVEYED TREES BASED ON WMH TREE SURVEY

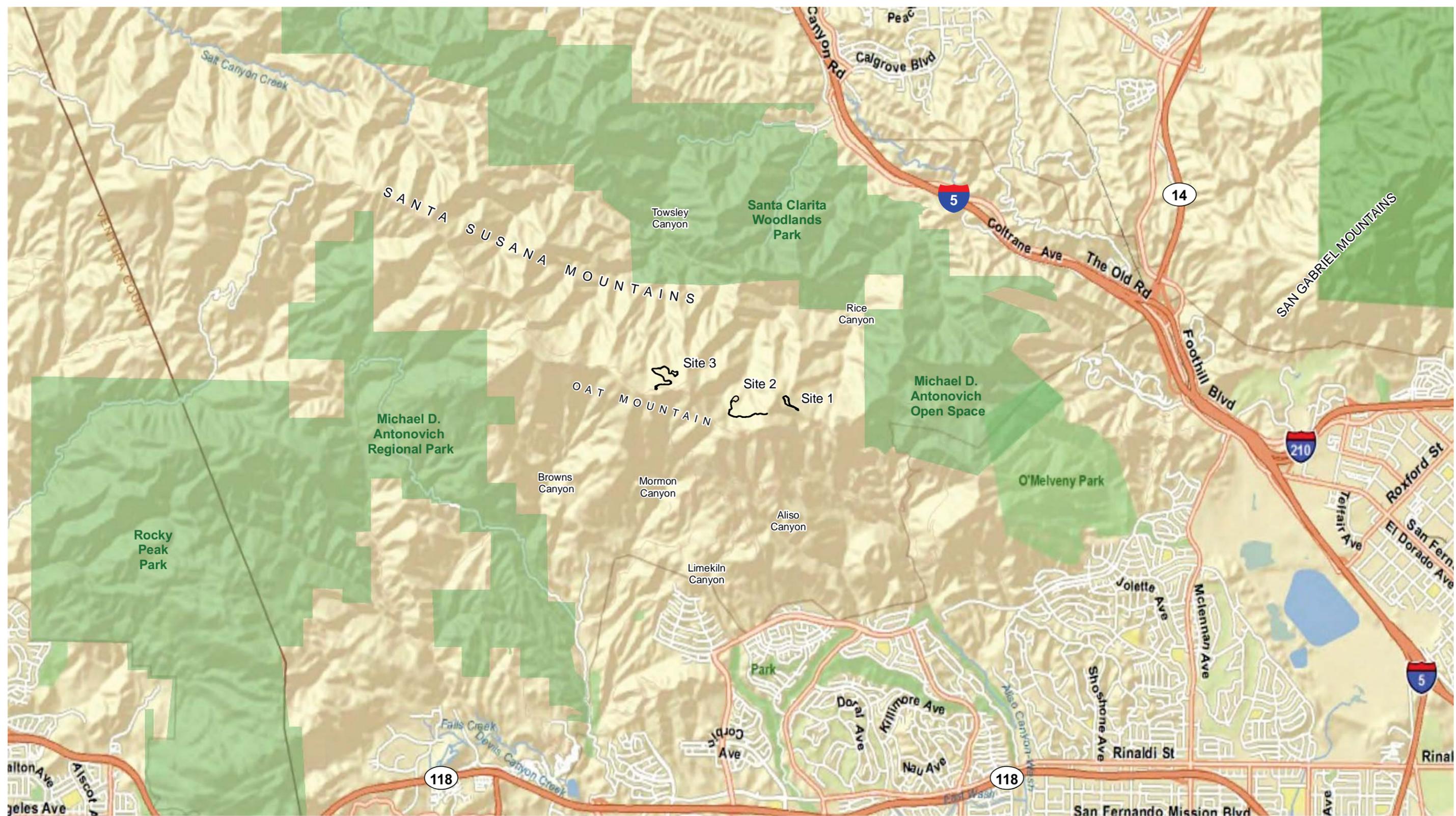
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937	1940794	6389653	48"
943	1940809	6389687	36"
951	1940784	6389765	36"
959	1940668	6389819	60"
963	1940625	6389871	24"
965	1940605	6389833	4"
968	1940599	6389825	6"
969	1940592	6389819	8"
970	1940588	6389810	4"
971	1940580	6389811	12"
977	1940528	6389805	24"
978	1940529	6389795	20"
979	1940516	6389773	16"
980	1940510	6389767	18"
981	1940511	6389758	16"
982	1940507	6389748	20"
984	1940503	6389717	48"
986	1940468	6389706	22"
987	1940466	6389719	16"
988	1940450	6389707	36"
989	1940451	6389674	24"

<sup>1</sup> Coordinates are in feet based on California State Plane Zone 5 using NAD 1983

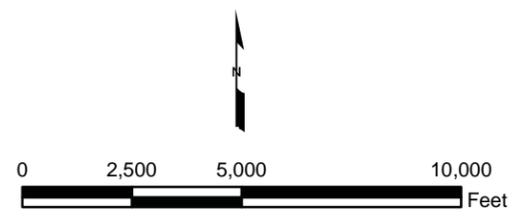
ARCADIS

FIGURES

G:\Client\_Files\5-U\Termo\Figures\GIS\Projects\Fig\_1\_Site\_Location.mxd



**Legend**  
 □ Anticipated Limits of Ground Disturbance

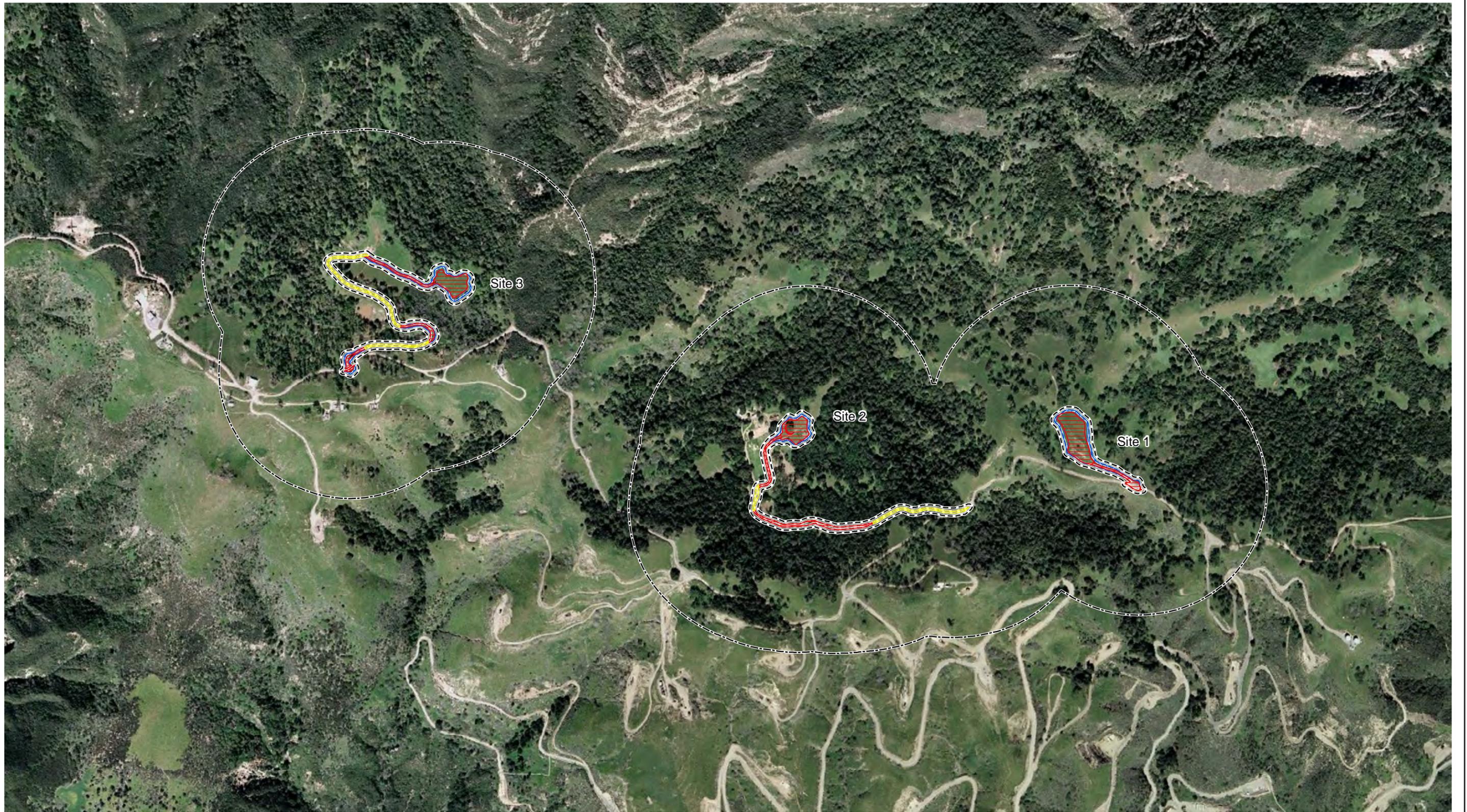


Map includes data from:  
multiple sources

**Site Location Map**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA

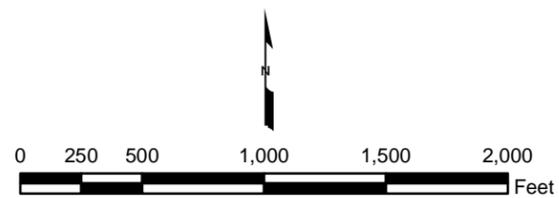
**Figure 1**

ENV: San Luis Obispo C:\Client Files\U\Termo\Aliso Canyon\Figures\GIS\Projects\Nov 2013\Fig 2 Aerial.mxd 11/18/2013 DFischer  
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Disturbance Type**

-  Existing Road
-  New / Re-graded Road / Pad
-  Temporary Disturbance
-  25' buffer
-  1000' buffer



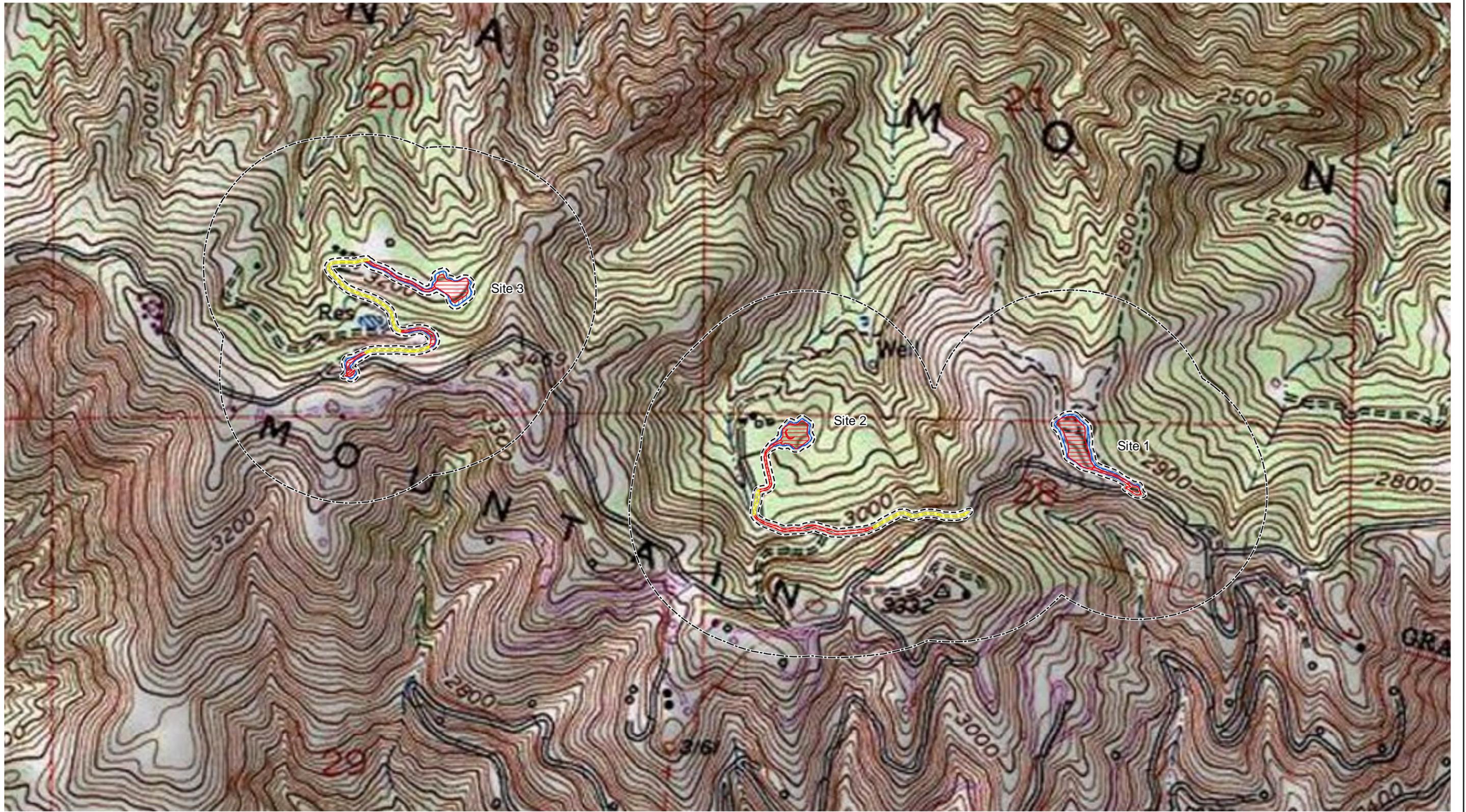
Map includes data from:  
USGS  
Los Angeles County Dept. of Regional Planning

**Aerial View of Site**  
Termo Aliso Canyon and Oat Mountain Oil Fields  
Los Angeles County, CA



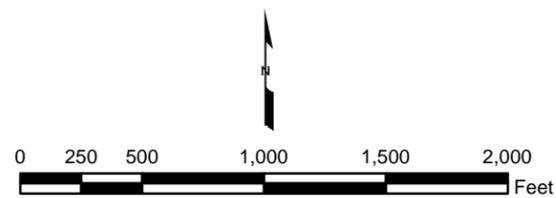
**Figure 2**

ENV: San Luis Obispo C:\Client Files\U\Termo\Aliso Canyon\Figures\GIS\Projects\Fig 3 Topographic Map.mxd 11/18/2013 DFischer  
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Anticipated Limits of Ground Disturbance**

-  Existing Road
-  New / Re-graded Road / Pad
-  Temporary Disturbance
-  25' buffer
-  1000' buffer



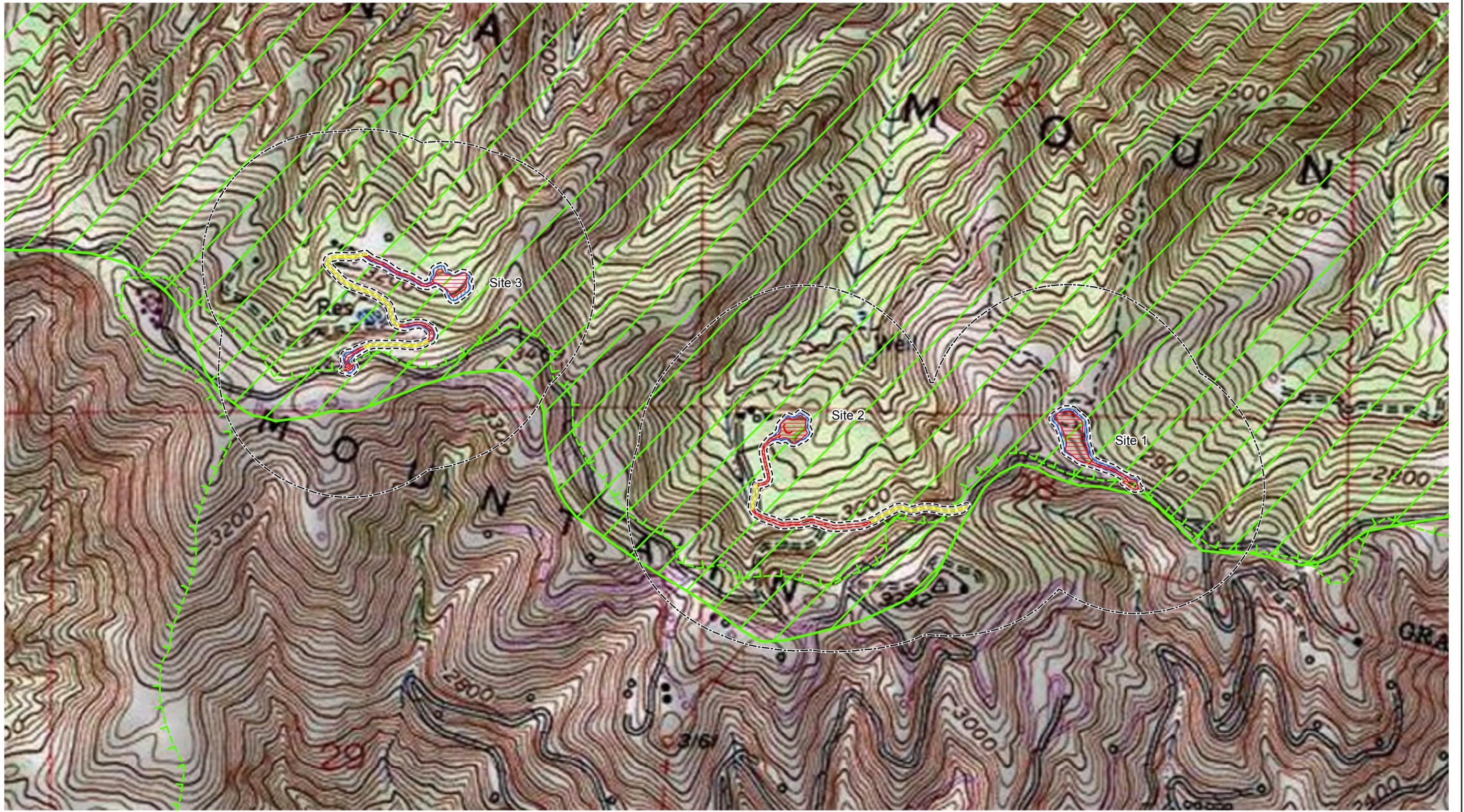
Map includes data from:  
USGS, ESRI, County of Los Angeles

**Topographic Map of Site**  
Termo Aliso Canyon and Oat Mountain Oil Fields  
Los Angeles County, CA

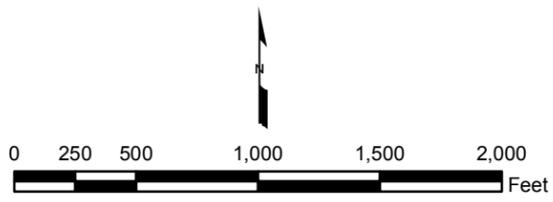


**Figure 3**

ENV: San Luis Obispo C:\Client\_Files\U\Termo\Aliso Canyon\Figures\GIS\Projects\Nov 2013\Fig 4 Significant Ecological Areas.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



<b>Disturbance Type</b>	Significant Ecological Area SEA-20 – Santa Susana Mountains
Existing Road	Proposed SEA
New / Re-graded Road / Pad	
Temporary Disturbance	
25' buffer	
1000' buffer	

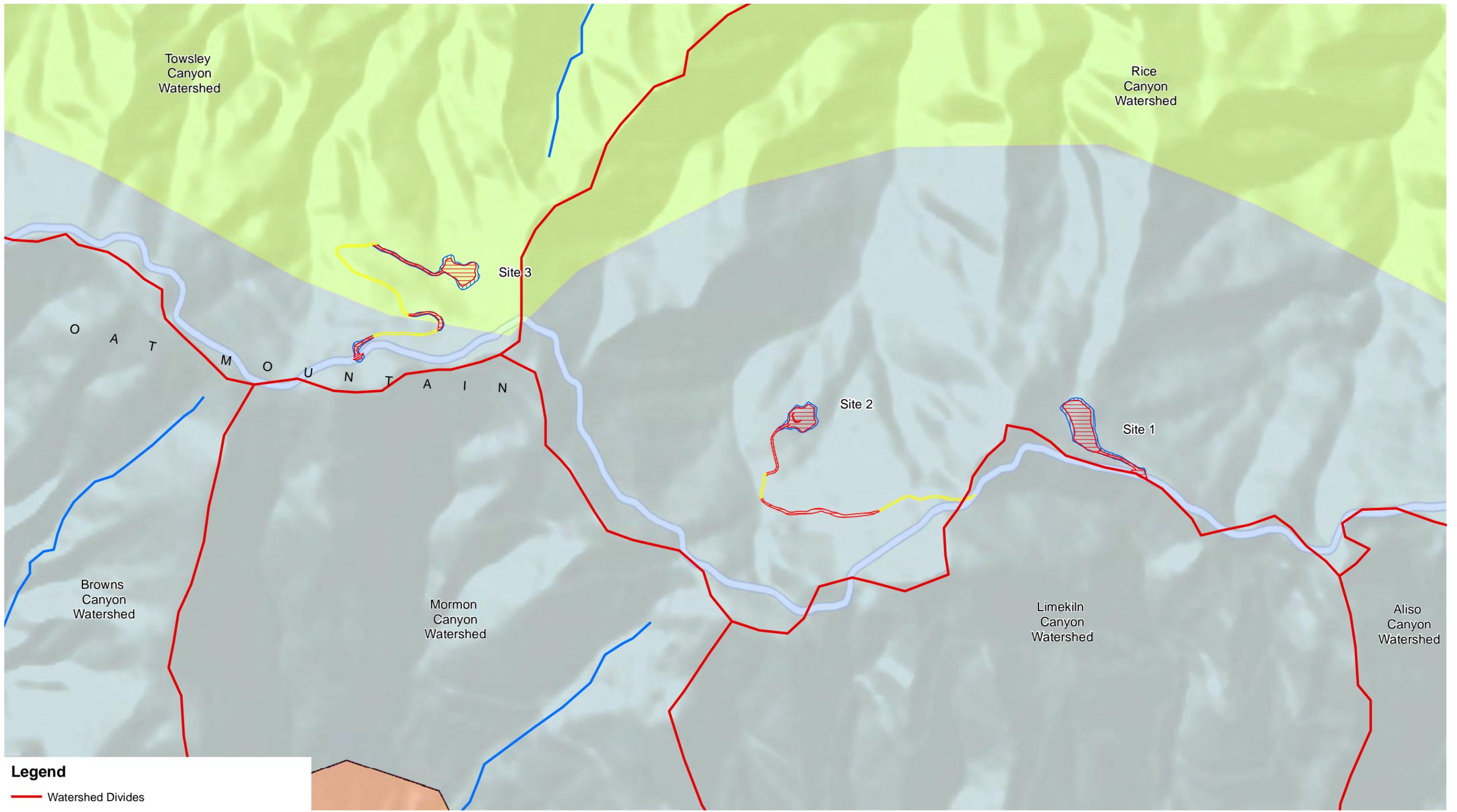


Map includes data from:  
 USGS  
 Los Angeles County Dept. of Regional Planning

**Significant Ecological Areas**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA

**Figure 4**

ENV: San Luis Obispo C:\Client Files\S-U\Termo\Aliso Canyon\Figures\GIS\Projects\Nov 2013\Fig 5 Watersheds and Landforms.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

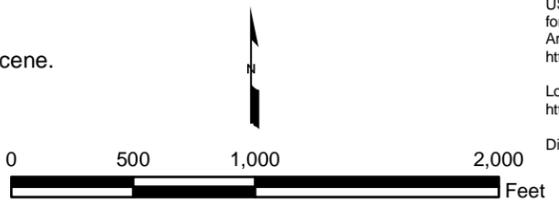


**Legend**

- Watershed Divides
- Streams (from LA County Planning Dept.)

**Underlying Geology**

- Plio-Pleistocene and Pliocene loosely consolidated deposits; Sandstone, shale, and gravel deposits; in part Miocene.
- Pliocene marine rocks; Sandstone, siltstone, shale, and conglomerate; in part Pleistocene and Miocene.
- Miocene marine rocks; Sandstone, shale, siltstone, conglomerate and breccia; in part Pliocene and Oligocene.
- Geologic Faults



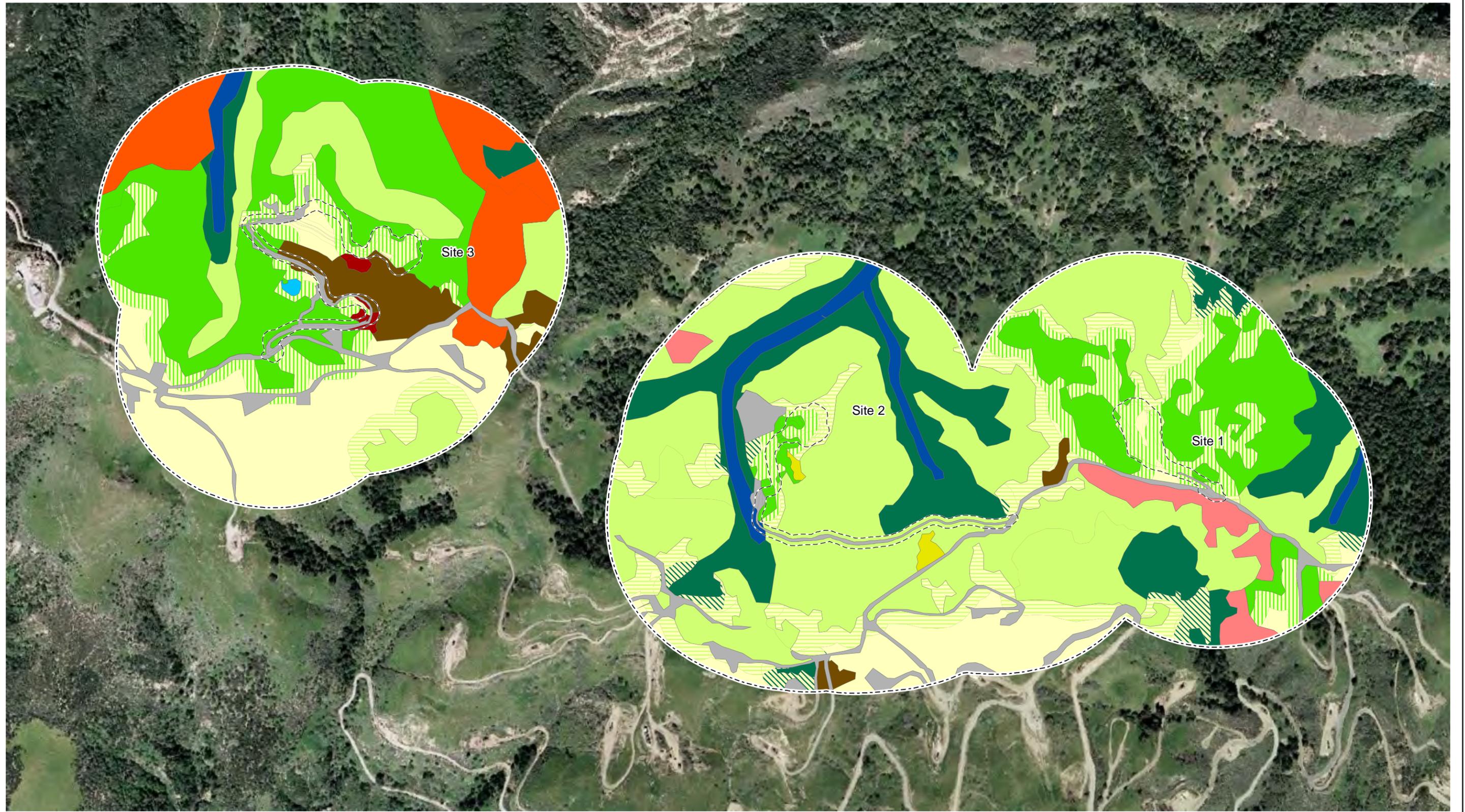
Map includes data from:  
 USGS; Preliminary integrated geologic map databases for the United States - western states: California, Nevada, Arizona, Washington, Oregon, Idaho, and Utah. <http://pubs.usgs.gov/of/2005/1305/>  
 Los Angeles County Dept. of Regional Planning; Streams <http://regionalgis.co.la.ca.us/imf51/imf.jsp?site=gisp>  
 Divides inferred from USGS 7.5" topographic maps.

**Watersheds and Landforms**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 5**

D:\lean\_luis\_episop\Figures\GIS\Projects\Jul2013\Fig 6A Existing Communities.mxd 7/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



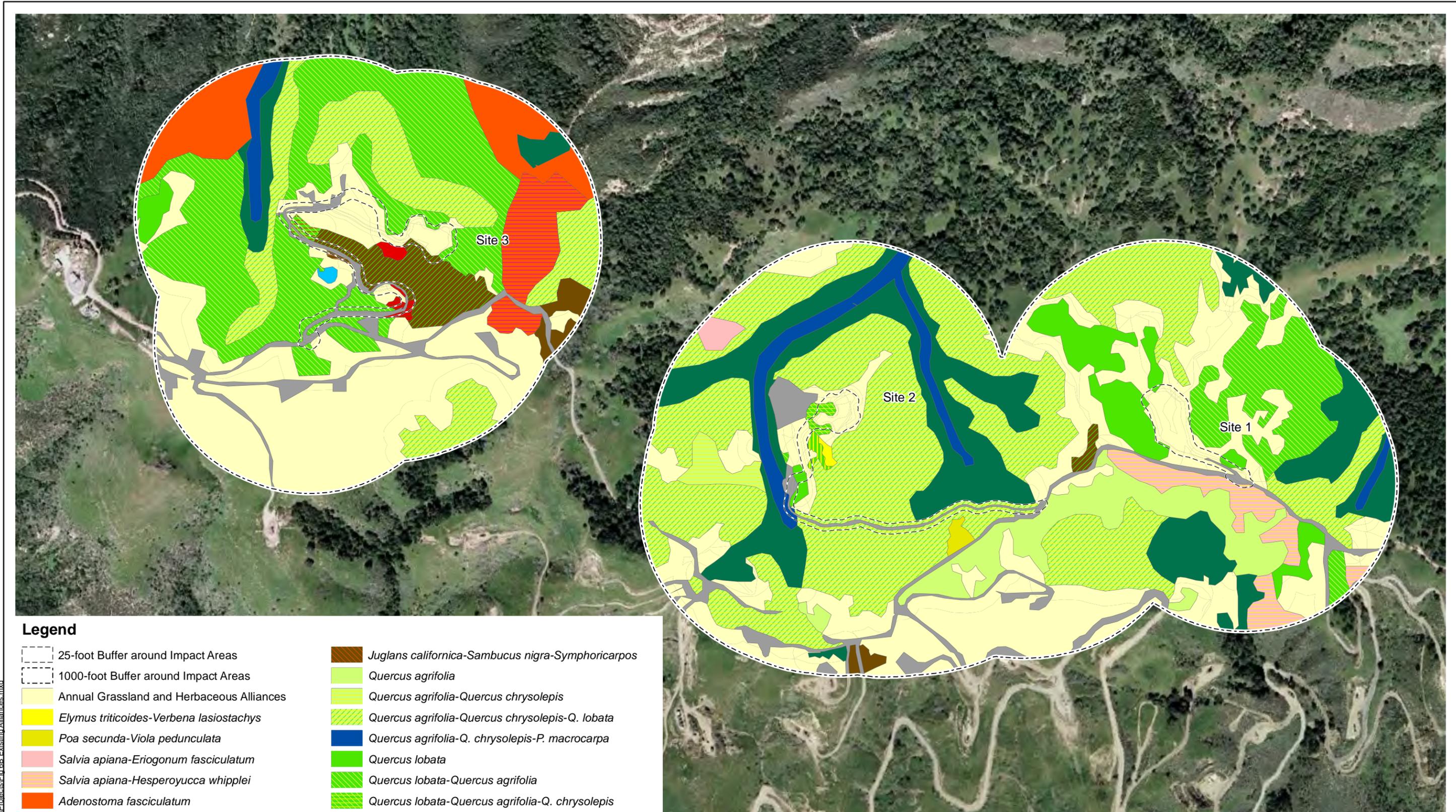
- |   |   |   |
|---|---|---|
| Annual Grassland and Herbaceous Alliances | Coast Live Oak Woodland                 | 100' Buffer for Coast Live Oak Woodland                 |
| Native Grassland                          | Valley Oak Woodland                     | 100' Buffer for Valley Oak Woodland                     |
| Diegan Coastal Sage Scrub                 | Southern Mixed Evergreen Forest         | 100' Buffer for Southern Mixed Evergreen Forest         |
| Chaparral                                 | Southern Coast Live Oak Riparian Forest | 100' Buffer for Southern Coast Live Oak Riparian Forest |
| Montane Deciduous Scrub                   | Agricultural Pond                       | 25-foot Buffer around Impact Areas                      |
| California Walnut Woodland                | Developed                               | 1000-foot Buffer around Impact Areas                    |

Map includes data from:  
 Aerial photograph interpretation  
 Field surveys April, May, August 2010  
 Aerial Photograph Source: USGS 15 Feb 2003  
 Aerial Photograph Copyright: 2013 ESRI



**Existing Plant Communities**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA

**Figure 6A**



**Legend**

- 25-foot Buffer around Impact Areas
- 1000-foot Buffer around Impact Areas
- Annual Grassland and Herbaceous Alliances
- Elymus triticoides-Verbena lasiostachys*
- Poa secunda-Viola pedunculata*
- Salvia apiana-Eriogonum fasciculatum*
- Salvia apiana-Hesperoyucca whipplei*
- Adenostoma fasciculatum*
- Ceanothus oliganthus-Q. wislizenii-Sambucus nigra*
- Prunus virginiana*
- Prunus virginiana-Juglans californica*
- Juglans californica*
- Juglans californica-Quercus lobata-Quercus agrifolia*
- Juglans californica-Symphoricarpos*
- Quercus agrifolia*
- Quercus agrifolia-Quercus chrysolepis*
- Quercus agrifolia-Quercus chrysolepis-Q. lobata*
- Quercus agrifolia-Q. chrysolepis-P. macrocarpa*
- Quercus lobata*
- Quercus lobata-Quercus agrifolia*
- Quercus lobata-Quercus agrifolia-Q. chrysolepis*
- Quercus lobata-Quercus agrifolia-Symphoricarpos*
- Quercus lobata-Elymus triticoides-Bromus diandrus*
- Pseudotsuga macrocarpa-Q. chrysolepis-Q. agrifolia*
- Chenopodium album-Polygonum aviculare*
- Developed

Map includes data from:  
 Aerial photograph interpretation  
 Field surveys April, May, August 2010  
 Aerial Photograph Source: USGS 15 Feb 2003  
 Aerial Photograph Copyright: 2013 ESRI

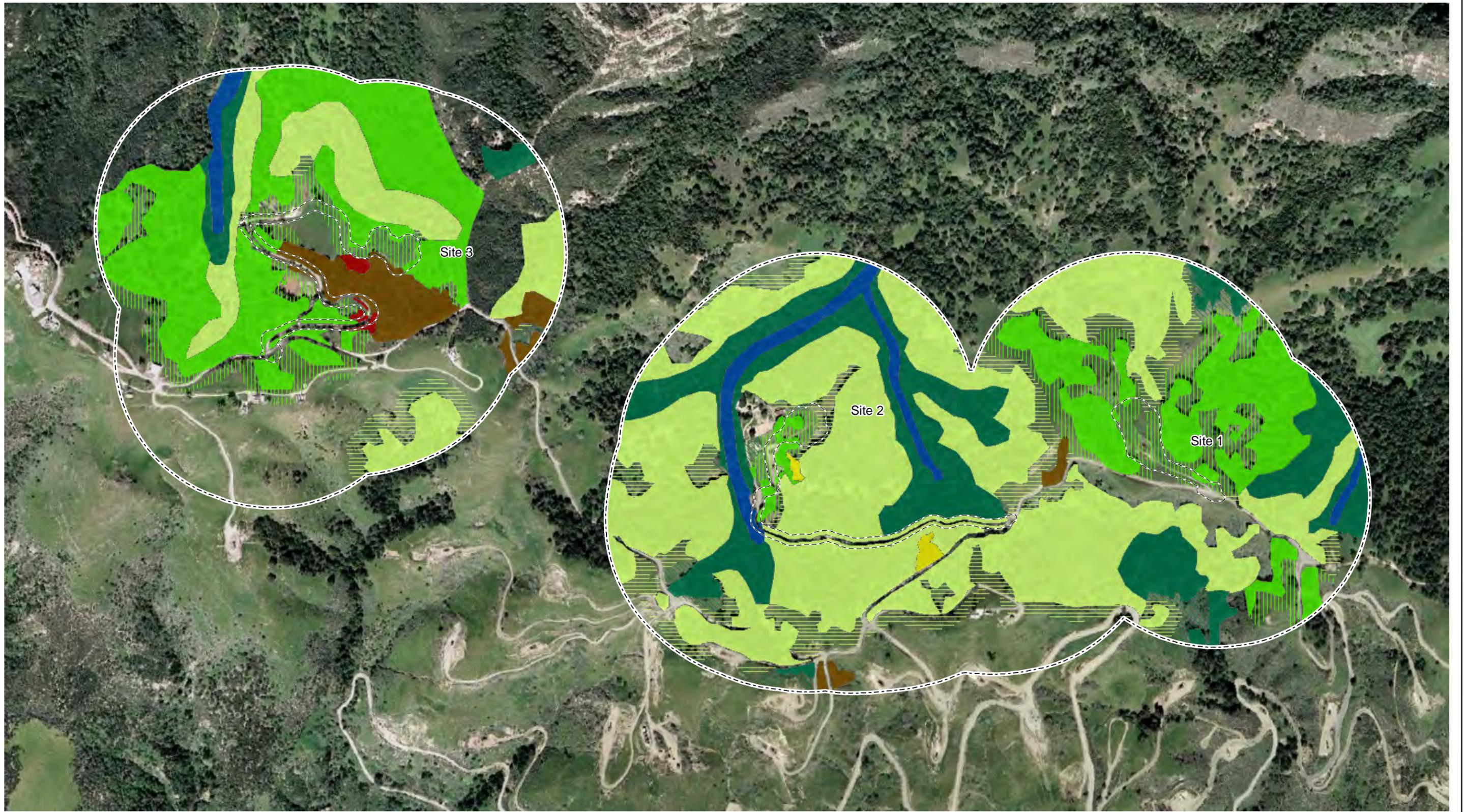


**Existing Vegetation Alliances**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 6B**

G:\Client\_Files\SS\UTermo\Figures\GIS\Projects\Fig 6B Existing Alliances.mxd



Map includes data from:  
 Aerial photograph interpretation  
 Field surveys April, May, August 2010  
 Aerial Photograph Source: USGS 15 Feb 2003  
 Aerial Photograph Copyright: 2013 ESRI



**Sensitive Plant Communities**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



Figure 7



**Legend**

- |                           |  |  |
|---------------------------|--|--|
| <b>Disturbance Type</b>   | <b>Surveyed Tree Species</b>                                   | <span style="color: green;">●</span> Quercus lobata          |
| Existing Road             | <span style="color: grey;">○</span> Other / unrecorded species | <span style="color: brown;">●</span> Juglans californica     |
| New / Regraded Road / Pad | <span style="color: yellow;">●</span> Quercus agrifolia        | <span style="color: orange;">●</span> Pseudotsuga macrocarpa |
| Temporary Disturbance     | <span style="color: blue;">●</span> Quercus chrysolepis        | <span style="color: red;">●</span> Umbellularia californica  |
| 25' buffer                | <b>Tag#</b> Tagged tree (Table 5)                              | <b>Tree#</b> Un-tagged tree (Table 6)                        |

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.



**Survey of Individual Trees**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8**



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)



Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.

0 50 100 200 300 Feet

**Survey of Individual Trees (Site 1)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA

**Figure 8.1**

ENV: San Luis Obispo\GIS\Projects\2013\11-18-2013 Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)



Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 1)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.1A**

ENV: San Luis Obispo\GIS\Projects\TermoAliso Canyon\Figures\GIS\Projects\Nov 2013\Fig 8 1B Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

-  Existing Road
-  New / Regraded Road / Pad
-  Temporary Disturbance
-  25' buffer

**Surveyed Tree Species**

-  Other / unrecorded species
-  Quercus agrifolia
-  Quercus chrysolepis

-  Quercus lobata
-  Juglans californica
-  Pseudotsuga macrocarpa
-  Umbellularia californica

-  Tag# Tagged tree (Table 5)
-  Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.

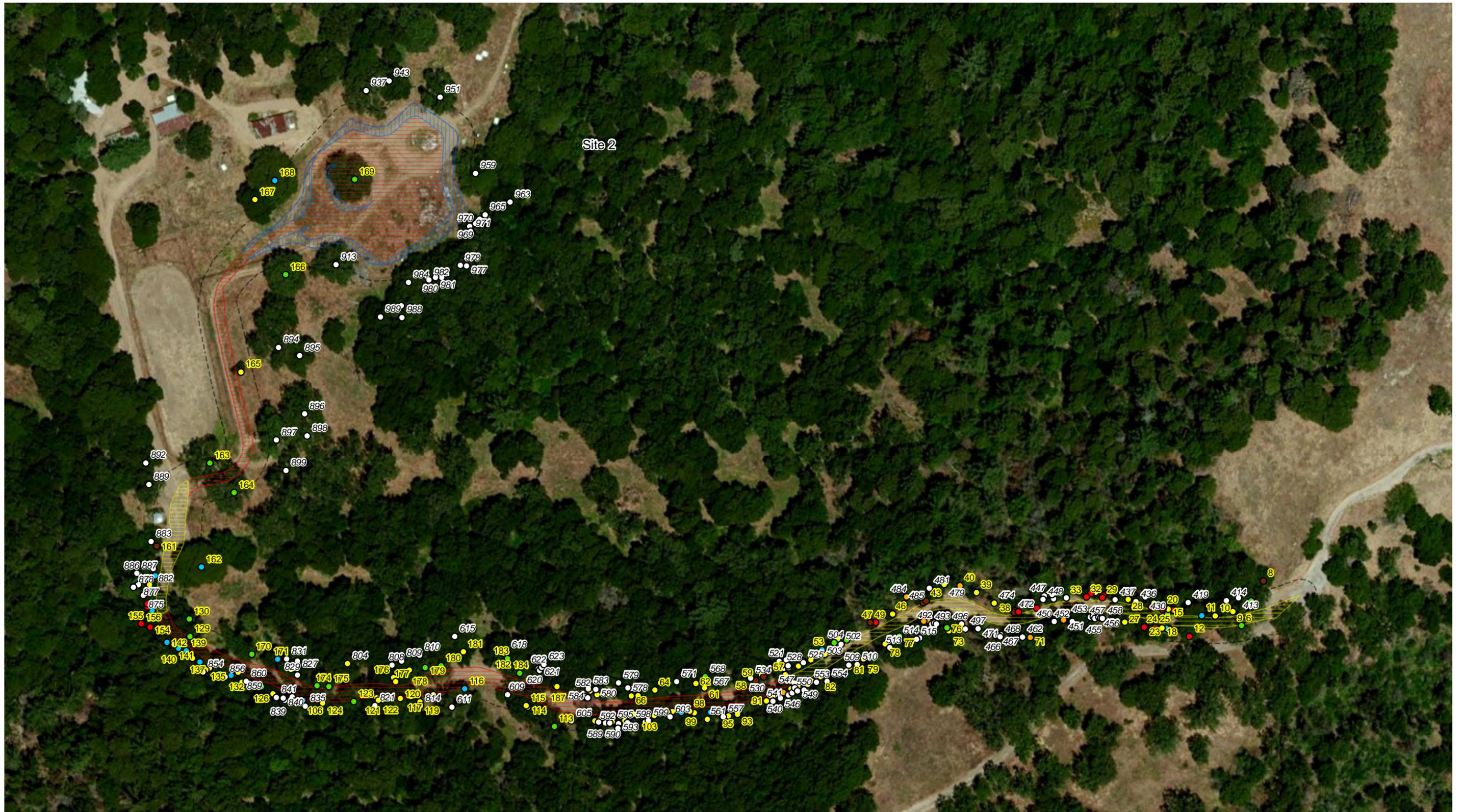


**Survey of Individual Trees (Site 1)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.1B**

ENV: San Luis Obispo\GIS\Projects\Nov 2013\Fig 8 2 Tree Survey.mxd 11/18/2013 D.Fischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

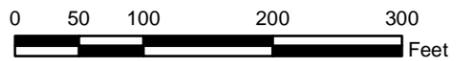
**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery  
 service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 2)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.2**

ENV: San Luis Obispo\GIS\Projects\2013\Fig 8 2A Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.

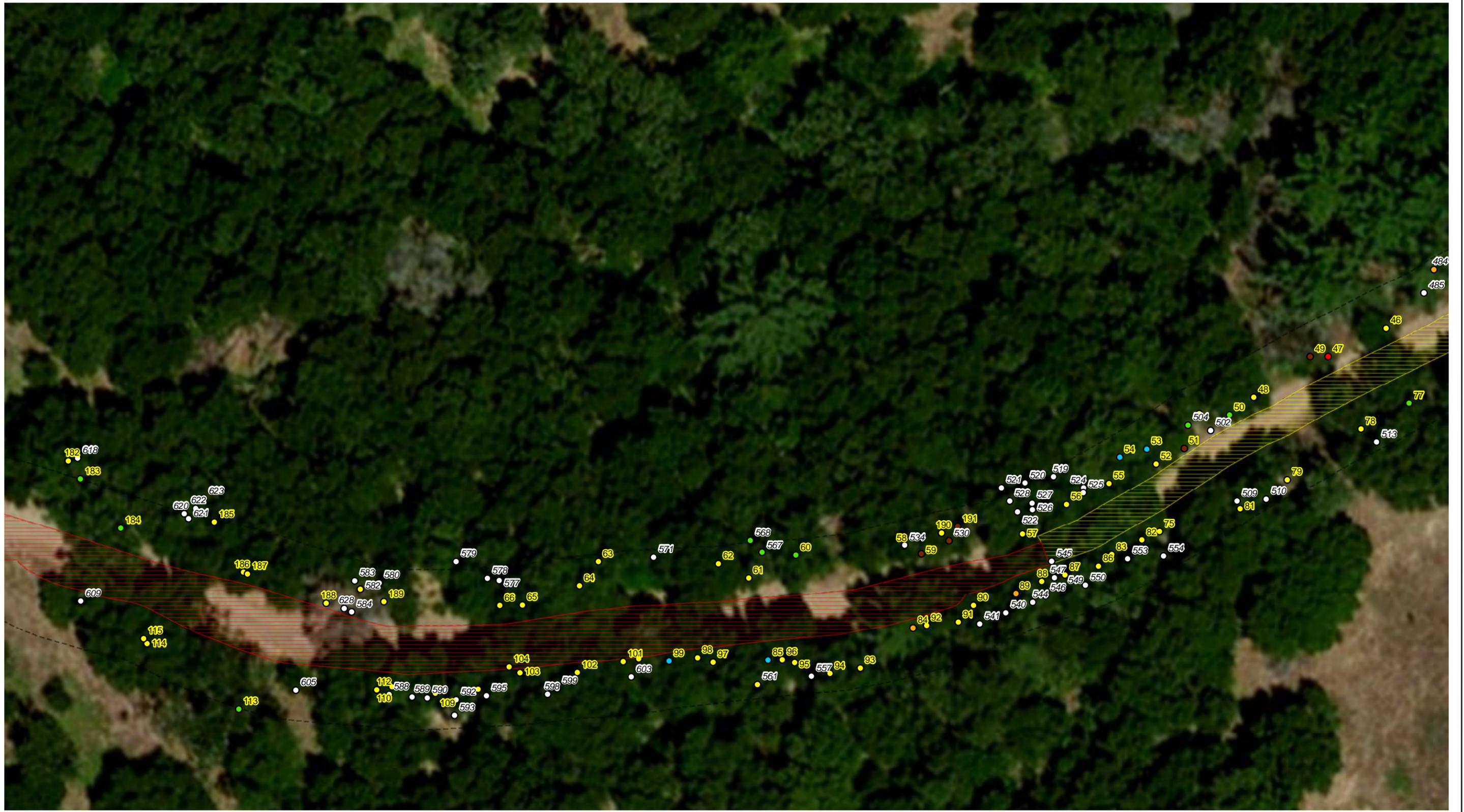


**Survey of Individual Trees (Site 2)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.2A**

ENV: San Luis Obispo\GIS\Projects\Nov 2013\Fig 8 2B Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.

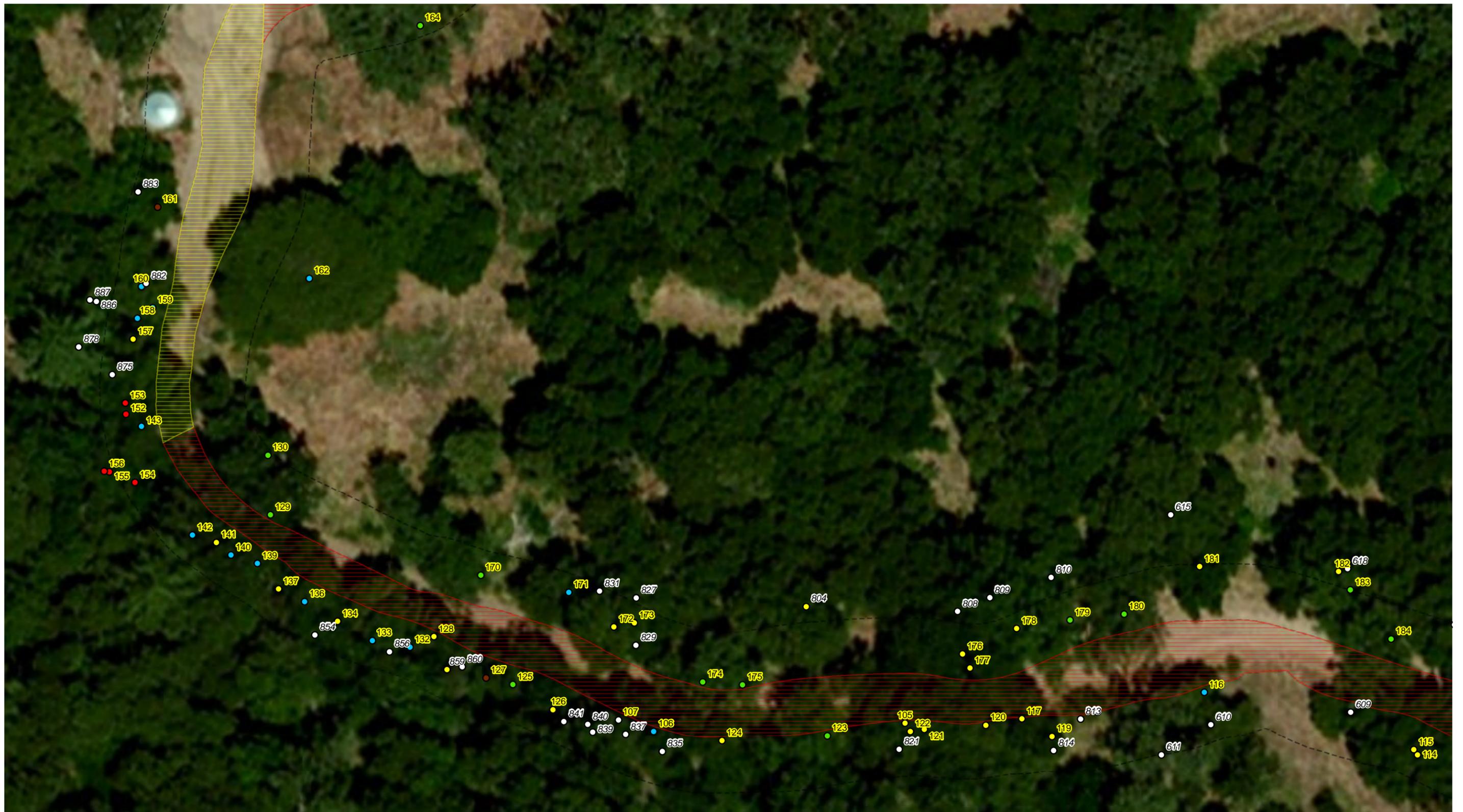


**Survey of Individual Trees (Site 2)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.2B**

ENV: San Luis Obispo\GIS\Projects\Nov 2013\Fig 8 2C Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery  
 service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 2)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



Figure 8.2C

ENV: San Luis Obispo\GIS\Projects\TermoAliso Canyon\Figures\GIS\Projects\Nov 2013\Fig 8 2D Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 2)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.2D**

ENV: San Luis Obispo\GIS\Projects\Nov 2013\Fig 8 2E Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery  
 service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 2)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA

**Figure 8.2E**



**Legend**

- |                           |                              |                          |
|---------------------------|------------------------------|--------------------------|
| <b>Disturbance Type</b>   | <b>Surveyed Tree Species</b> | <b>Tag#</b>              |
| Existing Road             | Other / unrecorded species   | Quercus lobata           |
| New / Regraded Road / Pad | Quercus agrifolia            | Juglans californica      |
| Temporary Disturbance     | Quercus chrysolepis          | Pseudotsuga macrocarpa   |
| 25' buffer                |                              | Umbellularia californica |
|                           |                              | Tagged tree (Table 5)    |
|                           |                              | Un-tagged tree (Table 6) |

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 3)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.3**

ENV: San Luis Obispo\GIS\Projects\2013\11\18\2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)



Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 3)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA

**Figure 8.3A**

ENV: San Luis Obispo\GIS\Projects\Nov 2013\Fig 8 3B Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica
- Tagged tree (Table 5)
- Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery  
 service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 3)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.3B**

ENV: San Luis Obispo\GIS\Projects\2013\11182013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 3)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.3C**

ENV: San Luis Obispo\GIS\Projects\TermoAliso Canyon\Figures\GIS\Projects\Nov 2013\Fig 8 3D Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)

Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 3)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.3D**

ENV: San Luis Obispo\GIS\Projects\Nov 2013\Fig 8 3E Tree Survey.mxd 11/18/2013 DFischer  
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



**Legend**

**Disturbance Type**

- Existing Road
- New / Regraded Road / Pad
- Temporary Disturbance
- 25' buffer

**Surveyed Tree Species**

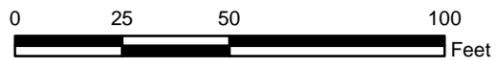
- Other / unrecorded species
- Quercus agrifolia
- Quercus chrysolepis

- Quercus lobata
- Juglans californica
- Pseudotsuga macrocarpa
- Umbellularia californica

- Tag# Tagged tree (Table 5)
- Tree# Un-tagged tree (Table 6)



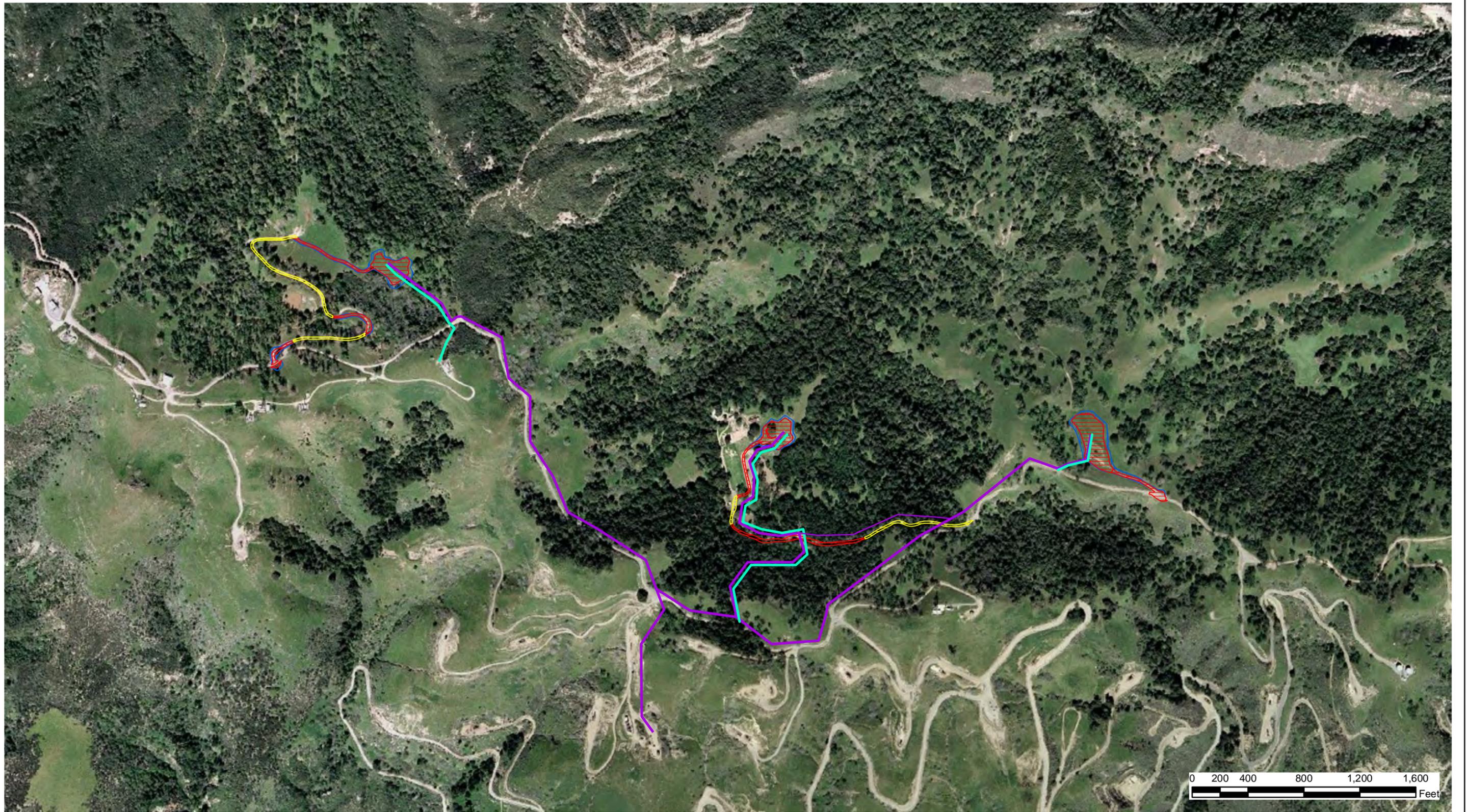
Note:  
 Tree locations from from WM Surveys, Jun-July 2010  
 Tree species and tags from ARCADIS surveys Sep-Oct 2013  
 Aerial photo dated 8 May 2010 from ESRI World Imagery service, copyright Microsoft and its suppliers.



**Survey of Individual Trees (Site 3)**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 8.3E**



**Legend**

**Disturbance Type**

-  Existing Road
-  New / Re-graded Road / Pad
-  Temporary Disturbance

**Proposed Utilities**

-  Surface Electric
-  Surface Fluid/Gas Pipes
-  Surface Fluid/Gas Pipes (Alt)



1. All power drops will come off of existing or planned poles from Edison (separate project being undertaken in stages by Edison)
2. Fluid / Gas / Electrical will follow the side of the road to the greatest extent possible.
3. Exact placement of infrastructure will be determined after a route survey.
4. All pipes will be placed on sleepers / risers above ground.

Map includes data from:  
 Los Angeles County GIS Data Portal  
<http://egis3.lacounty.gov/dataportal>, 1 Feb 2012  
 Los Angeles County Assessor's Office  
<http://assessor.lacounty.gov/extranet/Outsidesales/gisdata.aspx>, 3 Feb 2012  
 USGS Aerial Photograph, 15 Feb 2003  
 USGS Elevation contours, interval 50'  
 Geographix Well Locations, 9 Feb 2012  
 Proposed Utility locations, 14 Nov 2013  
 CA State Plane V, NAD83.

**Proposed Drill Sites and Utilities**  
 Termo Aliso Canyon and Oat Mountain Oil Fields  
 Los Angeles County, CA



**Figure 9**

ARCADIS

Appendix A

Site Photographs

**Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



The project area within Termo Aliso Canyon and Oat Mountain Oil Fields is located near the top of the eastern portion of the Santa Susana Mountains. Looking northeast.

3/23/2010

P3230118



Proposed Drilling Site 1, looking northeast. This location is dominated by grassland and scattered trees, mostly valley oaks, with a few coast live oak individuals.

3/23/2010

P3230121

Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California



Overview of Proposed  
Drilling Site 2, looking east.

3/23/2010

P3230101



The access road to Proposed  
Drilling Site 2 is heavily  
wooded and winds down the  
mountain side to the site.

8/10/2010

P8100043

Proposed Drilling Site 2,  
looking west.

3/23/2010

P3230101

**Significant Ecological Areas Biological Constraints Analysis  
Terro Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



Proposed Drilling Site 3,  
looking southeast.

6/01/2010

P6010189

**Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



The access road to Proposed Drilling Site 3 is lined with a variety of tree species in many locations.

8/10/2010

P8100395



Coast live oak woodland covers large expanses of the north-facing slopes of the Santa Susana Mountains in the general project area, although is uncommon in the proposed drilling site areas. A diverse assemblage of understory species were observed on Site.

6/1/2010

P6010181

**Significant Ecological Areas Biological Constraints Analysis  
Terro Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



Valley oak woodland and savanna is a common vegetation type at the Site, often in association with an herbaceous understory. Grassland species produce significant growth and flowering during the winter and early spring months before valley oak trees leaf out. Photograph taken near Proposed Drilling Site 1, looking northeast.

3/23/2010

P3230127

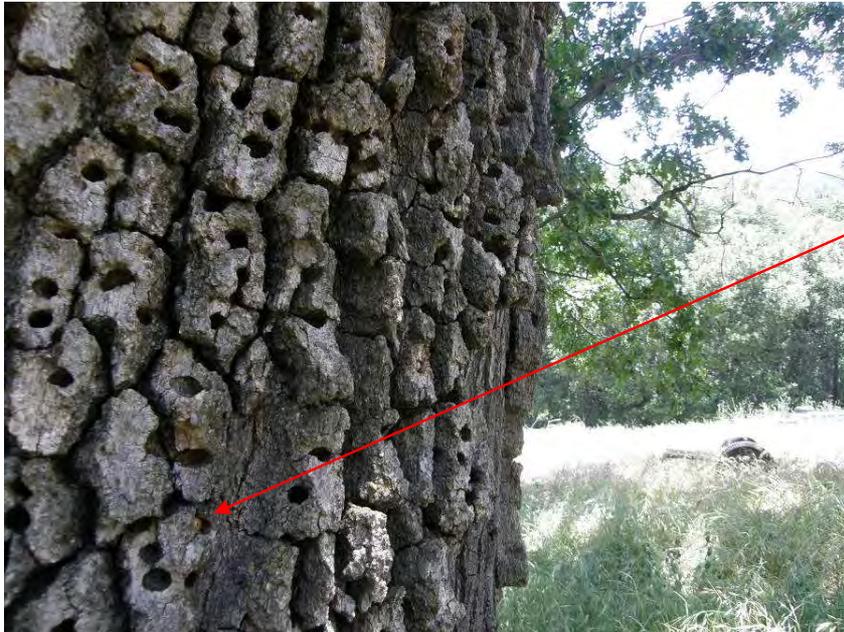


By late spring, valley oaks have fully leafed out, whereas many grassland species have flowered and are in the process of setting seed, prior to summer dormancy. Photograph taken in the vicinity of Proposed Drilling Site 3, looking east.

6/1/2010

P6010190

**Significant Ecological Areas Biological Constraints Analysis  
 Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
 California**



The bark of this valley oak is riddled with holes produced by acorn woodpeckers, who manage their “granaries” by moving acorns from one hole to another as they shrink in order to have a steady food supply.

6/1/2010

P6010170



Southern mixed evergreen forest is dominated by bigcone-spruce and canyon oak; California bay and coast live oak are also common. This vegetation type tends to occur in steep drainages descending from the crest of the mountains.

3/23/2010

P3230154

**Significant Ecological Areas Biological Constraints Analysis  
Terro Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



Canyon oaks reach considerable size on Site and are common in the vicinity of Proposed Drilling Site 2.

3/23/2010

P3230084



Mosaic of vegetation at Proposed Drilling Site 2 includes canyon oak on right, valley oak savanna in middle foreground, and bigcone-spruce on skyline in background.

3/23/2010

P3230092

**Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



Southern California walnut woodland is widespread on the north-facing slopes at the site, often in association with upright snowberry and native grasses.

6/01/2010

P6010161



Slopes adjacent to Proposed Drilling Site 3 contain a mixture of native oak species, bigleaf maple, Southern California black walnut, and large clumps of western choke cherry (still leafless in early spring).

3/23/2010

P3230049

**Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



The site is rich in diverse associations, such as this valley oak overtopping upright snowberry in the foreground and western chokecherry in the background.

6/1/2010

P6010198



Native grassland dominated by California brome and one-sided bluegrass is especially abundant under Southern California black walnut and valley oak at the Site.

6/1/2010

P5310158

**Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



Native grasslands dominated by blue wildrye are common at the edges of woodlands on Site. This photograph is taken at Proposed Drilling Site 2.

3/23/2010

P3230054



Native grasslands dominated by nodding needlegrass are found in small clusters by Proposed Drilling Site 2.

3/23/2010

P3230054

Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California



Herbaceous alliances such as the area dominated by native common fiddleneck near Proposed Drilling Site 1 are common in grassland areas on Site.

3/23/2010

P3230129



Most grassland areas support herbaceous species such as rusty popcorn flower on Site, as at Proposed Drilling Site 2.

3/23/2010

P3230126

Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California



Other native species, such as this grape soda lupine, are also common on Site.

3/23/2010

P3230151



Non-native herbaceous alliances, such as the ripgut brome, wild oats, and summer mustard, are widespread in disturbed areas on Site. At Proposed Drilling Site 2 looking north.

6/1/2010

P6010164

**Significant Ecological Areas Biological Constraints Analysis  
 Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
 California**



This pond area occurs outside the disturbance area near the access road to Proposed Drilling Site 2. It is mapped as a “reservoir” on the USGS Oat Mountain quadrangle and is dominated entirely by non-native annual species. Looking south. The arrow shows the location of the proposed access road.

8/10/2010

P81000378



Chaparral vegetation occurs outside of any disturbance areas but is mapped within the 1,000 foot buffer for the Site. Looking north.

8/10/2010

P81000425

**Significant Ecological Areas Biological Constraints Analysis  
Termo Aliso Canyon and Oat Mountain Oil Fields, Santa Susana Mountains,  
California**



Diegan coastal sage vegetation also occurs outside of any disturbance areas but is mapped within the 1,000 foot buffer for the Site. Looking northwest.

8/10/2010

P81000433