Irvine Ranch Open Space 2014 Donation Interim Recreation and Resource Management Plan Project IP 19-044

Initial Study/Mitigated Negative Declaration

September 5, 2019 Report Date

Prepared for:

County of Orange
Orange County Parks
Planning and Design Division
13042 Old Myford Road
Irvine, California 92602

Prepared by:

Stantec Consulting Services Inc.
290 Conejo Ridge Avenue
Thousand Oaks, California 91361

Table of Contents

ABBREVIATIONS IV

1.0 INTRODUCTION 1.1
1.1 OVERVIEW 1.1
1.2 PURPOSE 1.1
1.3 PROJECT TITLE 1.1
1.4 LEAD AGENCY 1.2
1.5 PROPONENT 1.2
1.6 AGENCIES INVOLVED AND PERMIT, CONSULTATION, AND ENVIRONMENTAL REVIEW REQUIREMENTS 1.2
1.7 INTENDED USES OF THE INITIAL STUDY/MITIGATED NEGATIVE DECLARATION 1.3
1.8 ORGANIZATION OF THE IS/MND 1.3

2.0 PROJECT DESCRIPTION 2.1
2.1 PROJECT LOCATION 2.2
2.1.1 East Orange I 2.2
2.1.2 East Orange II 2.3
2.1.3 Mountain Park 2.4
2.2 GENERAL PLAN LAND USE DESIGNATION 2.6
2.2.1 East Orange I and II 2.6
2.2.2 Mountain Park 2.6
2.3 ZONING 2.6
2.4 SURROUNDING LAND USES AND SETTING 2.7
2.4.1 East Orange I and II 2.7
2.4.2 Mountain Park 2.7
2.5 PROJECT ACTIVITIES AND SCHEDULE 2.7
2.5.1 Construction 2.8
2.5.2 Operations and Maintenance 2.8

3.0 ENVIRONMENTAL IMPACT ANALYSIS 3.1
3.1 AESTHETICS 3.2
3.1.1 Setting 3.2
3.1.2 Impact Analysis 3.2
3.2 AGRICULTURE AND FORESTRY RESOURCES 3.4
3.2.1 Setting 3.4
3.2.2 Impact Analysis 3.4
3.3 AIR QUALITY 3.6
3.3.1 Setting 3.6
3.3.2 Impact Analysis 3.8
3.4 BIOLOGICAL RESOURCES 3.12
3.4.1 Setting 3.12
3.4.2 Impact Analysis 3.13
3.5 CULTURAL RESOURCES 3.30
3.5.1 Setting 3.30
3.5.2 Impact Analysis 3.30

3.6 ENERGY 3.33
3.6.1 Setting 3.33
3.6.2 Impact Analysis 3.33
3.7 GEOLOGY AND SOILS 3.35
3.7.1 Setting 3.35
3.7.2 Impact Analysis 3.35
3.8 GREENHOUSE GAS 3.40
3.8.1 Setting 3.40
3.8.2 Impact Analysis 3.41
3.9 HAZARDS AND HAZARDOUS MATERIALS 3.44
3.9.1 Setting 3.44
3.9.2 Impact Analysis 3.44
3.10 HYDROLOGY AND WATER QUALITY 3.47
3.10.1 Setting 3.47
3.10.2 Impact Analysis 3.47
3.11 LAND USE AND PLANNING 3.54
3.11.1 Setting 3.54
3.11.2 Impact Analysis 3.55
3.12 MINERAL RESOURCES 3.57
3.12.1 Setting 3.57
3.12.2 Impact Analysis 3.57
3.13 NOISE 3.60
3.13.1 Setting 3.60
3.13.2 Impact Analysis 3.61
3.14 POPULATION AND HOUSING 3.63
3.14.1 Setting 3.63
3.14.2 Impact Analysis 3.63
3.15 PUBLIC SERVICES 3.64
3.15.1 Setting 3.64
3.15.2 Impact Analysis 3.64
3.16 RECREATION 3.67
3.16.1 Setting 3.67
3.16.2 Impact Analysis 3.67
3.17 TRANSPORTATION 3.69
3.17.1 Setting 3.69
3.17.2 Impact Analysis 3.70
3.18 TRIBAL CULTURAL RESOURCES 3.72
3.18.1 Setting 3.72
3.18.2 Impact Analysis 3.72
3.19 UTILITIES AND SERVICE SYSTEMS 3.74
3.19.1 Setting 3.74
3.19.2 Impact Analysis 3.74
3.20 WILDFIRE 3.76
3.20.1 Setting 3.76
3.20.2 Impact Analysis 3.76
3.21 MANDATORY FINDINGS OF SIGNIFICANCE 3.81

4.0 MITIGATION MONITORING AND REPORTING PLAN 4.1

5.0 PROPOSED FINDINGS 5.1

6.0 LIST OF PREPARERS 6.1

7.0 REFERENCES 7.1

LIST OF TABLES

Table 1 Agency Permits 1.3
Table 2 Attainment Status of Orange County within South Coast Air Basin 3.6
Table 3 SCAQMD Significance Thresholds for Mass Daily Emissions of Criteria Air Pollutants 3.8
Table 4 SCAQMD Unmitigated Project Construction Emissions in Comparison to SCAQMD Significance Criteria 3.9
Table 5 Unmitigated Project Operation Emissions in Comparison to SCAQMD Significance Criteria 3.9
Table 6 Estimated Impacts to Vegetation Communities and Land Cover Types 3.25
Table 7 Total Estimated Project GHG Emissions 3.42
Table 8 Land Use Designations 3.54

LIST OF FIGURES

Figure 1 Project Vicinity 7.1
Figure 2 Recreation Trail Opportunities Overview 7.2
Figure 3 Recreation Trail Opportunities East Orange I 7.3
Figure 4 Recreation Trail Opportunities East Orange II 7.4
Figure 5 Recreation Trail Opportunities Mountain Park 7.5

LIST OF APPENDICES

APPENDIX A PROJECT EMISSIONS ESTIMATES A.1

APPENDIX B BIOLOGICAL RESOURCES TECHNICAL REPORT B.1

APPENDIX C JURISDICTIONAL DELINEATION REPORT C.1

APPENDIX D CULTURAL RESOURCES TECHNICAL REPORT D.1

APPENDIX E PALEONTOLOGICAL RESOURCES TECHNICAL REPORT E.1

Abbreviations

ADA	Americans with Disabilities Act
amsl	feet above mean sea level
AQMP	Air Quality Management Plan
BMPs	Best Management Practices
BSA	Biological Study Areas
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalFire	California Department of Forestry and Fire Protection
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CH_4	methane
CHRIS	California Historic Resources Information System
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
CRPR	California Rare Plant Rank
CWA	Clean Water Act
DAMP	Drainage Area Management Plan
dB	decibel
DNL	Day/Night Average Sound Level
EO	*Executive Orders*
EOI	East Orange I
EOII	East Orange II
ESA	Federal Endangered Species Act
GHG	greenhouse gas
H2S	hydrogen sulfide
HCP	Habitat Conservation Plan
HFC	hydrofluorocarbons
IOP	Interim Operations Plan
IROS	Irvine Ranch Open Space
IRRMP	Interim Resource and Recreation Management Plan
IS/MND	Initial Study/Mitigated Negative Declaration
IVC	Irvine Valencia Growers
LID	Low Impact Development
LRA	Local Responsibility Area
LSTs	localized significance thresholds
MBTA	Migratory Bird Treaty Act
MMT	million metric tons



Abbreviations

MOU	Memorandum of Understanding
MP	Mountain Park
MPO	metropolitan planning organizations
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NNLs	National Natural Landmarks
NO2	nitrogen dioxide
NOI	Notice of Intent
NOX	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
O3	ozone
OC	County of Orange
OC Parks	Orange County Parks
OCFC	Orange County Fire Control
OCSD	Orange County Sheriff's Department
Pb	lead
PFC	perfluorocarbon
PM10	respirable particulate matter with an aerodynamic diameter of less than 10 microns
PM2.5	fine particulate matter with an aerodynamic diameter of less than 2.5 microns
PRMMP	paleontological resource monitoring and mitigation plan
RMP	Resource Management Plan
RPS	Renewable Portfolio Standard
RWQCB	Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCCIC	South Central Coastal Information Center
SF_6	sulfur hexafluoride
SO2	sulfur dioxide
SR	State Route
SRA	State Responsibility Area
SWPPP	Stormwater Pollution Prevention Plan
TNC	The Nature Conservancy
USACE	United States Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish & Wildlife Service
VHFHSZ	Very High Fire Hazard Severity Zone
VOCs	volatile organic compounds
WDID	Waste Discharge Identification
WDR	waste discharge requirements
WQMP	Water Quality Management Plan



1.0 INTRODUCTION

1.1 OVERVIEW

In 2014, the Irvine Company donated permanently protected open space to the County of Orange (OC). Four parcels consisting of East Orange I, East Orange II, Mountain Park, and Irvine Park Addition (collectively referred to as the 2014 IROS), have been donated for a total land area of nearly 2,300 acres, adding to the 20,000-acre Irvine Ranch Open Space (IROS) previously donated by The Irvine Company. These parcel areas are adjacent to Irvine Lake and near the junction of State Route (SR) 91 and SR 241. The properties are located near existing Orange County Regional Parks and Open Space and add further acreage to the previous inventory of nearly 60,000 acres. Orange County Parks (OC Parks) is responsible for the management of the property.

Recreational improvements and general park maintenance are proposed for three of the four parcels. Irvine Park Addition will not have improvements and is fenced off from access. The improvements are intended to identify and improve trails that currently exist and have existed in the past (historical) for permitted recreational uses including hiking, mountain biking, and horseback riding. Existing gravel lots and historical parking areas will be used for public staging areas. They would be improved to provide Americans with Disabilities Act parking, portable toilets, and picnic areas. Signage indicating relative information or regulation, access, park boundaries, and public health and safety will be replaced and/or added to the site. Existing and historical trails will be cleared of overgrown vegetation. In addition, the Project includes minimal vegetation restoration, such as planting of native plants, as well as non-native plant removal.

1.2 PURPOSE

The purpose of the Interim Recreation and Resource Management Plan (IRRMP; “Project”) is to improve and identify recreational opportunities within the 2014 IROS area. Studies, monitoring, and research shall be conducted in the 2014 IROS to inform management activities. Such studies are designed to generate information directly related to the management of the 2014 IROS and for the development of the long-term Recreation and Resource Management Plan (RRMP). Trails identified in the IRRMP are not officially adopted trails, but rather are provisional trails accepted on a trial basis. The provisional trails and the immediately surrounding habitat will be monitored and surveyed during the period of the IRRMP to inform and affirm which trails should be officially designated in the RRMP. Trail impacts, user satisfaction, and habitat impacts will be monitored with respect to each trail. The IRRMP will:

- Identify appropriate resource management strategies that maintain the Conservation Values identified in the 2014 IROS conservation easement documents, while providing opportunities for interim public access for recreational and educational purposes.

1.3 PROJECT TITLE

Interim Recreation and Resource Management Plan, 2014 Irvine Ranch Open Space Donation (Project).

1.4 LEAD AGENCY

County of Orange

OC Parks – Planning & Design Division
300N. Flower St.
Santa Ana, California 92703

1.5 PROPONENT

County of Orange
Orange County Parks
Planning and Design Division
13042 Old Myford Road
Irvine, California 92602

OC Parks is responsible for the management of the 2014 IROS and will utilize a number of park staff to patrol the property and perform day-to-day management. Additionally, OC Parks will be responsible for heavy or large-scale maintenance, and for repair of damage resulting from unauthorized use or from events such as storms, fire, earthquake, or vandalism.

1.6 AGENCIES INVOLVED AND PERMIT, CONSULTATION, AND ENVIRONMENTAL REVIEW REQUIREMENTS

The public agency that has the principal responsibility for carrying out or approving a project is designated as the "Lead Agency" under California Environmental Quality Act (CEQA). The County of Orange is the Lead Agency responsible for preparation of this Initial Study/Mitigated Negative Declaration (IS/MND) and therefore has the principal responsibility for approving and implementing the Project.

This IS/MND is intended to be used as the CEQA document for all local and state approvals required for the Project; including approvals by responsible agencies, and any approvals required from trustee agencies. "Responsible Agency" means a public agency that proposes to carry out or approve a project for which the Lead Agency is preparing the CEQA document for. For purposes of CEQA, the term "Responsible Agency" includes all public agencies other than the Lead Agency having discretionary approval authority over the Project. "Trustee Agency" means a State agency having jurisdiction by law over project-affected natural resources that are held in trust for the people of the State of California.

Responsible agencies that may have discretionary approval authority over the Project, and trustee agencies having jurisdiction over natural resources affected by the Project which are held in trust for the people of the State of California, will have the opportunity to review and provide comments during the review period. Other agencies and the public may also provide comments.

The agencies involved, and permit, consultation, are summarized below in Table 1.

Table 1 Agency Permits

Agency	Permits and Other Approvals
FEDERAL	
U.S. Fish and Wildlife Service	• Consultation with U.S. Army Corps of Engineers
U.S. Army Corps of Engineers	• Clean Water Act Section 404 Permit
STATE	
California Department of Fish and Wildfire	• Streambed Alteration Agreement if final Project design indicates alteration of jurisdictional streambed or bank
Santa Ana Regional Water Quality Control Board (Region 8)	• General Permits for Stormwater Discharges Associated with Construction and Land Disturbance Activities and Municipal Sewer Discharges • Stormwater Pollution Prevention Plan approval and discharge compliance oversight • issuance of U.S. Clean Water Act Section 401 Water Quality Certification or Waste Discharge Requirements if final Project design and implementation would not avoid discharge of dredge of fill materials to Waters of the U.S. and/or State.
LOCAL	
County of Orange	• Issuance of permits. • Review and approval of Water Quality Management Plan.

1.7 INTENDED USES OF THE INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

This Initial Study/Mitigated Negative Declaration (IS/MND) is an informational document intended to inform the lead agency, other responsible or interested agencies, and the public of potential environmental effects of the Project. The environmental review process has been established to enable public agencies to evaluate potential environmental consequences and to examine and implement methods of eliminating or reducing any potential significant adverse impacts.

1.8 ORGANIZATION OF THE IS/MND

To meet the requirements of CEQA, the IS/MND must inform members of the general public, decision makers, and technically oriented reviewers of the physical impacts associated with the Project.

The content and organization of this IS/MND are designed to meet the requirements of CEQA, the State CEQA Guidelines, the County's local guidelines, as well as to present issues, analyses, mitigation, and other information in a logical and understandable way. A description of the organization of this Draft IS/MND and the content of each section is provided in the following.

Section 1.0, Introduction, provides information and a brief overview of the Project, the environmental review process, and the organization of the IS/MND.



Section 2.0: Project Description, presents a description of the Project, which identifies the location of the Project site, the objectives of the Project, and the characteristics of the Project.

Section 3.0: Environmental Impact Analysis, contains a detailed environmental analysis of the potential for the Project to result in significant environmental effects with respect to the topics evaluated in this IS/MND.

Section 4.0: Mitigation Monitoring and Report Plan, lists the mitigation measures included in the IS/MND, actions required, responsibility, and required time of compliance.

Section 5.0: Proposed Finding, presents the environmental determination to prepare an MND based on the findings of the IS.

Section 6.0: List of Preparers, lists persons involved in the preparation of this IS/MND.

Section 7.0: References, lists the principal documents, reports, maps, and other information sources referenced in this IS/MND.

Appendices: provide information and technical studies that support the environmental analysis contained within the IS/MND.



2.0 PROJECT DESCRIPTION

The Project proposes recreational improvements and general park maintenance for East Orange I and II and Mountain Park. These are intended to improve and expand permitted recreational uses including hiking, mountain biking, and horseback riding. Selected existing and historical trails are proposed for recreation to create a sustainably designed trail systems and will be inclusive of a variety of trail characteristics in order to appeal to a wide spectrum of public user-group types and experience levels. The design of this trail system may be impacted by, among other things, soil conditions, topographical detail, presence of protected habitat, and opportunities for scenic viewpoints, and will adhere to the conservation easement conditions[1] established by OC Parks Foundation when the land was donated in 2014. Public use shall be restricted to existing dirt roads and suitable trails. Due to rugged terrain, not all trails are practical for all users. This shall be indicated when and where possible.

Existing gravel lots and historical parking areas will be used for public staging areas. They would be improved to provide Americans with Disabilities Act parking, public access, portable toilets, and picnic areas. If trash containers are provided, they will be emptied on a schedule that eliminates any contact by or disturbance to wildlife. In general, there is a “pack-it–in/pack-it-out” policy on the property.

Signage indicating relative information or regulation, access, park boundaries, and public health and safety will be replaced and/or added to the site. All signs shall be prepared, installed and maintained by OC Parks staff or contracted third party. Signs shall be brief and shall utilize graphic icons and simple language in accordance to the OC Parks Signage and Graphics Master Plan. Signs shall contain the contact information for access and emergencies as appropriate. Trail signs may indicate trail mileage if appropriate, and, in some cases, degree of difficulty. Trail mileage may also be included on maps of the property. An information/regulation sign shall be installed at each of the major access locations. This sign shall display the particular canyon or area the public is about to enter. A brief explanation of the “do’s and don’ts” of low impact wilderness access shall be standard on all signs. Individual signs may also contain interpretive information pertaining to the highlighted area and a brief explanation of the IROS. The 2014 IROS is a wilderness area subject to certain inherent public dangers including mountain lions, snakes, poisonous insects, and rugged terrain. The public shall be informed of these dangers by posting standard “Mountain Lion” and “Wilderness Warning” signs and/or other public safety signs at all public areas and trailheads. Additionally, an informational flyer regarding mountain lion sightings shall be made available to all park visitors.

Access signs shall be posted at access gates and trespass points around the perimeter of the land. These signs shall state the areas are protected wildlands, access to the land is restricted, and information on gaining access is available by contacting OC Parks. Existing perimeter fencing shall be maintained and repaired as needed. Internal barbed wire fencing directly adjacent to trails may be removed as needed. Gates required for vehicular access/control shall be upgraded to OC Parks’ standards and shall respect the rural characteristics of the area. A uniform lock control and inventory system shall be developed and implemented.

[1] These conditions can be viewed in Easement Documentation Report for The Irvine Company’s East Orange Area I Conservation Easement – dated October 30, 2014, Easement Documentation Report for The Irvine Company’s East Orange Area II Conservation Easement – dated October 30, 2014, Easement Documentation Report for The Irvine Company’s Mountain Park Conservation Easement – dated October 30, 2014

If any water troughs and wells currently exist on the property, they shall be identified as they are found on the property. If the wells are determined to be a danger, they shall be capped to prevent entry. If a water trough or well is determined to be safe, it may be considered as a resource for wildlife and maintained as such.

Public programs may be offered by OC Parks staff, qualified volunteers through the OC Parks Volunteer program, and/or third-party services. Types of programs offered would be consistent with conditions established in the Conservation Easements for the area, and may include interpretive, educational, and recreational activities including hiking, mountain biking, and equestrian use. Public access will be staff-led or qualified volunteer led managed access similar to the current model for the IROS. There is no open access to the trails except for a segment in Mountain Park that runs adjacent to the housing development. Subject to vehicle parking space constraints, OC Parks may also implement Wilderness Access Days to make self-guided passive recreational activities such as hiking, mountain biking, and equestrian use available to the public. This self-guided access could expand to a regular frequency if determined suitable by available research and adaptive management approval. Wilderness Access Days are only for a limited number of hours during the day and preregistration is required.

2.1 PROJECT LOCATION

The properties that make up the proposed Project (East Orange I, East Orange II, Mountain Park, and Irvine Park Addition) are located within the northern portion of the Central Sub-Area of the Orange County Central/Coastal Subregion Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP). This area is adjacent to Irvine Lake and near the junction of SR 91 and SR 241. Irvine Lake is a reservoir in Orange County, California, situated east of the City of Irvine and close to Irvine Regional Park. Refer to **Figures 1 and 2** for Project location map.

Each property description and location are provided below.

2.1.1 East Orange I

2.1.1.1 Existing Conditions

East Orange I is located in the foothills of the Santa Ana Mountains, bordered to the north and east by OC Parks open space. It lies west of Irvine Lake and the Santiago Landfill, east of the SR 241, and north of Santiago Canyon Road, within unincorporated Orange County. A small portion of the East Orange I property is located west of the 241 toll-road. The East Orange I parcel is protected by the OC Parks Foundation Conservation Easement with overlapping NCCP Reserve. Nearby are other OC Parks' IROS facilities: Fremont Canyon Management Unit to the north, Black Star Canyon Management Unit to the east, and Loma Ridge and Limestone Canyon Management Units to the south.

East Orange I is approximately 430 acres. Large portions of East Orange I were formerly part of Saddleback Park, an off-road motorcycle racing facility that was phased out in 1984. In the decades since, patchy native and non-native vegetation has filled in where the course once was. Some remnant routes from the raceway are still evident. There is an existing paved road which provides access to the property and the former Santiago Canyon Landfill; a second paved road in the southeast corner allows access to the property from Santiago Canyon Road via a locked gate. Fencing (standard 5-strand barbed-wire) is placed throughout the property, primarily along road areas.

2.1.1.2 Initial Operating Tasks

Interim improvements are designated for East Orange I. **Figure 3** provides details for East Orange I. In East Orange I, 10 historical trails will be reestablished, totally approximately 2.22 miles. Access to the site is from Santiago Canyon Road via the Santiago Landfill Access road. An operating agreement or Memorandum of Understanding (MOU) with OC Waste & Recycling and OC Public Works will need to be established for the short portion of shared road. An existing graded area that was used for parking by the previous motorcross operations would be improved to establish a staging area for managed, public access to the site. The site of the Staging Area is a non-vegetated, disturbed soil and includes a weathered concrete slab that supported previously existing structures. The concrete slab will accommodate Americans with Disabilities Act (ADA) parking and two portable restrooms. Additional improvements include a picnic area, a trailhead, signage, and an entry gate. The parking lot will accommodate approximately 50 personal vehicles and six-horse trailers. Parking space quantities of each type can be adjusted to accommodate the needs of the programmed event.

OC Parks will provide signage at all access points consistent with other OC Parks wilderness and nature preserve facilities. An OC Park standard vehicle access gate will replace a deteriorated chain link gate at the access point off of the Santiago Landfill Access road.

Historical trails will continue to be maintained in its current condition. The provisional trails will be used for managed access events. Trail conditions, habitat impacts, and public satisfaction for the provisional trails will be regularly evaluated/surveyed during the term of the IRRMP. Based on the Conservation Easements, research findings, potential for future restoration, and habitat types, official trails will be designated in the RRMP.

2.1.2 East Orange II

2.1.2.1 Existing Conditions

East Orange II is located in the foothills of the Santa Ana Mountains, north, south and east of Irvine Lake near Santiago Canyon Road, within unincorporated Orange County. East Orange II is approximately 819 acres distributed across multiple parcels. There are four existing paved access roads, which provide access to the property and adjacent areas, as well as several maintained dirt roads. Fencing (standard five-strand barbed-wire) is placed throughout the property, primarily along road areas. A chain link fence is installed in one parcel, adjacent to an access gate.

The largest 673-acre area to the southeast of the lake includes the majority of the area's natural habitat, wildlife connectivity, scenic viewshed value, and public recreation opportunities.

The 96-acre parcel on the east side of Irvine Lake is largely devoid of native vegetation other than weeds due to previous uses and impacts. This parcel contains a radio-controlled airfield including a paved landing strip, helicopter landing zone, fencing, parking areas, picnic tables, portable bathrooms, and message boards. The location currently utilized by the radio-controlled airfield will also be used as a staging area as a key starting point to access multiple adjacent OC Parks properties.

Bordering the north side of the Irvine Lake dam, there is a 45-acre parcel that contains habitats important for wildlife movement and the existing Fremont Staging Area, which provides high recreational and educational value as a starting point for animal tracking programs, long-distance hiking, biking, and equestrian programs. Existing asphalt

access roads and concrete Arizona crossing maintained by water districts provide vehicle access across Santiago Creek.

There is also a small, undeveloped 5-acre parcel west of Santiago Canyon Road contiguous with the Limestone Canyon Management Unit. This parcel has minimal to no recreation/educational opportunity due to small size and location. Most value exists in preserving the area's natural aesthetic and viewshed. One existing old ranch style gate and a grown over section of ranch road remain. There is also a drainpipe to collect and funnel water off Santiago Canyon Road and into the property.

2.1.2.2 Initial Operating Tasks

The existing Augustine Staging Area in the adjacent Limestone Canyon Nature Preserve will provide an immediate access point for public programs to the southern portion of East Orange II. **Figure 4** provided details for East Orange II. In East Orange II, 7 historical trails will be reestablished, totaling approximately 3.39 miles. The public will be able to park in Augustine Staging Area and proceed via Blue Diamond Haul Road across the Blue Diamond Haul Road Bridge (commonly known as Bat Bridge). Use of the bridge may be subject to coordination with OC Public Works as the bridge itself is managed within the OCPW Road Right-of-Way portfolio. This staging area will continue to be maintained by IRC per existing Land Management agreement for OC Parks IROS.

OC Parks will provide immediate signage along perimeter and access points, consistent with other OC Parks wilderness areas and managed open space. Staff will also improve and/or replace vehicle gates as necessary as determined by OC Parks IROS staff.

Provisional trails will be opened to managed access events in the Large Natural Open Space Area. An existing dirt road that runs the length of the large parcel will be utilized as a multi-use trail. This trail follows the ascending ridge to the highest point on the property presenting visitors with panoramic views of Black Star's red rock formation, Irvine Lake, and the greater Santiago Canyon area. Other previously existing dirt roads and trails connect to the dirt road to form loops accessible to multiple user-groups. Existing trails will be maintained in their current condition. Trail conditions, habitat impacts, and public satisfaction for the provisional trails will be regularly evaluated during the term of the IRRMP. Official trails will be identified in the RRMP, based on the Conservation Easements, research findings, potential for future restoration, and habitat types.

2.1.3 Mountain Park

2.1.3.1 Existing Conditions

Mountain Park is located in the northwestern extent of the Santa Ana Mountains approximately where the SR 241 meets the 91 Freeway, within the City of Anaheim. The property totals approximately 1,040 acres. It is bordered to the east and south by OC Parks IROS (Weir Canyon and Gypsum Canyon Management Units), to the north by the SR 91 and to the west by existing residential development. The SR 241 bisects the property. The property is comprised of multiple parcels. **Figure 5** provided details for Mountain Park.

- **Parcel 1** is bordered by Santa Ana Canyon Road and SR 91 to the north, SR 241 to the west, Chino Hills State Park to the east and OC Parks Gypsum Canyon Management Unit to the south. The parcel shows occasional evidence of previous impacts from former ranching and former mining operations.. The main remnants from previous uses include a largely unmaintained ranch road infrastructure, capped water wells,

non-active water/gas lines, miscellaneous dumped concrete and debris, and significant areas of non-native vegetation. Parcel 1 also contains a graveled area near the parcel entry gates.

- **Parcel 2** is an empty graveled lot with perimeter wire fencing and is devoid of vegetation aside from sporadic weeds and is surrounded by roadways including SR 91, Santa Ana Canyon Road and Gypsum Canyon Road.

- **Parcel 3** is a mostly weed-filled parcel dotted with a few native and non-native trees. It is bordered on the south and east by a small parcel that is part of OC Parks IROS Gypsum Canyon Management Unit, on the west by a community church and on the north by Santa Ana Canyon Road.

- **Parcel 4** borders a residential Anaheim Hills community. There are pre-existing dirt roads and trails from ranching operations in varying condition. This parcel is bisected by a corridor set aside for the potential future extension of Weir Canyon Road to SR 241. The northwest edge of the parcel contains a series of V-ditches installed for the protection of the adjacent residential development. Maintenance for these V-ditches are the responsibility of the adjacent Homeowners Association. Parcel 4 is bordered by Blue Sky Road to the north, the SR 241 to the east, and OC Parks Weir Canyon Management Unit to the south and west.

- "**Unencumbered Parcel**" Parcels 1 through 4 are all governed by a conservation easement. Mountain Park also contains an additional 283-acre parcel that is not encumbered by a conservation easement. This parcel, known as the Unencumbered Parcel, contains little native habitat due to the area's previous use as a quarry operation. This area ranges from large flat gravel areas to rolling hills to steep rocky terrain. The "Unencumbered Parcel" is bordered by SR 91 on the north, Chino Hills State Park to the east, Parcel 1 to the south, and Gypsum Canyon Road to the east.

2.1.3.2 Initial Operating Tasks

OC Parks will provide immediate signage along perimeter and access points, consistent with other OC Parks wilderness areas and managed open space. Staff will also improve and/or replace vehicle gates as determined by OC Parks IROS staff. In Mountain Park, 10 historical trails will be reestablished, totaling approximately 4.44 miles.

The existing gravel lot near the entrance of Mountain Park shall receive basic improvements to provide parking for public access, including portable restrooms, signage, and ADA parking stalls. Trash and debris shall be removed from the area nearest to SR 91 as well as scattered around previously impacted areas.

Due to previous quarry operations within a parcel that is not encumbered by any conservation easement, (the unencumbered portion of Mountain Park), many erosion control devices are present to prevent runoff issues in Gypsum Creek. OC Parks staff shall evaluate these erosion control Best Management Practices (BMPs) and establish a site plan to stay compliant with National Pollutant Discharge Elimination System (NPDES) regulations.

A current social trail along the residential development in the eastern portion of the parcel bordering the Anaheim Hills community may be evaluated for consideration as an authorized trail, connecting Oak Canyon Drive to S Weir Canyon Road. The trail shall be opened for public access during daylight hours, seven days a week. Closure of the trail for a period of time may occur following heavy rains of more than 0.25 inch (usually 48 to 72 hours) and during periods of high fire danger such as official Red Flag Warnings or after extended periods without precipitation and high fuel buildup.



2.2 GENERAL PLAN LAND USE DESIGNATION

Project Component	General Plan Land Use Designation
East Orange I	General Agriculture (County of Orange), Low/Medium Density Residential (City of Orange)
East Orange II	General Agriculture (County of Orange), Open Space, Low/Medium Density Residential (City of Orange Sphere of Influence)
Mountain Park	Estate Density (City of Anaheim)
Oak Canyon	Open Space, Estate Density, Low/Medium Density (City of Anaheim)

Permitted recreational uses within OC Parks designated wilderness park lands include:

- **Hiking, Mountain Biking, and Horseback Riding (Equestrian).** Tours and Wilderness Access Days shall be conducted within areas of the property where the activity does not conflict with preservation of the conservation and resource values of the property. Hiking, biking, and horseback riding where permitted, shall be on established trails consisting of dirt roads and single-track trails. Based on the study results, season restrictions may be applied predicated on trial/soil conditions.

2.2.1 East Orange I and II

The East Orange I property is topographically complex and is comprised of low rolling hills, steep canyons with intervening scrub- and chaparral-covered ridges and alluvial terraces with deeply incised watercourses. Elevations on site range from approximately 750- to 1,600-feet above sea level [Glen Lukos, 2004].

The East Orange II property contains similar habitat to that described above for the East Orange I property. This area, however, has experienced much less disturbance and remains in a more natural state.

2.2.2 Mountain Park

The properties containing the proposed Mountain Park and Oak Canyon areas lie within the City of Anaheim and are designated by the City as Open Space. It is bordered to the east and south by OC Parks IROS (Weir Canyon and Gypsum Canyon Management Units), to the north by the SR 91 and to the west by existing residential development. SR 241 bisects the property.

Similar to the East Orange properties, the overall site is topographically complex and is comprised of low rolling hills, steep canyons, and alluvial terraces, bordering both sides of the 241. Elevations across the four parcels that make up Mountain Park range from approximately 450- to 950-feet above sea level.

2.3 ZONING

Project Component	Zoning (Jurisdiction)
East Orange I	P-C: Planned Community (City of Orange)
East Orange II	P-C: Planned Community (City of Orange)
Mountain Park	SP 90-4: Mountain Park (City of Anaheim)
Oak Canyon	SP 90-4: Mountain Park (City of Anaheim)



2.4 SURROUNDING LAND USES AND SETTING

Orange County is located along the Pacific Ocean between Los Angeles County to the north and northwest, San Bernardino County to the northeast, Riverside County to the east, and San Diego County to the south. Orange County stretches approximately 40 miles along the Pacific Coast and extends inland approximately 20 miles, covering 789 square miles. Regionally, the area encompassing the Project is in open space (OC Parks Open Space and NCCP Reserve).

The Project surrounding area consists of a series of low-lying hills and valleys along the Santa Ana Mountains. Residential, commercial and industrial developments exist in the general Project area. As noted, the Project is located within the northern portion of the Central Sub-Area of the Central/Coastal NCCP/HCP and contains a variety of sensitive species and wildlife. The NCCP planning process, completed in 1996, resulted in the creation of the Natural Reserve, which includes natural open space in its central and subregional reserves.

The surrounding land uses and setting associated with each property are described below.

2.4.1 East Orange I and II

Much of the land surrounding East Orange I and II is in OC Parks Open Space and NCCP Reserve. Southern California maintains an electric powerline easement and PAC Bell maintains a telephone line easement along the paved access road to Santiago Canyon Landfill (East Orange I) and the airport (East Orange II).

The East Orange I property is topographically complex and is comprised of low rolling hills, steep canyons with intervening scrub- and chaparral-covered ridges and alluvial terraces with deeply incised watercourses. Elevations on site range from approximately 750- to 1,600-feet above sea level [Glen Lukos, 2004].

The East Orange II property contains similar habitat to that described above for the East Orange I property. This area, however, has experienced much less disturbance and remains in a more natural state.

2.4.2 Mountain Park

Much of the land surrounding Mountain Park is in OC Parks Open Space and NCCP Reserve; remaining areas are bounded by existing residential development and the SR 91 freeway. In the north-central portion of the property, Questar maintains a gas pipeline easement and Southern California Edison maintains an electric power line easement. Irvine Valencia Growers (IVC) currently leases two small areas, approximately five acres total, to Orange County Fire Control (OCFC) for use as a storage yard.

The Summit Association performs landscaping maintenance activities northeast of Oak Canyon Road in the northwestern portion of the property.

2.5 PROJECT ACTIVITIES AND SCHEDULE

Pending regulatory approval, Project construction activities (including clearing) are anticipated to occur over a one-month period.

2.5.1 Construction

Construction activities will be planned to minimize vegetation removal and replacement; however, some vegetation removal is anticipated. Existing and historical trails will be cleared of overgrown vegetation. In addition, the Project includes minimal vegetation restoration, such as planting of native plants, as well as non-native plant removal. The Project will require various earthmoving equipment (e.g., compact excavators, ride-on earthmovers) for development of staging areas, reestablishment of existing trails, and parking lot areas. Specialized tools (e.g., power wheelbarrows, brush mowers, rock drills, chainsaws) will also be utilized for tree and vegetation removal (if necessary), as well as removal of other debris.

Operation of on-road vehicles will be required for crew transportation to/from the Project site as well as conventional off-road construction equipment.

2.5.2 Operations and Maintenance

Maintenance of IROS property acquired by the County in 2010 is divided into six Management Units. The Property parcels will be added to two existing Management Units and establish two new Management Units, Red Rock and Saddleback, with the exception of Irvine Park Addition, which will be managed by Irvine Regional Park. Gypsum Canyon will be divided into North Gypsum Canyon and South Gypsum Canyon. Five acres from East Orange II will be added to Limestone Canyon. Operation of on-road vehicles will be required for staff transportation to/from the site. During operations, the Project will require light routine park maintenance activities, such as:

- Litter removal from trails and staging areas;
- Trail service and minor erosion remediation and prevention including:
    - mowing of trail centerline annually on an as-needed basis;
    - installation of water bars and erosion prevention features as required;
    - identification and remediation of acute and/or small-scale erosion problems on roads and trails as required;
    - grading and/or drainage modification on ranch roads or trails to resolve emergency or acute small-scale problems and to ensure effective function;
    - maintenance of single-track trails;
    - removal of invasive plant species on trail alignments including single-track trails;
- Minor and emergency repairs on signs, fences and gates including change-outs, touch-ups and rapid response fence repairs;
- Installation and maintenance service of signage, kiosks, benches, shade structures, and similar trail facilities;
- Open and close gates and restrooms associated with scheduled public access program activities; and
- Oversight and maintenance of staging area operations, including litter removal and weed abatement.

Potentially, large-scale maintenance activities will be required, such as:

- Storm or fire damage cleanup and major trail rehabilitation and repair;
- Major trail erosion and damage remediation/reconstruction;
- Large-scale refuse removal, maintenance and repair of permanent restrooms, if any;
- Removal of trash from permanent receptacles (if any);
- Remediation and cleanup of illegal dumping;
- Installation and maintenance of trail head kiosks, booths and similar facilities;
- Replacement/repainting/repair of fences, locks, and gates;
- Seasonal mowing of trail centerlines;



- Fuel modification;
- Firebreak maintenance;
- Patching and repair of paved surfaces associated with staging areas and gateways;
- Pumping, maintenance and supply of portable restroom facilities on a routine schedule.

3.0 ENVIRONMENTAL IMPACT ANALYSIS

This Project is evaluated based upon its effect on twenty-one (21) major categories of environmental factors. The environmental factors checked below would be potentially affected by the proposed Project, as indicated by the resource checklists in this IS/MND.

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

A detailed analysis of environmental impacts will be presented for each resource area (listed above) utilizing the model Environmental Checklist Form found in Appendix G of the CEQA Guidelines Section 15063(f). Impacts to the environment for construction and operation of the Project will be assessed and described, and the level of significance of impacts will be measured against criteria that have been established by regulation, accepted standards, or other definable criteria. The use of an MND is only permissible if all potentially significant environmental impacts assessed in the IS are rendered Less than Significant with incorporation of mitigation measures.

Each environmental resource area is reviewed by analyzing a series of questions (i.e., Initial Study Checklist) regarding level of impact posed by the Project. Substantiation is provided to justify each determination. One of four following conclusions is then provided as a determination of the analysis for each of the major environmental factors.

No Impact. A finding of no impact is made when it is clear from the analysis that the Project would not affect the environment.

Less than Significant Impact. A finding of a Less than Significant impact is made when it is clear from the analysis that the Project would cause no substantial adverse change in the environment and no mitigation is required.

Less than Significant Impact with Mitigation Incorporated. A finding of a Less than Significant impact with mitigation incorporated is made when it is clear from the analysis that a project would cause no substantial adverse change in the environment when mitigation measures are successfully implemented by the Project's proponent.

Potentially Significant Impact. A finding of a potentially significant impact is made when the analysis concludes that the Proposed Project could have a substantially adverse change in the environment for one or more of the environmental resources assessed in the checklist. In this case, typically preparation of an Environmental Impact Report (EIR) would be required.

3.1 AESTHETICS

3.1.1 Setting

The Project surrounding area consists of a series of low-lying hills and valleys along the Santa Ana Mountains. Residential, commercial and industrial developments exist in the general project area. Much of the land surrounding the three properties (East Orange I and II and Mountain Park) is in OC Parks Open Space and NCCP Reserve, including various OC Parks' Irvine Ranch Open Space facilities (e.g., Fremont Canyon Management Unit, Black Star Canyon Management Unit, and Loma Ridge and Limestone Canyon Management Units), as well as Irvine Lake. Based on the geological and ecological significance, nearly 40,000 acres of open space on the historic Irvine Ranch, including the 20,000 of the Irvine Ranch Open Space, have been designated a Natural Landmark by both the State of California and the U.S. Department of the Interior in 2006 (OC Parks 2018). A California Natural Landmark is a natural area that is designated as one of the best examples of California's natural heritage. This honor recognizes the exceptional value of these lands to California and the entire nation. "Irvine Ranch" was designated in 2006 and contains a remarkably complete stratigraphic succession ranging in age from late Cretaceous (80 million years ago) to the present. The primary biological features at the site include coastal sage scrub and chaparral communities, including rare Tecate cypress woodlands. National Natural Landmarks (NNLs) are not national parks. NNLs are owned by a variety of public and/or private entities and allowing visitation is at their discretion. All three properties include areas that have been previously disturbed and are designated as P-R (Parks and Recreation) and zoned as P-L (Public Lands). There is one State designated scenic highway (highway 91) located adjacent to the Project site(s).

3.1.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
AESTHETICS: Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning or other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

a) Have a substantial adverse effect on a scenic vista?

Less than Significant Impact. A scenic vista is defined as a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public. The Project site is not listed as a scenic vista; and as noted, much of the land surrounding the Project is in OC Parks Open Space and NCCP Reserve. Project construction activities (e.g., development of staging areas, reestablishing existing trails, and improving parking lot areas) will primarily occur in previously disturbed areas and will be short-term (approximate 1 month). Once operational, the Project would continue to allow for a variety of public recreational uses during managed programs and Wilderness Access Days, as well as routine maintenance of trails, signage, parking areas, etc. Trails would only be available for public access during Wilderness Access Days. Furthermore, the primary objective of the Project is to improve existing recreational facilities while preserving the area's natural aesthetic and viewshed. Therefore, implementation of the proposed Project would result in a Less than Significant impact on scenic vistas.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Less than Significant impact. The State Scenic Highway System is a list of highways, mainly state highways, that have been designated by the California Department of Transportation (Caltrans) as scenic highways. The Project site(s) are located nearest to the junction of SR 91 and SR 241. According to the California Scenic Highway Mapping System, Route 91, located adjacent to the Mountain Park property, is a designated scenic highway (Caltrans, 2018). The Project is intended to improve existing recreational facilities with the development of staging areas, restore historic trails, and parking lot areas. However, as stated in 3.1.2(a) above, construction activities will primarily occur in previously disturbed areas, will be short-term. The visibility of the nearest Project site (Mountain Park, at approximately quarter of a mile) from SR 91 is limited. Therefore, the project would result in a Less than Significant impact to scenic resources.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings?

Less than Significant Impact. As stated in 3.1.2(a) above, Project -related construction activities would result in changes to the existing visual character of the Project site(s); however, these activities would primarily occur in previously disturbed areas, and would be temporary. Post-construction activities (e.g., revegetation; planting of tress) would be implemented to improve the long-term visual character and quality of the site. Therefore, implementation of the Project would result in a Less than Significant impact to the existing visual quality of the Project site.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No impact. Construction activities would occur during, and be limited to, daytime hours, Monday – Friday, 8:00 AM - 7:00 PM. During operations, any park maintenance activities would also occur during daytime hours and are not anticipated to affect nearby residences. The Project does not include installation of lights or use of materials with the potential to introduce glare. As such, the Project would result in no impact due to light or glare.



3.2 AGRICULTURE AND FORESTRY RESOURCES

3.2.1 Setting

Orange County was once a rural county supported primarily by an agricultural economy. The County's agricultural communities have experienced tremendous growth and decline over time and are presently experiencing urban growth (Orange County, 2005). Residential, commercial and industrial developments exist in the general Project area. Much of the land surrounding the Project area is in OC Parks Open Space and NCCP Reserve.

3.2.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
AGRICULTURE AND FORESTRY RESOURCES: Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526, or timberland zoned Timberland Protection (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. According to the Farmland Mapping and Monitoring Program of the California Resources Agency as well as the *Prime Farmland in Orange County* Map depicted in the Resources Element of the County of Orange General

Plan (2005), there is no farmland considered Prime, Unique, or of Statewide Importance within or adjacent to the Project area. Surrounding land consists of open space, grazing land, and urban and built-up land. In addition, no agricultural use zone currently exists within or near the Project, nor are any agricultural zones proposed. Therefore, no impacts related to the conversion of farmland to non-agricultural use would occur.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The Williamson Act restricts land development of contract lands typically to agriculture, recreation, and open space, unless otherwise stated in the contract. According to California Department of Conservation, land within and adjacent to the Project area is considered either urban and built-up land or land not enrolled in a Williamson Act contract. In addition, no agricultural use zone currently exists within or near the Project, nor are any agricultural zones proposed. Therefore, the Project would not conflict with existing zoning for agricultural use and no impacts related to existing agricultural zone use or Williamson Act contracts would occur.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526, or timberland zoned Timberland Protection (as defined by Government Code section 51104(g))?

No Impact. The Project would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Protection because none of the lands within or adjacent to the Project area are identified as “forest land,” “timberland,” or “Timberland Protection” as defined in the Public Resources Code Section 12220(g) and Section 4526, or Government Code Section 51104 (g). Additionally, land within and adjacent to the Project area is designated as either developed or non-forest (USDA, 2016). Therefore, no impacts related to zoning of forest land, timberland, or Timberland Protection would occur.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. The Project would not result in the loss of forest land or conversion of forest land to non-forest use because none of the lands within and adjacent to the Project are identified as forest land as defined in the Public Code Section 12220(g). Therefore, no impacts related to loss or conversion of forest land would occur.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use?

No Impact. The Project would not involve other changes in the existing environment that could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use because there is no farmland or forest land within or adjacent to the Project area. The Project proposal to maintain existing permitted recreational uses (such as hiking, mountain biking, and horseback riding) through general park maintenance activities; therefore, no impacts related to conversion of farmland to non-agricultural use or conversion of forest land to non-forest use would occur.

3.3 AIR QUALITY

3.3.1 Setting

The three properties that make up the proposed Project are located adjacent to Irvine Lake in Orange County, within the South Coast Air Basin (SCAB). Regulatory oversight authority regarding air quality rests at the local, State, and federal levels with the South Coast Air Quality Management District (SCAQMD), California Air Resources Board (CARB), and U.S. Environmental Protection Agency (USEPA), respectively.

Ambient air quality is determined by comparing pollutant levels in ambient air samples to national and State standards. These standards are established by the USEPA and CARB at levels determined to be protective of public health and welfare, with an adequate margin of safety. California Ambient Air Quality Standards (CAAQS) were established in 1967, whereas National Ambient Air Quality Standards (NAAQS) were first established by the federal Clean Air Act of 1970. California standards are generally more stringent than national standards.

Air quality standards specify the upper limits of pollutant concentrations, over defined durations, in ambient air, consistent with the management goal of preventing specific harmful effects. There are national and state standards for the six “criteria pollutants”: ozone (O3); carbon monoxide (CO); nitrogen dioxide (NO2); suspended particulate matters including fine particulate matter with an aerodynamic diameter of less than 2.5 microns (PM2.5), and respirable particulate matter with an aerodynamic diameter of less than 10 microns (PM10); sulfur dioxide (SO2); lead (Pb). Nitrogen oxides (NOX) and volatile organic compounds (VOCs) are of particular interest as they are precursors to ozone formation. California has established ambient air quality standards for criteria pollutants, as well as visibility reducing particles; sulfates, hydrogen sulfide (H2S); and vinyl chloride.

The USEPA and CARB determine the air quality attainment status relative to the level of pollutants in designated areas by comparing local ambient air quality measurements from State or local ambient air monitoring stations with the NAAQS and CAAQS. Non-attainment status indicates that ambient measurements for a given pollutant in that area exceed the NAAQS and/or CAAQS. Consistent with federal requirements, an unclassifiable designation is treated as an attainment designation. Table 2 presents the federal and State attainment status for the project area which is in Orange County within the SCAB.

Table 2 Attainment Status of Orange County within South Coast Air Basin

Pollutant	Federal Designation	State Designation
Ozone (O_3)	Non-Attainment (Extreme)	Non-Attainment
Particulate Matter (PM10)	Attainment/Maintenance	Non-Attainment
Particulate Matter (PM2.5)	Non-Attainment (Moderate)	Non-Attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead (Pb)	Attainment	Attainment
Hydrogen Sulfide (H_2S)	*	Unclassified
Sulfates	*	Attainment
Visibility Reducing Particles	*	Unclassified

Source: SCAQMD, 2017a
Notes: (*) = Not Applicable/ No Federal Standards.

As shown in Table 2, the Project is in an area designated non-attainment for both the federal and State standards for O_3 and PM2.5, and for the State standard for PM10. Because Orange County (within SCAB) currently exceeds these

State and federal ambient air quality standards, the SCAQMD is required to implement strategies to reduce pollutant levels to recognized acceptable standards.

The SCAQMD in conjunction with the Southern California Association of Governments (SCAG), CARB, and USEPA recently prepared the 2016 Air Quality Management Plan (AQMP) (SCAQMD, 2017b). The purpose of the 2016 AQMP is to provide a comprehensive and integrated program to lead the SCAB into compliance with the federal ozone and particulate matter standards.

The 2016 AQMP accounts for projected population growth, predicted future emissions in energy and transportation demand, and determined control strategies for the eventual achievement of NAAQS attainment designation. These control strategies are either organized into the SCAQMD rules and regulations, or otherwise set forth as formal SCAQMD recommendations to other agencies.

The 2016 AQMP includes policies that are consistent with the SCAQMD and specify review according to the recommendations of SCAQMD guidelines. Other policies are aimed at reducing transportation emissions and emissions from major stationary sources.

The Project would be subject to the following general SCAQMD rules and regulations, also as required by the Orange County Grading and Excavation Codes:

Regulatory IV – Prohibitions

. Rule 401 – Visible Emissions: prohibits discharges of visible air contaminants that occlude the air beyond certain thresholds;

a. Rule 402 – Nuisance: prohibits discharges of air contaminants that cause “injury, detriment, nuisance, or annoyance” to the public; and

b. Rule 403 – Fugitive Dust: prohibits discharges of fugitive dust that exceed certain thresholds.

The SCAQMD has adopted regional and localized significance thresholds (LSTs) to determine the significance of a project’s potential air quality impacts. Separate thresholds of significance have been adopted for the construction and operation phases of projects. For the purposes of a CEQA analysis, the SCAQMD considers a sensitive receptor to be a receptor such as a residence, hospital, or convalescent facility where people stay in extended amount of time during the day. Commercial and industrial facilities are not included in the definition of sensitive receptor, because employees typically are present for shorter periods of time, such as eight hours per day. The LSTs were developed by the SCAQMD to assist lead agencies in analyzing localized air quality impacts from projects. LSTs look-up tables for one-, two-, and five-acre proposed projects emitting CO, NOx, PM2.5 or PM10 were prepared for easy reference according to source receptor area. The LSTs methodology and associated mass rates are not applicable to mobile sources travelling over the roadways.

SCAQMD does not mandate impact determination based on LSTs; more importantly, LSTs are a voluntary approach to be implemented at the discretion of local agencies (SCAQMD, 2008). Because the proposed Project is limited to minor construction activities and non-motorized use of recreational trails during operation, it is not a project with a high potential to result in substantial air pollutant emissions. The limited sources of air pollutants associated with the proposed Project that could affect local sensitive receptors would be generated from sources such as construction or maintenance landscaping equipment. These sources would be operated in a linear manner along the trails (proceeding from one end to another) and would be operated in close proximity to any sensitive receptor for only short-periods of time. Additionally, the limited sources of air pollutants would occur over an approximate 4.5-acre area

interspersed within a larger 2,300-acre open space area. As a result, the LSTs have been determined not to be applicable to the proposed Project and are not considered further in this analysis.

Table 3, below, presents the regional thresholds applicable to the Project. These daily emission thresholds are used in this analysis for purposes of determining the air quality impacts from project construction and operation.

Table 3 SCAQMD Significance Thresholds for Mass Daily Emissions of Criteria Air Pollutants

Regional Thresholds (lbs/day)	VOC	NO_X	SO_X	CO	PM10	PM2.5	Pb
Construction	75	100	150	550	150	55	3
Operation	55	55	150	550	150	55	3
SOURCES: SCAQMD Air Quality Significance (Mass Daily) Thresholds, 2015							

3.3.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
AIR QUALITY: Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	☒

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant Impact. The Project is limited to minor improvements to existing parking facilities and re-establishment of existing recreation trails on open space land. The Project would generate emissions during construction primarily from off-road equipment and on-road vehicle exhaust from worker vehicles and materials delivery. Operation phase emissions would occur from on-road vehicles associated with trail users travel to adjacent parking and trail access facilities as well as from maintenance trail/landscaping equipment periodically used during operation.

Emissions below the SCAQMD mass emissions thresholds of significance presented in Table 4 would not be expected to conflict with or obstruct implementation of the applicable air quality plan. Project construction and operation emissions were calculated using the California Emissions Estimator Model (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planning, and environmental professionals to quantify potential criteria air pollutant emissions associated with both construction and operations from a variety of land use projects. The model quantifies direct emissions from construction and operations including vehicle use¸ off-road equipment, fugitive dust, off-gas from asphalt and landscaping maintenance. Default data (i.e., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is an accurate and comprehensive tool for quantifying air quality impacts from land use projects throughout California.

Estimated unmitigated Project construction and operation emissions are summarized below in Tables 4 and 5, respectively. Detailed emission estimates and assumptions are provided in **Appendix A** (Project Emissions Estimates). The proposed Project does not include a source of lead emissions.

Table 4 SCAQMD Unmitigated Project Construction Emissions in Comparison to SCAQMD Significance Criteria

Peak Daily Emissions (lbs/day)							
Component	**VOC**	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**Lead (Pb)**
Construction Emissions	4.19	43.15	0.04	22.45	20.58	12.04	--
Regional Thresholds Construction	75	100	150	550	150	55	3
Exceeds Thresholds?	**No**	**No**	**No**	**No**	**No**	**No**	**n/a**

Table 5 Unmitigated Project Operation Emissions in Comparison to SCAQMD Significance Criteria

Peak Daily Emissions (lbs/day)							
Component	**VOC**	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**Lead (Pb)**
Project Operation Emissions	0.19	0.72	0.01	2.4	0.81	0.22	--
Regional Thresholds Operation	55	55	150	55	55	150	55
Exceeds Thresholds?	**No**	**No**	**No**	**No**	**No**	**No**	**n/a**

As shown in Tables 4 and 5, Project construction and operation emissions are below the applicable SCAQMD mass emissions thresholds of significance. Project construction and operation emissions would therefore not conflict with or obstruct implementation of the AQMP and impacts would be Less than Significant.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less than Significant Impact. In accordance with SCAQMD methodology, projects that do not exceed or can be mitigated to less than the daily threshold values do not add significantly to a cumulative impact. As discussed above in response a), estimated Project emissions are below the applicable SCAQMD regional mass emissions thresholds of



significance. The proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant and would have a Less than Significant impact.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact with Mitigation Incorporated. Because the proposed Project is limited to minor construction activities and non-motorized use of recreational trails during operation, it is not a project with a high potential to result in substantial air pollutant emissions. The limited sources of air pollutants associated with the proposed Project that could affect local sensitive receptors such as construction or maintenance landscaping equipment would be operated in a linear manner along the trails and would be operated in close proximity to any sensitive receptor for only short-periods of time. Additionally, the limited sources of air pollutants would occur over an approximate 4.5-acre area interspersed within a larger 2,300-acre open space area. However, these types of activities have the potential to result in fugitive dust emissions from surface disturbing activities that could expose sensitive receptors to substantial pollutant concentrations and result in a potentially significant impact. The closest sensitive receptors to the project would be the residences located between S Weir Canyon and Oak Canyon Drive (part of Mountain Park), located approximately 200 feet away from the Mountain Park alignment. All other residences would be geographically separated from the proposed work areas by existing roadways.

Mitigation Measures AQ-1 through AQ-5 below would be implemented to reduce fugitive dust emissions.

Mitigation Measures

Applicable to All Project Activities

AQ-1: Vehicle travel on unpaved roadways shall be limited to 15 miles per hour or less.

Applicable to Project Activities Involving Excavations

AQ-2: A gravel apron, 25 feet long by road width, shall be used to reduce mud/dirt trackout from unpaved truck/vehicle exit routes.

AQ-3: A soil stabilizer shall be applied to unpaved construction site access routes.

AQ-4: Apply water three times daily to disturbed construction areas.

AQ-5: Ground cover shall be replaced in disturbed areas as quickly as possible.

Mitigation Measures AQ-1 through AQ-5 would substantially reduce fugitive dust emissions and exposure of sensitive receptors to substantial pollutant concentrations. Potential impacts would be Less than Significant with mitigation incorporated.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

No Impact. The SCAQMD has identified land uses subject to odor complaints. These land uses include agriculture (farming and livestock), wastewater treatment, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding (SCAQMD, 1993). The Project involves minor recreation improvements on open space lands and does not involve any of the SCAQMD identified land uses subject to odor complaints or

components with the potential to create objectionable odors affecting a substantial number of people. No impact would occur.



3.4 BIOLOGICAL RESOURCES

3.4.1 Setting

The Biological Study Areas (BSA) are located in eastern Orange County, California. All the BSAs are situated within the western half of the U.S. Geological Survey (USGS) Black Star Canyon 7.5-minute topographic quadrangle with the individual BSA location described in further detail below.

East Orange I (EOI)

The EOI BSA is situated immediately east of SR 241 adjacent to its intersection with SR 261. The main portion of the approximately 495-acre BSA occupies the open space between SR 241 and the now-closed Santiago Canyon Landfill, just west of Irvine Lake. A smaller spur reaches out from the southern end of the BSA, extending approximately 0.75 mile to the east-southeast, north of and adjacent to Santiago Canyon Road (S18). The mountainous EOI BSA ranges in elevation from approximately 1,250 feet above mean sea level (amsl) in the east central portion of the BSA to 725 feet amsl in the northernmost corner. Lands surrounding the EOIBSA generally include OC Parks Open Space and NCCP Reserve. This BSA is bound to the north by SR 261, to the west and south by Santiago Canyon Road and SR 241, and to the east by the now-closed Santiago Canyon Landfill. Further east beyond the landfill is Irvine Lake and a temporary use area for private radio-controlled aviation.

East Orange II (EOII)

The EOII BSA is situated in open space to the southeast of Irvine Lake and just northeast of Santiago Canyon Road. A small section of the approximately 485-acre BSA extends to the south of Santiago Canyon Road, along Blue Diamond Haul Road and encompassing the Irvine Ranch Augustine Staging Area. The mountainous EOII BSA ranges from approximately 1,225 feet amsl along the ridgelines in the southeastern portion of the BSA to 800 feet amsl in the in the northwest corner of the BSA. The EOII BSA is situated approximately 1.5 miles to the southeast of the EOI BSA and is also largely surrounded by OC Parks Open Space and NCCP Reserve lands. It is bound to the north by the private radio-controlled aviation area and to the south, east, and west by undeveloped lands with Santiago Canyon Road traversing along its southern boundary.

Mountain Park (MP)

The MP BSA is situated along the east side of SR 241, immediately south of its intersection with SR 91. In general, it spans the area between SR 241 and the unpaved road leading south from Gypsum Canyon Road, extending approximately 1.2 miles to the south. This BSA is approximately 312 acres in size. The MP BSA is composed of two general landforms: lowland canyon areas and surrounding hillslopes and ridgetops, ranging in elevation from approximately 980 feet amsl in the southwest portion of the BSA to 400 feet amsl in the north, at the intersection of East Santa Ana Canyon and Gypsum Canyon Roads. The land to the south and east of the MP BSA is in OC Parks Open Space and NCCP Reserve, with the I-91 freeway and SR 241 bordering the BSA to the north and west, respectively, with urban development beyond. Irvine Valencia Growers currently leases two small areas totaling approximately five acres in the northern portion of the MP BSA to Orange County Fire Control for use as storage yards.

The portions of Mountain Park located west of SR 241 were surveyed separately and denoted as the Oak Canyon (OC) BSA. The OC BSA is situated between California SR 241 and a residential development to the west. The approximately 30-acre BSA abuts the residential development to the east, extending approximately 0.4 mile in a northeast to southwest direction from Oak Canyon Drive to South Weir Canyon Road. The OC BSA has a lower basin area and an upper hillslope area and ranges in elevation from approximately 950 feet above mean sea level (amsl) along the eastern boundary of the southern portion of the BSA to 675 feet amsl in the stormwater detention basin in the northern portion of the BSA. This basin receives flows diverted away from the adjacent residential area. A large berm runs north/south through the middle of the BSA separating the residential development to the west from the open space and drainage features to the east. The eastern side of the BSA also has unpaved access roads and concrete viaducts. The OC BSA is bordered to the west by residential development and to the north, east, and south by undeveloped land, though SR 241 separates the BSA from the wider area of open space to the east.

3.4.2 Impact Analysis

Regulatory Environment

Federal Endangered Species Act

Federal Endangered Species Act (ESA) provisions protect federally listed threatened and endangered species and their habitats from unlawful take and ensure that federal actions do not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Under the ESA, “take” is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct.” The U.S. Fish & Wildlife Service’s (USFWS) regulations define harm to mean “an act which actually kills or injures wild-life.” Such an act “may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering” (50 CFR § 17.3). Critical habitat is defined in Section 3(5)(A) of the ESA as “(i) the specific areas within the geographical area occupied by the species on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species upon a determination by the Secretary of Commerce or the Secretary of the Interior (Secretary) that such areas are essential for the conservation of the species.” The effects analyses for designated critical habitat must consider the role of the critical habitat in both the continued survival and the eventual recovery (i.e., the conservation) of the species in question, consistent with the Ninth Circuit judicial opinion, Gifford Pinchot Task Force v. USFWS. Activities that may result in “take” of individuals are regulated by the USFWS. The USFWS produced an updated list of candidate species December 6, 2007 (72 FR 69034). Candidate species are not afforded any legal protection under ESA; however, candidate species typically receive special attention from Federal and State agencies during the environmental review process.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711) makes it unlawful to possess, buy, sell, purchase, barter or “take” any migratory bird listed in Title 50 of the Code of Federal Regulations Part 10. “Take” is defined as possession or destruction of migratory birds, their nests or eggs. Disturbances that cause nest abandonment and/or loss of reproductive effort or the loss of habitats upon which these birds depend may be a violation of the MBTA. The MBTA prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary. This act encompasses whole birds, parts of birds, and bird nests and eggs.

Bald and Golden Eagle Protection Act of 1940 (16 USC 668)

The Bald Eagle Protection Act of 1940 (16 U.S.C. 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. Take of bald and golden eagles is defined as follows: "disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior'' (72 FR 31132; 50 CFR 22.3).

The USFWS is the primary federal authority charged with the management of golden eagles in the United States. A permit for take of golden eagles, including take from disturbance such as loss of foraging habitat, may be required if this project affects such resources. USFWS guidance on the applicability of current Eagle Act statutes and mitigation is currently under review. On November 10, 2009, the USFWS implemented new rules (74 FR 46835) governing the "take" of golden and bald eagles. The new rules were released under the existing Bald and Golden Eagle Act which has been the primary regulation protection unlisted eagle populations since 1940. All activities that may disturb or incidentally take an eagle or its nest as a result of an otherwise legal activity must be permitted by the USFWS under this act. The definition of disturb (72 FR 31132) includes interfering with normal breeding, feeding, or sheltering behavior to the degree that it causes or is likely to cause decreased productivity or nest abandonment. If a permit is required, due to the current uncertainty on the status of golden eagle populations in western United States, it is expected permits would only be issued for safety emergencies or if conservation measures implemented in accordance with a permit would result in a reduction of ongoing take or a net take of zero.

Federally Regulated Habitats

Areas meeting the regulatory definition of "Waters of the U.S." (Jurisdictional Waters) are subject to the jurisdiction of the United States Army Corps of Engineers (USACE) under provisions of Section 404 of the Clean Water Act (CWA) (1972) and Section 10 of the Rivers and Harbors Act (1899). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as "Waters of the U.S.," tributaries of waters otherwise defined as "Waters of the U.S.," the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to "Waters of the U.S." (33 CFR, Part 328, Section 328.3). Wetlands on non-agricultural lands are identified using the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987). The Project Area falls within the South Pacific Division of the USACE and is under the jurisdiction of the Los Angeles District.

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must comply with permit requirements of the USACE. No USACE permit would be effective in the absence of State water quality certification pursuant to Section 401 of the CWA. As a part of the permit process the USACE works directly with the USFWS to assess potential project impacts on biological resources.

National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA) requires all Federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and utilize public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements and prepare appropriate NEPA documents to facilitate better environmental decision making. NEPA requires Federal agencies to



review and comment on Federal agency environmental plans/documents when the agency has jurisdiction by law or special expertise with respect to any environmental impacts involved (42 U.S.C. 4321- 4327) (40 CFR 1500-1508).

State Regulations

California Environmental Quality Act

CEQA establishes State policy to prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures. CEQA applies to actions directly undertaken, financed, or permitted by State lead agencies. Regulations for implementation are found in the State CEQA Guidelines published by the Resources Agency. These guidelines establish an overall process for the environmental evaluation of projects.

California Endangered Species Act

Provisions of the California Endangered Species Act protect State-listed Threatened and Endangered species. The CDFW regulates activities that may result in "take" of individuals ("take" means "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of "take" under the California Fish and Game Code. Additionally, the California Fish and Game Code contains lists of vertebrate species designated as "fully protected" (California Fish & Game Code §§ 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], 5515 [fish]). Such species may not be taken or possessed.

In addition to Federal and State-listed species, the CDFW also has produced a list of Species of Special Concern to serve as a "watch list." Species on this list are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Species of Special Concern may receive special attention during environmental review, but they do not have statutory protection.

Birds of prey are protected in California under the State Fish and Game Code. Section 3503.5 states it is "unlawful to take, possess, or destroy any birds of prey (in the order Falconiformes or Strigiformes) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by the CDFW. Under Sections 3503 and 3503.5 of the State Fish and Game Code, activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory nongame bird as designated in the MBTA, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the MBTA, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800 are prohibited.

Native Plant Protection Act (Fish & Game Code 1900-1913)

California's Native Plant Protection Act (NPPA) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of NPPA prohibit the taking of listed plants from the wild and require notification of the CDFW at least 10 days in advance of any change in land use. This allows CDFW to salvage listed plant species that would otherwise be destroyed. The Applicant is required to conduct botanical inventories and consult with CDFW during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.



Section 3503 & 3503.5 of the Fish and Game Code

Under these sections of the Fish and Game Code, the Applicant is not allowed to conduct activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory non-game bird as designated in the MBTA, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the MBTA, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800.

Porter-Cologne Water Quality Control Act

Regional Water Quality Control Boards (RWQCBs) regulate the "discharge of waste" to "waters of the State." All projects proposing to discharge waste that could affect waters of the State must file a waste discharge report with the appropriate regional board. The board responds to the report by issuing waste discharge requirements (WDR) or by waiving WDRs for that project discharge. Both terms "discharge of waste" and "waters of the State" are broadly defined such that discharges of waste include fill, any material resulting from human activity, or any other "discharge." Isolated wetlands within California, which are no longer considered "waters of the United States" as currently defined by Section 404 of the CWA, are addressed under the Porter-Cologne Act.

State-Regulated Habitats

The State Water Resources Control Board is the State agency (together with the RWQCBs) charged with implementing water quality certification in California. The Project Area falls under the jurisdiction of the Santa Ana RWQCB.

The CDFW extends the definition of stream to include "intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams (USGS-defined), and watercourses with subsurface flows. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife" (CDFW, 1994).

Activities that result in the diversion or obstruction of the natural flow of a stream; or which substantially change its bed, channel, or bank; or which utilize any materials (including vegetation) from the streambed, may require that the project Applicant enter into a Streambed Alteration Agreement with the CDFW.

Local Regulations

Orange County General Plan – Chapter VI. Resources Element

Natural Resources Component

The Natural Resources Component of the Resources Element of the Orange County General Plan contains policies and programs which are designed to protect and conserve natural resources in the County, including scenic areas such as ridgelines and hillsides, climate, farmlands, native vegetation and wildlife, and mineral resources. It provides a basis for programs which served to implement natural resource conservation goals and policies and establish a framework for additional inventory and resource planning efforts (County of Orange, 2015). The Project Area occurs within a County-designated Wildlife Habitat Area.

The Goals, Objectives, and Policies relative to natural resources that apply to the Project Area are as follows:

Goal 1 Protect wildlife and vegetation resources and promote development that preserves these resources.



- **Objective 1.1** To prevent the elimination of significant wildlife and vegetation through resource inventory and management strategies.

- **Policy 1.** To identify and preserve the significant wildlife and vegetation habitats of the County.

Goal 3 Manage and utilize wisely the County's landform resources.

- **Objective 3.1** To minimize to the extent feasible the disruption of significant natural landforms in Orange County.

- **Policy 5.** To protect the unique variety of significant landforms in Orange County through environmental review procedures and community and corridor planning activities.

Open Space Component

The Open Space Component of the Resources Element of the Orange County General Plan is the open space plan for the unincorporated areas of Orange County. This component is the successor to the Open Space Element originally adopted by the Board of Supervisors on June 27, 1973. The preparation of this component is in compliance with State Government Code Sections 65560-65568, which require each city and county to prepare and adopt an open space plan for the comprehensive and long-range preservation of open space land within its jurisdiction. [County of Orange, 2015].

The Open Space Component contains the necessary goals, objectives, policies, and programs to promote the preservation and protection of resource areas and the protection of the public from potential hazards. The component also functions in a manner to shape the overall urban form of Orange County. To that end, open space facilities such as greenbelts that buffer conflicting land uses or link recreation facilities along regional trails and water courses are desired, as well as areas set aside to preserve cultural-historic resources, significant wildlife habitats, and biotic resources such as oak groves, sycamore/riparian woodlands, and marshlands. [County of Orange, 2015]

An integral part of the Open Space Component is the Open Space/Conservation Program Map which depicts an open space framework of countywide significance. This framework includes areas of resource concentration such as existing and proposed regional recreation facilities and a system of linkages such as trails and major open space corridors. The implementation programs provide the mechanism by which an integrated open space network can be realized. [County of Orange, 2015]

The Project Area occurs within the County-designated Upper Santiago Canyon Open Space/Conservation Area. The Upper Santiago Canyon area is proposed as the County's largest inland open space/recreation corridor, linking the proposed Limestone Canyon/Whiting Ranch Regional Park complex with the Irvine Park/proposed Villa Park Basin, Peters Canyon, and Weir Canyon Regional Park complex. Upper Santiago Canyon open space corridor affords buffering and gateway opportunities at points along the Cleveland National Forest boundary in the Central County and is easily accessible to residents of the County's largest cities. The area includes Orange County's largest lake, Santiago Reservoir (Irvine Lake). When combined with the proposed Limestone Canyon Regional Park, Santiago Reservoir presents a centrally located opportunity to establish the County's largest active urban recreation area, modeled after Griffith Park in Los Angeles. Upper Santiago Canyon and environs merit high-priority status due to the presence of a scenic highway, arterial bikeways, existing and proposed regional riding and hiking trails, and six existing and proposed County regional parks. [County of Orange, 2015]



The Goals, Objectives, and Policies relative to open space that apply to the Project Area are as follows:

Goal 1 Retain the character and natural beauty of the environment through the preservation, conservation, and maintenance of open space.

- **Objective 1.1** To designate open space areas that preserve, conserve, maintain, and enhance the significant natural resources and physical features of unincorporated Orange County.
- **Policy 1.1** To guide and regulate development of the unincorporated areas of the County to ensure that the character and natural beauty of Orange County is retained.
- **Policy 1.2** To implement the Open Space Component through a program organization capable of conducting multiple projects at priority locations throughout the County and with sufficient resources, authority, and responsibility to effectively manage the program.
- **Policy 1.3** To seek out, evaluate, and take advantage of special opportunities to obtain open space as these opportunities become available and when the available open space meets or helps to meet established open space goals and objectives.

Goal 4 Conserve open space lands needed for recreation, education, and scientific activities, as well as cultural-historic preservation.

- **Objective 4.1** To encourage the conservation of open space lands which provide recreational scenic, scientific, and educational opportunities.
- **Policy 4.1** To plan for the acquisition, development, maintenance, operation, and financing of open space lands which provide recreational, scenic, aesthetic, scientific, and educational opportunities.

Orange County Central-Coastal Subregion Natural Community Conservation Plan/Habitat Conservation Plan

Assembly Bill 2172 (Natural Community Conservation Planning Act) bill was drafted in recognition of the fact that individual species protection programs prepared and implemented under the FESA and/or SESA were costly and ineffective in protecting and/or preventing extinction of a plant or animal species, and that habitat-based, multi-species or ecosystem-based management and preservation approach has a greater potential for long-term success. AB 2172 was formally signed by Governor Wilson in September of 1991. It provided enabling legislation authorizing the California Department of Fish and Game (CDFG) to enter into agreements with any person, for the purpose of preparing and implementing Natural Community Conservation Plans (NCCP). The NCCP Act also provided the regulatory framework for the preparation of conservation guidelines for the development and implementation of NCCPs. In addition, the act also authorized NCCPs to be undertaken by local, state or federal agencies independently or in cooperation with other persons. [County of Orange, 2015]

The County of Orange established two distinct study areas: the Southern NCCP Subregion and Central/Coastal Sub-region NCCP. The Central-Coastal Subregional NCCP is one of eleven NCCP subregions that has been initiated within the five-county Southern California area and includes a Central Subarea and a Coastal Subarea (County of Orange, 2015). The Project Area occurs in the Central Subarea of the Central-Coastal Subregion NCCP. The Orange County Board of Supervisors approved the Central-Coastal NCCP/HCP on April 16, 1996 along with the certification of EIR/EIS No. 553. On July 17, 1996 an implementation agreement was executed by the Chairman of the Orange



County Board of Supervisors, the State Resources Agency, Department of the Interior, the Transportation Corridor Agencies, Southern California Edison, the Irvine Company and other participating landowners and utility companies. The approval of the NCCP/HCP established the following (County of Orange, 2015):

- Habitat Reserve System (Nature Reserve of Orange County)
- Species and habitat covered under the approved NCCP/HCP
- Coastal Sage Scrub Take Authorization
- "Mutual Assurances" provisions
- Adaptive management programs
- Funding for reserve creation and habitat management
- Nonprofit Corporation

The primary goal of the NCCP/HCP is to protect and manage habitat supporting a broad range of plant and animal populations that are now found within the Central and Coastal Subregion. To accomplish this goal, the NCCP/HCP creates a subregional habitat Reserve System and implements a coordinated program to manage biological resources within the habitat reserve. [County of Orange, 1996]

Other Applicable Regulations, Plans, and Standards

California Native Plant Society Rare Plant Program

The mission of the CNPS Rare Plant Program is to develop current, accurate information on the distribution, ecology, and conservation status of California's rare and endangered plants, and to use this information to promote science-based plant conservation in California. Once a species has been identified as being of potential conservation concern, it is put through an extensive review process. Once a species has gone through the review process, information on all aspects of the species (e.g., listing status, habitat, distribution, threats, etc.) are entered into the online CNPS Inventory and given a California Rare Plant Rank (CRPR). In 2011, the CNPS officially changed the name "CNPS List" to "CRPR." The Program currently recognizes more than 1,600 plant taxa (species, subspecies and varieties) as rare or endangered in California.

Vascular plants listed as rare or endangered by the CNPS, but which might not have a designated status under State endangered species legislation, are defined by the following CRPR:

- CRPR 1A - Plants considered by the CNPS to be extinct in California
- CRPR 1B - Plants rare, threatened, or endangered in California and elsewhere
- CRPR 2 - Plants rare, threatened, or endangered in California, but more numerous elsewhere
- CRPR 3 - Plants about which we need more information – a review list
- CRPR 4 - Plants of limited distribution – a watch list

In addition to the CRPR designations above, the CNPS adds a Threat Rank as an extension added onto the CRPR and designates the level of endangerment by a 1 to 3 ranking, with 1 being the most endangered and 3 being the least endangered. These are described as follows:

- 0.1 – Seriously threatened in California (high degree/immediacy of threat)
- 0.2 – Fairly threatened in California (moderate degree/immediacy of threat)
- 0.3 – Not very threatened in California (low degree/immediacy of threats or no current threats known.

Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporation	Less than Significant Impact	No Impact
BIOLOGICAL RESOURCES: Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☒	☐	☐

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than Significant Impact with Mitigation Incorporated. The Biological Resources Technical Report for the Project (refer to **Appendix B**) describes the surveys that were conducted for the Project site and immediate surrounding areas; initial reconnaissance-level surveys were conducted on January 10 and 11, 2018, with additional focused surveys were conducted from May 9 through 18, 2018 and June 25 through 28, 2018. Surveys were conducted within and adjacent to four distinct locations in the Santa Ana Mountains in eastern Orange County. These areas are defined as the Oak Canyon, Mountain Park, East Orange I, and East Orange II Biological Study Areas (OC

BSA, MP BSA, EOI BSA, and EOII BSA, respectively). Collectively the BSAs are referred to as the Project Area (Project Area). Although federal, State or locally protected wildlife species were not detected during the surveys, site assessment revealed that the habitats within or adjacent to the Project site have the potential to support (i.e., nesting, foraging, breeding, etc.) special-status wildlife species such as but not limited to; coastal California gnatcatcher (*Polioptila californica*), least Bell's vireo (*Vireo bellii pusillus*), Cooper's hawk (*Accipiter cooperii*), coast range newt (*Taricha torosa*), and western mastiff bat (*Eumops perotis*).

Two special-status plant species recognized by the California National Plant Society (CNPS) Rare Plant Program and assigned a CRPR were observed in the Project Area; many-stemmed dudleya (*Dudleya multicaulis*) and Peirson's morning glory (*Calystegia peirsonii*). Several other special-status species are known to occur in the general Project Area; Tecate cypress (*Hesperocyparis forbesii*), felt-leaved monardella (*Monardella hypoleuca ssp. Lanata*), and Allen's pentachaeta (*Pentachaeta aurea ssp. Allenii*). These plant species, as well as others, (full list is provided in **Appendix B**) have a "low" or "moderate" potential of occurrence within the Project Area.

In general, direct impacts to special-status plants and wildlife include ground-disturbing activities associated with construction of the Project and increased human presence (i.e., crushing, trampling, trapping). Potential indirect impacts include increased noise levels from heavy equipment (wildlife only), increased human disturbance, exposure to fugitive dust, the spread of noxious weeds, and disruption of breeding or foraging activity due to routine maintenance activities (wildlife only). Weed abatement through herbicide application or mechanized tools could also impact special-status species. If the Project construction were to occur during the avian nesting season (generally considered to be between February 15th through September 15th; although some raptors species may nest as early as January) indirect impacts to nesting birds could occur; the MBTA of 1918 (16 U.S.C. 703-711) does not allow for take of migratory birds.

The MBTA makes it unlawful to possess, buy, sell, purchase, barter or "take" any migratory bird listed in Title 50 of the Code of Federal Regulations Part 10. "Take" is defined as possession or destruction of migratory birds, their nests or eggs. Disturbances that cause nest abandonment and/or loss of reproductive effort or the loss of habitats upon which these birds depend may be a violation of the MBTA. The MBTA prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary. This act encompasses whole birds, parts of birds, and bird nests and eggs.

If implementation of the Project were to impact special-status species, these impacts would be considered significant. Therefore, Mitigation Measures BIO-1 through BIO-6, which would require pre-construction wildlife surveys prior to ground disturbance, focused protocol surveys for least Bell's vireo and coastal California gnatcatcher, relocation of wildlife found within Project impact areas during pre-construction surveys and daily monitoring, a biological monitor during site disturbing activities, implementation of environmental awareness training to educate Project personnel regarding on-site plants and wildlife, implementation of site-wide BMPs (i.e., restriction on open trenches and guidelines for refueling near drainage features), nesting bird surveys and avoidance measures for active nests, and pre-construction surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and other Special-Status plants and development of a transplanting plan. These measures would be implemented to mitigate potentially significant impacts. Implementation of these Mitigation Measures would ensure that any potential impacts to special-status plant and wildlife species are reduced to a Less than Significant level.

Mitigation Measures

BIO-1 Wildlife Pre-Construction Surveys and Biological Monitoring: Prior to ground disturbance or vegetation clearing within the Project site, a qualified biologist shall conduct surveys for wildlife (no more than 14 days prior to

site disturbing activities) where suitable habitat is present and directly impacted by construction activities. The qualified biologist must be approved by OC Parks prior to the commencement of surveys. Wildlife found within the Project site or in areas potentially affected by the Project will be relocated to the nearest suitable habitat that will not be affected by the project prior to the start of construction. Special-status species found within a Project impact area shall be relocated by an authorized biologist to suitable habitat outside the impact area.

Prior to the issuance of permits the Project proponent shall provide written evidence to OC Parks that the Project proponent has retained a qualified biological monitor with expertise in the species known to occur or with the potential to occur on the Project site. The qualified biologist shall be present during initial ground disturbance for each phase of construction. Once initial ground disturbance is complete, monitoring will occur periodically during all construction activities. The qualified biologist(s) shall be present at all times during ground-disturbing activities immediately adjacent to, or within habitat that supports populations of listed or special-status species.

If required, during pre-construction surveys and/or required monitoring efforts, the qualified biologist will relocate common and special-status species that enter the Project site; some special-status species may require specific permits prior to handling and/or have established protocols for relocation. Records of all detection capture, and release shall be reported to CDFW.

BIO-2 Environmental Awareness Training: Prior to the issuance of permits the Project proponent shall submit proof to the OC Parks, that all Project personnel attended an environmental awareness and compliance training program. The training program shall present the environmental regulations and applicable permit conditions that the Project team shall comply with. The training program shall include applicable measures established for the Project to minimize impacts to water quality and avoid sensitive resources, habitats and species. Dated sign-in sheets for attendees at these meetings shall be maintained and submitted to OC Parks.

BIO-3 Implement Best Management Practices (BMPs): Project shall implement the following Best Management Practices (BMPs):

- Restrict non-essential equipment to the existing roadways and/or ruderal areas to avoid disturbance to native vegetation.

- All excavation, steep-walled holes or trenches in excess of six inches in depth shall will be covered at the close of each working day by plywood or similar materials or provided with one or more escape ramps constructed of earth dirt fill or wooden planks. Trenches will also be inspected for entrapped wildlife each morning prior to onset of construction activities and immediately prior to covering with plywood at the end of each working day. Before such holes or trenches are filled, they will be thoroughly inspected for entrapped wildlife. Any wildlife discovered will be allowed to escape before construction activities are allowed to resume or removed from the trench or hole by a qualified biologist holding the appropriate permits (if required).

- Minimize mechanical disturbance of soils to reduce impact of habitat manipulation on small mammals, reptiles, and amphibians.

- Removal/disturbance of vegetation shall be minimized to the greatest extent feasible.

- Install and maintain appropriate erosion/sediment control measures, as needed, throughout the duration of work activities.



- Vehicles shall not be driven, or equipment operated, in water covered/wetted portions of the stream channel, or where riparian vegetation may be destroyed, except as otherwise provided for in the permits/agreements from the CDFW, USACE, and/or Regional Water Quality Control Board (RWQCB).

- No vehicles or equipment shall be refueled within 100 feet of an ephemeral drainage or wetland unless a bermed and lined refueling area is constructed. Spill kits shall be maintained on site in sufficient quantity to accommodate at least three complete vehicle tank failures of 50 gallons each. Any vehicles driven and/or operated within or adjacent to drainages or wetlands shall be checked and maintained daily to prevent leaks of materials.

- Disinfection of all equipment prior to use on the project site to reduce potential for the spread of ISHBs.

- Pruning of tree limbs within the Project area potentially infested with ISHBs.

- Avoidance and minimization of the transport of potential ISHB host tree materials and proper disposal of potential host materials (i.e., chipping, solarization, composting all prior to delivering to a landfill).

BIO-4 Nesting Bird Surveys and Avoidance Measures: Prior to initial site disturbance, seasonally timed presence/absence surveys for nesting birds shall be conducted by a qualified biologist; the qualified biologist must be approved by OC Parks prior to the commencement of surveys. If construction activities carry over into a second nesting season(s) the surveys will need to be completed annually until the Project is complete. A minimum of three survey events, three days apart shall be conducted (with the last survey no more than three days prior to the start of site disturbance), if construction is scheduled to begin during avian nesting season (February 15th through September 15th); surveys for raptors shall be conducted from January 1st to August 15th. Surveys shall be conducted within 500 feet of all Project activities.

If coastal California gnatcatcher, least Bell's vireo, or other special-status species are observed, consultation with USFWS and/or CDFW is required. If breeding birds with active nests are found prior to or during construction, a qualified biological monitor shall establish a 300-foot buffer around the nest and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. The prescribed buffers may be adjusted by the qualified biologist based on existing conditions around the nest, planned construction activities, tolerance of the species, and other pertinent factors. The qualified biologist shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails. If construction occurs outside of avian nesting season, only a single presence/absence survey will be required.

BIO-5 Conduct Pre-Construction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and other Special-Status Plants and Development of a Transplanting Plan: Prior to initial ground disturbance and for undisturbed areas in subsequent construction years, the Project proponent shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, Candidate, and other special-status plants in all areas subject to ground-disturbing activity. The surveys shall be conducted during the appropriate blooming period(s) by a qualified plant ecologist/biologist, approved by OC Parks, according to protocols established by the USFWS, CDFW, and CNPS. All listed plant species found shall be marked and avoided. Any populations of special-status plants found during surveys will be fully described, mapped, and a CNPS Field Survey Form or written equivalent shall be prepared.



Prior to excavation activities or vegetation removal, any populations of listed or special-status plant species identified during the surveys within the Project limits and beyond, shall be protected and a buffer zone placed around each population. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance including human trampling, erosion, and dust. The size of the buffer depends upon the proposed use of the immediately adjacent lands and includes consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, physical and chemical characteristics of soils) that are identified by the qualified plant ecologist and/or botanist. The buffer for herbaceous and shrub species shall be, at minimum, 50 feet from the perimeter of the population or the individual; the qualified plant ecologist/biologist may increase this minimum buffer depending on species and location. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the USFWS and CDFW as applicable.

Where impacts to listed plants are determined to be unavoidable, the USFWS and/or CDFW shall be consulted for authorization. Additional mitigation measures to protect or restore listed plant species or their habitat, including but not limited to a salvage plan including seed collection and replanting, may be required by the USFWS or CDFW before impacts are authorized, whichever is appropriate.

BIO-6 Conduct Protocol Surveys for Least Bell's Vireo and Coastal California Gnatcatcher: A qualified avian biologist shall conduct focused protocol surveys in suitable habitat within 500 feet of proposed Project disturbance areas within the breeding season prior to the start of construction. The surveys shall be of adequate duration to verify potential nest sites if work is scheduled to occur during the breeding season and follow established protocols.

If a territory or nest is confirmed in a previously unoccupied area, the CDFW and USFWS shall be notified within 48 hours. In coordination with the CDFW and USFWS, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted as determined by a qualified avian biologist in coordination with the CDFW and USFWS. The City, in consultation with the qualified biologist, shall halt construction if activities outside of but near the 300-foot buffer are determined to be negatively impacting the nesting birds. The qualified biologist shall devise methods to reduce the noise and/or disturbance in the vicinity as needed. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish or U.S. Fish and Wildlife Service?

Less than Significant Impact with Mitigation Incorporated. One "sensitive" riparian habitat, mulefat thickets, is present within the Project Area (as defined above) but would not be subject to reestablishment modifications or impacted by proposed construction activities; approximately 2.49 acres occur within Project Area. This habitat has an "S3" designation, which indicates that they are vulnerable due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines; global and state ranks are determined by the NatureServe Network and recognized by the CDFW. The loss of sensitive riparian plant communities would be considered a significant impact.

Riparian habitats, including ephemeral and perennial streams, are biologically productive and diverse, and are the exclusive habitat of several threatened or endangered wildlife species and many other special-status species.



Riparian and wetland habitats are highly productive ecosystems that also provide drinking water sources and foraging, nesting, and cover habitat for a diverse assemblage of wildlife species, both within the riparian habitats and adjacent upland habitats. Many wildlife species are wholly dependent on riparian habitats throughout their life cycles, and many others use riparian habitats only during certain seasons or life history phases. For example, certain mammals require drinking water or cool shaded cover during summer but otherwise may live in upland habitats. Numerous amphibians breed in aquatic habitats but spend most of their lives in uplands.

Two sensitive upland communities, coast prickly pear scrub and lemonade berry scrub, would be impacted by the Project. Approximately 0.01 acres of coast prickly pear scrub and 0.02 acres of lemonade berry scrub would be permanently impacted by construction of the Project. These habitats have the same "S3" designation as described above for mulefat thickets. The Project Area occurs in the Central Sub-Area of the Central/Coastal Subregion Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP) boundaries. This NCCP/HCP treats California sage scrub as a sensitive resource; therefore, for the purposes of this project impacts and mitigation, California sage scrub is considered a sensitive community.

Table 6 below identifies the potential impacts to vegetation communities that are expected to occur from Project implementation. These impacts include the removal of existing vegetation along historical trails for reestablishment.

Table 6 Estimated Impacts to Vegetation Communities and Land Cover Types

Vegetation Communities/Land Cover Types	Survey Area (in acres)							
	OC BSA		MP BSA		EOI BSA		EOII BSA	
	Survey Area	Project Impacts	Survey Area	Project Impacts	Survey Area	Project Impacts	Survey Area	Project Impacts
MCVII VEGETATION COMMUNITIES								
Annual brome grassland	-		17.83		-			
Black sage scrub	-		-		25.78			
Black willow thickets	-		-		0.60			
Bush mallow scrub	-		0.90	0.01	-		-	
California buckwheat scrub	-		-		5.12			
California sagebrush scrub*	-		-		260.61	0.96	278.44	0.72
Chamise chaparral	-		2.49		-		7.04	0.03
Coast live oak woodland	0.57		8.82		5.83	0.02	18.98	0.06
Coast prickly pear scrub*	-		1.48	0.01	0.51		-	
Lemonade berry scrub*	-		-		22.64	0.02	-	
Mulefat thickets*	-		2.45		-			
Poison oak scrub	-		-		6.52		-	
Red brome grasslands	20.27	0.12	270.59	1.48	79.76	0.64	153.53	0.75
Red willow thickets	-		-		2.40		5.30	

Vegetation Communities/Land Cover Types	Survey Area (in acres)							
	OC BSA		MP BSA		EOI BSA		EOII BSA	
Upland mustards	-		-		76.77		-	
Wild oats grasslands	-				2.40			
OTHER LAND COVER TYPES								
Disturbed/Developed	9.64	0.01	7.40	0.01	5.84	0.05	17.56	0.01
TOTAL	**30.48**	**0.13**	**311.96**	**1.51**	**494.78**	**1.69**	**480.85**	**1.57**

*Sensitive Vegetation Community

Construction of the Project would remove vegetation, alter soil conditions, and have the potential to result in the loss of native seed banks within portions of the Project site. Construction activities could also result in the spread of noxious weeds within the Project site and adjacent habitats. During operation and maintenance of the Project, impacts would occur during routine maintenance activities and could include trampling or crushing of native vegetation by foot traffic, alterations in topography and hydrology, increased erosion and sedimentation, and the introduction of non-native, invasive plants due to increased human presence on foot or equipment.

Mitigation Measure BIO-7 below, which includes minimizing vegetation removal and compensation for impacts to native vegetation communities would be implemented to mitigate these potential impacts. In addition, BIO-2 and BIO-3 would require environmental awareness training for all project personnel and implementation of best management practices (i.e., establishment of construction exclusion zones). Implementation of these measures would ensure that potential impacts to sensitive habitats (approximately 0.18 acres), is reduced to a Less than Significant level.

Mitigation Measures

BIO-2 Environmental Awareness Training

BIO-3 Implement Best Management Practices (BMPs)

BIO-7 Vegetation Removal and Replacement: Construction activities shall be done in such a manner as to minimize the removal of native vegetation. If native vegetation removal cannot be avoided, and the removal is approved by OC Parks, the impacted plant communities shall be replaced at a mitigation ratio of 1:1. Sensitive communities shall be replaced at a mitigation ration of 3:1. The compensation for the loss of habitats may be achieved either by a) on-site habitat creation or enhancement of California sycamore woodlands and southern riparian scrub communities with similar species compositions to those present prior to construction, b) off-site creation or enhancement of California sycamore woodlands and southern riparian scrub communities, or c) participation in an established mitigation bank program.

Prior to the removal of native vegetation, if on or off-site mitigation is required, a Habitat Mitigation and Monitoring Plan shall be prepared that will guide all restoration and monitoring activities. This plan shall include, at a minimum, the following:

- Proposed species list for creation/enhancement;
- Planting/seeding methodology;
- Irrigation plan;
- Weeding schedule;
- Success criteria;
- Monitoring methodology and schedule; and
- Reporting requirements.



c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than Significant Impact with Mitigation Incorporated. Multiple potentially jurisdictional features were mapped within the Project Area (refer to **Appendix C** for additional details). By virtue of its hydrological connectivity to the Santa Ana River and subsequently with the Pacific Ocean, drainages within the Project Area are potentially subject to Sections 404 and 401 (Water Quality Certification) of the CWA (USACE and Regional Water Quality Control Board). Impacts to and activities within jurisdictional features are also subject to CDFW Section 1600 of the California Department of Fish and Game Code (Streambed Alteration Agreement Program). Project establishment of trails and usage of trail systems (of Mountain Park, East Orange I, East Orange II) is anticipated to permanently impact up to approximately 0.012 acres of Waters of the United States and up to approximately 0.023 acres of CDFW jurisdictional waters. The precise nature and location of these impacts is described in Appendix C.

The importance of intermittent and ephemeral streams to wildlife in arid environments is well known (Levick et al., 2008). Ephemeral drainages, such as those occurring within the Project Area, provide unique habitat that is distinct from the surrounding uplands, providing more continuous vegetation cover and microtopographic diversity than the surrounding uplands. Ephemeral and intermittent streams in the arid west provide important habitat for wildlife and are responsible for much of the biotic diversity (Levick et al., 2008). They have higher moisture content and provide shade and cooler temperatures within the channel. In cases where the habitat is distinct in species composition, structure, or density, wash communities provide habitat values not available in the adjacent uplands.

Direct impacts to “Waters of the U.S“ and CDFW jurisdictional waters could include the removal of native riparian vegetation, the discharge of fill, degradation of water quality, and increased erosion and sediment transport. Potential indirect impacts could include alterations to the existing topographical and hydrological conditions and the introduction of non-native, invasive plant species. Operational impacts to jurisdictional habitats would be similar to direct and potential indirect impacts.

As required by law, the County would comply with State and federal regulations regarding conducting Project activities in water courses and habitats under the jurisdiction of the CDFW and USACE. In compliance with State and federal regulations, the County would be required to obtain requisite permits pursuant to Sections 401 and 404 of the CWA, and Game Code Section 1600, prior to Project construction.

Although the County proposes to construct the Project when potentially jurisdictional features are dry, Project related impacts to jurisdictional waters would be considered significant. Therefore, Mitigation Measures BIO-1 (Wildlife Pre-Construction Surveys and Biological Monitoring), BIO-3 (Implement Best Management Practices), and BIO-6 (Vegetation Removal and Replacement) which would require on-site biological monitoring, compensation for loss of native habitats (to fund replacement elsewhere), installation and maintenance of appropriate erosion/sediment control measures (to limit runoff and downstream impacts), would be implemented to mitigate these potentially significant impacts. Implementation of these Mitigation Measures, along with compliance with the requisite regulatory agency-issued permits, would ensure that potential impacts to jurisdictional features are less than significant.

Mitigation Measures

BIO-1 Wildlife Pre-Construction Surveys and Biological Monitoring

BIO-3 Best Management Practices

BIO-7 Vegetation Removal and Replacement

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

Less than Significant Impact. The literature review conducted as part of the Biological Resources Technical Report (Appendix B) did not reveal known wildlife movement corridors within or immediately adjacent to the Project Area. Drainages and small canyons within the Project Area likely provide a conduit for travel for mammals such as coyotes (*Canis latrans*), bob cats (*Lynx rufus*), deer, and mega fauna such as mountain lions (*Puma concolor*). The movement of such wildlife through the Project site is expected to be somewhat limited during the daytime due to residential dwellings and resulting human activity in the area.

The Project Area is located at the western edge of a large area of generally undeveloped open space that facilitates unimpeded wildlife movement and provides "live-in habitat" for a variety of species. Due to the lack of significant development to within the BSAs and the Santa Ana Mountains to the east and southeast, wildlife movement is generally unconstrained throughout that area. Wildlife movement in lands to the west and north is heavily impacted by urban development. In addition, California State Routes 241 (to the west) and 91 (to the north of the OC and MP BSAs) likely serve as barriers to terrestrial wildlife movement.

Within the BSAs, the lack of structures or other significant development and the presence of relatively intact habitat and features such as ephemeral drainages and unpaved roads all facilitate wildlife passage. However, the BSAs do not occur within any known wildlife movement corridor or habitat linkage (Penrod et al, 2001).

The Project is not expected to impact or interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. Construction activities would be limited to daytime hours; wildlife movement is anticipated to be limited during this time due to existing anthropogenic influence. There are no known bird or bat migratory corridors that would be directly impeded by the Project. Large concentrations of migrants are not known to utilize any specific portion of the Project site and Project activities are not expected to preclude use of the area. Migrating birds would have access to riparian communities within the Project site. Although species would be disrupted during certain activities, impacts to migratory corridors from the Project would not be significant. Therefore, impacts would be Less than Significant in this regard

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

No Impact. There are no known local policies or ordinances protection biological resources in the Project area. Therefore, Project implementation is not expected to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?

Less than Significant Impact with Mitigation Incorporated. The Project Area is located in the northern portion of the Central Sub-Area of the Central/Coastal Subregion NCCP/HCP boundaries. The goal of the NCCP/HCP, "is to protect and manage habitat supporting a broad range of plant and animal populations that now are found within the Central and Coastal Subregion." The Project would permanently impact approximately 1.68 acres of coastal sage scrub habitat.



Where applicable the Project would follow the conservation measures outlined in the NCCP/HCP within Section 5.8.5 (Policies Governing the Siting and Construction of New Recreational Facilities), and included below.

1. New County EMA/HBP facility improvements shall be consistent with permitted facilities outlined in Section 5.8.4, and the parks, approved Interim Operations Plan, or Resource Management Plan.
2. New facility siting shall be coordinated with the non-profit reserve management corporation.
3. The facility shall be located and designed to minimize impacts to sensitive resources.
4. Access roads and infrastructure supporting new facilities will be routed to minimize disturbance and impacts to sensitive resources.
5. Necessary infrastructure required for new park facilities shall be consistent with policies set forth in Section 5.9.
6. Where proposed facilities may potentially impact sensitive resources, a qualified biologist shall be hired to document the resources and vegetation in the area to be disturbed by the proposed facility.
7. EMA/HBP estimates that the construction of future recreational facilities within regional parks could result in up to 150 acres of CSS loss and Incidental Take of habitat supporting gnatcatcher sites within the Reserve System. The take of habitat and species associated with the development of future recreational facilities located within the reserve is considered authorized take and mitigated under this subregional NCCP/HCP
8. Since many proposed recreational facilities will not be constructed in the immediate future and because regional recreational needs change over time, flexibility will be allowed in future design and siting of facilities
9. Where impacts to sensitive vegetation occurs, revegetation plans shall be come part of the facility improvement plans
10. Revegetated areas shall be monitored for a minimum 5 year period

In addition, Mitigation Measure BIO-06 would require compensation for impacts to native plant communities such as coastal sage scrub habitat. Integration of the mitigation measures outlined above for other impacts, along with implementation of all applicable conservation measures outlined in the NCCP/HCP would ensure that the proposed Project would not conflict with the provisions of the plan.

Mitigation Measures

BIO-1 Wildlife Pre-Construction Surveys and Biological Monitoring

BIO-2 Environmental Awareness Training

BIO-3 Best Management Practices

BIO-4 Nesting Bird Surveys and Avoidance Measures

BIO-5 Conduct Pre-Construction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and other Special-Status Plants and Development of a Transplanting Plan

BIO-6 Conduct Protocol Surveys for Least Bell's Vireo and Coastal California Gnatcatcher

BIO-7 Vegetation Removal and Replacement



3.5 CULTURAL RESOURCES

3.5.1 Setting

Between January and June 2018, Stantec Consulting Services Inc. (Stantec) conducted an archaeological study of portions of the East Orange I, East Orange II, and Mountain Park Project Areas (Stantec, 2018). The archaeological study consisted of an archival records search of the Project Areas and the surrounding Study Area conducted at the South Central Coastal Information Center (SCCIC) of the California Historic Resources Information System (CHRIS), located at California State University, Fullerton, a Sacred Lands File search conducted with the Native American Heritage Commission (NAHC) in Sacramento, and an archaeological survey of approximately 584.9 acres within portions of the Project Areas. The remaining 68.9 acres were not surveyed due to steep terrain, dense vegetation or combination of both.

The results of the record search indicated that one prehistoric resource was previously documented within the East Orange I Project Area, and 12 prehistoric resources, three historic resources, and one multi-component resource were previously documented within a ½-mile radius; one prehistoric site, two isolated finds comprised of a single mano, and two groundstone fragments were previously documented within the East Orange II Project Area, and five archaeological sites (all prehistoric) were previously documented within a ½-mile radius; one historic resource was previously documented within the Mountain Park Project Area, and one prehistoric resource and one historic resource were previously documented adjacent to the Mountain Park Project Area. The survey resulted in the identification and documentation of a single historic resource, the Saddleback Park Motocross Raceway, within the East Orange I Project Area (Stantec, 2018). The Cultural Resources Technical Report is included as **Appendix D**.

3.5.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

Less than Significant Impact with Mitigation Incorporated. According to the Resources Element of the County of Orange General Plan, none of the Project Areas are located within a designated historical area; however, as discussed above, historic resources are documented within, as well as within a ½-mile radius of, both the East Orange I and Mountain Park Project Areas. Therefore, there is a potential to disturb previously documented and/or undocumented historic resources. The Project involves clearing activities required for development of the new staging areas, trails, and parking lot areas. Mitigation Measure CULT-1 listed below would be implemented to reduce potential impacts to historic resources to a Less than Significant level and if cultural resources are encountered during construction activities, activity would halt until a determination by an archaeologist is made. With the implementation of Mitigation Measure CULT-1, the Project would have Less than Significant impacts on historic resources and no further mitigation would be required.

Mitigation Measure

CULT-1: Prior to start of the Project, the applicant shall provide written evidence to OC Parks, that the applicant has retained a County-certified archaeologist, to observe ground disturbance activities and salvage and catalogue archaeological resources as necessary. The archaeologist shall be present at the pre-grade conference, shall establish procedures for archaeological resource surveillance, and shall establish, in cooperation with the applicant, procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the artifacts as appropriate. If the archaeological resources are found to be significant, the archaeological observer shall determine appropriate actions, in cooperation with the project applicant, for exploration and/or salvage.

Prior to the ground disturbance, the applicant shall obtain approval of the archaeologist's follow-up report from OC Parks. The report shall include: the period of inspection, an analysis of any artifacts found and the present repository of the artifacts. The archaeologist shall prepare excavated material to the point of identification. Applicant shall offer excavated finds for curatorial purposes to the County of Orange, or its designee, on a first refusal basis. These actions, as well as final mitigation and disposition of the resources, shall be subject to the approval of OC Parks. Applicant shall pay curatorial fees if an applicable fee program has been adopted by the Board of Supervisors, and such fee program is in effect at the time of presentation of the materials to the County of Orange or its designee, all in a manner meeting the approval of OC Parks.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Less than Significant Impact with Mitigation Incorporated. As discussed above, prehistoric archaeological resources are documented within, as well as within a ½-mile radius of, both the East Orange I and East Orange II Project Areas, and within a ½-mile radius of the Mountain Park Project Area. According to the Resources Element of the County of Orange General Plan, East Orange I and East Orange II Project Areas are located within the Foothill Area and Mountain Park is located with the Upper Santa Ana River-Weir Canyon Area general area of sensitivity for prehistoric archaeology. Therefore, the potential to disturb previously documented and/or undocumented prehistoric archaeological resources is high. The Project involves clearing activities required for development of the new staging areas, trails, and parking lot areas. Mitigation Measure CULT-1 listed below would be implemented to reduce potential impacts to prehistoric archaeological resources to a Less than Significant level and if cultural resources are encountered during construction activities, activity would halt until a determination by an archaeologist is made. With

the implementation of Mitigation Measure CULT-1, the Project would have Less than Significant impacts on archaeological resources and no further mitigation would be required.

Mitigation Measure

CULT-1

c) Disturb any human remains, including those interred outside of formal cemeteries?

Less than Significant Impact with Mitigation. No evidence exists to suggest the Project site has been used for human burials. However, in the event human remains are encountered during Project activities, implementation of Mitigation Measure CULT-2 would serve to address potential impacts. This measure requires that no further work would continue at the location of the find until the County Coroner has made all the necessary findings as to the origin and distribution of such remains. With implementation of this mitigation measure, impacts related to the disturbance of previously unknown human remains on site would be less than significant.

Mitigation Measure

CULT-2 **Human Remains**. If human remains are discovered, all work shall be halted immediately within 50 feet of the discovery, the City shall be notified, and the County Coroner must be notified, according to Section Public Code Resources Code Section 5097.98. The County Coroner must be notified within 24 hours of the discovery, and within two working days of notification of the discovery would make such a determination. If the County Coroner determines that the remains are or are believed to be Native American, the County Coroner would notify the NAHC in Sacramento within 24 hours. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the County Construction Engineer, the treatment and disposition of the human remains.

3.6 ENERGY

3.6.1 Setting

There are a number of state and local regulations requiring energy efficiency. These include but are not limited to the state's Renewable Portfolio Standard (RPS) requirements which mandate an increasing use of renewable energy supplies for electricity generation, the City of Anaheim General Plan Green Element, and the County of Orange General Plan Natural Resources Element.

3.6.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
Energy. Would the Project:				
a) Result in potentially significance environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction and operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

a) Result in potentially significance environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction and operation?

Less than Significant Impact. Resources that would be consumed as a result of the proposed Project include water, electricity, and fossil fuels during construction and operation. Construction would require the manufacture of new materials, some of which may not be recyclable at the end of the proposed Project's lifetime. The energy required for the production of these materials would also result in an irretrievable commitment of natural resources. However, the amount and rate of consumption of these resources would not result in significant environmental impacts or the unnecessary, inefficient, or wasteful use of resources. Construction and operation of the Project would utilize only a small amount of fuel, as necessary to fuel vehicles and equipment necessary for the reestablishment and maintenance of the recreational facilities. Compliance with all applicable building codes, state of California, County of Orange, and cities of Anaheim and Orange policies would ensure that all-natural resources are conserved to the maximum extent possible.

Furthermore, to meet air quality requirements and save materials and fuel for economic gain, it is to the advantage of the Applicant to implement energy efficiency and fuel use reduction measures for all on-site equipment, and wherever possible during construction.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Impact. The proposed project would be compliant with all state and local plans for renewable energy or energy efficiency because it would develop a renewable source of power, helping to offset the use of nonrenewable resources and contribute to an overall reduction of nonrenewable resources currently used to generate electricity.



3.7 GEOLOGY AND SOILS

3.7.1 Setting

East Orange I and II are located within the unincorporated area of Silverado, California, and Mountain Park is located within the City of Anaheim. These areas are located within Orange County in the foothills of the Santa Ana Mountains. This part of Orange County is part of the Peninsular Range Natural Province of southern California, a system of northwesterly trending ridges that extend from the Transverse Ranges south into Baja California. The topography of this province is characterized by irregular coastal plain in the west, as well as prominent ridges, peaks, valleys and subdued upland areas as one moves south and east (Jahns, 1954). The general topography of the Project areas is comprised of rolling foothills intersected by ephemeral and perennial drainages, with slope between 10 and 30 degrees. The Paleontological Resources Technical Report is included as **Appendix E**.

3.7.2 Impact Analysis

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

Issues		Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building code (1997), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving?

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

Less than Significant Impact. The County of Orange is identified as affected by Alquist-Priolo Earthquake Fault Zones as of January 2010 (DOC, 2010). The areas of East Orange I and II and Mountain Park are represented within the Black Star Canyon Quadrangle. However, Alquist-Priolo Earthquake Fault Zones have not been prepared for the Black Star Canyon Quadrangle (CGS, 2001). The Alquist-Priolo Earthquake Fault Zone nearest to the Project areas is Elsinore Fault Zone represented within the Prado Dam Quadrangle (CGS, 2003). The Whittier Fault of the Elsinore Fault Zone is the nearest fault to the Project areas located approximately 1.15 miles north to northeast of the Mountain Park area. The Whittier Fault is an approximately 40 km long, Holocene, right-lateral strike-slip fault with a slip rate of approximately 2.5 and 3.0 mm per year and a probable magnitude of M_w 6.0 to M_w 7.2 (SCEDC, 2018). The Project consists of the development of staging areas, rehabilitating existing trails, reestablishing historical trails, and parking lot areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. Due to the minimal nature of the proposed disturbance caused by the Project, the risk of exposing people or structures to potential adverse effects, including the risk of loss, injury, or death due to fault rupture during an earthquake is limited. Therefore, impacts are expected to be Less than Significant.

ii. Strong seismic ground shaking?

Less than Significant Impact. No habitable structures (e.g. residential buildings) are proposed to be built within the Project area. Therefore, the risk of exposing people or structures to potential adverse effects, including the risk of loss, injury, or death due to strong seismic ground shaking is limited and impacts are expected to be Less than Significant.

iii. Seismic-related ground failure, including liquefaction?

Less than Significant Impact. Liquefaction occurs when groundwater is forced out of the pores of soil as it subsides. This excess water momentarily liquefies the soil, causing an almost complete loss of strength. If this layer is at the surface, its effect is much like that of quicksand for any structure located on it. If the liquefied layer is subsurface, the material above it may slide laterally depending on the confinement of the unstable mass. Zones of liquefaction are located near and/or within the Project areas (DOC, 2001). However, the Project is limited to the development of staging areas, rehabilitating existing trails, reestablishing historical trails, and parking lot areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. The Project does not include the construction of habitable or new structures that would expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. Therefore, Project impacts from seismic related ground failure, including liquefaction, would be Less than Significant.

iv. Landslides?

Less than Significant Impact. Landslides often occur during or after strong earthquakes. The areas of the Project are located within Earthquake-Induced Landslide Zones (DOC, 2001). However, the Project is limited to the development of staging areas, rehabilitating existing trails, reestablishing historical trails, and parking lot areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. The Project does not include the construction of habitable or new structures that would expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. Therefore, Project impacts from landslides would be Less than Significant.

b) Result in substantial soil erosion or the loss of topsoil?

Less than Significant Impact with Mitigation. The Project consists of the development of a staging area, rehabilitating existing trails, and reestablishing historical trails within previously disturbed areas. No new trails are proposed as part of the Project. An existing staging area will be improved with ADA parking and a connection to existing trails. The new staging area will include a decomposed granite parking lot, accessible parking and signage in accordance with standards for ADA use, portable restrooms, benches, and picnic tables. Construction activities of the Project may temporarily cause soil erosion and would be managed through the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), as required by State Water Resources Control Board Order No. 2009-0009-DWQ.

Mitigation Measure

WQ-3: Stormwater Pollution Prevention Plan: The applicant shall demonstrate compliance with California's General Permit for Stormwater Discharges Associated with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number; or other proof of filing in a manner meeting the satisfaction of the Manager, Permit Intake. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). A copy of the current SWPPP shall be kept at the project site and be available for County review on request.



c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less than Significant Impact. Please refer to responses 3.6 a), iii) and a), iv).

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building code (1997), creating substantial risks to life or property?

Less than Significant Impact. Expansive soils generally have a significant amount of clay particles, which can give up water (shrink) or take on water (swell). The change in volume exerts stress on buildings and other loads placed on these soils. The extent of shrink/swell is influenced by the amount and kind of clay in the soil. According to the Soil Survey of Orange County and Parts of Riverside County, the soils within the Project areas have moderate to high percentages of clays and loams and the soil within the Mountain Park area may be expansive (USDA, 2018). However, the Project is limited to the development of staging areas, rehabilitating existing trails, reestablishing historical trails, and parking lot areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance and does not create substantial risks to life or property. Therefore, Project impacts related to expansive soils would be Less than Significant.

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

No Impact. The Project does not include the construction of new septic tanks or alternative wastewater disposal system; therefore, no impacts would occur.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less than Significant with Mitigation Incorporated. A paleontological evaluation and inventory of the Project area analyzed existing paleontological data to determine sensitivity (Paleo Solutions, 2018). The three components of the analysis included a geologic map review, a literature search, and an institutional record search. The analysis of existing data was supplemented with a pedestrian field survey, which was conducted in order to search for fossil resources exposed at the Project area surface as well as to document the geological units that are exposed within the Project area. According to the record search, there are no previously recorded fossil localities within the Project area; however, there are numerous fossil localities recorded from within the Project vicinity and other areas of California from sediments similar to those mapped within the Project area. Additionally, the Resources Element of the County of Orange General Plan designates all of the Project areas as being located within the Northern Santa Ana Mountains general area of paleontological sensitivity.

The field survey results indicate that all mapped high and very high paleontologically sensitive units, with the exception of early to middle Pleistocene-aged very old alluvial fan deposits, are currently exposed in the Project area. Additionally, several fossil localities were documented during the field survey, and specimens included fish scales, invertebrate shell fragments, and mammal bones (Paleo Solutions, 2018). Therefore, there is potential for adverse impacts to scientifically significant paleontological resources during ground disturbance within the paleontologically sensitive units identified within the Project area. Mitigation Measure GEO-1 listed below would be implemented to reduce potential impacts to paleontological resources or unique geologic features to a Less than Significant level and if paleontological resources are encountered during construction activities, activity would halt until a determination by a paleontologist is made. With the implementation of Mitigation Measure GEO-1, the Project would have Less than



Significant impacts on paleontological resources or unique geologic features and no further mitigation would be required.

Mitigation Measure

GEO-1: Prior to the start of construction, a paleontological resource monitoring and mitigation plan (PRMMP) will be prepared. The PRMMP will provide detailed recommended monitoring locations including locations mapped as high to very high sensitivity; a description of a worker training program; detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; and notification procedures in the event of a fossil discovery by paleontological monitor or other project personnel. A curation agreement with an accredited repository approved by OC Parks must be obtained. Any subsurface bones or potential fossils that are unearthed during construction should be evaluated by a Qualified Paleontologist.



3.8 GREENHOUSE GAS

3.8.1 Setting

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs), comparable to a greenhouse, which captures and traps radiant energy. GHGs are emitted by natural processes and human activities. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. Global warming is the observed increase in average temperature of the earth's surface and atmosphere.

The six major GHGs are; carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbon (PFCs). The GHGs absorb longwave radiant energy emitted by the Earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the Earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect." However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. Emissions from human activities such as fossil fuel combustion for electricity production and vehicles have elevated the concentration of these gases in the atmosphere.

The California Air Pollution Control Officers Association (CAPCOA), in its 2008 "Report on Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act," stated:

> *"While it may be true that many GHG sources are individually too small to make any noticeable difference to climate change, it is also true that the countless small sources around the globe combine to produce a very substantial portion of total GHG emissions."*

California Global Warming Solution Act of 2006 (AB32):

Under AB 32, CARB is responsible for monitoring and reducing GHG emissions in the State and for establishing a statewide GHG emissions cap for 2020 that is based on 1990 emissions levels. CARB (2009) has adopted the AB 32 Climate Change Scoping Plan (Scoping Plan), which contains the main strategies for California to implement to reduce CO_2 equivalent (CO_2e) emissions by 169 million metric tons (MMT) from the State's projected 2020 emissions level of 596 MMT CO_2e under a business-as-usual scenario. The Scoping Plan breaks down the amount of GHG emissions reductions the CARB recommends for each emissions sector of the State's GHG inventory but does not directly discuss GHG emissions generated by construction activities.

Senate Bills (SB) 97 and 375:

- Pursuant to SB 97, the State Office of Planning and Research prepared, and the Natural Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Effective as of March 2010, the revisions to the CEQA Environmental Checklist Form (Appendix G) and the Energy Conservation Appendix (Appendix F) provide a framework to address global climate change impacts in the CEQA process; State CEQA Guidelines section 15064.4 was also added to provide an approach for assessing impacts from GHGs.

- SB375 (effective January 1, 2009) requires CARB to develop regional reduction targets for GHG emissions and prompted the creation of regional land use and transportation plans to reduce emissions from

passenger vehicle use throughout the State. The targets apply to the regions covered by California's 18 metropolitan planning organizations (MPOs). The 18 MPOs must develop regional land use and transportation plans and demonstrate an ability to attain the proposed reduction targets by 2020 and 2035.

Executive Orders (EO):

- EO B-30-15 (Governor Brown, April 2015) established a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It additionally directed all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve GHG emissions reductions to meet the 2030 and 2050 targets.
- EO S-13-08 (Governor Schwarzenegger, November 2008) established a coalition of state agencies and directed them to plan for sea level rise and climate impacts through coordination of the state Climate Adaptation Strategy.
- EO S-01-07 (Governor Schwarzenegger, January 2007) established a low carbon fuel standard for California and directed the carbon intensity of California's transportations fuels to be reduced by at least 10 percent by 2020.
- EO S-3-05 (Governor Schwarzenegger, June 2005) directed the state to reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 level by 2050. Executive Order B-16-2012 (Governor Brown, March 2012) affirmed the long-range emissions reduction target of 80 percent below 1990 levels by 2050.

The SCAQMD has proposed a "bright-line" screening level threshold of 3,000 metric tons/year CO_2e for all non-industrial land use types. This bright-line threshold is based on a review of the Governor's Office of Planning and Research database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal, and therefore, Less than Significant impact on GHG emissions. SCAQMD's guidelines for analyzing a project's GHG impacts is to amortize project emissions over a 30-year period, add them to annual operation phase emissions and compare the emissions to the 3,000 metric tons/year CO_2e threshold of significance level to determine significance.

Many California counties and cities have developed a climate action plan focusing on reducing GHGs from local sources, to facilitate meeting the State reduction targets of AB 32. To date, County of Orange has not adopted a Climate Action Plan.

3.8.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
GREENHOUSE GASES: Would the project:				

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

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant Impact. The proposed Project is limited to minor improvements to existing parking facilities and reestablishment of existing and historical trails on open space land. No new trails are proposed as part of the Project. The Project would generate GHG emissions during construction primarily from off-road equipment and on-road vehicle exhaust from worker vehicles and materials delivery. Operation phase emissions would occur from on-road vehicles associated with trail users travel to adjacent parking and trail access facilities as well as from maintenance trail/landscaping equipment periodically used during operation.

GHG emissions for the Project were estimated using the CalEEMod version 2016.3.2 (CalEEMod, 2016). Detailed GHG emissions estimates for the Project are included in **Appendix A** (Project Emissions Estimates). **Table 7** below, presents a summary of the estimated total GHG emissions that would result from Project implementation.

Table 7 Total Estimated Project GHG Emissions

Project Phase	Total Metric Tons			
	CO_2	CH_4	N_2O	CO_2e
Construction Emissions (total)	20.58	0.01	<0.00	20.73
Construction Emissions (amortized over 30 years)	0.69	<0.00	<0.00	0.69
Operation Emissions (annual)	66.23	0.01	<0.00	66.48
Total Project Emissions	2.58	0	0	67.17
Interim SCAQMD Threshold				3,000
Project Emissions Exceed SCAQMD Threshold?				No

As shown in **Table 7**, the Project would result in a total estimated 67.17 metric tons of CO_2e emissions per year when construction emissions are amortized over 30 years in accordance with SCAQMD guidance. The 67.17 metric tons of CO_2e emissions is less than the 3,000 metric tons CO_2e significance threshold and the Project would therefore not generate greenhouse gas emissions, either directly or indirectly, that would have a substantial adverse effect on the environment and potential impacts would be Less than Significant.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant Impact. The State Legislature, enacted Assembly Bill 32 [AB 32], (the California Global Warming Solutions Act of 2006 which was signed on September 27, 2006), to further the goals of Executive Order S-3-05 (Health and Safety Code, S38500 et seq.). AB 32 requires CARB to adopt Statewide GHG emissions limits to achieve Statewide GHG emissions levels at the same levels they were atmospherically in 1990 by the year 2020. A longer-range goal requires an 80% reduction in GHG emissions from 1990 levels by 2050. CARB adopted the 2020 Statewide target and mandatory reporting requirements in December 2007 and a Statewide scoping plan in December 2008 (the AB 32 Scoping Plan). Senate Bill 32 (SB 32), signed on September 8, 2016, expands on the mandate of AB 32 requiring CARB to ensure that State GHG emissions are reduced to 40 percent below the 1990 emission level by year 2030. Section 38566 is added to the current Health and Safety Code, which states "the State board shall ensure that Statewide greenhouse gas emissions are reduced to at least 40 percent below the Statewide greenhouse gas emissions limit no later than December 31, 2030".

The Project does not include stationary sources of GHG emissions and is not subject to compliance with AB 32's cap-and-trade program. Orange County has not adopted a Climate Action Plan. The Project's use of fuels during construction would be consistent with existing regulations related to low carbon fuel standards achieved through regulations placed on the fuel manufacturing and supply industry. Considering the above, as well as that the Project's GHG emissions would be below SCAQMD's thresholds of significance, the Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Potential impacts would be Less than Significant.

3.9 HAZARDS AND HAZARDOUS MATERIALS

3.9.1 Setting

This section evaluates potential impacts to Hazards and Hazardous Materials that could result from Project implementation. Analysis in this section is based on the existing environmental setting conditions.

3.9.2 Impact Analysis

Issues		Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
HAZARDS AND HAZARDOUS MATERIALS: Would the project:					
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g)	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than Significant Impact. The Project includes recreational improvements and general park maintenance. Vehicles and equipment associated with Project construction and maintenance would use limited quantities of hazardous materials. Hazardous materials associated with construction (i.e. gasoline, diesel, coolants etc.) are considered hazardous because they are flammable and/or may contain toxic compounds, such as volatile organic compounds and heavy metals. All hazardous materials and wastes associated with Project construction would be handled, transported, and disposed of in compliance with all applicable federal, State, and local regulations. Compliance with these laws and regulations would reduce the potential impact associated with the routine transport, use, storage, or disposal of hazardous materials to a Less than Significant level.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than Significant Impact. The Project includes recreational improvements and general park maintenance consisting of sustainably designed trail systems, staging areas for parking, public access, portable toilets, and picnic areas, informative signage, and planting of native plants as well as non-native plant removal. The Project does not include a component with the potential to create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials to the environment; therefore, impacts would be Less than Significant

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. There are no schools within 0.25 mile of the Project area. The nearest school, Running Springs Elementary School, is located approximately 0.40 mile west of the Mountain Park Area at 8670 Running Springs Dr, Anaheim, CA 92808. Therefore, no impacts would occur.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. Based on desktop review of public databases (DTSC EnviroStor; State Water Resources Control Board GeoTracker), there are no known hazardous waste facilities or open cleanup sites within the Project area. Therefore, since the Project is not located on a list associated with hazardous materials, no impacts would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the Project Area?

No Impact. The Project area is located approximately 10 miles northeast of John Wayne Airport, approximately 15 miles east of Fullerton Municipal Airport, and approximately nine miles southwest of Chino Airport. The Project is not located within an airport land use plan area or compatibility zone. Therefore, no impacts would occur.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?



No Impact. All roads in the vicinity of the Project area would remain open during Project construction, eliminating potential impacts related to access for emergency vehicles. In addition, the Project does not include construction of residences or facilities that would require evacuation. As such, the Project would not impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, no impacts would occur.

g) *Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*

Less than Significant Impact. The Project and surrounding area are within a County-adopted 'Very High Fire Hazard' Zone. The Project does not involve development of residential dwellings and would not increase the wildland-urban interface, defined as the area where structures and other human development meet or intermingle with undeveloped wildland or natural open space. Any construction equipment and activities would comply with codes and ordinances enforced by the County's Fire Authority-Community Risk Reduction Department through compliance with established local codes and regulations during construction activities. The Project would have a Less than Significant impact with respect to exposing people or structures to a significant risk of loss, injury, or death involving wildland fires.

3.10 HYDROLOGY AND WATER QUALITY

3.10.1 Setting

East Orange I and II are located within the unincorporated area of Silverado, California, and Mountain Park is located within the City of Anaheim. These areas are located within the north-central portion of Orange County in the foothills of the Santa Ana Mountains. The general topography of the Project areas is comprised of rolling foothills intersected by ephemeral and perennial drainages, with slope between 10 and 30 degrees. East Orange I and II project sites surround Irvine Lake (East Orange I is located to the west of the lake, and East Orange II is located to the north, south and east of the lake). Irvine Lake was originally constructed in 1933 and is now owned by the Serrano Water District and the Irvine Ranch Water Districted and is operated by Serrano Water District. The primary purpose of Irvine Lake (Santiago Creek Reservoir) is to store water; the lake is used both as a source of water for non-drinking purposes, such as irrigation for avocado orchards, and as a source of water for the Baker Water Treatment Plant which creates drinking water for an estimated 85,000 homes in Orange County (Irvine Ranch Water District, 2019).

The Project consists of the reestablishment of trails; staging areas for parking, public access, portable toilets, and picnic areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. No new trails are proposed as part of the Project. Project construction activities may temporarily cause impacts to hydrology and water quality through removal of native riparian vegetation, alterations to the existing topographical and hydrological conditions, the discharge of fill, as well as soil erosion and sediment transport. Operational impacts to hydrology and water quality would be limited to general operations and maintenance activities associated with upkeep of trails, as well as cleaning/ pumping out of portable toilets.

As detailed in Section 3.5 (Biological Resources), Project construction is anticipated to permanently impact up to 0.023 acres of CDFW jurisdictional waters and 0.012 acres of Waters of the United States); the Project would not impact any potentially jurisdictional wetland “waters of the U.S.”

3.10.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river				

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
through the addition of impervious surfaces, in a manner which would:				
(i) Result in substantial erosion or siltation on- or off-site;	☐	☒	☐	☐
(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
(iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
(iv) Impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☒	☐	☐

a) Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade surface or ground water quality?

Less than Significant Impact with Mitigation. The Project site is under the jurisdiction of the Santa Ana RWQCB, which administers the NPDES program at the regional level. Establishment and operation of the proposed Project would consist of maintenance activities such as minor ground disturbance, trail maintenance, and periodic vegetation removal which is approved under the conditions established with the donation of the land. According to Santa Ana RWQCB guidance, the proposed Project is not required to obtain coverage under the Construction General Permit, as construction activities for routine maintenance to maintain original line and grade, hydraulic capacity, or the original purpose of a facility do not require coverage. Additionally, as discussed above in Section 1.6, the proposed Project would obtain (if needed) a 401 permit from the Santa Ana RWQCB to provide coverage for fill of Waters of the United States if implementation would not avoid discharge of dredge of fill materials to Waters of the U.S. and/or State and a 404 permit from the USACE. It is anticipated that coverage for the 404 permit would be provided under a Nationwide Permit (such as Nationwide 3: Maintenance, Nationwide 18: Minor Discharges, or Nationwide 42: Recreational Facilities).

Direct impacts to "Waters of the U.S" and CDFW jurisdictional waters (necessitating the 401/404 permitting) could include the removal of native riparian vegetation, the discharge of fill, degradation of water quality, and increased erosion and sediment transport. Potential indirect impacts could include alterations to the existing topographical and



hydrological conditions and the introduction of non-native, invasive plant species. Operational impacts to jurisdictional habitats would be similar to direct and potential indirect impacts.

As required by law, the County would comply with State and federal regulations regarding conducting Project activities in water courses and habitats under the jurisdiction of the CDFW and USACE. In compliance with State and federal regulations, the County would be required to obtain requisite permits pursuant to Sections 401 and 404 of the CWA, and Game Code Section 1600, prior to Project construction.

In the event that construction activities (outside of routine maintenance) for the Project would exceed one acre, the potential for stormwater discharges would be managed through the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), as required by State Water Resources Control Board Order No. 2009-0009-DWQ. The County of Orange's Construction General Permit would provide coverage for the proposed Project.

Project operation activities which have the potential to cause soil erosion and/or impacts to water quality, such as minor ground disturbance, trail maintenance, or vegetation removal, would be mitigated through implementation of a WQMP, which is required by the County of Orange. The WQMP would utilize the Orange County DAMP, which documents the specific water pollutant control elements of the Orange County Stormwater Program. The DAMP is the primary policy, planning and implementation document for municipal NPDES Stormwater Permit compliance (Orange County Public Works, 2019).

Compliance with the requirements of the 401/404 permits, SWPPP, WQMP, and DAMP would ensure that the Project's potential impact to violate a water quality standard or waste discharge requirements would, therefore, be Less than Significant with mitigation.

Mitigation Measures

WQ-1: Water Quality Management Plan: The applicant shall submit for review and approval by the Manager, Building and Safety Permit Services, a Water Quality Management Plan (WQMP) specifically identifying Best Management Practices (BMPs) that will be used onsite to control predictable pollutant runoff. The applicant shall utilize the Orange County Drainage Area Management Plan (DAMP), Model WQMP, and Technical Guidance Manual for reference, and the County's WQMP template for submittal. This WQMP shall include the following:

- Detailed site and project description
- Potential stormwater pollutants
- Post-development drainage characteristics
- Low Impact Development (LID) BMP selection and analysis Hydromodification Control BMP selection and analysis
- Structural and Non-Structural source control BMPs
- Site design and drainage plan (BMP Exhibit)
- GIS coordinates for all LID and Treatment Control BMPs
- Operation and Maintenance (O&M) Plan that (1) describes the long-term operation and maintenance requirements for BMPs identified in the BMP Exhibit; (2) identifies the entity that will be responsible for long-term operation and maintenance of the referenced BMPs; and (3) describes the mechanism for funding the long-term operation and maintenance of the referenced

BMPs

The BMP Exhibit from the approved WQMP shall be included as a sheet in all plan sets submitted for plan check and all BMPs shall be depicted on these plans.

WQ 2: Compliance with the NPDES Implementation Program: The applicant shall demonstrate compliance with the County's NPDES Implementation Program in a manner meeting the satisfaction of the Manager, OC Inspection, including:

- Demonstrate that all structural Best Management Practices (BMPs) described in the BMP Exhibit from the project's approved WQMP have been implemented, constructed and installed in conformance with approved plans and specifications
- Demonstrate that the applicant has complied with all non-structural BMPs described in the project's WQMP
- Submit for review and approval an Operations and Maintenance (O&M) Plan for all structural BMPs (the O&M Plan shall become an attachment to the WQMP;
- Demonstrate that copies of the project's approved WQMP (with attached O&M Plan) are available for each of the initial occupants;
- Agree to pay for a Special Investigation from the County of Orange for a date twelve (12) months after the issuance of a Certificate of Use and Occupancy for the project to verify compliance with the approved WQMP and O&M Plan
- Demonstrate that the applicant has RECORDED one of the following:

1. The CC&R's (that must include the approved WQMP and O&M Plan);
2. A water quality implementation agreement that has the approved WQMP and O&M Plan attached; or
3. The final approved Water Quality Management Plan (WQMP) and Operations and Maintenance (O&M) Plan.

WQ 3: Stormwater Pollution Prevention Plan: The applicant shall demonstrate compliance with California's General Permit for Stormwater Discharges Associated with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number; or other proof of filing in a manner meeting the satisfaction of the Manager, Permit Intake. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). A copy of the current SWPPP shall be kept at the project site and be available for County review on request.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

No Impact. The Project consists of rehabilitating existing trails, reestablishing historical trails; creating staging areas for parking, public access, portable toilets, and picnic areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. The Project would not tap into groundwater underneath or adjacent to the Project site, nor would it impede groundwater recharge. Project activities are not anticipated to result in a substantial change to infiltration as no new impervious surfaces are being proposed. Furthermore, the Project's minimal water requirements (e.g., placement of water troughs for horseback riding) are not expected to exceed the allowable water supply. Therefore, no impact would occur.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:



i. Result in substantial erosion or siltation on- or off-site?

Less than Significant Impact with Mitigation. The Project would incorporate a SWPPP, which would prevent substantial erosion or siltation into the ephemeral drainage features during construction. Erosion and sediment control measures specified in the NPDES permit would also minimize impacts during construction and operations. Additionally, the County would comply with State and federal regulations regarding conducting Project activities in watercourses and habitats under the jurisdiction of the CDFW and USACE. This includes obtaining required CDFW Streambed Alteration Agreement, as well as CWA Section 401 and 404 permits (for discharge of dredged or fill materials into waters of the U.S.).

With the implementation of a SWPPP, WQMP, NPDES permit, CWA permits, the Project would not result in substantial erosion or siltation on- or off-site. Therefore, the Project would have a Less than Significant impact with implementation of mitigation measures WQ-1, WQ-2, and WQ-3.

Mitigation Measures

WQ-1: Water Quality Management Plan

WQ 2: Compliance with the NPDES Implementation Program

WQ 3: Stormwater Pollution Prevention Plan

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

Less than Significant Impact. The Project consists of the rehabilitating existing trails, reestablishing historical trails; creating staging areas for parking, public access, portable toilets, and picnic areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. The Project does not include substantial development of impervious surfaces and is therefore not expected to create or contribute to run-off water. Under the NPDES permit, any surface run-off associated with Project construction activities would be captured and managed. Furthermore, with the implementation of the WQMP, any potential runoff resulting from project operations activities would also be mitigated. In compliance with State and federal regulations, the County would obtain required permits pursuant to Sections 401 and 404 of the CWA. Potential impacts would be Less than Significant.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwter drainage systems tot provide substantial additional sources of polluted runoff; or

Less than Significant Impact. The Project consists of the rehabilitating existing trails, reestablishing historical trails, creation of staging areas for parking, public access, portable toilets, and picnic areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. The Project does not include substantial development of impervious surfaces and is therefore not expected to create or contribute to run-off water which would exceed the capacity of existing or planned stormwater drainage systems. Impervious surface will be installed at the existing gravel parking lot in Parcel 1 of Mountain Park for ADA parking stalls. Furthermore, the Project would incorporate a SWPPP and WQMP which would prevent and/or mitigate substantial polluted runoff during both construction and operations. Therefore, the Project would have a Less than Significant impact.



iv. Impede or redirect flood flows?

No Impact. As stated above, the Project site (i.e., East Orange II) is within a 100-year flood hazard area. However, the Project consists of the development of staging areas, rehabilitating existing trails, reestablishing historical trails, and development of parking lot areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. The Project does not propose construction of any permanent or habitable structures. Therefore, the Project would not place obstacles or structures within a 100-year flood hazard area which could impede or redirect flood flows, and no impact would occur.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less than Significant Impact. A tsunami is a series of waves generated in a body of water by a pulsating or abrupt disturbance that vertically displaces water. Inundation of the Project's site by a tsunami is highly unlikely as the Project site is approximately 15 miles northeast of the Pacific Ocean. With respect to seiche, which is a standing wave in an enclosed or partially enclosed body of water, the Project site is partially surrounded by Irvine Lake. However, aside from minimal vegetation restoration, most project activities are planned to occur away from Irvine Lake and are therefore not anticipated to be impacted by seiche.

Mudflow may occur in the Project area as a result of heavy rains following wildfires. The Project and surrounding area are within a County-adopted 'Very High Fire Hazard' Zone. Any construction equipment and activities would comply with codes and ordinances enforced by the County's Fire Authority-Community Risk Reduction Department through compliance with established local codes and regulations during construction activities. Therefore, the Project would have a Less than Significant impact with respect to inundation by mudflow.

The Project site (i.e., East Orange II) is within a 100-year flood hazard area. Specifically, East Orange II is partially located in "Zone A" and "Zone AE" as well as a defined floodway of Santiago Creek (FEMA, 2019). However, the Project would not place habitable structures or any sources of pollutants (above the baseline) that would affect flows in a 100-year flood hazard area. Therefore, the Project would have a Less than Significant impact with respect to potential pollutant releases and flooding hazards.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less than Significant Impact with Mitigation. The Project consists of the development of rehabilitating existing trails, reestablishing historical trails; creating staging areas for parking, public access, portable toilets, and picnic areas, as well as necessary tree, vegetation, and debris removal, and routine park maintenance. The Project does not include substantial development of impervious surfaces and is therefore not expected to create or contribute to run-off water which would exceed the capacity of existing or planned stormwater drainage systems.

The Project site is under the jurisdiction of the Santa Ana RWQCB, which administers the NPDES program at the regional level. Construction projects resulting in the disturbance of 1.0 acre or more require a NPDES permit. Under NPDES, run-off from development must be captured and filtered to remove pollutants prior to discharging the run-off into storm drains. Development of the Project, and implementation of the required SWPPP, WQMP, NPDES permit, CWA and permits, would not conflict with or obstruct the implementation of any water quality control plan or sustainable groundwater management plan. Implementation of the project would include preparation and implementation of a Water Quality Control Plan.



With the implementation of a SWPPP, WQMP, NPDES permit, CWA permits, the Project would not result in substantial erosion or siltation on- or off-site. Therefore, the Project would have a Less than Significant impact with implementation of mitigation measures WQ-1, WQ-2, and WQ-3.

Mitigation Measures

WQ-1: Water Quality Management Plan

WQ 2: Compliance with the NPDES Implementation Program

WQ 3: Stormwater Pollution Prevention Plan

3.11 LAND USE AND PLANNING

3.11.1 Setting

The East Orange areas consists of a series of low-lying hills and valleys along the Santa Ana Mountains. Residential, commercial and industrial developments exist to the west of these sites. Both Mountain Park and Oak Canyon are located within the City of Anaheim.

Table 8 Land Use Designations

Project Component	General Plan Land Use Designation	Zoning (Jurisdiction)
East Orange I	General Agriculture (County of Orange), Low/Medium Density Residential (City of Orange)	P-C: Planned Community (City of Orange)
East Orange II	General Agriculture (County of Orange), Open Space, Low/Medium Density Residential (City of Orange Sphere of Influence)	P-C: Planned Community (City of Orange)
Mountain Park	Estate Density (City of Anaheim)	SP 90-4: Mountain Park (City of Anaheim)
Oak Canyon	Open Space, Estate Density, Low/Medium Density (City of Anaheim)	SP 90-4: Mountain Park (City of Anaheim)

Both of East Orange I and II are located within the City of Orange sphere of influence. East Orange I is located within the boundaries of the City of Orange, with a small portion of the trail crossing unincorporated County of Orange lands. East Orange II is located within unincorporated Orange County, however East Orange II is also located within the Sphere of Influence of the City of Orange. Both Mountain Park and Oak Canyon are located within the City of Anaheim. Lands within the Sphere of Influence could become part of the City at a later date.

Much of the land surrounding East Orange I and II is in OC Parks Open Space and NCCP Reserve. Southern California maintains an electric powerline easement and PAC Bell maintains a telephone line easement along the paved access road to Santiago Canyon Landfill (East Orange I) and the airport (East Orange II).

As discussed above under Section 2.0, the East Orange I property is topographically complex and is comprised of low rolling hills, steep canyons with intervening scrub- and chaparral-covered ridges and alluvial terraces with deeply incised watercourses. Elevations on site range from approximately 750- to 1,600-feet above sea level [Glen Lukos, 2004]. The East Orange II property contains similar habitat to that described above for the East Orange I property. This area, however, has experienced much less disturbance and remains in a more natural state.

Mountain Park is located generally in Gypsum Canyon, south of the Riverside (SR-91) Freeway, in the City of Anaheim and its Sphere of Influence, Orange County, California. The majority of Mountain Park is in the jurisdiction of the City of Anaheim; however, the southern- and eastern-most portions of the project site are in unincorporated County of Orange in the City of Anaheim's sphere-of-influence. The City of Anaheim has prepared a specific plan for Mountain Park, which was adopted in 2005, which establishes the framework for the development of the project site. The Mountain Park Specific Plan encompasses approximately 3,001 acres. The project site is currently undeveloped with the exception of a 300-acre sand and gravel mining operation located in the northeastern portion of Gypsum Canyon which was vacated in June 2005. In addition to describing the project's purpose, vision, and features, the specific plan presents the project description, zoning and development standards. The Specific Plan is regulatory in nature and serves as zoning for Mountain Park. Subsequent development plans and subdivision maps must be consistent with both the specific plan and the City of Anaheim General Plan. Any situation or condition not specifically



covered by the provisions contained within the Mountain Park Specific Plan is subject to the regulations of the City of Anaheim Municipal Code.

3.11.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

a) Physically divide an established community?

No Impact. While the Project is located within either the City of Orange (East Orange I and II) or the City of Anaheim (Mountain Park and Oak Canyon) Sphere of Influence and has a varied general plan designation of open space, low density, and low medium density residential, the individual sites (East Orange I, East Orange II, Oak Canyon, and Mountain Park) are undeveloped, with no residential uses on any of the sites. Existing uses on the sites include recreational use, event spaces, and wildlife corridors. The sites are all physically separated from the developed and urbanized portions of the City of Orange by several different features, including the existing 241 toll road, and California SR-91. All improvements made by the Project would be limited to minor recreational improvements which would not occur within in or near residential areas. Therefore, the project would have no impact on physically divide an established community.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The East Orange I site's zoning designation for both the City and County of Orange is P-C (planned community), which is intended to provide for a more efficient use of land and a better community environment by utilizing more imaginative and innovative planning concepts than would be possible under conventional zoning controls. If usable open space is provided in excess of the amount required under conventional zoning, a proposed project within the P-C district constitutes an environment equal to or better than what might be accomplished under traditional zoning practices. As the site is to effectively be used as 100-percent open space, the East Orange I site would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project.

The East Orange II site's County of Orange zoning is a combination of A1 (general agricultural), and SG (sand and gravel extraction). The site is designated on the County of Orange General Plan as OS (open space). One of the permitted uses of the A1 designation is for parks, playgrounds, and non-commercial athletic fields. The open space

designation also allows for a variety or recreational activities. The SG zoning designation also allows for all agricultural and open space uses. The proposed project's recreational activities would be consistent with all three zones. Therefore, the East Orange II site would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the Project.

The Mountain Park Specific Plan was previously found to be consistent with the City of Anaheim General Plan and was adopted with its own Environmental Impact Report. The Specific Plan also allowed up to 2,500 units of housing. The currently proposed Project would not include any housing units on the Mountain Park site, limiting its overall environmental impact compared to the previously approved Specific Plan and its associated Environmental Impact Report. As with the Specific Plan before, the Mountain Park site would be consistent with the City of Anaheim's Land Use, Aesthetics, Geology and Soils, Hydrology, Water Quality, Circulation, Air Quality, Noise, Hazardous Materials, Public Utilities, and Parks and Recreation Goals, Policies and Objectives. The Mountain Park site would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project. Therefore, the project would have no impact.



3.12 MINERAL RESOURCES

3.12.1 Setting

The Mineral Resources and Mineral Hazards Mapping Program provides data about California's non-fuel resources, naturally occurring mineral hazards, and information about active and historic mining activities throughout the State. Land classification is the principal responsibility of the Mineral Resources and Mineral Mapping Program. The non-fuel mineral resources include the metals such as gold, silver, iron and copper; the industrial minerals such as boron compounds, rare-earth elements, clays, limestone, gypsum, salt and dimension stone; and construction aggregate which includes sand and gravel, and crushed stone. The presence or absence of significant sand, gravel, or stone deposits that are suitable as sources of aggregate are classified according to areas called Mineral Resource Zones (MRZ), which are described below. The intent of classification is to assist lead agencies, planners, and the public in the wise use, management, and conservation of California's mineral resources. As California's population continues to expand, the demand for minerals-especially building construction such as aggregate-will similarly grow.

MRZ-1 – Mineral Resource Zone where adequate information indicates that no significant mineral deposits are present or likely to be present.

MRZ-2 – Mineral Resource Zone where adequate information indicates that significant mineral deposits are present, or there is a high likelihood of their presence and development should be controlled.

MRZ-3 – Mineral Resource Zone where the significance of mineral deposits cannot be determined from the available data.

MRZ-4 – Mineral Resource Zone where there is insufficient data to assign any other MRZ designation.

3.12.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☒	☐
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☒	☐

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Less than Significant Impact.

East Orange I: The East Orange I site is not located within a Mineral Resource Zone. Maintaining the current nature of the site while providing additional hiking and recreational opportunities as the Project proposes would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

East Orange II: Two sections of the East Orange II site are located within areas of potential mineral deposits, specifically aggregate. The 96-acre remote control airfield area upstream of Irvine Lake is located within an MRZ-2 area, which is an area where adequate information indicates that significant deposits are present, or where it is judged that a high likelihood exists for their presence. Current uses on the site include a paved landing strip for remote controlled airplanes, a helicopter landing zone, parking areas, picnic tables, portable bathrooms, and message boards. The area's parking facilities can also be used staging area for hiking. The use of the site would not change as part of the proposed project. Likewise, the recreational area downstream of Irvine Lake Dam would not see a change in its usage. As the proposed use of the sites are not changed from the existing uses, the Project itself would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

Mountain Park: The former quarry is located within an MRZ-2 area, which is an area where adequate information indicates that significant deposits are present, or where it is judged that a high likelihood exists for their presence. The City of Anaheim states that this is only aggregate resources within the Project site. The City of Anaheim General Plan EIR mentions the closure of mineral extraction within the Project site, and that the Project site is not designated as a regionally significant source of aggregate.

Therefore, the project would have less than significant impacts.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Less than Significant Impact.

East Orange I: The East Orange I site is located within the City of Orange Sphere of Influence. Mineral resource deposits in Orange (and its Sphere of Influence) are primarily limited to the sand and gravel resources contained in and along the Santa Ana River and Santiago Creek. The East Orange I site is not located along any waterway listed by the City of Orange General Plan. Therefore, no loss of availability of a locally important mineral resource recovery site as delineated by a local general plan, specific plan or other land use plan.

East Orange II: The East Orange II site is also located within the City of Orange Sphere of Influence. Mineral resource deposits in Orange (and its Sphere of Influence) are primarily limited to the sand and gravel resources contained in and along the Santa Ana River and Santiago Creek. As the East Orange II site surrounds portions of Irvine Lake, part of the Santiago Creek system, the City will evaluate development proposals within these areas, and ensure adequate mitigation or preservation of the areas for future mining activity. As the proposed Project would not introduce any new uses to the East Orange II site, less than Significant impacts would occur regarding the loss of availability of a locally important mineral resource recovery site as delineated by a local general plan, specific plan or other land use plan.

Mountain Park: The City of Anaheim has delineated specific locations within city limits and its Sphere of Influence where important mineral resources are located. In general, these locations are located along the Santa Ana River. All three specified locations that contain other materials other than aggregate are located at least five miles to the west of the Project site. The City also mentions that the project site, along with other areas of the City, contain aggregate resources. The City of Anaheim General Plan EIR mentions the closure of mineral extraction within the Project site, and that the Project site is not designated as a regionally significant source of aggregate; therefore, there would be a Less than Significant impact.



3.13 NOISE

3.13.1 Setting

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise scales which are used to describe noise in a particular location. A decibel (dB) is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 dBs represents a ten-fold increase in acoustic energy, while 20 dBs is 100 times more intense, 30 dBs is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a wide range of intensities.

There are several methods of characterizing sound. The most common in California is the A weighted sound level or dBA. This scale gives weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called Leq. The most common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level (CNEL) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The Day/Night Average Sound Level (DNL) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Existing Noise Environment

The Project site(s) are within OC Parks open space, including portions of the NCCP Reserve, adjacent to SR 91 and SR 241. The nearest sensitive receptors to the Project sites are located in an existing residential area near Oak Canyon, approximately 100 feet. The existing noise environment in the Project vicinity is primarily from vehicular traffic along SR 91 and SR 241.

City Noise Ordinance

The City of Anaheim, which is the closest city to the proposed Project area, states in their Municipal Code that noise sources associated with construction-related activities are typically exempt provided the activities do not take place between the hours of 7:00 p.m. and 7:00 a.m. (City of Anaheim, 2016). A portion of the Project is also located within



the City of Orange. The City of Orange states in their Municipal Code Section 8.24.050(e) Noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except for Sunday or a Federal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a Federal holiday are typically exempt.

3.13.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
NOISE: Would the project:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive ground borne vibration or ground borne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of an private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant Impact. The Project includes the development of staging areas, update of existing trails, and parking lot areas, primarily within existing disturbed areas. The City of Anaheim, which is the closest city to the Project area, states in their Municipal Code that noise sources associated with construction-related activities are typically exempt provided the activities do not take place between the hours of 7:00 p.m. and 7:00 a.m. (City of Anaheim, 2016). A portion of the Project is also located within the City of Orange. The City of Orange states in their Municipal Code that noise sources associated with construction-related activities are typically exempt provided the activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on Monday through Saturdays. Additionally, no construction activities are allowed on Sundays or federal holidays.

While construction of the Project could temporarily increase noise levels beyond those that currently exist at or near the Project site, the Project would not result in exposure of persons to or generation of noise levels in excess of standards established in the local General Plan, noise ordinance, or applicable standards of other agencies. As described above, construction would occur only during approved times. These include Monday through Saturday, between the hours of 8:00 a.m. and 7:00 p.m. Compliance with these work hours would be enforced through the

implementation of Mitigation Measure NOI-1. As construction remains within the City's approved work hours potential impacts would be less than significant.

Mitigation Measure

NOI-1 Construction and Maintenance Noise Reduction

A. The project proponent shall produce evidence acceptable to the Manager, Building and Safety, that:

   1) All construction vehicles or equipment, fixed or mobile, operated within 1,000 feet of a dwelling shall be equipped with properly operating and maintained mufflers.

   2) All operations shall comply with Orange County Codified Ordinance Division 6 (Noise Control) including limiting construction activities between the hours of 8:00 a.m. and 7:00 p.m. on all days except Sunday.

   3) Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings.

B. Notations in the above format, appropriately numbered and included with other notations on the front sheet of the project's permitted plans, will be considered as adequate evidence of compliance with this condition.

b) Generation of excessive ground borne vibration or ground borne noise levels?

Less than Significant Impact. Construction of the Project could result in noise and vibration from the use of mechanical machinery (e.g., clearing activities), as well as crew vehicles, required for development of the new staging areas, rehabilitating existing trails, reestablishing historical trails, and parking lot areas. Some noise may also occur during operations from maintenance workers accessing the site. No blasting is required for either construction or operation of the Project. The nearest sensitive receptors to the Project site are residences located more than 100 feet from Oak Canyon. Construction activities would be short-term and intermittent; during operations, maintenance activities would be confined to road, trail, and parking lot areas away from sensitive receptors. Therefore, impacts resulting from exposure to or generation of excessive ground borne vibration/ noise would be less than significant.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the Project Area to excessive noise levels?

No impact. The Project area is located approximately ten miles northeast of John Wayne Airport, approximately 15 miles east of Fullerton Municipal Airport, and approximately nine miles southwest of Chino Airport. The Project is not located within an airport land use plan area or compatibility zone. Therefore, no impacts would occur.

3.14 POPULATION AND HOUSING

3.14.1 Setting

This section evaluates potential impacts on Population and Housing that could result from Project implementation. Analysis in this section is based on the existing environmental setting conditions. The United States Census estimates the population of Irvine at approximately 282,572. Irvine has approximately 98,362 total housing units, with a 0.8% homeowner vacancy rate, and a 4% rental vacancy rate. Of the total housing supply, approximately 48.2% (44,762 units) are owner-occupied, and 51.8% (48,107) are renter-occupied.

3.14.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
POPULATION AND HOUSING: Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The Project would not induce population growth in the area either directly or indirectly. The Project is intended to improve existing recreational facilities with the development of staging areas, rehabilitating existing trails, reestablishing historical trails, and develop parking lot areas, and does not include the construction of new homes, businesses, or other buildings or infrastructure. Therefore, no population impacts would occur.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. There is no existing housing within the Project areas; therefore, there would be no impact to displace substantial numbers of existing housing or the need for replacement housing elsewhere.

3.15 PUBLIC SERVICES

3.15.1 Setting

This section evaluates potential impacts to Public Services that could result from Project implementation. Analysis in this section is based on the existing environmental setting conditions.

Fire protection, as well as emergency medical services and rescue services, is provided by the Orange County Fire Authority (OCFA). Many cities in Orange County have their own fire department; however, others choose to contract fire services with the OCFA. The OCFA is contracted to provide these services to the unincorporated areas of Orange County as well as numerous cities. East Orange I and II are located within the unincorporated area of Silverado, California, and Mountain Park is located within the City of Anaheim. East Orange I and II and Mountain Park are covered by Division 4 of the OCFA with Station #8 being approximately three miles west of East Orange I and II , located at 10631 Skyline Dr, North Tustin and Station #53 being approximately one mile north of Mountain Park, located at 25415 La Palma Ave, Yorba Linda.

Police protection for the Project area is provided by the Orange County Sheriff's Department (OCSD). East Orange I and II are located within the unincorporated area of Silverado and Mountain Park is located within the City of Anaheim. The City of Anaheim, as well as the unincorporated areas of Orange County, contract with the OCSD for police services. The closest OCSD office from the Project site is located at 20202 Windrow Dr, Lake Forest, CA, approximately seven miles south of East Orange II.

All areas of the Project are within the jurisdiction of the Orange Unified School District. However, the nearest school to East Orange Areas I and II is Northwood High School approximately 2.7 miles southwest in the adjacent Irvine Unified School District, located at 4515 Portola Pkwy, Irvine. The nearest school to Mountain Park is Running Springs Elementary School approximately 0.40 mile west at 8670 Running Springs Dr, Anaheim.

3.15.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
PUBLIC SERVICES: Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impact, in order to maintain acceptable service ratios for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impact, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i. Fire protection?

No Impact. The Project consists of the development of staging areas, rehabilitating existing trails, reestablishing historical trails, and develop parking lot areas. The Project would not construct additional residential or commercial developments, nor would it alter acceptable service ratios or response times. The implementation of the Project would not result in environmental impacts associated with the provision of or requiring new or physically altered fire department facilities. Therefore, no impacts would occur.

ii. Police protection?

No Impact. The Project consists of the development of staging areas, rehabilitating existing trails, reestablishing historical trails, and develop parking lot areas. The Project would not construct additional residential or commercial developments, nor would it alter acceptable service ratios or response times. The implementation of the Project would not result in environmental impacts associated with the provision of or requiring new or physically altered police department facilities. Therefore, no impacts would occur.

iii. Schools?

No Impact. The Project would not introduce additional residential development or result in any population increase that would increase demand for school services. Therefore, no impacts would occur.

iv. Parks?

No Impact. The Project would increase the available park supply in the region and would not result in increased usage of existing parks. The recreational improvements to existing trails and general park maintenance proposed for all three parcels are intended to improve and expand permitted recreational use including hiking, mountain biking, and horseback riding. The Project area is designated as P-R (Parks and Recreation). The properties are located within existing Orange County Regional Parks and Open Space and add further acreage to the previous inventory of nearly 60,000 acres. No new housing is proposed, and OC Parks is responsible for and will continue management of the property; therefore, less than Significant impact would occur.



v. Other public facilities?

No Impact. The Project would not introduce new residences and thus the Project would not significantly impact the level of other public services or increase the need for other public facilities, such as libraries or hospitals. Therefore, no impact would occur.



3.16 RECREATION

3.16.1 Setting

In 2014, the Irvine Company donated permanently protected open space to the County of Orange. Four parcels consisting of East Orange I, East Orange II, Mountain Park, and Irvine Park Addition were donated for a total land area of nearly 2,300 acres, adding to the 20,000-acre IROS previously donated by the Irvine Company. These parcel areas are adjacent to Irvine Lake and near the junction of SR 91 and SR 241. The properties are located near existing Orange County Regional Parks and Open Space, such as the recreational facilities surrounding Irvine Lake, and add further acreage to the previous inventory of nearly 60,000 acres. OC Parks is responsible for the management of the property. East Orange II is adjacent to Irvine Lake, which is stocked with largemouth bass, catfish, trout, and crappie. Other activities surrounding the lake include boating and camping.

Recreational improvements and general park maintenance are proposed for three of the four parcels and are intended to improve and expand permitted recreational uses including hiking, mountain biking, and horseback riding. Sustainably designed trail systems are proposed and will be inclusive of a variety of trail characteristics in order to appeal to a wide spectrum of public user-group types and experience levels. Staging areas are proposed to provide parking, public access, portable toilets, and picnic areas. Signage indicating relative information or regulation, access, park boundaries, and public health and safety will be added around the Property and much of the existing signage will be replaced.

3.16.2 Impact Analysis

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

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Less than Significant Impact. Within the East Orange I site, a staging area will be established to facilitate managed public recreational access to the site. Additional improvements include a picnic area, a trailhead, signage, and an entry gate. OC Parks will provide signage at all access points consistent with other OC Parks wilderness and nature preserve facilities. A multi-use trail configuration comprised of historical trails and provisional trails will be established

as part of the proposed project. Historical trails will continue to be maintained in their current condition. The provisional trails and staging area will be used for managed access events only. Trail conditions, habitat impacts, and public satisfaction for the provisional trails will be regularly evaluated during the term of the IRRMP. Official trails will be designated in the RRMP, based on findings from the studies of the provisional trails. Proper maintenance and an increased number of trails and other facilities will keep any increase of use to the existing trails and recreational facilities to a Less than Significant impact, preventing accelerated physical deterioration.

East Orange II has a variety of recreational opportunities and existing facilities. The large event space along the shores of the lake would retain their existing uses and intensities. Lease terms with James Event Productions, Inc. set prior to the land transfer to Orange County Parks will still be honored. As with East Orange I, provisional trails will be opened through managed activities to expand controlled access and provide further recreational activities. Existing trails will be maintained in their current condition. Proper maintenance will keep any increase of use to the existing trails and recreational facilities to a Less than Significant impact, preventing accelerated physical deterioration.

Mountain Park will feature a new staging area with ADA parking at the existing gravel parking lot. Routine maintenance would ensure that existing trails do not deteriorate. Impacts would be Less than Significant.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Less than Significant Impact. The Project consists of the development of a staging area, rehabilitating existing trails, and reestablishing historical trails within previously disturbed areas and would not require the construction or expansion of recreational facilities. An existing staging area will be improved with ADA parking and a connection to existing trails. The new staging area will include accessible parking and signage in accordance with standards for ADA use, portable restrooms, benches, and picnic tables. No motorized vehicles would be permitted on the trails, except for vehicles associated with routine operations and maintenance, park patrol, and emergency services. The Project sets aside the majority of its acreage to wildlife habitat. Project impacts would be Less than Significant.

3.17 TRANSPORTATION

3.17.1 Setting

This section evaluates potential impacts to traffic and transportation that could result from Project implementation. Analysis in this section is based on the existing environmental setting conditions. For the purposes of this section, the network of freeways and roadways surrounding the Project sites is referred to as the existing roadway system.

3.17.1.1 Existing Roadway System

The existing roadway network with the potential to be utilized by the Project includes:

State Route 241

State Route (SR) 241 (SR-241) is a north-south state route that bisects the Project site. SR 241 is a toll road for its entire length within Orange County. The northern portion of SR 241 which bisects the Project is part of the Eastern Transportation Corridor, which is comprised of SR 261, SR 133, and SR 241.

State Route 91

State Route 91 (SR-91) is a major east-west highway that serves a large portion of Los Angeles County. SR-91 runs 59 miles in length, beginning at Vermont Avenue in Gardena, west of the Junction with I-110. SR-91 then runs eastwards to Riverside at the Junction with SR-60.

East Santiago Canyon Road

East Santiago Canyon Road is an east-west major arterial two-lane highway, located in County of Orange unincorporated lands. Shortly south if Irvine Lake, East Santiago Canyon Road downgrades to a primary arterial highway. Santiago Canyon Road begins at the intersection E Chapman Ave and Jamboree Road (E Chapman becomes E Santiago Canyon Road). Santiago Canyon Road then runs roughly southeast for 11 miles through Santiago Canyon to the intersection of Ridgeline Road and El Toro Road.

East Santa Ana Canyon Road

Santa Cana Canyon Road, located within the City of Anaheim, parallels SR 91 east-west from the Anaheim-Orange County line to Gypsum Canyon Road. In the vicinity of the Project, East Santa Ana Canyon Road is classified by the City of Anaheim as a Hillside Secondary Arterial. These are roadways that provide for circulation within the City through areas that are constrained by terrain. Hillside secondary arterial facilities are four-lane roadways, with two parking lanes, that are undivided.

Gypsum Canyon Road

Gypsum Canyon Road, located within the City of Anaheim, runs north-south for approximately one mile, and crosses both SR 91 and the Santa Ana River. In the vicinity of the Project, Gypsum Canyon Road is classified by the City of Anaheim as a Hillside Primary Arterial. These are roadways that provide for circulation within the City and to its adjacent communities through areas that are constrained by terrain. Primary arterials are typically six lane divided facilities with no parking or four lane divided with left turn pockets and two parking lanes.



S Weir Canyon Road

Weir Canyon Road, located within the City of Anaheim, runs northwest-southwest between the Project and SR-91. In the vicinity of the Project, Weir Canyon Road is classified by the City of Anaheim as a Hillside Primary Arterial. These are roadways that provide for circulation within the City and to its adjacent communities through areas that are constrained by terrain. Primary arterials are typically six lane divided facilities with no parking or four lane divided with left turn pockets and two parking lanes. Northwest of the Project, Weir Canyon is classified by the City of Anaheim as a Scenic Expressway.

3.17.1.2 Project Site Primary Access

The Project locations will be accessed by a variety of routes. It is anticipated that East Orange I and II will be accessed primarily via East Santiago Canyon Road, and Mountain Park will be accessed by a combination of East Santa Ana Canyon Road, Gypsum Canyon Road, and S Weir Canyon Road.

3.17.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
TRANSPORTATION AND TRAFFIC: Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less than Significant Impact. Implementation of the Project would not result in an impact on measures of effectiveness for the performance of the circulation system. During construction, a small number of worker trips would be required to transport equipment and labor to and from the site daily; the exact number of trips would vary based on the staffing level and intensity of the construction activity, however it is not expected to exceed 20 trips per day during the one month construction period. These trips would be easily accommodated by the existing traffic system and would not result in a change in the existing level of service in the region. Operation of the Project is anticipated to add

an additional 9 trips during the week to the local traffic system. This small increase in traffic above baseline would not result in a conflict with the applicable plans, ordinances, and polices. Therefore, no impact would occur.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Less than Significant Impact. Implementation of the Project would not result in a noticeable increase in level of service standards or travel demand measures. During construction, a small number of worker trips would be required to transport equipment and labor to and from the site daily; the exact number of trips would vary based on the staffing level and intensity of the construction activity; however, it is not expected to exceed 20 trips per day. These trips would be easily accommodated by the existing traffic system and would not result in a change in the existing level of service in the region. Operation of the Project is anticipated to add an additional 9 trips during the week to the local traffic system

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact. Implementation of the Project would not include design features which would increase hazards, such as new curves or intersections. The Project would require the temporary use of construction equipment such as small earth movers. These pieces of equipment would be transported using existing roadways using trailers and would not constitute an incompatible use or create an on-going traffic disruption.

d) Result in inadequate emergency access?

No Impact. Implementation of the Project would not include any physical changes to the access routes at or near the Project site during either construction or project operations which would hinder or prevent emergency access to the area. The Project area has existing recreational infrastructure which is currently supported by regional emergency services. The Project would not reduce or remove existing emergency access points. Therefore, no impact resulting from inadequate emergency access would occur.

3.18 TRIBAL CULTURAL RESOURCES

3.18.1 Setting

The Legislature added new requirements regarding tribal cultural resources for CEQA in Assembly Bill 52 (AB 52) that took effect July 1, 2015. AB 52 requires consultation with California Native American tribes and consideration of tribal cultural resources in the CEQA process. By including tribal cultural resources early in the CEQA process, the legislature intended to ensure that local and Tribal governments, public agencies, and project proponents would have information available, early in the project planning process, to identify and address potential adverse impacts to tribal cultural resources. By taking this proactive approach, the legislature also intended to reduce the potential for delay and conflicts in the environmental review process. To help determine whether a project may have such an effect, the Public Resources Code requires a lead agency to consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a proposed project.

3.18.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
TRIBAL CULTURAL RESOURCES: Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☒	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a) *Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or*

Less than Significant Impact. The Project site is not listed or eligible for listing in the California Register of Historical Resources or local register. As discussed in Section 3.5, a cultural resources study of the Project areas and 0.5-mile radii was conducted for cultural resources to assist in determining whether implementation of the Project would affect cultural resources.

The results of the East Orange I record search indicated that one prehistoric resource (CA-ORA-1240, P30- 001240) was previously documented within the East Orange I Project Area, and 12 prehistoric resources, three historic resources, and one multi-component resource were previously documented within a 0.5-mile radius of East Orange I. The results of the East Orange II record search indicated that one prehistoric site CA-ORA-1294 (P30-001294), two isolated finds comprised of a single mano, and two groundstone fragments were previously documented within the East Orange II Project Area, and five archaeological sites (all prehistoric) were previously documented within a 0.5-mile radius of the East Orange II Project Area. The results of the Mountain Park records search indicated that one historic period resource was previously documented within the Mountain Park Project Area and one prehistoric resource and one historic resource were previously documented adjacent to the Mountain Park Project Area.

As there are no structures, grading, or excavation activities associated with the Project, the Project would not cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), and Less than Significant impacts would occur.

b) *A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.*

Less than Significant Impact. California Native American tribes have been notified and requested consultation conducted in accordanceaccordance AB 52. On February 28, 2019, letters were sent out to the San Gabriel Band of Mission Indians, the Juaneño Band of Mission Indians, the Soboba Band of Luiseño Indians, and the Gabrieleño Band of Mission Indians - Kizh Nation. The Gabrieleño Band of Mission Indians - Kizh Nation requested consultation with the County on March 8, 2019, via email. Following the written request, representatives from the Tribe and staff from OC Public Works/OC Development Services and OC Parks engaged in consultation via telephone conference on April 18, 2019. Given the information provided on the specifics of the Project, the Tribe concluded consultation. A final consultation letter was sent to the Gabrieleño Band of Mission Indians - Kizh Nation on April 23, 2019.

3.19 UTILITIES AND SERVICE SYSTEMS

3.19.1 Setting

Utilities and service systems to much of the project site is minimal. Most of the site is undeveloped or previously disturbed and vacant. The Santa Ana Regional Water Quality Control Board is responsible for all areas of the project. Power is provided by Southern California Edison. The site is without potable water.

3.19.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
d) Generate solid waste in excess of the State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local management reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects?

Less than Significant Impact. The Project requires no potable water supply for the Project site; however, it does include portable toilets to facilitate the East Orange I parking lot. The Project would not require the construction of a

new water or wastewater treatment facility or expansion of the existing treatment facilities serving the Project area. Therefore, Less than Significant impacts would occur.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

No Impact. The project consists of the development of a staging area, rehabilitating existing trails, and reestablishing historical trails within previously disturbed areas. An existing staging area will be improved with ADA parking. The new staging area will include accessible parking and signage in accordance with standards for ADA use, portable restrooms, benches, and picnic tables. Water supplies would not be required as part of the proposed Project. Water supplies would not be impacted by the Project.

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Less than Significant Impact. The Project consists of the development of a staging area, rehabilitating existing trails, and reestablishing historical trails within previously disturbed areas. An existing staging area will be improved with ADA parking and a connection to existing trails. The new staging area will include a decomposed granite parking lot, accessible parking and signage in accordance with standards for ADA use, portable restrooms, benches, and picnic tables. While the project would include approximately 4 additional portable restrooms (two at EO I/II, two at Mountain Park) there are already existing portable restrooms on the Project site on land managed by OC Parks. These portable restrooms would be provided and serviced by a local company with the capacity to maintain and dispose of all generated wastes. The impact would be Less than Significant to the wastewater treatment provider.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

No Impact. The Project consists of the development of a staging area, rehabilitating existing trails, and reestablishing historical trails within previously disturbed areas. An existing staging area will be improved with ADA parking. The new staging area will include accessible parking and signage in accordance with standards for ADA use, portable restrooms, benches, and picnic tables. Trash cans would be placed at each staging area to prevent littering. The Project location is are served by the Olinda Alpha Landfill, the Frank R. Bowerman Landfill and the Prime Desecha Landfill, which collect the solid waste currently generated by existing activities within festival areas around Irvine Lake. New solid waste generated by the Project's proposed improvements would be minimal compared with existing activities. There would be no impact.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. New solid waste generated by the Project's proposed improvements would be minimal compared with existing activities. The Project would comply with all federal, state, and local statues and regulations relating to solid waste. There would be no impact.



3.20 WILDFIRE

3.20.1 Setting

Wildland fires (wildfires) can occur in open spaces containing a mixture of flammable and nonflammable vegetation cover. The native areas surrounding the active landfill operation area are vulnerable to wildfires due to the steep topography, highly flammable scrub vegetation and limited access for firefighting.

Portions of the proposed Project are located within State Responsivity Areas (SRA) and Local Responsibility Areas (LRA) mapped by CalFire as Very High Fire Hazard Severity Zone (VHFHSZ). An LRA is an area where fire protection is typically provided by city fire departments rather than by CalFire. An SRA is an area where CalFire has the legal responsibility to provide fire protection services. Areas which have been mapped as VHFHSZ are the most at risk for fire within the State. The fire hazard severity model used by CalFire to map these areas consists of two key elements: probability of burning and probable fire behavior. The model also includes probability of flames and embers threatening buildings and considers potential flame length, ember generation potential, and overall likelihood of an area burning. Actions such as creating defensible space around buildings or thinning of nearby vegetation reduce the fire risk of an area, but such actions do not substantially change the overall fire hazard. Fire risk is evaluated as a combination of existing hazards plus mitigations (such as vegetation clearance).

In general, the fire hazard of an area is based on a combination of several variables. Some of these include:

- Fuel Load (vegetation type, density, moisture content)
- Topography (slope)
- Weather
- Building construction (considering combustible roof coverings)
- Wildfire history, and
- Whether there are local measures in place to help reduce the zone's fire rating.

3.20.2 Impact Analysis

Issues	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
Wildfire. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☒	☐	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☒	☐	☐

Issues	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
d) Expose people or structures to significance risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

No Impact. Construction and operation of the proposed Project would include renovations and improvements to existing recreational trails, and the installation of minor improvements such as portable toilets and trash containers. The Project does not include the construction and operation of infrastructure which would alter the existing baseline emergency response risks or interfere with any adopted emergency response or emergency evacuation plans. All existing plans would remain unchanged during the construction and operation of the proposed Project.

b) Due to slope, prevailing winds, or other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Less than Significant Impact with Mitigation. Construction of the proposed Project would involve the use of various earthmoving equipment such as compact excavators or ride-on earth movers. Additionally, some specialized internal combustion tools such as brush mowers and chainsaws will be utilized for tree and vegetation removal. This introduction of equipment into the areas mapped as VHFHSZ would increase the baseline wildfire risks and expose construction workers, and nearby residents to an increased risk of wildfire. During construction, heavy equipment and passenger vehicles driving on vegetated areas prior to clearing could increase the risk of fire. Heated mufflers, explosives used during site preparation, and improper disposal of cigarettes could potentially ignite surrounding vegetation. The use of heavy equipment, such as bulldozers and graders during construction activities and to clear vegetation, has the potential to ignite a wildland fire from sparks created when equipment blades strike rocks or metal objects. If discovered by equipment operator or other Project personnel, small ignitions can be quickly suppressed by the construction equipment and/or on site fire watch personnel by activities such as bulldozing a small ignition.

The Project site contains areas mapped as a VHFHSZ, during extreme weather conditions an uncontrolled grass fire originating within those areas could spread off site and up the slopes of the adjacent wildland areas, posing a risk to life and property. However, the probability of a wildfire to occur as a result of unmitigated Project construction would be low due to the low vegetative fuel load, the proposed moderate level of heavy equipment use and the short construction duration. Regionally, any fire that escapes control or spreads into the mountains could result in a large amount of damage, and the risk of fire as a result of unmitigated Project construction is therefore considered potentially significant.

The fuel tanks on board some construction equipment can contain fuel volumes ranging from 100 to 500 gallons. Accidental ignition could result in a fire, which, depending on the location, could spread outside the immediate area. All construction equipment is required to have fire suppression equipment on board or at the work site. Additionally, permitting requirements of the jurisdictional fire agencies, existing fire codes, and the development of a Project-

specific fire plan, as required by Mitigation Measure FIRE-1 (Fire Protection Plan), would mitigate this potentially significant impact to below a level of significance.

Mitigation Measure

FIRE-1 Fire Prevention Plan

The Applicant shall prepare a Fire Prevention Plan that meets the Orange County Fire Authority (Authority) requirements. The plan shall contain, but not be limited to, the following provisions:

1. Comply with all applicable laws of the State of California and the Fire Prevention Plan. Ensure that a copy of this Fire Prevention Plan and any special permits are to be known and in possession of Project foreman/supervisor on work site daily.

2. All construction equipment shall be fitted with appropriate spark arrestors. Spark arrestors shall meet the standards set forth in the National Wildfire Coordinating Group publication for Multi-position Small Engines, #430-1, or General Purpose and Locomotive, #430-2. Unless determined appropriate by the Authority, spark arrestors are not required on equipment powered by exhaust-driven turbo charged engines or motor vehicles equipped with a maintained muffler. The Applicant shall provide documentation of spark arrestors to the Authority prior to bringing each piece of equipment on site.

3. All construction vehicles and equipment shall carry at least one fully charged fire extinguisher. Fire extinguishers shall be of the type and size set forth in the California Public Resources Code Section 4431. Fire extinguishers shall be appropriately maintained throughout construction, and records of pressure checks shall be submitted to the Authority monthly. Additionally, the following requirements shall apply:

    i. Each truck, personnel vehicle, tractor, grader or piece of heavy equipment shall have one shovel, one axe (or Pulaski) and a fully charged fire extinguisher.

    ii. Each gasoline powered tool (such as chainsaws, chippers, rock drills, etc.) shall have one shovel and one pressurized fire extinguisher. Shovels must be kept within 25 feet of tools when in use.

    iii. All tools and equipment above shall be in good workable conditions, with employee's trained on their use.

    iv. Shovels shall be "O" or larger and be not less than 46 inches in over length.

    v. Axes (or Pulaskis) shall have 2.5-pound or larger heads and be not less than 28 inches in overall length

4. Welding or other hot work shall not occur during the Project without an appropriate hot work permit.

5. A full-time fire watch with appropriately trained personnel and appropriate firefighting equipment shall be available and on site during all times when construction work is taking place. The Applicant shall designate a qualified on-site fire supervisor during Project construction who shall be authorized to act on behalf of the Authority in fire prevention and suppression. The on-site supervisors shall be approved prior to start of Project construction by the Authority.

Fire Watch personnel shall be responsible for patrolling the construction work area for the prevention and detection of fires, and to make sure all fire regulations and fire prevention plans are met, and to take/direct suppression action where necessary. The Fire Watch personnel shall not be permitted to perform other non-fire-related duties. Fire Watch personnel shall remain on duty for at least one hour after the close of work or sunset (whichever comes first). During Red Flag conditions or when deemed necessary by the Authority, Fire Watch personnel shall be required until sunset.

6. The Applicant shall cooperate with the Authority to determine appropriate protocols and provisions for fire and emergency access to the area. The protocols shall include provisions and appropriate notifications if roadway blockages were to occur due to large loads during construction or operation.

7. Cleared and maintained parking areas shall be designated. No parking shall be allowed outside of designated areas. Parking lots shall be covered with gravel.

8. The Applicant shall coordinate with the Authority to determine if additional repeaters or communication equipment would be required for fire response.

9. Refueling shall be performed within equipment service areas, parking areas, and gas and oil storage areas whenever possible.

10. Equipment service areas, parking areas, and gas and oil storage areas shall be cleared of all flammable material down to mineral soil for the radius of at least ten feet. Small mobile or stationary internal combustion engines shall be cleared of flammable material for a slope distance of at least ten feet from such engine.

11. The Applicant shall participate in the Red Flag Warning program with local fire agencies and the National Weather Service. The Applicant shall stop work during Red Flag conditions. If a Red Flag Warning were to occur during critical work activities, or work activities that cannot be stopped (such as equipment movement), the Authority shall be immediately notified. Communication protocols shall be outlined in the plan. The Authority shall approve resumption of construction activities.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Less than Significant Impact with Mitigation. The Project does not propose the installation of new infrastructure, rather improvements to the existing project facilities. The Project would not include new roadways or powerlines which could increase fire risk. Construction and operation of the project would both involve ongoing maintenance to existing facilities, and would include the use of internal combustion engines and small earth moving equipment. This introduction of equipment into the areas mapped as VHFHSZ for the rehabilitation and maintenance of the Project would increase the baseline wildfire risks and expose construction workers, and nearby residents to an increased risk of wildfire. Similar to impacts discussed above, permitting requirements of the jurisdictional fire agencies, existing fire codes, and the development of a Project-specific fire plan, as required by Mitigation Measure FIRE-1 (Fire Protection Plan), would mitigate this potentially significant impact to below a level of significance.

Mitigation Measure

FIRE-1 Fire Prevention Plan

d) Expose people or structures to significance risks, including downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes?

No Impact. The Project does not involve development of residential dwellings and would not increase the wildland-urban interface, defined as the area where structures and other human development meet or intermingle with undeveloped wildland or natural open space. Construction of the Project does not substantially alter the risk of landslides after a wildfire compared to other uses and risks in the area. Impacts which could result from increased risks to downslope or downstream areas would be similar to those currently posed by the existing baseline wildfire risk and would not increase during operation of the proposed Project.

3.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Less than Significant with Mitigation Incorporated. Subject to Mitigation Measures BIO-1 through BIO-7, the Project would not have a substantial impact on special status species, stream habitat, and wildlife dispersal and migration. The Project does not include a component with the potential to otherwise degrade the quality of the environment or eliminate important examples of the major periods of California history or prehistory and include the implementation of Mitigation Measures CULT-1 and GEO-1. Consequently, the Project's Mandatory Finding of Significance relative to degrading the quality of the environment would be Less than Significant with mitigation incorporated.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Less than Significant with Mitigation Incorporated. Less than Significant with Mitigation Incorporated.



A cumulative impact could occur for a given resource area if the project were to result in an incrementally considerable contribution to a significant cumulative impact resulting from past, present, and reasonably foreseeable future projects. As addressed in the above analysis, implementation of the Project would not, in itself, result in any potentially direct or indirect significant unavoidable impacts.

The Project is limited to short-term construction activities regarding development of a staging area, rehabilitating existing trails, and installing minor services such as trash cans. An existing staging area will be improved with ADA parking and a connection to existing trails. The new staging area will include a graveled parking lot, accessible parking and signage in accordance with standards for ADA use, portable restrooms, benches, and picnic tables. The Project is consistent with the existing land use, would not result in population growth, would not generate substantial demand for new utility and service systems or long-term increase in air emissions, noise, or traffic. The Project trails and parking lot are located in generally remote areas, and there are no known planned projects in the vicinity of any of the Project sites. Past and ongoing projects in the vicinity of the trails and trailheads include roads, residential developments, and other recreational projects. The impacts of the proposed Project would be limited in both intensity and scope due to the relatively small size, scattered locations, and type of trail improvements proposed.

Construction of the Project would primarily result in potential impacts associated with construction to biological resources, cultural resources, geology and soils, hydrology and water quality, and noise. With incorporation of Mitigation Measures AQ-1 through AQ-5, BIO-1 through BIO-7, CULT-1, GEO-1, WQ-1 through WQ-3, NOI-1, and FIRE-1, potential impacts of the Project would be substantially avoided or offset and would not rise to a level of significance.

Since Project impacts would be less than significant after mitigation, impacts associated with the proposed Project are not expected to contribute considerably to cumulative impacts in the vicinity of the trail alignments. Cumulative impacts would be less than significant.

c) *Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?*

Less than Significant with Mitigation Incorporated. Subject to Mitigation Measure NOI-1, which would require construction and maintenance activities to occur during days and times consistent the County's Noise Ordinance, the Project would not have result in an environmental effect, which would cause substantial adverse effects on human beings. The Project would have Less than Significant impacts relative to adverse effects on humans, either directly or indirectly with mitigation incorporated.

4.0 MITIGATION MONITORING AND REPORTING PLAN

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
AIR QUALITY							
AQ-1	OC Parks	Vehicle travel on unpaved roadways shall be limited to 15 miles per hour or less.	All Project Activities				
AQ-2	OC Parks	A gravel apron, 25 feet long by road width, shall be used to reduce mud/dirt trackout from unpaved truck/vehicle exit routes.	Project Activities Involving Grading and/or Excavations				
AQ-3	OC Parks	A soil stabilizer shall be applied to unpaved construction site access routes.	Project Activities Involving Grading and/or Excavations				
AQ-4	OC Parks	Apply water three times daily to disturbed construction areas.	Project Activities Involving Grading and/or Excavations				
AQ-5	OC Parks	Ground cover shall be replaced in disturbed areas as quickly as possible.	Project Activities Involving Grading and/or Excavations				
BIOLOGICAL RESOURCES							
BIO-1	OC Parks	**Wildlife Pre-Construction Surveys and Biological Monitoring:** Prior to ground disturbance or vegetation clearing within the Project site, a qualified biologist shall conduct surveys for wildlife (no more than 14 days prior to site disturbing activities) where suitable habitat is present and directly impacted by construction activities. The qualified biologist must be approved by OC Parks prior to the commencement of surveys. Wildlife found within the Project site or in areas	Prior to Construction				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		potentially affected by the Project will be relocated to the nearest suitable habitat that will not be affected by the project prior to the start of construction. Special-status species found within a Project impact area shall be relocated by an authorized biologist to suitable habitat outside the impact area. The Project proponent shall provide written evidence to OC Parks, that the Project proponent has retained a qualified biological monitor with expertise in the species known to occur or with the potential to occur on the Project site. The qualified biologist shall be present during initial ground disturbance for each phase of construction. Once initial ground disturbance is complete, monitoring will occur periodically during all construction activities. The qualified biologist(s) shall be present at all times during ground-disturbing activities immediately adjacent to, or within habitat that supports populations of listed or special-status species. If required, during pre-construction surveys and/or required monitoring efforts, the qualified biologist will relocate common and special-status species that enter the Project site; some special-status species may require specific permits prior to handling and/or have established protocols for relocation. Records of all detection capture, and release shall be reported to CDFW.					
BIO-2	OC Parks	**Environmental Awareness Training:** The Project proponent shall submit proof to the OC Parks, that all Project personnel attended an environmental awareness and compliance training program. The training program shall present the environmental regulations and applicable permit conditions that the Project team shall comply with. The training program shall include applicable measures established for the Project to minimize impacts to water quality and avoid sensitive resources, habitats and species. Dated sign-in sheets for attendees at these meetings shall be maintained and submitted to OC Development Services.	Prior to Construction				
BIO-3	OC Parks	**Implement Best Management Practices (BMPs):** The Project shall implement the following Best Management Practices (BMPs):	All Project Activities				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		• Restrict non-essential equipment to the existing roadways and/or ruderal areas to avoid disturbance to native vegetation. • All excavation, steep-walled holes or trenches in excess of six inches in depth shall will be covered at the close of each working day by plywood or similar materials or provided with one or more escape ramps constructed of earth dirt fill or wooden planks. Trenches will also be inspected for entrapped wildlife each morning prior to onset of construction activities and immediately prior to covering with plywood at the end of each working day. Before such holes or trenches are filled, they will be thoroughly inspected for entrapped wildlife. Any wildlife discovered will be allowed to escape before construction activities are allowed to resume or removed from the trench or hole by a qualified biologist holding the appropriate permits (if required). • Minimize mechanical disturbance of soils to reduce impact of habitat manipulation on small mammals, reptiles, and amphibians. • Removal/disturbance of vegetation shall be minimized to the greatest extent feasible. • Install and maintain appropriate erosion/sediment control measures, as needed, throughout the duration of work activities. • Vehicles shall not be driven, or equipment operated, in water covered/wetted portions of the stream channel, or where riparian vegetation may be destroyed, except as otherwise provided for in the permits/agreements from the CDFW, USACE, and/or Regional Water Quality Control Board (RWQCB). • No vehicles or equipment shall be refueled within 100 feet of an ephemeral drainage or wetland unless a bermed and lined refueling area is constructed. Spill kits shall be maintained on site in sufficient quantity to accommodate at least three complete vehicle tank failures of 50 gallons each. Any vehicles driven and/or operated within or adjacent to drainages or wetlands shall be checked and maintained daily to prevent leaks of materials.					

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		• Disinfection of all equipment prior to use on the project site to reduce potential for the spread of ISHBs. • Pruning of tree limbs within the Project area potentially infested with ISHBs. • Avoidance and minimization of the transport of potential ISHB host tree materials and proper disposal of potential host materials (i.e., chipping, solarization, composting all prior to delivering to a landfill).					
BIO-4	OC Parks	**Nesting Bird Surveys and Avoidance Measures:** Prior to initial site disturbance, seasonally timed presence/absence surveys for nesting birds shall be conducted by a qualified biologist; the qualified biologist must be approved by OC Parks ices prior to the commencement of surveys. If construction activities carry over into a second nesting season(s) the surveys will need to be completed annually until the Project is complete. A minimum of three survey events, three days apart shall be conducted (with the last survey no more than three days prior to the start of site disturbance), if construction is scheduled to begin during avian nesting season (February 15th through September 15th); surveys for raptors shall be conducted from January 1st to August 15th. Surveys shall be conducted within 500 feet of all Project activities. If coastal California gnatcatcher, least Bell's vireo, or other special-status species are observed, consultation with USFWS and/or CDFW is required. If breeding birds with active nests are found prior to or during construction, a qualified biological monitor shall establish a 300-foot buffer around the nest and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. The prescribed buffers may be adjusted by the qualified biologist based on existing conditions around the nest, planned construction activities, tolerance of the species, and other pertinent factors. The qualified biologist shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails. If construction occurs outside of avian nesting season, only a single presence/absence survey will be required.	All Project Activities				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
BIO-5	OC Parks	**Conduct Pre-Construction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and other Special-Status Plants and Development of a Transplanting Plan:** Prior to initial ground disturbance and for undisturbed areas in subsequent construction years, the Project proponent shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, Candidate, and other special-status plants in all areas subject to ground-disturbing activity. The surveys shall be conducted during the appropriate blooming period(s) by a qualified plant ecologist/biologist, approved by OC Parks, according to protocols established by the USFWS, CDFW, and CNPS. All listed plant species found shall be marked and avoided. Any populations of special-status plants found during surveys will be fully described, mapped, and a CNPS Field Survey Form or written equivalent shall be prepared. Prior to ground disturbance activities or vegetation removal, any populations of listed or special-status plant species identified during the surveys within the Project limits and beyond, shall be protected and a buffer zone placed around each population. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance including human trampling, erosion, and dust. The size of the buffer depends upon the proposed use of the immediately adjacent lands and includes consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, physical and chemical characteristics of soils) that are identified by the qualified plant ecologist and/or botanist. The buffer for herbaceous and shrub species shall be, at minimum, 50 feet from the perimeter of the population or the individual; the qualified plant ecologist/biologist may increase this minimum buffer depending on species and location. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the USFWS and CDFW as applicable. Where impacts to listed plants are determined to be unavoidable, the USFWS and/or CDFW shall be consulted for authorization. Additional mitigation measures to protect or	Prior to construction				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		restore listed plant species or their habitat, including but not limited to a salvage plan including seed collection and replanting, may be required by the USFWS or CDFW before impacts are authorized, whichever is appropriate.					
BIO-6	OC Parks	**Conduct Protocol Surveys for Least Bell's Vireo and Coastal California Gnatcatcher** A qualified avian biologist shall conduct focused protocol surveys in suitable habitat within 500 feet of proposed Project disturbance areas within the breeding season prior to the start of construction. The surveys shall be of adequate duration to verify potential nest sites if work is scheduled to occur during the breeding season and follow established protocols. If a territory or nest is confirmed in a previously unoccupied area, the CDFW and USFWS shall be notified within 48 hours. In coordination with the CDFW and USFWS, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted as determined by a qualified avian biologist in coordination with the CDFW and USFWS. The County, in consultation with the qualified biologist, shall halt construction if activities outside of but near the 300-foot buffer are determined to be negatively impacting the nesting birds. The qualified biologist shall devise methods to reduce the noise and/or disturbance in the vicinity as needed. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge.	Prior to construction				
BIO-7	OC Parks	**Vegetation Removal and Replacement:** Construction activities shall be done in such a manner as to minimize the removal of native vegetation. If native vegetation removal cannot be avoided, and the removal is approved by OC Parks, the impacted plant communities shall be replaced at a mitigation ratio of 1:1. Sensitive communities shall be replaced at a mitigation ration of 3:1. The compensation for the loss of habitats may be achieved either by a) on-site habitat creation or enhancement of California sycamore woodlands and southern	All Project Activities				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		riparian scrub communities with similar species compositions to those present prior to construction, b) off-site creation or enhancement of California sycamore woodlands and southern riparian scrub communities, or c) participation in an established mitigation bank program. Prior to the removal of native vegetation, if on or off-site mitigation is required, a Habitat Mitigation and Monitoring Plan shall be prepared that will guide all restoration and monitoring activities. This plan shall include, at a minimum, the following: • Proposed species list for creation/enhancement; • Planting/seeding methodology; • Irrigation plan; • Weeding schedule; • Success criteria; • Monitoring methodology and schedule; and • Reporting requirements.					
CULTURAL RESOURCES							
CULT-1	OC Parks	The applicant shall provide written evidence to OC Parks, that the applicant has retained a County-certified archaeologist, to observe ground disturbance activities and salvage and catalogue archaeological resources as necessary. The archaeologist shall be present at the pre-grade conference, shall establish procedures for archaeological resource surveillance, and shall establish, in cooperation with the applicant, procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the artifacts as appropriate. If the archaeological resources are found to be significant, the archaeological observer shall determine appropriate actions, in cooperation with the project applicant, for exploration and/or salvage. The applicant shall obtain approval of the archaeologist's follow-up report from OC Parks. The report shall include: the period of inspection, an analysis of any artifacts found and the present repository of the artifacts. The archaeologist shall prepare excavated material to the point of identification. Applicant shall offer excavated finds for curatorial purposes to the County of Orange, or its designee, on a first refusal basis.	Prior to construction				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		These actions, as well as final mitigation and disposition of the resources, shall be subject to the approval of OC Parks. Applicant shall pay curatorial fees if an applicable fee program has been adopted by the Board of Supervisors, and such fee program is in effect at the time of presentation of the materials to the County of Orange or its designee, all in a manner meeting the approval of OC Parks.					
CULT-2	OC Parks	Human Remains. If human remains are discovered, all work shall be halted immediately within 50 feet of the discovery, the City shall be notified, and the County Coroner must be notified, according to Section Public Code Resources Code Section 5097.98. The County Coroner must be notified within 24 hours of the discovery, and within two working days of notification of the discovery would make such a determination. If the County Coroner determines that the remains are or are believed to be Native American, the County Coroner would notify the NAHC in Sacramento within 24 hours. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the County Construction Engineer, the treatment and disposition of the human remains.	During Construction				
Geology and Soils							
GEO-1	OC Parks	Prior to the start of construction, a paleontological resource monitoring and mitigation plan (PRMMP) will be prepared. The PRMMP will provide detailed recommended monitoring locations including locations mapped as high to very high sensitivity; a description of a worker training program; detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; and notification procedures in the event of a fossil discovery by paleontological monitor or other project personnel. A curation agreement with an accredited repository approved by OC Parks must be obtained. Any subsurface bones or potential fossils that are unearthed during construction should be evaluated by a Qualified Paleontologist.	Prior to construction				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
WQ-3	OC Parks	See **WQ-3 Stormwater Pollution Prevention Plan** below	Prior to construction				
Hydrology and Water Quality							
WQ-1	OC Parks	The applicant shall submit for review and approval by the Manager, Building and Safety Permit Services, a Water Quality Management Plan (WQMP) specifically identifying Best Management Practices (BMPs) that will be used onsite to control predictable pollutant runoff. The applicant shall utilize the Orange County Drainage Area Management Plan (DAMP), Model WQMP, and Technical Guidance Manual for reference, and the County's WQMP template for submittal. This WQMP shall include the following: - Detailed site and project description - Potential stormwater pollutants - Post-development drainage characteristics - Low Impact Development (LID) BMP selection and analysis Hydromodification Control BMP selection and analysis - Structural and Non-Structural source control BMPs - Site design and drainage plan (BMP Exhibit) - GIS coordinates for all LID and Treatment Control **BMPs** Operation and Maintenance (O&M) Plan that (1) describes the long-term operation and maintenance requirements for BMPs identified in the BMP Exhibit; (2) identifies the entity that will be responsible for long-term operation and maintenance of the referenced BMPs; and (3) describes the mechanism for funding the long-term operation and maintenance of the referenced BMPs The BMP Exhibit from the approved WQMP shall be included as a sheet in all plan sets submitted for plan check and all BMPs shall be depicted on these plans.	Prior to construction				
WQ-2	OC Parks	**Compliance with the NPDES Implementation Program** Prior to the issuance of a certificate of use and occupancy, the applicant shall demonstrate compliance with the County's	Prior to construction				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		NPDES Implementation Program in a manner meeting the satisfaction of the Manager, OC Inspection, including: - Demonstrate that all structural Best Management Practices (BMPs) described in the BMP Exhibit from the project's approved WQMP have been implemented, constructed and installed in conformance with approved plans and specifications - Demonstrate that the applicant has complied with all non-structural BMPs described in the project's WQMP - Submit for review and approval an Operations and Maintenance (O&M) Plan for all structural BMPs (the O&M Plan shall become an attachment to the WQMP; - Demonstrate that copies of the project's approved WQMP (with attached O&M Plan) are available for each of the initial occupants; - Agree to pay for a Special Investigation from the County of Orange for a date twelve (12) months after the issuance of a Certificate of Use and Occupancy for the project to verify compliance with the approved WQMP and O&M Plan - Demonstrate that the applicant has RECORDED one of the following: 1. The CC&R's (that must include the approved WQMP and O&M Plan) for the project's Homeowner's Association; 2. A water quality implementation agreement that has the approved WQMP and O&M Plan attached; or 3. 3. The final approved Water Quality Management Plan (WQMP) and Operations and Maintenance (O&M) Plan.					
WQ-3	OC Parks	**Stormwater Pollution Prevention Plan** The applicant shall demonstrate compliance with California's General Permit for Stormwater Discharges Associated with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number; or other proof of filing in a manner meeting the satisfaction of the Manager, Permit Intake. Projects subject to this requirement shall prepare					

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		and implement a Stormwater Pollution Prevention Plan (SWPPP). A copy of the current SWPPP shall be kept at the project site and be available for County review on request.					
Noise							
NOI-1	OC Parks	**Construction and Maintenance Noise Reduction** A. The project proponent shall produce evidence acceptable to the Manager, Building and Safety, that: 1. All construction vehicles or equipment, fixed or mobile, operated within 1,000 feet of a dwelling shall be equipped with properly operating and maintained mufflers. 2. All operations shall comply with Orange County Codified Ordinance Division 6 (Noise Control) including limiting construction activities between the hours of 8:00 a.m. and 7:00 p.m. on all days except Sunday. 3. Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings. B. Notations in the above format, appropriately numbered and included with other notations on the front sheet of the project's permitted plans, will be considered as adequate evidence of compliance with this condition.	During Construction				
Wildfires							
FIRE-1	Orange County Fire Authority	**FIRE-1 Fire Prevention Plan** The Applicant shall prepare a Fire Prevention Plan that meets the Orange County Fire Authority (Authority) requirements. The plan shall contain, but not be limited to, the following provisions: 1. Comply with all applicable laws of the State of California and the Fire Prevention Plan. Ensure that a copy of this Fire Prevention Plan and any special permits are to be known and in possession of Project foreman/supervisor on work site daily.	Prior to construction				

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		2. All construction equipment shall be fitted with appropriate spark arrestors. Spark arrestors shall meet the standards set forth in the National Wildfire Coordinating Group publication for Multi-position Small Engines, #430-1, or General Purpose and Locomotive, #430-2. Unless determined appropriate by the Authority, spark arrestors are not required on equipment powered by exhaust-driven turbo charged engines or motor vehicles equipped with a maintained muffler. The Applicant shall provide documentation of spark arrestors to the Authority prior to bringing each piece of equipment on site. 3. All construction vehicles and equipment shall carry at least one fully charged fire extinguisher. Fire extinguishers shall be of the type and size set forth in the California Public Resources Code Section 4431. Fire extinguishers shall be appropriately maintained throughout construction, and records of pressure checks shall be submitted to the Authority monthly. Additionally, the following requirements shall apply: 4. Each truck, personnel vehicle, tractor, grader or piece of heavy equipment shall have one shovel, one axe (or Pulaski) and a fully charged fire extinguisher. 5. Each gasoline powered tool (such as chainsaws, chippers, rock drills, etc.) shall have one shovel and one pressurized fire extinguisher. Shovels must be kept within 25 feet of tools when in use. 6. All tools and equipment above shall be in good workable conditions, with employee's trained on their use. 7. Shovels shall be "O" or larger and be not less than 46 inches in over length. 8. Axes (or Pulaskis) shall have 2.5-pound or larger heads and be not less than 28 inches in overall length 9. Welding or other hot work shall not occur during the Project without an appropriate hot work permit. 10. A full-time fire watch with appropriately trained personnel and appropriate firefighting equipment shall be available and on site during all times when					

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		construction work is taking place. The Applicant shall designate a qualified on-site fire supervisor during Project construction who shall be authorized to act on behalf of the Authority in fire prevention and suppression. The on-site supervisors shall be approved prior to start of Project construction by the Authority. Fire Watch personnel shall be responsible for patrolling the construction work area for the prevention and detection of fires, and to make sure all fire regulations and fire prevention plans are met, and to take/direct suppression action where necessary. The Fire Watch personnel shall not be permitted to perform other non-fire-related duties. Fire Watch personnel shall remain on duty for at least one hour after the close of work or sunset (whichever comes first). During Red Flag conditions or when deemed necessary by the Authority, Fire Watch personnel shall be required until sunset. 11. The Applicant shall cooperate with the Authority to determine appropriate protocols and provisions for fire and emergency access to the area. The protocols shall include provisions and appropriate notifications if roadway blockages were to occur due to large loads during construction or operation. 12. Cleared and maintained parking areas shall be designated. No parking shall be allowed outside of designated areas. Parking lots shall be covered with gravel. 13. The Applicant shall coordinate with the Authority to determine if additional repeaters or communication equipment would be required for fire response. 14. Refueling shall be performed within equipment service areas, parking areas, and gas and oil storage areas whenever possible. 15. Equipment service areas, parking areas, and gas and oil storage areas shall be cleared of all flammable material down to mineral soil for the radius of at least					

Mitigation Measure	Lead Agency Department	Action(s) Required	Required Time of Compliance	Action Taken	Verified By/Dept.	Date	Further Action Needed
		ten feet. Small mobile or stationary internal combustion engines shall be cleared of flammable material for a slope distance of at least ten feet from such engine. 16. The Applicant shall participate in the Red Flag Warning program with local fire agencies and the National Weather Service. The Applicant shall stop work during Red Flag conditions. If a Red Flag Warning were to occur during critical work activities, or work activities that cannot be stopped (such as equipment movement), the Authority shall be immediately notified. Communication protocols shall be outlined in the plan. The Authority shall approve resumption of construction activities.					

5.0 PROPOSED FINDINGS

ENVIRONMENTAL DETERMINATION

On the basis of this initial evaluation: ☐
I find that the proposed Project **COULD NOT** have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.

I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A **MITIGATED NEGATIVE DECLARATION** will be prepared. *Attached Mitigation Measures and Monitoring Program.* ☒

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

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

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

Joanna Chang
Signature:

9/6/19
Date:

6.0 LIST OF PREPARERS

Lead Agency	Natalia Gaerlan, PLA	Orange County Parks
Project Manager	StephAnnie Roberts	Stantec Consulting Services Inc.
Graphics Design	Jared Varonin	Stantec Consulting Services Inc.
Project Description	Lindsay McDonough	Stantec Consulting Services Inc.
	StephAnnie Roberts	Stantec Consulting Services Inc.
Aesthetics	Lindsay McDonough	Stantec Consulting Services Inc.
Agriculture and Forestry Resources	Colleen Hulbert	Stantec Consulting Services Inc.
Air Quality	Michael Weber	Stantec Consulting Services Inc.
Biological Resources	Jared Varonin	Stantec Consulting Services Inc.
Cultural Resources	Colleen Hulbert	Stantec Consulting Services Inc.
Energy	Patrick Meddaugh	Stantec Consulting Services Inc.
Geology and Soils	Colleen Hulbert	Stantec Consulting Services Inc.
Greenhouse Gas Emissions	Michael Weber	Stantec Consulting Services Inc
Hazards and Hazardous Materials	Colleen Hulbert	Stantec Consulting Services Inc.
	StephAnnie Roberts	Stantec Consulting Services Inc.
Hydrology and Water Quality	Lindsay McDonough	Stantec Consulting Services Inc.
Land Use and Planning	Patrick Meddaugh	Stantec Consulting Services Inc.
Mineral Resources	Colleen Hulbert	Stantec Consulting Services Inc.
Noise	Lindsay McDonough	Stantec Consulting Services Inc.
Population and Housing	Colleen Hulbert	Stantec Consulting Services Inc.
Public Services	Colleen Hulbert	Stantec Consulting Services Inc.
Recreation	David Christie	Stantec Consulting Services Inc.
Transportation and Traffic	Patrick Meddaugh	Stantec Consulting Services Inc.
Tribal Cultural Resources	Colleen Hulbert	Stantec Consulting Services Inc.
Utilities and Service System	David Christie	Stantec Consulting Services Inc.
Wildfire	Patrick Meddaugh	Stantec Consulting Services Inc.
Mandatory Findings of Significance	StephAnnie Roberts	Stantec Consulting Services Inc.

7.0 REFERENCES

Glen Lukos, 2004

California Farmland Mapping and Monitoring Program, 2018. Available online at https://www.arcgis.com/home/webmap/viewer.html?layers=6586b7d276d84581adf921de7452f765. Accessed on November 19, 2018.

County of Orange General Plan, 2005. Resources Element. Available Online at https://www.ocgov.com/civicax/filebank/blobdload.aspx?blobid=40235. Accessed November 19, 2018.

United States Department of Agriculture (USDA), 2016. California's Forest Resources: Forest Inventory and Analysis, 2001–2010. General Technical Report PNW-GTR-913. Available online at https://www.fs.fed.us/pnw/pubs/pnw_gtr913.pdf. Accessed on November 19, 2018.

Paleo Solutions, Inc., 2018. Paleontological Evaluation and Inventory Report. Orange County Parks 2014 Irvine Ranch Open Space Donation Project. Prepareed for Stantec Consulting Services, Inc. August 1, 2018.

Levick et al. 2008 – Levick, L., J. Fonseca, D. Goodrich, M. Hernandez, D. Semmens, J. Stromberg, R. Leidy, M. Scianni, D.P. Guertin, M. Tluczek, and W. Kepner, The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest. U.S. Environmental Protection Agency and USDA/ARS Southwest Watershed Research Center, EPA/600/R-08/134, ARS/233046, 116 p.

Penrod, K., R. Hunter, and M. Merrifield. 2001. Missing Linkages: Restoring Connectivity to the California Landscape, Conference Proceedings. Co-sponsored by California Wilderness Coalition, The Nature Conservancy, U.S. Geological Survey, Center for Reproduction of Endangered Species, and California State Parks.

City of Anaheim, 2016. Anaheim Municipal Code. Chapter 6.70 Sound Pressure Levels. Available online at http://www.nonoise.org/lawlib/cities/ordinances/Anaheim,%20California.pdf. Accessed on April 9, 2019.

Orange County Parks. 2019. Irvine Ranch Open space. Available online at http://www.ocparks.com/parks/irvineranch/. Accessed June 11, 2019

National Parks Service. National Natural Land Marks, Irvine Ranch. Available online at https://www.nps.gov/subjects/nnlandmarks/site.htm?Site=IRRA-CA. Accessed June 11, 2019

California Scenic Highway Mapping System. State of California. Avalible online at. http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/ Accessed June 11, 2019

Stantec Consulting Services, Inc. (Stantec), 2018. Cultural Resources Survey on Behalf of OC Parks of Portions of East Orange I, II, and Mountain Park Conservation Easements. Staging Area and Trail Improvement Projects, Near Irvine Lake, Orange County, California.

California Department of Conservation (DOC), 2010. Alquist-Priolo Earthquake Fault Zones. http://www.conservation.ca.gov/cgs/Pages/Earthquakes/affected.aspx. Accessed October 11, 2018.

California Geological Survey (CGS), 2001. Earthquake Zones of Required Investigation - Black Star Canyon Quadrangle. http://gmw.conservation.ca.gov/SHP/EZRIM/Maps/BLACK_STAR_CANYON_EZRIM.pdf. Accessed October 11, 2018.

References

California Geological Survey (CGS), 2003. Earthquake Zones of Required Investigation – Prado Dam Quadrangle. http://gmw.conservation.ca.gov/SHP/EZRIM/Maps/PRADO_DAM_EZRIM.pdf. Accessed October 11, 2018.

Southern California Earthquake Data Center, 2018. Significant Earthquakes and Faults. http://scedc.caltech.edu/significant/whittier.html. Accessed October 11, 2018.

County of Orange General Plan, 2005. Safety Element. https://www.ocgov.com/civicax/filebank/blobdload.aspx?blobid=40234. Accessed October 11, 2018.

United States Department of Agriculture (USDA), 2018. https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed October 11, 2018.

Jahns, R., 1954. Southern California Geology. California Division of Mines Bulletin 170, San Francisco.

Dice, M., and C. Taniguchi, 2004. Phase 2 Archaeological Testing Evaluation of Irvine Ranch Cultural Resources. Report on file at the South Central Coastal Information Center, Fullerton.

California Emission Estimator Model (CalEEMod). 2016. CalEEMod Version 2016.3.2. air model. http://www.caleemod.com/

South Coast Air Quality Management District, 2017a, National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin, available at http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf?sfvrsn=2, accessed on April 3, 2017.

South Coast Air Quality Management District, 2017b, Final 2016 Air Quality Management Plan, available at http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

South Coast Air Quality Management District, 2008, Final Localized Significance Threshold Methodology, available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2.

South Coast Air Quality Management District, 2008, SCAQMD Air Quality Significance Thresholds, available at www.aqmd.gov/docs/default.../ceqa/.../scaqmd-air-quality-significance-thresholds.pdf.

South Coast Air Quality Management District, 1993, CEQA Air Quality Handbook.

United States Census Bureau. American Fact Finder. 2018a. Population Estimates. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

United States Census Bureau. American Fact Finder. 2018b. Housing Characteristics. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

City of Orange. Chapter 8,24 – Noise Control. Subsection 8.24.050e. https://library.municode.com/ca/orange/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.24NOCO

City of Anaheim General Plan EIR. May 2004. http://m.anaheim.net/generalplan/EIR/eir.htm

California Department of Conservation. Guidelines for Classification and Designation of Mineral Lands. https://www.conservation.ca.gov/smgb/Guidelines/Documents/ClassDesig.pdf

FIGURES

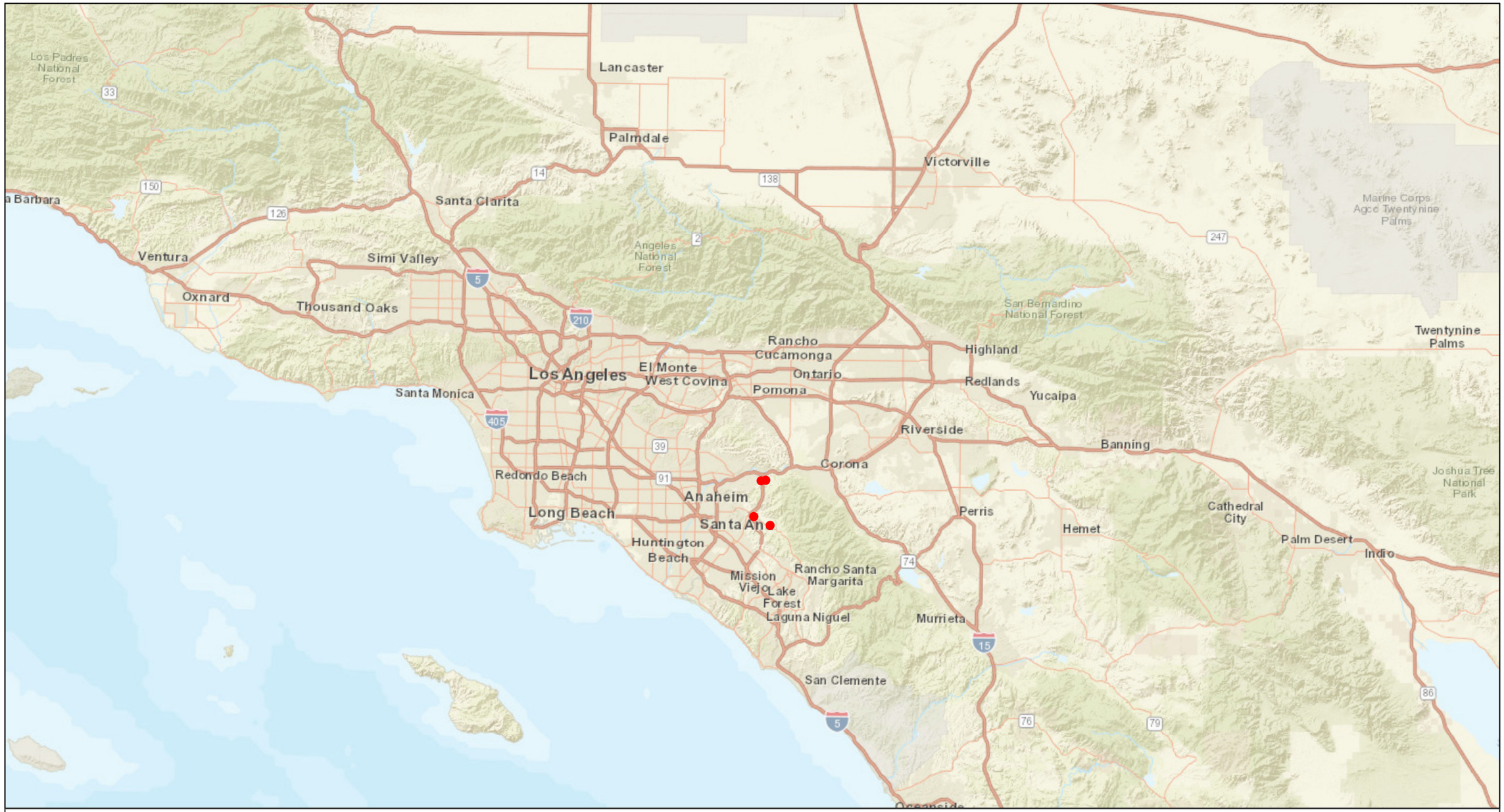
Figure 1 Project Vicinity

Figure 2 Recreation Trail Opportunities Overview

Figure 3 Recreation Trail Opportunities East Orange I

Figure 4 Recreation Trail Opportunities East Orange II

Figure 5 Recreation Trail Opportunities Mountain Park



Project Site Location

N

0 38,000 76,000 Feet

1:906,055 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Stantec

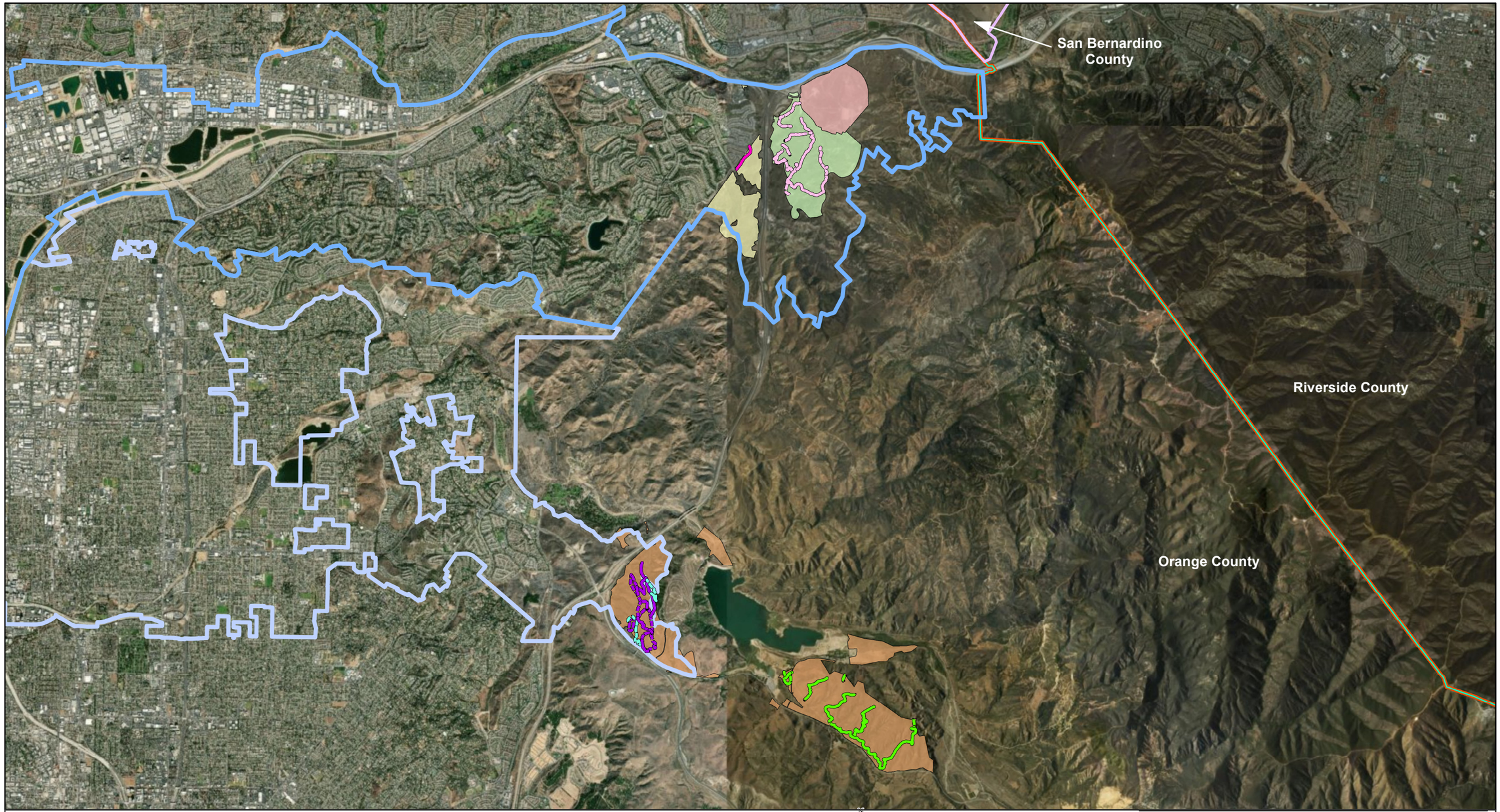
Project Location
Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Initial Study / Mitigated Negative Declaration

Figure No.
1

Title
Project Vicinity



East Orange I - Primary Trail
East Orange I - Secondary Trail
East Orange II Trail
Mountain Park Trail
Oak Canyon Trail

East Orange Conservation Easements 080414
Mountain Park Conservation Easement Left
Mountain Park Conservation Easement Right
Mountain Park Unencumbered Parcel
Anaheim City Boundary

Orange City Boundary

County Boundaries

Orange County Boundary
Riverside County Boundary
San Bernardino County Boundary

N

0 3,000 6,000 Feet

1:72,125 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

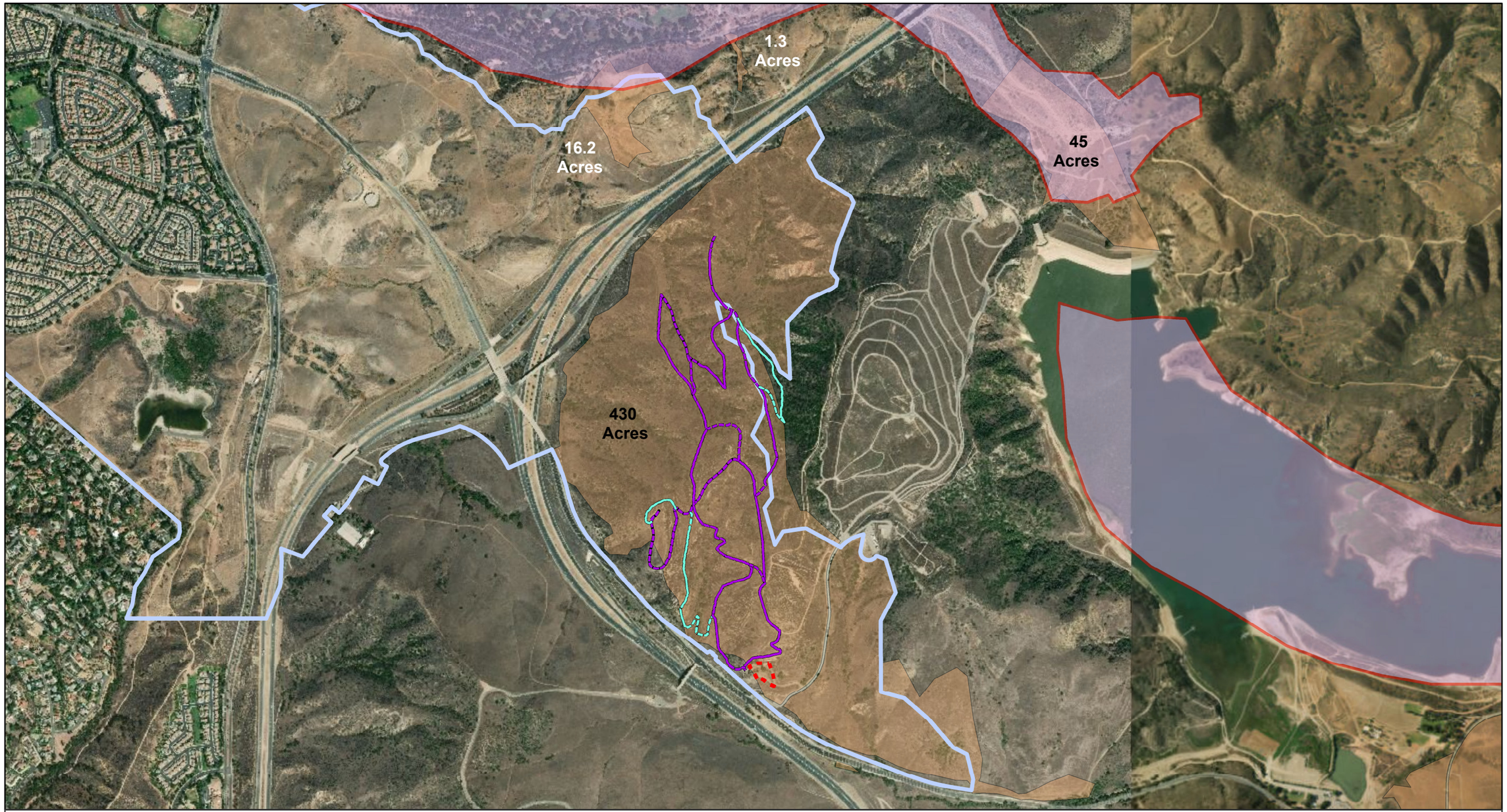
Project Location
Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-04-02
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.
2

Title
Recreation Trail Opportunities Overview



Staging Area

East Orange I - Primary Trail

East Orange I - Secondary Trail

East Orange Conservation Easements 080414

Orange City Boundary

MRZ-2 – Mineral Resource Zone where adequate information indicates that significant mineral deposits are present, or there is a high likelihood of their presence and development should be controlled

N

0 625 1,250 Feet

1:14,784 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

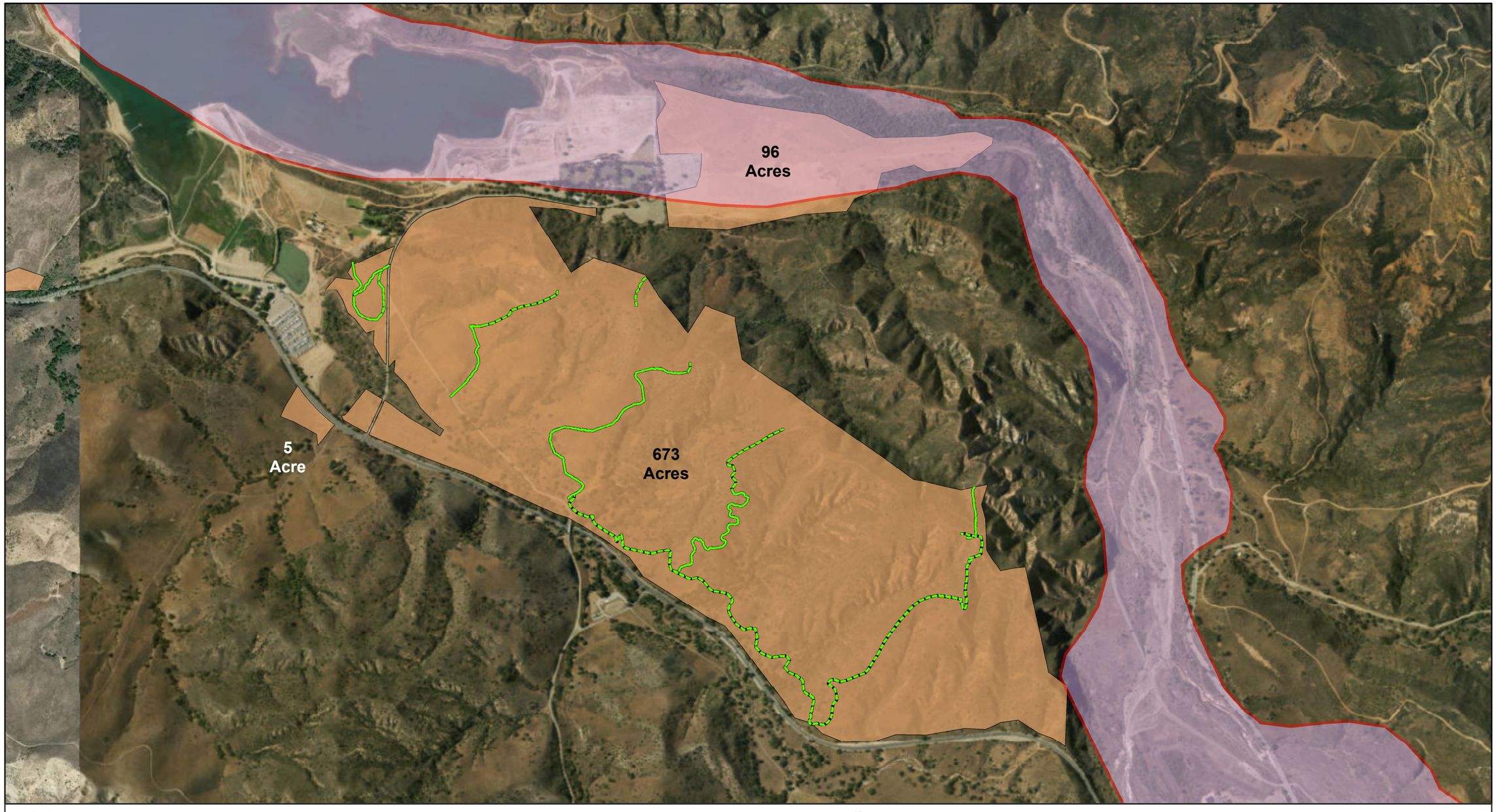
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3

Title

Recreation Trail Opportunities East Orange I



East Orange II Trail

East Orange Conservation Easements 080414

MRZ-2 – Mineral Resource Zone where adequate information indicates that significant mineral deposits are present, or there is a high likelihood of their presence and development should be controlled

N

0 640 1,280 Feet

1:15,041 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

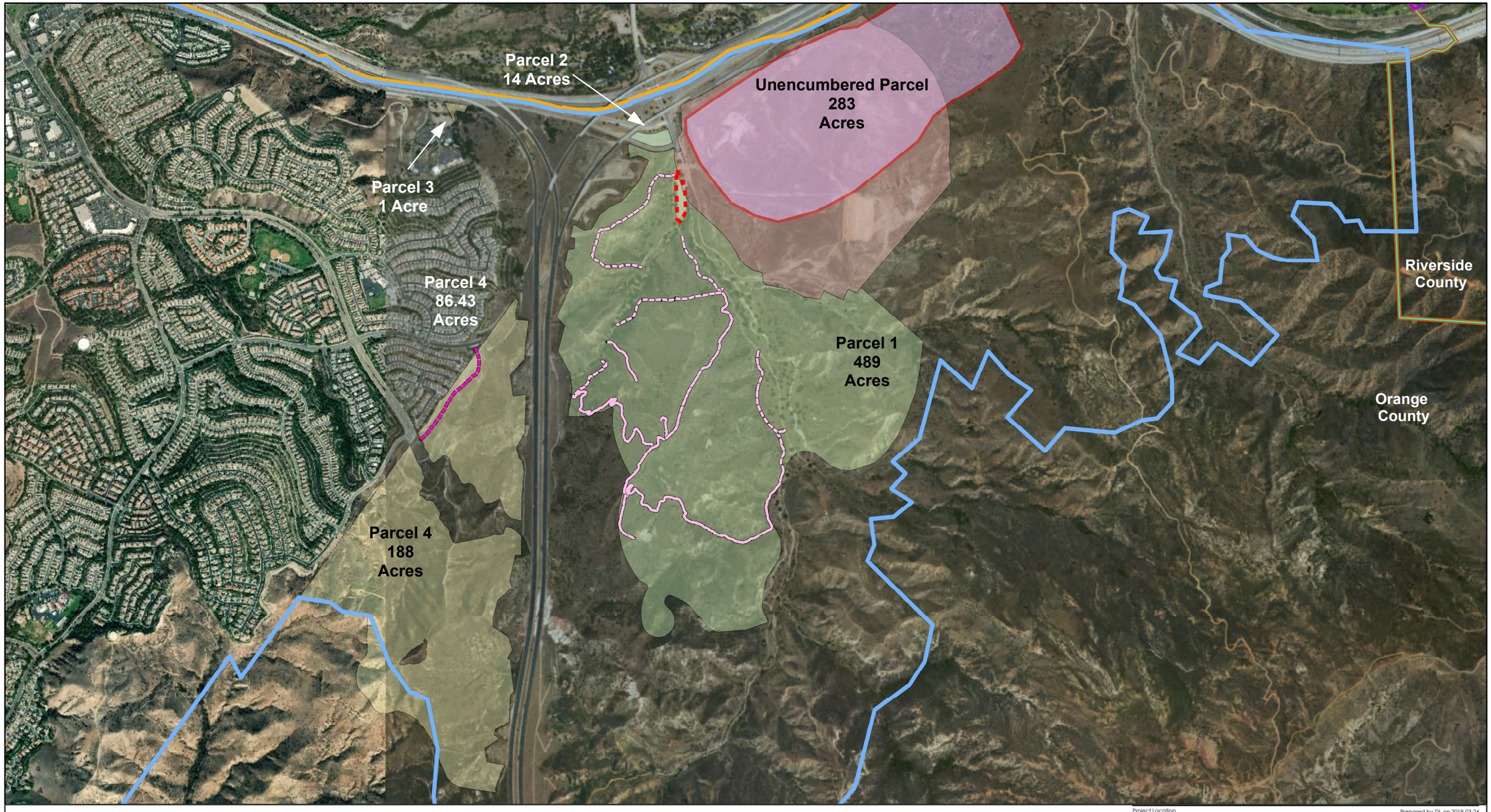
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

4

Title

Recreation Trail Opportunities East Orange II



Staging Area
Mountain Park Trail
Oak Canyon Trail
Mountain Park Conservation Easement Left
Mountain Park Conservation Easement Right
Mountain Park Unencumbered Parcel

MRZ-2 – Mineral Resource Zone where adequate information indicates that significant mineral deposits are present, or there is a high likelihood of their presence and development should be controlled
Anaheim City Boundary
Yorba Linda City Boundary

County Boundaries
Orange County Boundary
Riverside County Boundary
San Bernardino County Boundary

N

0 760 1,520 Feet

1:17,959 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location
Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Initial Study / Mitigated Negative Declaration

Figure No.
5

Title
Recreation Trail Opportunities Mountain Park

Appendix APROJECT EMISSIONS ESTIMATES

Interim Recreation and Resource Management Plan-IROS 2014 Donation

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	5.00	Acre	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase -

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialImported	0.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	13.00	12.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.0205	0.2137	0.1227	2.3000e-004	0.0730	0.0106	0.0836	0.0387	9.7500e-003	0.0485	0.0000	20.5790	20.5790	6.1500e-003	0.0000	20.7328
Maximum	**0.0205**	**0.2137**	**0.1227**	**2.3000e-004**	**0.0730**	**0.0106**	**0.0836**	**0.0387**	**9.7500e-003**	**0.0485**	**0.0000**	**20.5790**	**20.5790**	**6.1500e-003**	**0.0000**	**20.7328**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.0205	0.2137	0.1227	2.3000e-004	0.0730	0.0106	0.0836	0.0387	9.7500e-003	0.0485	0.0000	20.5790	20.5790	6.1500e-003	0.0000	20.7328
Maximum	**0.0205**	**0.2137**	**0.1227**	**2.3000e-004**	**0.0730**	**0.0106**	**0.0836**	**0.0387**	**9.7500e-003**	**0.0485**	**0.0000**	**20.5790**	**20.5790**	**6.1500e-003**	**0.0000**	**20.7328**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2020**	**3-31-2020**	0.2218	0.2218
		Highest	0.2218	0.2218

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.0500e-003	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	9.4700e-003	0.0412	0.1301	4.9000e-004	0.0439	3.6000e-004	0.0443	0.0118	3.4000e-004	0.0121	0.0000	45.0491	45.0491	1.8800e-003	0.0000	45.0960
Waste						0.0000	0.0000		0.0000	0.0000	0.0873	0.0000	0.0873	5.1600e-003	0.0000	0.2163
Water						0.0000	0.0000		0.0000	0.0000	0.0000	21.0885	21.0885	8.7000e-004	1.8000e-004	21.1640
Total	**0.0115**	**0.0412**	**0.1302**	**4.9000e-004**	**0.0439**	**3.6000e-004**	**0.0443**	**0.0118**	**3.4000e-004**	**0.0121**	**0.0873**	**66.1377**	**66.2250**	**7.9100e-003**	**1.8000e-004**	**66.4764**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.0500e-003	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	9.4700e-003	0.0412	0.1301	4.9000e-004	0.0439	3.6000e-004	0.0443	0.0118	3.4000e-004	0.0121	0.0000	45.0491	45.0491	1.8800e-003	0.0000	45.0960
Waste						0.0000	0.0000		0.0000	0.0000	0.0873	0.0000	0.0873	5.1600e-003	0.0000	0.2163
Water						0.0000	0.0000		0.0000	0.0000	0.0000	21.0885	21.0885	8.7000e-004	1.8000e-004	21.1640
Total	**0.0115**	**0.0412**	**0.1302**	**4.9000e-004**	**0.0439**	**3.6000e-004**	**0.0443**	**0.0118**	**3.4000e-004**	**0.0121**	**0.0873**	**66.1377**	**66.2250**	**7.9100e-003**	**1.8000e-004**	**66.4764**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/29/2020	2/4/2020	5	5	
2	Grading	Grading	2/5/2020	2/14/2020	5	8	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	158	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	12.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.1060	0.0538	1.0000e-004		5.4900e-003	5.4900e-003		5.0500e-003	5.0500e-003	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4253
Total	**0.0102**	**0.1060**	**0.0538**	**1.0000e-004**	**0.0452**	**5.4900e-003**	**0.0507**	**0.0248**	**5.0500e-003**	**0.0299**	**0.0000**	**8.3577**	**8.3577**	**2.7000e-003**	**0.0000**	**8.4253**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.7000e-003	4.3000e-004	0.0000	1.0000e-004	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.4614	0.4614	5.0000e-005	0.0000	0.4626
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.6000e-004	1.8200e-003	1.0000e-005	6.7000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5728	0.5728	1.0000e-005	0.0000	0.5731
Total	**2.7000e-004**	**1.8600e-003**	**2.2500e-003**	**1.0000e-005**	**7.7000e-004**	**1.0000e-005**	**7.8000e-004**	**2.1000e-004**	**1.0000e-005**	**2.1000e-004**	**0.0000**	**1.0341**	**1.0341**	**6.0000e-005**	**0.0000**	**1.0357**

3.2 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.1060	0.0538	1.0000e-004		5.4900e-003	5.4900e-003		5.0500e-003	5.0500e-003	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4252
Total	**0.0102**	**0.1060**	**0.0538**	**1.0000e-004**	**0.0452**	**5.4900e-003**	**0.0507**	**0.0248**	**5.0500e-003**	**0.0299**	**0.0000**	**8.3577**	**8.3577**	**2.7000e-003**	**0.0000**	**8.4252**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.7000e-003	4.3000e-004	0.0000	1.0000e-004	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.4614	0.4614	5.0000e-005	0.0000	0.4626
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.6000e-004	1.8200e-003	1.0000e-005	6.7000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5728	0.5728	1.0000e-005	0.0000	0.5731
Total	**2.7000e-004**	**1.8600e-003**	**2.2500e-003**	**1.0000e-005**	**7.7000e-004**	**1.0000e-005**	**7.8000e-004**	**2.1000e-004**	**1.0000e-005**	**2.1000e-004**	**0.0000**	**1.0341**	**1.0341**	**6.0000e-005**	**0.0000**	**1.0357**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.1055	0.0642	1.2000e-004		5.0900e-003	5.0900e-003		4.6900e-003	4.6900e-003	0.0000	10.4235	10.4235	3.3700e-003	0.0000	10.5078
Total	**9.7200e-003**	**0.1055**	**0.0642**	**1.2000e-004**	**0.0262**	**5.0900e-003**	**0.0313**	**0.0135**	**4.6900e-003**	**0.0182**	**0.0000**	**10.4235**	**10.4235**	**3.3700e-003**	**0.0000**	**10.5078**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.1000e-004	2.4200e-003	1.0000e-005	8.9000e-004	1.0000e-005	8.9000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7637	0.7637	2.0000e-005	0.0000	0.7641
Total	**3.0000e-004**	**2.1000e-004**	**2.4200e-003**	**1.0000e-005**	**8.9000e-004**	**1.0000e-005**	**8.9000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7637**	**0.7637**	**2.0000e-005**	**0.0000**	**0.7641**

3.3 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.1055	0.0642	1.2000e-004		5.0900e-003	5.0900e-003		4.6900e-003	4.6900e-003	0.0000	10.4235	10.4235	3.3700e-003	0.0000	10.5078
Total	**9.7200e-003**	**0.1055**	**0.0642**	**1.2000e-004**	**0.0262**	**5.0900e-003**	**0.0313**	**0.0135**	**4.6900e-003**	**0.0182**	**0.0000**	**10.4235**	**10.4235**	**3.3700e-003**	**0.0000**	**10.5078**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.1000e-004	2.4200e-003	1.0000e-005	8.9000e-004	1.0000e-005	8.9000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7637	0.7637	2.0000e-005	0.0000	0.7641
Total	**3.0000e-004**	**2.1000e-004**	**2.4200e-003**	**1.0000e-005**	**8.9000e-004**	**1.0000e-005**	**8.9000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7637**	**0.7637**	**2.0000e-005**	**0.0000**	**0.7641**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.4700e-003	0.0412	0.1301	4.9000e-004	0.0439	3.6000e-004	0.0443	0.0118	3.4000e-004	0.0121	0.0000	45.0491	45.0491	1.8800e-003	0.0000	45.0960
Unmitigated	9.4700e-003	0.0412	0.1301	4.9000e-004	0.0439	3.6000e-004	0.0443	0.0118	3.4000e-004	0.0121	0.0000	45.0491	45.0491	1.8800e-003	0.0000	45.0960

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	9.45	113.75	83.70	115,759	115,759
Total	9.45	113.75	83.70	115,759	115,759

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	18.50	10.10	7.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.558976	0.043534	0.209821	0.113949	0.016111	0.005791	0.025447	0.016654	0.001713	0.001553	0.004896	0.000590	0.000966

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.0500e-003	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Unmitigated	2.0500e-003	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.0500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Total	**2.0600e-003**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.0000**	**1.3000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.0500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Total	**2.0600e-003**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.0000**	**1.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	21.0885	8.7000e-004	1.8000e-004	21.1640
Unmitigated	21.0885	8.7000e-004	1.8000e-004	21.1640

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 5.95741	21.0885	8.7000e-004	1.8000e-004	21.1640
Total		**21.0885**	**8.7000e-004**	**1.8000e-004**	**21.1640**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 5.95741	21.0885	8.7000e-004	1.8000e-004	21.1640
Total		**21.0885**	**8.7000e-004**	**1.8000e-004**	**21.1640**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0873	5.1600e-003	0.0000	0.2163
Unmitigated	0.0873	5.1600e-003	0.0000	0.2163

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.43	0.0873	5.1600e-003	0.0000	0.2163
Total		**0.0873**	**5.1600e-003**	**0.0000**	**0.2163**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.43	0.0873	5.1600e-003	0.0000	0.2163
Total		**0.0873**	**5.1600e-003**	**0.0000**	**0.2163**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Interim Recreation and Resource Management Plan-IROS 2014 Donation

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	5.00	Acre	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase -

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialImported	0.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	13.00	12.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1818	43.1343	22.4518	0.0425	18.3813	2.2013	20.5825	10.0143	2.0253	12.0396	0.0000	4,152.7025	4,152.7025	1.2190	0.0000	4,183.1767
Maximum	**4.1818**	**43.1343**	**22.4518**	**0.0425**	**18.3813**	**2.2013**	**20.5825**	**10.0143**	**2.0253**	**12.0396**	**0.0000**	**4,152.7025**	**4,152.7025**	**1.2190**	**0.0000**	**4,183.1767**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1818	43.1343	22.4518	0.0425	18.3813	2.2013	20.5825	10.0143	2.0253	12.0396	0.0000	4,152.7025	4,152.7025	1.2190	0.0000	4,183.1767
Maximum	**4.1818**	**43.1343**	**22.4518**	**0.0425**	**18.3813**	**2.2013**	**20.5825**	**10.0143**	**2.0253**	**12.0396**	**0.0000**	**4,152.7025**	**4,152.7025**	**1.2190**	**0.0000**	**4,183.1767**

Interim Recreation and Resource Management Plan-IROS 2014 Donation - Orange County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0113	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1772	0.7030	2.4016	9.0500e-003	0.7990	6.4700e-003	0.8055	0.2137	6.0200e-003	0.2197		917.8782	917.8782	0.0373		918.8094
Total	**0.1885**	**0.7030**	**2.4022**	**9.0500e-003**	**0.7990**	**6.4700e-003**	**0.8055**	**0.2137**	**6.0200e-003**	**0.2197**		**917.8793**	**917.8793**	**0.0373**	**0.0000**	**918.8105**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0113	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1772	0.7030	2.4016	9.0500e-003	0.7990	6.4700e-003	0.8055	0.2137	6.0200e-003	0.2197		917.8782	917.8782	0.0373		918.8094
Total	**0.1885**	**0.7030**	**2.4022**	**9.0500e-003**	**0.7990**	**6.4700e-003**	**0.8055**	**0.2137**	**6.0200e-003**	**0.2197**		**917.8793**	**917.8793**	**0.0373**	**0.0000**	**918.8105**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/29/2020	2/4/2020	5	5	
2	Grading	Grading	2/5/2020	2/14/2020	5	8	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	158	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	12.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0685	0.0000	18.0685	9.9310	0.0000	9.9310			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0685**	**2.1974**	**20.2659**	**9.9310**	**2.0216**	**11.9526**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0181	0.6599	0.1668	1.8400e-003	0.0418	2.1400e-003	0.0439	0.0114	2.0400e-003	0.0135		204.7339	204.7339	0.0212		205.2645
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0872	0.0571	0.7714	2.6400e-003	0.2709	1.7500e-003	0.2727	0.0719	1.6200e-003	0.0735		262.8671	262.8671	5.9100e-003		263.0147
Total	**0.1053**	**0.7170**	**0.9382**	**4.4800e-003**	**0.3127**	**3.8900e-003**	**0.3166**	**0.0833**	**3.6600e-003**	**0.0869**		**467.6010**	**467.6010**	**0.0271**		**468.2792**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0685	0.0000	18.0685	9.9310	0.0000	9.9310			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0685**	**2.1974**	**20.2659**	**9.9310**	**2.0216**	**11.9526**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0181	0.6599	0.1668	1.8400e-003	0.0418	2.1400e-003	0.0439	0.0114	2.0400e-003	0.0135		204.7339	204.7339	0.0212		205.2645
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0872	0.0571	0.7714	2.6400e-003	0.2709	1.7500e-003	0.2727	0.0719	1.6200e-003	0.0735		262.8671	262.8671	5.9100e-003		263.0147
Total	**0.1053**	**0.7170**	**0.9382**	**4.4800e-003**	**0.3127**	**3.8900e-003**	**0.3166**	**0.0833**	**3.6600e-003**	**0.0869**		**467.6010**	**467.6010**	**0.0271**		**468.2792**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716		2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.5523**	**1.2734**	**7.8258**	**3.3675**	**1.1716**	**4.5390**		**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0726	0.0476	0.6429	2.2000e-003	0.2258	1.4600e-003	0.2272	0.0599	1.3500e-003	0.0612		219.0559	219.0559	4.9200e-003		219.1790
Total	**0.0726**	**0.0476**	**0.6429**	**2.2000e-003**	**0.2258**	**1.4600e-003**	**0.2272**	**0.0599**	**1.3500e-003**	**0.0612**		**219.0559**	**219.0559**	**4.9200e-003**		**219.1790**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716	0.0000	2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.5523**	**1.2734**	**7.8258**	**3.3675**	**1.1716**	**4.5390**	**0.0000**	**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0726	0.0476	0.6429	2.2000e-003	0.2258	1.4600e-003	0.2272	0.0599	1.3500e-003	0.0612		219.0559	219.0559	4.9200e-003		219.1790
Total	**0.0726**	**0.0476**	**0.6429**	**2.2000e-003**	**0.2258**	**1.4600e-003**	**0.2272**	**0.0599**	**1.3500e-003**	**0.0612**		**219.0559**	**219.0559**	**4.9200e-003**		**219.1790**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1772	0.7030	2.4016	9.0500e-003	0.7990	6.4700e-003	0.8055	0.2137	6.0200e-003	0.2197		917.8782	917.8782	0.0373		918.8094
Unmitigated	0.1772	0.7030	2.4016	9.0500e-003	0.7990	6.4700e-003	0.8055	0.2137	6.0200e-003	0.2197		917.8782	917.8782	0.0373		918.8094

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	9.45	113.75	83.70	115,759	115,759
Total	9.45	113.75	83.70	115,759	115,759

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	18.50	10.10	7.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.558976	0.043534	0.209821	0.113949	0.016111	0.005791	0.025447	0.016654	0.001713	0.001553	0.004896	0.000590	0.000966

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0113	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Unmitigated	0.0113	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0112					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Total	**0.0113**	**0.0000**	**5.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0900e-003**	**1.0900e-003**	**0.0000**		**1.1700e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0112					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Total	**0.0113**	**0.0000**	**5.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0900e-003**	**1.0900e-003**	**0.0000**		**1.1700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Interim Recreation and Resource Management Plan-IROS 2014 Donation

Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	5.00	Acre	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase -

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialImported	0.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	13.00	12.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1946	43.1483	22.3966	0.0423	18.3813	2.2013	20.5826	10.0143	2.0253	12.0396	0.0000	4,135.4720	4,135.4720	1.2191	0.0000	4,165.9504
Maximum	**4.1946**	**43.1483**	**22.3966**	**0.0423**	**18.3813**	**2.2013**	**20.5826**	**10.0143**	**2.0253**	**12.0396**	**0.0000**	**4,135.4720**	**4,135.4720**	**1.2191**	**0.0000**	**4,165.9504**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1946	43.1483	22.3966	0.0423	18.3813	2.2013	20.5826	10.0143	2.0253	12.0396	0.0000	4,135.4720	4,135.4720	1.2191	0.0000	4,165.9504
Maximum	**4.1946**	**43.1483**	**22.3966**	**0.0423**	**18.3813**	**2.2013**	**20.5826**	**10.0143**	**2.0253**	**12.0396**	**0.0000**	**4,135.4720**	**4,135.4720**	**1.2191**	**0.0000**	**4,165.9504**

Interim Recreation and Resource Management Plan-IROS 2014 Donation - Orange County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0113	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1743	0.7240	2.2954	8.6400e-003	0.7990	6.4900e-003	0.8055	0.2137	6.0500e-003	0.2197		877.1063	877.1063	0.0371		878.0337
Total	**0.1856**	**0.7240**	**2.2960**	**8.6400e-003**	**0.7990**	**6.4900e-003**	**0.8055**	**0.2137**	**6.0500e-003**	**0.2197**		**877.1074**	**877.1074**	**0.0371**	**0.0000**	**878.0348**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0113	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1743	0.7240	2.2954	8.6400e-003	0.7990	6.4900e-003	0.8055	0.2137	6.0500e-003	0.2197		877.1063	877.1063	0.0371		878.0337
Total	**0.1856**	**0.7240**	**2.2960**	**8.6400e-003**	**0.7990**	**6.4900e-003**	**0.8055**	**0.2137**	**6.0500e-003**	**0.2197**		**877.1074**	**877.1074**	**0.0371**	**0.0000**	**878.0348**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/29/2020	2/4/2020	5	5	
2	Grading	Grading	2/5/2020	2/14/2020	5	8	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	158	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	12.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0685	0.0000	18.0685	9.9310	0.0000	9.9310			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0685**	**2.1974**	**20.2659**	**9.9310**	**2.0216**	**11.9526**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0186	0.6682	0.1756	1.8100e-003	0.0418	2.1800e-003	0.0440	0.0114	2.0800e-003	0.0135		201.6432	201.6432	0.0217		202.1864
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0996	0.0627	0.7074	2.4900e-003	0.2709	1.7500e-003	0.2727	0.0719	1.6200e-003	0.0735		248.7273	248.7273	5.5700e-003		248.8666
Total	**0.1182**	**0.7310**	**0.8830**	**4.3000e-003**	**0.3127**	**3.9300e-003**	**0.3167**	**0.0833**	**3.7000e-003**	**0.0870**		**450.3705**	**450.3705**	**0.0273**		**451.0530**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0685	0.0000	18.0685	9.9310	0.0000	9.9310			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0685**	**2.1974**	**20.2659**	**9.9310**	**2.0216**	**11.9526**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0186	0.6682	0.1756	1.8100e-003	0.0418	2.1800e-003	0.0440	0.0114	2.0800e-003	0.0135		201.6432	201.6432	0.0217		202.1864
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0996	0.0627	0.7074	2.4900e-003	0.2709	1.7500e-003	0.2727	0.0719	1.6200e-003	0.0735		248.7273	248.7273	5.5700e-003		248.8666
Total	**0.1182**	**0.7310**	**0.8830**	**4.3000e-003**	**0.3127**	**3.9300e-003**	**0.3167**	**0.0833**	**3.7000e-003**	**0.0870**		**450.3705**	**450.3705**	**0.0273**		**451.0530**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716		2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.5523**	**1.2734**	**7.8258**	**3.3675**	**1.1716**	**4.5390**		**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0830	0.0523	0.5895	2.0800e-003	0.2258	1.4600e-003	0.2272	0.0599	1.3500e-003	0.0612		207.2727	207.2727	4.6400e-003		207.3889
Total	**0.0830**	**0.0523**	**0.5895**	**2.0800e-003**	**0.2258**	**1.4600e-003**	**0.2272**	**0.0599**	**1.3500e-003**	**0.0612**		**207.2727**	**207.2727**	**4.6400e-003**		**207.3889**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716	0.0000	2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.5523**	**1.2734**	**7.8258**	**3.3675**	**1.1716**	**4.5390**	**0.0000**	**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0830	0.0523	0.5895	2.0800e-003	0.2258	1.4600e-003	0.2272	0.0599	1.3500e-003	0.0612		207.2727	207.2727	4.6400e-003		207.3889
Total	**0.0830**	**0.0523**	**0.5895**	**2.0800e-003**	**0.2258**	**1.4600e-003**	**0.2272**	**0.0599**	**1.3500e-003**	**0.0612**		**207.2727**	**207.2727**	**4.6400e-003**		**207.3889**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1743	0.7240	2.2954	8.6400e-003	0.7990	6.4900e-003	0.8055	0.2137	6.0500e-003	0.2197		877.1063	877.1063	0.0371		878.0337
Unmitigated	0.1743	0.7240	2.2954	8.6400e-003	0.7990	6.4900e-003	0.8055	0.2137	6.0500e-003	0.2197		877.1063	877.1063	0.0371		878.0337

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	9.45	113.75	83.70	115,759	115,759
Total	9.45	113.75	83.70	115,759	115,759

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	18.50	10.10	7.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.558976	0.043534	0.209821	0.113949	0.016111	0.005791	0.025447	0.016654	0.001713	0.001553	0.004896	0.000590	0.000966

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0113	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Unmitigated	0.0113	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0112					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Total	**0.0113**	**0.0000**	**5.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0900e-003**	**1.0900e-003**	**0.0000**		**1.1700e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0112					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Total	**0.0113**	**0.0000**	**5.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0900e-003**	**1.0900e-003**	**0.0000**		**1.1700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B BIOLOGICAL RESOURCES TECHNICAL REPORT

Irvine Ranch Open Space

Draft Biological Resources Technical Report

April 10, 2019

Prepared for:

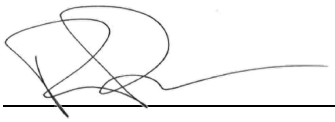
County of Orange
Orange County Parks
Planning and Design Division
13042 Old Myford Road
Irvine, California 92602

Prepared by:

Stantec Consulting Services Inc.
290 Conejo Ridge Ave.
Thousand Oaks, CA 91361

Sign-off Sheet

This document entitled Irvine Ranch Open Space Biological Resources Technical Report was prepared by Stantec Consulting Services Inc. (“Stantec”) for the account of Orange County Parks (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by 

(signature)

Rocky Brown, Associate Biologist

Reviewed by 

(signature)

StephAnnie Roberts, Senior Project Manager

Approved by 

(signature)

Jared Varonin, Principal Biologist

Table of Contents

ABBREVIATIONS III

1.0 INTRODUCTION 1
1.1 PURPOSE OF THE REPORT 1
1.2 PROJECT LOCATION 1
1.2.1 Oak Canyon 1
1.2.2 Mountain Park 1
1.2.3 East Orange I 1
1.2.4 East Orange II 2
1.3 PROJECT DESCRIPTION 2
1.3.1 Construction 2
1.3.2 Operations and Maintenance 2

2.0 METHODOLOGIES 2
2.1 LITERATURE REVIEW 3
2.2 HABITAT ASSESSMENT AND BIOLOGICAL SURVEYS 3
2.2.1 Site Reconnaissance and Wildlife Surveys 3
2.2.2 Botanical Surveys 4
2.2.3 Vegetation Mapping 4
2.2.4 Jurisdictional Delineation 5

3.0 REGULATORY ENVIRONMENT 5
3.1.1 Federal Endangered Species Act 5
3.1.2 Migratory Bird Treaty Act 6
3.1.3 Bald and Golden Eagle Protection Act of 1940 (16 USC 668) 6
3.1.4 Federally Regulated Habitats 7
3.1.5 National Environmental Policy Act 7
3.2 STATE REGULATIONS 7
3.2.1 California Environmental Quality Act 7
3.2.2 California Endangered Species Act 7
3.2.3 Native Plant Protection Act (Fish & Game Code 1900-1913) 8
3.2.4 Section 3503 & 3503.5 of the Fish and Game Code 8
3.2.5 Porter-Cologne Water Quality Control Act 8
3.2.6 State-Regulated Habitats 9
3.3 LOCAL REGULATIONS 9
3.3.1 Orange County General Plan – Chapter VI. Resources Element 9
3.3.2 Orange County Central-Coastal Subregion Natural Community Conservation Plan/Habitat Conservation Plan 11
3.4 OTHER APPLICABLE REGULATIONS, PLANS, AND STANDARDS 12
3.4.1 California Native Plant Society Rare Plant Program 12

4.0 EXISTING CONDITIONS 13
4.1 SETTING 13
4.1.1 Oak Canyon 13
4.1.2 Mountain Park 13

4.1.3 East Orange I 13
4.1.4 East Orange II 13
4.2 VEGETATION COMMUNITIES AND LAND COVER TYPES 14
4.2.1 Oak Canyon 14
4.2.2 Mountain Park 15
4.2.3 East Orange I 16
4.2.4 East Orange II 17
4.2.5 Soils 18
4.2.6 Jurisdictional Waters/Wetlands 25
4.3 COMMON WILDLIFE 27
4.3.1 Invertebrates and Gastropods 27
4.3.2 Fish 27
4.3.3 Amphibians 27
4.3.4 Reptiles 28
4.3.5 Birds 28
4.3.6 Mammals 28

5.0 SPECIAL STATUS BIOLOGICAL RESOURCES 30
5.1 SPECIAL-STATUS NATURAL COMMUNITIES 30
5.2 DESIGNATED CRITICAL HABITAT 31
5.3 SPECIAL-STATUS PLANTS 31
5.4 SPECIAL-STATUS WILDLIFE 38
5.5 WILDLIFE CORRIDORS AND SPECIAL LINKAGES 51
5.5.1 Wildlife Movement in the BSA 52

6.0 REFERENCES 53

LIST OF APPENDICES

APPENDIX A FIGURES 6.A

APPENDIX B SITE PHOTOGRAPHS B.1

APPENDIX C PLANT COMPENDIUM C.1

Abbreviations

CCH	Consortium of California Herbaria
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
ESA	Endangered Species Act
HCP	Habitat Conservation Plan
IROS	Irvine Ranch Open Space
IRRMP	Interim Resource and Recreation Management Plan
MBTA	Migratory Bird Treaty Act
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NPPA	Native Plant Protection Act
RWQCB	Regional Water Quality Control Board
SR	California State Route
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
WDR	Waste Discharge Requirement

1.0 INTRODUCTION

This report is intended to document the biological resources that are associated with the for the Irvine Ranch Open Space (IROS) 2014 Donation Interim Resource and Recreation Management Plan (IRRMP) (Project) in Orange County, CA (refer to Appendix A, Figure 1). The surveys conducted and analysis presented in this report were performed/prepared to support regulatory agency permitting and supply associated documentation. Surveys were conducted within and adjacent to four distinct locations in the Santa Ana Mountains in eastern Orange County. These areas are defined as the Oak Canyon, Mountain Park, East Orange I, and East Orange II Biological Study Areas (OCBSA, MPBSA, EOIBSA, and EOIIBSA, respectively) (refer to Appendix A, Figure 2a through 2s for a depiction of the BSAs).

1.1 PURPOSE OF THE REPORT

The goals of this report are to document the current environmental conditions that occur within and adjacent to the four BSAs, which include areas proposed for trail construction and an approximately 300-foot survey buffer. This report describes existing biological resources that occur within or adjacent to the BSAs (with special emphasis on special-status plant and wildlife species, wildlife corridors, and special-status/sensitive natural communities), and evaluates the potential for these species to occur within each BSA.

1.2 PROJECT LOCATION

The four BSAs are located in eastern Orange County, California. All the BSAs are situated within the western half of the U.S. Geological Survey (USGS) Black Star Canyon 7.5-minute topographic quadrangle with the individual BSA location described in further detail below and depicted in Appendix A, Figure 2.

1.2.1 Oak Canyon

The OCBSA is situated between California State Route (SR) 241 and a residential development to the west. The approximately 30-acre BSA abuts the residential development to the east, extending approximately 0.4 mile in a northeast to southwest direction from Oak Canyon Drive to South Weir Canyon Road.

1.2.2 Mountain Park

The MPBSA is situated along the east side of SR 241, immediately south of its intersection with SR 91. In general, it spans the area between SR 241 and the unpaved road leading south from Gypsum Canyon Road, extending approximately 1.2 miles to the south. This BSA is approximately 312 acres in size.

1.2.3 East Orange I

The EOIBSA is situated immediately east of SR 241 adjacent to its intersection with SR 261. The main portion of the approximately 495-acre BSA occupies the open space between SR 241 and the now-closed Santiago Canyon Landfill, just west of Irvine Lake. A smaller spur reaches out from the southern end of the BSA, extending approximately 0.75 mile to the east-southeast, north of and adjacent to Santiago Canyon Road (S18).

1.2.4 East Orange II

The EOIIBSA is situated in open space to the southeast of Irvine Lake and just northeast of Santiago Canyon Road. A small section of the approximately 485-acre BSA extends to the south of Santiago Canyon Road, along Blue Diamond Haul Road and encompassing the Irvine Ranch Augustine Staging Area.

1.3 PROJECT DESCRIPTION

1.3.1 Construction

The Project includes the construction and maintenance of a system of unpaved hiking trails throughout the four BSAs. The Project will employ various heavy-duty earthmoving equipment (e.g., compact excavators, ride-on earthmovers) for development of staging areas, new trails, and parking lot areas. Specialized tools (e.g., power wheelbarrows, brush mowers, rock drills, chainsaws) will also be utilized for tree and vegetation removal as necessary, as well as removal of other debris. Construction activities will be planned to minimize vegetation removal and replacement; however, some vegetation removal is anticipated.

1.3.2 Operations and Maintenance

During operations, the Project will require routine park maintenance activities, such as:

- removal of unhealthy or dead trees and limbs
- signage repair (due to age and/or vandalism)
- mowing and pruning around trails and parking lot areas
- weed control through herbicide application or mechanized tools
- trailside litter pickup and trash collection
- bridge inspections

2.0 METHODOLOGIES

Stantec Associate Biologist Rocky Brown and Principal Biologist Jared Varonin conducted an initial reconnaissance-level survey on January 10 and 11, 2018, prior to which a preliminary literature review of readily available resources was performed. Based on the results of the initial reconnaissance, Stantec Biologist Rocky Brown and Environmental Scientist and Botanist Joey Seamands conducted focused botanical surveys and a preliminary jurisdictional delineation at each of the four BSAs. The initial botanical survey and jurisdictional delineation was conducted on May 9 through 18, 2018, with a late-season botanical survey and “ground truthing” of jurisdictional resources conducted on June 25 through 28, 2018. These investigations included protocol-level botanical surveys and non-protocol surveys to detect the presence of special-status wildlife species and birds. All surveys were conducted on foot within each BSA where accessible based on terrain and vegetative cover. A photographic log for the survey has been included in Appendix B.

2.1 LITERATURE REVIEW

A literature search focused on the four BSAs was conducted prior to field surveys. The BSAs are located within the USGS Black Star Canyon, California, 7.5-minute topographic quadrangle. A search of the CDFW California Natural Diversity Database (CNDDB) was conducted for this quadrangle to determine special-status plants, wildlife, and vegetation communities that have been documented within the vicinity of the Project Area (CDFW, 2018a). The following eight adjacent quadrangles were also included in the database search to encompass potential occurrences of special-status species in the region surrounding the BSAs:

- Yorba Linda
- Prado Dam
- Corona North
- Orange
- Corona South
- Tustin
- Lake Forest
- Santiago Peak

Additional data regarding the potential occurrence of special-status species and policies relating to these special-status natural resources were gathered from the following sources:

- State and federally listed endangered and threatened animals of California (CDFW, 2018b);
- Special Animals List (CDFW, 2018c);
- List of California Sensitive Natural Terrestrial Communities (CDFW, 2018d)
- Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2018); and
- Consortium of California Herbaria (CCH, 2018).

2.2 HABITAT ASSESSMENT AND BIOLOGICAL SURVEYS

2.2.1 Site Reconnaissance and Wildlife Surveys

In order to document the environmental conditions present within and adjacent to the four BSAs, on January 10 and 11, 2018, Stantec conducted a habitat assessment and reconnaissance-level survey. The primary goal of this initial survey was to identify and assess habitat that may be capable of supporting special-status plant or wildlife species and determine the need for additional focused surveys for special-status resources. This survey was conducted by walking meandering transects throughout portions of each BSA and recording general habitat and other environmental conditions. Biologists also recorded all incidental wildlife observations, but this assessment did not include focused surveys for botanical resources or special-status resources.

Subsequent surveys were focused on rare plants and mapping vegetation communities and jurisdictional resources; however, biologists also recorded all wildlife observed. Each BSA was investigated on foot by experienced field biologists walking meandering transects through the entirety of each BSA at an average pace of approximately 1.5 km/hr. while visually searching for and listening to wildlife songs and calls and observing for animal signs. The walking survey was halted approximately every 50 meters to listen for wildlife or as necessary to identify, record, or enumerate any other detected species. Terrestrial insects and other invertebrates were searched for on flowers and leaves, under loose bark, and under stones and logs on the ground throughout each BSA. Randomly selected areas within appropriate micro habitats (e.g., leaf litter, woody debris piles, etc.) were hand raked or visually inspected to determine the presence/absence of gastropods, reptiles, small mammals, and amphibians. Species present were identified and recorded through direct visual observation, sound, or their sign (e.g., scat, tracks, etc.) and all potential refugia sites



search were returned to their original state upon completion of inspection. Species identifications conform to the most up-to-date field guides and technical literature.

To the extent possible, surveys were conducted during a season and time of day when migratory birds were expected to be present, resident bird species were nesting and fledging, small mammals were active and detectable visually or by sign, and above-ground amphibian and reptile movement would generally be detectable. However, it should be noted that some wildlife species and/or individuals may have been difficult to detect due to their elusive nature, cryptic morphology, or nocturnal behavior. Surveys were conducted during daylight hours when temperatures were such that reptiles and other wildlife would be active (i.e., between 75-95° Fahrenheit).

A list wildlife observed is presented in Table 4 in Section 4.3 and a list of special-status wildlife species that have the potential to occur in the region (based on the database queries) is presented in Table 6 in Section 5.4.

2.2.2 Botanical Surveys

Focused botanical surveys were conducted by qualified biologists and conducted during periods when special-status plant species known to occur in the region would be in bloom or identifiable. Each BSA was assessed by walking "meandering transects" (Nelson, 1987) throughout all accessible portions, with particular attention given to areas of suitable habitat for special-status plant species. All plant species observed were identified in the field or collected for later identification microscopically in the laboratory. Plants were identified using keys, descriptions, and illustrations in Baldwin et al. (2012), applicable volumes of the Flora of North America (1993+), and other regional references, and their locations were mapped using the Esri® Collector for ArcGIS app on an Apple® iPad® coupled with a Bad Elf® GNSS Surveyor sub-meter external global positioning system (GPS) unit. In conformance with CDFW protocols (2009), surveys were (a) floristic in nature, (b) consistent with conservation ethics, (c) systematically covered all habitat types on the sites, and (d) well documented by this report and by voucher specimens to be deposited at Rancho Santa Ana Botanic Garden.

All species identified during the survey are listed in Appendix C and a list of special-status plant species that have the potential to occur in the region is presented in Table 5 in Section 5.3.

2.2.3 Vegetation Mapping

Vegetation mapping was conducted concurrently with the botanical survey. Vegetation descriptions and nomenclature are based on Sawyer et al. (2009), where applicable, and have been defined at least to the alliance level. Vegetation maps were prepared by recording tentative vegetation type boundaries over recent aerial photograph base maps using the data collection equipment described above for the botanical surveys. Mapping was further refined in the office using ArcGIS (version 10.4) with aerial photograph base maps with an accuracy of one foot. Most boundaries shown on the maps are accurate within approximately three feet; however, boundaries between some vegetation types are less precise due to difficulties interpreting aerial imagery and accessing stands of vegetation.

Vegetation communities can overlap in many characteristics and over time may shift from one community type to another. Note also that all vegetation maps and descriptions are subject to variability for the following reasons:

- In some cases, vegetation boundaries result from distinct events, such as wildfire or flooding, but vegetation types usually tend to intergrade on the landscape, without precise boundaries between them. Even distinct



boundaries caused by fire or flood can be disguised after years of post-disturbance succession. Mapped boundaries represent best professional judgment, but usually should not be interpreted as literal delineations between sharply defined vegetation types.

- Natural vegetation tends to exist in generally recognizable types, but also may vary over time and geographic region. Written descriptions cannot reflect all local or regional variation. Many (perhaps most) stands of natural vegetation do not strictly fit into any named type. Therefore, a mapped unit is given the best name available in the classification system being used, but this name does not imply that the vegetation unambiguously matches written descriptions.

- Vegetation tends to be patchy. Small patches of one named type are often included within larger stands mapped as units of another type. For this Study Area, the minimum mapping unit was approximately three feet, and smaller inclusions are described in the text but are not visible on the maps.

2.2.4 Jurisdictional Delineation

A formal jurisdictional waters delineation per US Army Corps of Engineers (USACE) guidelines was conducted as part of this assessment. The four BSAs were evaluated for potential wetlands and/or waters subject to federal and/or state jurisdiction pursuant to Section 404 and 401 of the Clean Water Act (CWA) concurrently with the field surveys described above. This jurisdictional assessment also included an investigation of areas that could be jurisdictional pursuant to Section 1600 et seq. of the California Fish and Game Code. Prior to conducting the field assessment, Stantec reviewed current and historic aerial imagery, topographic maps, soil maps (USDA, 2018), local and state hydric soils lists, and the National Wetlands Inventory (USFWS, 2018a) to evaluate the potential active channels and wetland features that occur within the BSAs. During the field assessment, hydrologic features were mapped using the same data collection equipment described above for the botanical surveys. Field data were further manipulated in the office using GIS and total jurisdictional area for each regulatory jurisdiction was calculated. The results of the delineation are summarized below in Section 4.2.6; a stand-alone Preliminary Jurisdictional Wetlands/Waters Delineation Report was also prepared.

3.0 REGULATORY ENVIRONMENT

3.1.1 Federal Endangered Species Act

Federal Endangered Species Act (ESA) provisions protect federally listed threatened and endangered species and their habitats from unlawful take and ensure that federal actions do not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Under the ESA, “take” is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct.” The U.S. Fish & Wildlife Service’s (USFWS) regulations define harm to mean “an act which actually kills or injures wild-life.” Such an act “may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering” (50 CFR § 17.3). Critical habitat is defined in Section 3(5)(A) of the ESA as “(i) the specific areas within the geographical area occupied by the species on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management considerations or



protection; and (ii) specific areas outside the geographical area occupied by the species upon a determination by the Secretary of Commerce or the Secretary of the Interior (Secretary) that such areas are essential for the conservation of the species." The effects analyses for designated critical habitat must consider the role of the critical habitat in both the continued survival and the eventual recovery (i.e., the conservation) of the species in question, consistent with the Ninth Circuit judicial opinion, Gifford Pinchot Task Force v. USFWS. Activities that may result in "take" of individuals are regulated by the USFWS. The USFWS produced an updated list of candidate species December 6, 2007 (72 FR 69034). Candidate species are not afforded any legal protection under ESA; however, candidate species typically receive special attention from Federal and State agencies during the environmental review process.

3.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711) makes it unlawful to possess, buy, sell, purchase, barter or "take" any migratory bird listed in Title 50 of the Code of Federal Regulations Part 10. "Take" is defined as possession or destruction of migratory birds, their nests or eggs. Disturbances that cause nest abandonment and/or loss of reproductive effort or the loss of habitats upon which these birds depend may be a violation of the MBTA. The MBTA prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary. This act encompasses whole birds, parts of birds, and bird nests and eggs.

3.1.3 Bald and Golden Eagle Protection Act of 1940 (16 USC 668)

The Bald Eagle Protection Act of 1940 (16 U.S.C. 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. Take of bald and golden eagles is defined as follows: "disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior'' (72 FR 31132; 50 CFR 22.3).

The USFWS is the primary federal authority charged with the management of golden eagles in the United States. A permit for take of golden eagles, including take from disturbance such as loss of foraging habitat, may be required if this project affects such resources. USFWS guidance on the applicability of current Eagle Act statutes and mitigation is currently under review. On November 10, 2009, the USFWS implemented new rules (74 FR 46835) governing the "take" of golden and bald eagles. The new rules were released under the existing Bald and Golden Eagle Act which has been the primary regulation protection unlisted eagle populations since 1940. All activities that may disturb or incidentally take an eagle or its nest as a result of an otherwise legal activity must be permitted by the USFWS under this act. The definition of disturb (72 FR 31132) includes interfering with normal breeding, feeding, or sheltering behavior to the degree that it causes or is likely to cause decreased productivity or nest abandonment. If a permit is required, due to the current uncertainty on the status of golden eagle populations in western United States, it is expected permits would only be issued for safety emergencies or if conservation measures implemented in accordance with a permit would result in a reduction of ongoing take or a net take of zero.



3.1.4 Federally Regulated Habitats

Areas meeting the regulatory definition of "Waters of the U.S." (Jurisdictional Waters) are subject to the jurisdiction of the United States Army Corps of Engineers (USACE) under provisions of Section 404 of the Clean Water Act (CWA) (1972) and Section 10 of the Rivers and Harbors Act (1899). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as "Waters of the U.S.," tributaries of waters otherwise defined as "Waters of the U.S.," the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to "Waters of the U.S." (33 CFR, Part 328, Section 328.3). Wetlands on non-agricultural lands are identified using the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987). The Project Area falls within the South Pacific Division of the USACE and is under the jurisdiction of the Los Angeles District.

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must comply with permit requirements of the USACE. No USACE permit would be effective in the absence of State water quality certification pursuant to Section 401 of the CWA. As a part of the permit process the USACE works directly with the USFWS to assess potential project impacts on biological resources.

3.1.5 National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA) requires all Federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and utilize public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements and prepare appropriate NEPA documents to facilitate better environmental decision making. NEPA requires Federal agencies to review and comment on Federal agency environmental plans/documents when the agency has jurisdiction by law or special expertise with respect to any environmental impacts involved (42 U.S.C. 4321- 4327) (40 CFR 1500-1508).

3.2 STATE REGULATIONS

3.2.1 California Environmental Quality Act

CEQA establishes State policy to prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures. CEQA applies to actions directly undertaken, financed, or permitted by State lead agencies. Regulations for implementation are found in the State CEQA Guidelines published by the Resources Agency. These guidelines establish an overall process for the environmental evaluation of projects.

3.2.2 California Endangered Species Act

Provisions of the California Endangered Species Act protect State-listed Threatened and Endangered species. The CDFW regulates activities that may result in "take" of individuals ("take" means "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of "take" under the California Fish and Game Code. Additionally, the California Fish and Game Code contains lists of vertebrate species designated as "fully protected" (California Fish & Game Code §§ 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], 5515 [fish]). Such species may not be taken or possessed.



In addition to Federal and State-listed species, the CDFW also has produced a list of Species of Special Concern to serve as a "watch list." Species on this list are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Species of Special Concern may receive special attention during environmental review, but they do not have statutory protection.

Birds of prey are protected in California under the State Fish and Game Code. Section 3503.5 states it is "unlawful to take, possess, or destroy any birds of prey (in the order Falconiformes or Strigiformes) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by the CDFW. Under Sections 3503 and 3503.5 of the State Fish and Game Code, activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory nongame bird as designated in the MBTA, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the MBTA, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800 are prohibited.

3.2.3 Native Plant Protection Act (Fish & Game Code 1900-1913)

California's Native Plant Protection Act (NPPA) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of NPPA prohibit the taking of listed plants from the wild and require notification of the CDFW at least 10 days in advance of any change in land use. This allows CDFW to salvage listed plant species that would otherwise be destroyed. The Applicant is required to conduct botanical inventories and consult with CDFW during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

3.2.4 Section 3503 & 3503.5 of the Fish and Game Code

Under these sections of the Fish and Game Code, the Applicant is not allowed to conduct activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory non-game bird as designated in the MBTA, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the MBTA, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800.

3.2.5 Porter-Cologne Water Quality Control Act

Regional Water Quality Control Boards (RWQCBs) regulate the "discharge of waste" to "waters of the State." All projects proposing to discharge waste that could affect waters of the State must file a waste discharge report with the appropriate regional board. The board responds to the report by issuing waste discharge requirements (WDR) or by waiving WDRs for that project discharge. Both terms "discharge of waste" and "waters of the State" are broadly defined such that discharges of waste include fill, any material resulting from human activity, or any other "discharge." Isolated wetlands within California, which are no longer considered "waters of the United States" as defined by Section 404 of the CWA, are addressed under the Porter-Cologne Act.

3.2.6 State-Regulated Habitats

The State Water Resources Control Board is the State agency (together with the RWQCBs) charged with implementing water quality certification in California. The Project Area falls under the jurisdiction of the Santa Ana RWQCB.

The CDFW extends the definition of stream to include "intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams (USGS-defined), and watercourses with subsurface flows. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife" (CDFW, 1994).

Activities that result in the diversion or obstruction of the natural flow of a stream; or which substantially change its bed, channel, or bank; or which utilize any materials (including vegetation) from the streambed, may require that the project Applicant enter into a Streambed Alteration Agreement with the CDFW.

3.3 LOCAL REGULATIONS

3.3.1 Orange County General Plan – Chapter VI. Resources Element

Natural Resources Component

The Natural Resources Component of the Resources Element of the Orange County General Plan contains policies and programs which are designed to protect and conserve natural resources in the County, including scenic areas such as ridgelines and hillsides, climate, farmlands, native vegetation and wildlife, and mineral resources. It provides a basis for programs which served to implement natural resource conservation goals and policies and establish a framework for additional inventory and resource planning efforts (County of Orange, 2015). The Project Area occurs within a County-designated Wildlife Habitat Area.

The Goals, Objectives, and Policies relative to natural resources that apply to the Project Area are as follows:

Goal 1 Protect wildlife and vegetation resources and promote development that preserves these resources.

- **Objective 1.1** To prevent the elimination of significant wildlife and vegetation through resource inventory and management strategies.
- **Policy 1.** To identify and preserve the significant wildlife and vegetation habitats of the County.

Goal 3 Manage and utilize wisely the County's landform resources.

- **Objective 3.1** To minimize to the extent feasible the disruption of significant natural landforms in Orange County.
- **Policy 5.** To protect the unique variety of significant landforms in Orange County through environmental review procedures and community and corridor planning activities.

Open Space Component

The Open Space Component of the Resources Element of the Orange County General Plan is the open space plan for the unincorporated areas of Orange County. This component is the successor to the Open Space Element originally adopted by the Board of Supervisors on June 27, 1973. The preparation of this component is in compliance with State Government Code Sections 65560-65568, which require each city and county to prepare and adopt an open space plan for the comprehensive and long-range preservation of open space land within its jurisdiction. [County of Orange, 2015].

The Open Space Component contains the necessary goals, objectives, policies, and programs to promote the preservation and protection of resource areas and the protection of the public from potential hazards. The component also functions in a manner to shape the overall urban form of Orange County. To that end, open space facilities such as greenbelts that buffer conflicting land uses or link recreation facilities along regional trails and water courses are desired, as well as areas set aside to preserve cultural-historic resources, significant wildlife habitats, and biotic resources such as oak groves, sycamore/riparian woodlands, and marshlands. [County of Orange, 2015]

An integral part of the Open Space Component is the Open Space/Conservation Program Map which depicts an open space framework of countywide significance. This framework includes areas of resource concentration such as existing and proposed regional recreation facilities and a system of linkages such as trails and major open space corridors. The implementation programs provide the mechanism by which an integrated open space network can be realized. [County of Orange, 2015]

The Project Area occurs within the County-designated Upper Santiago Canyon Open Space/Conservation Area. The Upper Santiago Canyon area is proposed as the County's largest inland open space/recreation corridor, linking the proposed Limestone Canyon/Whiting Ranch Regional Park complex with the Irvine Park/proposed Villa Park Basin, Peters Canyon, and Weir Canyon Regional Park complex. Upper Santiago Canyon open space corridor affords buffering and gateway opportunities at points along the Cleveland National Forest boundary in the Central County and is easily accessible to residents of the County's largest cities. The area includes Orange County's largest lake, Santiago Reservoir (Irvine Lake). When combined with the proposed Limestone Canyon Regional Park, Santiago Reservoir presents a centrally located opportunity to establish the County's largest active urban recreation area, modeled after Griffith Park in Los Angeles. Upper Santiago Canyon and environs merit high-priority status due to the presence of a scenic highway, arterial bikeways, existing and proposed regional riding and hiking trails, and six existing and proposed County regional parks. [County of Orange, 2015]

The Goals, Objectives, and Policies relative to open space that apply to the Project Area are as follows:

Goal 1 Retain the character and natural beauty of the environment through the preservation, conservation, and maintenance of open space.

- **Objective 1.1** To designate open space areas that preserve, conserve, maintain, and enhance the significant natural resources and physical features of unincorporated Orange County.
- **Policy 1.1** To guide and regulate development of the unincorporated areas of the County to ensure that the character and natural beauty of Orange County is retained.



- **Policy 1.2** To implement the Open Space Component through a program organization capable of conducting multiple projects at priority locations throughout the County and with sufficient resources, authority, and responsibility to effectively manage the program.

- **Policy 1.3** To seek out, evaluate, and take advantage of special opportunities to obtain open space as these opportunities become available and when the available open space meets or helps to meet established open space goals and objectives.

Goal 4 Conserve open space lands needed for recreation, education, and scientific activities, as well as cultural-historic preservation.

- **Objective 4.1** To encourage the conservation of open space lands which provide recreational scenic, scientific, and educational opportunities.

- **Policy 4.1** To plan for the acquisition, development, maintenance, operation, and financing of open space lands which provide recreational, scenic, aesthetic, scientific, and educational opportunities.

3.3.2 Orange County Central-Coastal Subregion Natural Community Conservation Plan/Habitat Conservation Plan

Assembly Bill 2172 (Natural Community Conservation Planning Act) bill was drafted in recognition of the fact that individual species protection programs prepared and implemented under the FESA and/or SESA were costly and ineffective in protecting and/or preventing extinction of a plant or animal species, and that habitat-based, multi-species or ecosystem-based management and preservation approach has a greater potential for long-term success. AB 2172 was formally signed by Governor Wilson in September of 1991. It provided enabling legislation authorizing the California Department of Fish and Game (CDFG) to enter into agreements with any person, for the purpose of preparing and implementing Natural Community Conservation Plans (NCCP). The NCCP Act also provided the regulatory framework for the preparation of conservation guidelines for the development and implementation of NCCPs. In addition, the act also authorized NCCPs to be undertaken by local, state or federal agencies independently or in cooperation with other persons. [County of Orange, 2015]

The County of Orange established two distinct study areas: the Southern NCCP Subregion and Central/Coastal Sub-region NCCP. The Central-Coastal Subregional NCCP is one of eleven NCCP subregions that has been initiated within the five-county Southern California area and includes a Central Subarea and a Coastal Subarea (County of Orange, 2015). The Project Area occurs in the Central Subarea of the Central-Coastal Subregion NCCP. The Orange County Board of Supervisors approved the Central-Coastal NCCP/Habitat Conservation Plan (HCP) on April 16, 1996 along with the certification of EIR/EIS No. 553. On July 17, 1996 an implementation agreement was executed by the Chairman of the Orange County Board of Supervisors, the State Resources Agency, Department of the Interior, the Transportation Corridor Agencies, Southern California Edison, the Irvine Company and other participating landowners and utility companies. The approval of the NCCP/HCP established the following (County of Orange, 2015):

- Habitat Reserve System (Nature Reserve of Orange County)
- Species and habitat covered under the approved NCCP/HCP
- Coastal Sage Scrub Take Authorization
- “Mutual Assurances” provisions



- Adaptive management programs
- Funding for reserve creation and habitat management
- Nonprofit Corporation

The primary goal of the NCCP/HCP is to protect and manage habitat supporting a broad range of plant and animal populations that are now found within the Central and Coastal Subregion. To accomplish this goal, the NCCP/HCP creates a subregional habitat Reserve System and implements a coordinated program to manage biological resources within the habitat reserve. [County of Orange, 1996]

3.4 OTHER APPLICABLE REGULATIONS, PLANS, AND STANDARDS

3.4.1 California Native Plant Society Rare Plant Program

The mission of the CNPS Rare Plant Program is to develop current, accurate information on the distribution, ecology, and conservation status of California's rare and endangered plants, and to use this information to promote science-based plant conservation in California. Once a species has been identified as being of potential conservation concern, it is put through an extensive review process. Once a species has gone through the review process, information on all aspects of the species (e.g., listing status, habitat, distribution, threats, etc.) are entered into the online CNPS Inventory and given a California Rare Plant Rank (CRPR). In 2011, the CNPS officially changed the name "CNPS List" to "CRPR." The Program currently recognizes more than 1,600 plant taxa (species, subspecies and varieties) as rare or endangered in California.

Vascular plants listed as rare or endangered by the CNPS, but which might not have a designated status under State endangered species legislation, are defined by the following CRPR:

- CRPR 1A - Plants considered by the CNPS to be extinct in California
- CRPR 1B - Plants rare, threatened, or endangered in California and elsewhere
- CRPR 2 - Plants rare, threatened, or endangered in California, but more numerous elsewhere
- CRPR 3 - Plants about which we need more information – a review list
- CRPR 4 - Plants of limited distribution – a watch list

In addition to the CRPR designations above, the CNPS adds a Threat Rank as an extension added onto the CRPR and designates the level of endangerment by a 1 to 3 ranking, with 1 being the most endangered and 3 being the least endangered. These are described as follows:

- 0.1 – Seriously threatened in California (high degree/immediacy of threat)
- 0.2 – Fairly threatened in California (moderate degree/immediacy of threat)
- 0.3 – Not very threatened in California (low degree/immediacy of threats or no current threats known.

4.0 EXISTING CONDITIONS

4.1 SETTING

The four BSAs are located in the western foothills of the Santa Ana Mountains and generally consist of hilly terrain with associated ridges, valleys, and gullies. Elevations and surrounding land use for each BSA are described below.

4.1.1 Oak Canyon

The OCBSA has a lower basin area and an upper hillslope area and ranges in elevation from approximately 950 feet above mean sea level (amsl) along the eastern boundary of the southern portion of the BSA to 675 feet amsl in the stormwater detention basin in the northern portion of the BSA. This basin receives flows diverted away from the adjacent residential area. A large berm runs north/south through the middle of the BSA separating the residential development to the west from the open space and drainage features to the east. The eastern side of the BSA also has unpaved access roads and concrete viaducts. The OCBSA is bordered to the west by residential development and to the north, east, and south by undeveloped land, though SR 241 separates the BSA from the wider area of open space to the east.

4.1.2 Mountain Park

The MPBSA is composed of two general landforms: lowland canyon areas and surrounding hillslopes and ridgetops, ranging in elevation from approximately 980 feet amsl in the southwest portion of the BSA to 400 feet amsl in the north, at the intersection of East Santa Ana Canyon and Gypsum Canyon Roads. The land to the south and east of the MPBSA is in Orange County Parks (OC Parks) Open Space and Natural Community Conservation Plan (NCCP) Reserve, with the I-91 freeway and SR 241 bordering the BSA to the north and west, respectively, with urban development beyond. Irvine Valencia Growers currently leases two small areas totaling approximately five acres in the northern portion of the MPBSA to Orange County Fire Control for use as storage yards.

4.1.3 East Orange I

The mountainous EOIBSA ranges in elevation from approximately 1,250 feet amsl in the east central portion of the BSA to 725 feet amsl in the northernmost corner. Lands surrounding the EOIBSA generally include OC Parks Open Space and NCCP Reserve. This BSA is bound to the north by SR 261, to the west and south by Santiago Canyon Road and SR 241, and to the east by the now-closed Santiago Canyon Landfill. Further east beyond the landfill is Irvine Lake and a temporary use area for private radio-controlled aviation.

4.1.4 East Orange II

The mountainous EOIIBSA ranges from approximately 1,225 feet amsl along the ridgelines in the southeastern portion of the BSA to 800 feet amsl in the in the northwest corner of the BSA. The EOIIBSA is situated approximately 1.5 miles to the southeast of the EOIBSA and is also largely surrounded by OC Parks Open Space and NCCP Reserve lands. It is bound to the north by the private radio-controlled aviation area and to the south, east, and west by undeveloped lands with Santiago Canyon Road traversing along its southern boundary.



4.2 VEGETATION COMMUNITIES AND LAND COVER TYPES

Generally, mapping and description of plant communities follows the classification system described in the second edition of A Manual of California Vegetation (MCVII) (Sawyer et al., 2009). As defined in MCVII, an alliance is defined as "a category of vegetation classification which describes repeating patterns of plants across a landscape. Each alliance is defined by plant species composition, and reflects the effects of local climate, soil, water, disturbance, and other environmental factors."

Species scientific and common names correspond to those described in the second edition of The Jepson Manual (Baldwin et al., 2012). Within the BSAs, Stantec biologists mapped 16 plant communities defined by Sawyer et al. (2009) and four additional land cover types: English plantain herbaceous, rock outcrop, unvegetated streambed, and disturbed/developed land. A discussion of the conditions present within each BSA is included below, summarized in Table 1, and depicted in Figure 2 in Appendix A.

Land Cover Types

DEVELOPED/DISTURBED LAND

Common to all four BSAs, this classification was used to map portions of the BSAs that are developed, including residential developments, paved and unpaved roads, concrete drainage ditches, and landscaped areas heavily dominated by ornamental species. In general, these areas are unvegetated or vegetation is generally sparse. Where vegetated, these areas are generally composed of ruderal pioneer plant species that readily colonize open disturbed soil and thrive as a result of anthropogenic impacts. Some of the plants present within this cover type included red-stem filaree, tocalote (*Centaurea melitensis*), wild oats (*Avena fatua*), and other non-native grasses and forbs.

Vegetation Communities

4.2.1 Oak Canyon

The following MCVII Alliances were observed during the biological surveys conducted within the OCBSA:

- *Bromus rubens* Herbaceous Semi-Natural Alliance – Red brome grasslands
- *Quercus agrifolia* Woodland Alliance – Coast live oak woodland

The OCBSA has been burned relatively recently as evidenced by the presence of blackened substrate and fire scarred woody vegetation. The vegetation community was dominated by early successional, non-native, graminoid and forbs, (80% to 90% absolute aerial coverage) including the invasive species red brome (*Bromus madritensis* var. *rubens*), redstem filaree (*Erodium cicutarium*), and white sweetclover (*Melilotus alba*). In general, the vegetation cover on the hillslopes and ridges was less dense, with more granite based, gravelly substrates.

Toward the northern portion of the berm area of the OCBSA, ornamental herbaceous species such as treasure flower (*Gazania linearis*) and Mexican evening primrose (*Oenothera speciosa*) proliferated. There was also a small coast live oak (*Quercus agrifolia*) woodland on a steep hillslope drain, much of the which was fire scarred. Early successional shrub re-sprouting was observed and included native forb and shrub species including chamise (*Adenostoma fasciculatum*) and deerweed (*Acmispon glaber*).

4.2.2 Mountain Park

The following MCVII Alliances were observed during the biological surveys conducted within the MPBSA:

- *Adenostoma fasciculatum* Shrubland Alliance – Chamise chaparral
- *Avena fatua* Herbaceous Semi-Natural Alliance – Wild oats grasslands
- *Baccharis salicifolia* Shrubland Alliance – Mulefat thickets
- *Bromus diandrus* Herbaceus Semi-Natural Alliance – Annual brome grasslands
- *Bromus rubens* Herbaceous Semi-Natural Alliance – Red brome grasslands
- *Malacothamnus fasciculatus* Shrubland Alliance – Bush mallow scrub
- *Opuntia littoralis* Shrubland Alliance – Coast prickly pear scrub
- *Quercus agrifolia* Woodland Alliance – Coast live oak woodland

Artemisia californica Shrubland Alliance – California sagebrush scrub was also observed, but areas occupied by this community were too small of a mapping unit to include separately in this discussion.

The entire MPBSA was recently burned, as evidenced by the presence of early successional annual grasses and forbs, fire scarred shrub re-sprouts, fire scarred prickly pear (*Opuntia littoralis*), and standing fire scarred coast live oak trees. Due to the disturbance resulting from the fire, there was a high diversity of spring annual herbs within the BSA. The hillslopes and ridges within the MPBSA primarily consisted of early successional grasses and forb species communities, with the presence of fire scar shrubs re-sprouts. Homogenous shrub communities were nearly absent and were punctuated by an occasional fire-scarred prickly pear present on steep slopes or small patches of resprouting chaparral mallow (*Malacothamnus fasciculatus*). Other typical fire-scarred shrub re-sprouts observed consisted of lemonade berry (*Rhus integrifolia*) and laurel sumac (*Malosma laurina*). Red brome was the dominant annual grass community that occupied over 60% of the entire BSA, and smaller headwater drains were also covered in annual grasses. Common forbs observed consisted of mustard (*Hirschfeldia incana*), common eucrypta (*Eucrypta chrysanthemifolia*), and a mix of phacelia species (*Phacelia* spp.).

The coast live oak woodlands that occupy over 20% of the BSA, generally associated with ephemeral drainages, had an aerial canopy coverage of between 10% to 30%. In addition to coast live oak trees, other common canopy species within the riparian habitat included cottonwood (*Populus fremontii*) and western sycamore (*Platanus racemosa*). Where present, the shrub understory consisted of elderberry (*Sambucus nigra*), yerba santa (*Eriodictyon crassifolium*), and California sagebrush (*Artemisia californica*). Ground cover within the oak woodlands was dominated by a mix of annual grass species including ripgut brome (*Bromus diandrus*), wild oat (*Avena fatua*), and red brome at approximately 95% to 100% absolute cover. The thick grasslands would generally occupy floodplains extending to the toe of the hillslope. The streambed in the downstream (northern) end of the MPBSA was mostly unvegetated while the upper reaches were generally composed of a mulefat thicket (*Baccharis salicifolia*) understory. In some locations within the drainage channels, rock rip-rap lined the streams' bed and banks.



4.2.3 East Orange I

The following MCVII Alliances were observed during the biological surveys conducted within the EOIBSA:

- *Artemisia californica* Shrubland Alliance – California sagebrush scrub
- *Avena fatua* Herbaceous Semi-Natural Alliance – Wild oats grasslands
- *Malosma laurina* Shrubland Alliance – Laurel sumac scrub
- *Opuntia littoralis* Shrubland Alliance – Coast prickly pear scrub
- *Quercus agrifolia* Woodland Alliance – Coast live oak woodland
- *Rhus integrifolia* Shrubland Alliance – Lemonade berry scrub
- *Salix goodingii* Woodland Alliance – Black willow thickets

Baccharis salicifolia Shrubland Alliance – Mulefat thickets were also observed, but areas occupied by this community were too small of a mapping unit to include separately in this discussion.

The EOIBSA is comprised of rugged, mountainous terrain with deep drainage features and is covered primarily by California sagebrush scrub interspersed with wild oat (*Avena fatua*) grassland. These two communities represented almost 90% percent of the land cover throughout this BSA. Along with California sagebrush, co-dominant shrub species within the California sagebrush scrub habitat consisted of black sage (*Salvia melifera*), California buckwheat (*Eriogonum fasciculatum*), and deerweed, all growing to a height of 3 to 4 feet. On the west-facing hillslopes in the northeast portion of the BSA, Lemonade berry scrub was the dominant strata, in which a near monoculture of lemonade berry was growing to 6 to 8 inches in height.

In general, the headwaters of the drainages within the EOIBSA were occupied by Laurel sumac scrub comprised primarily of laurel sumac with codominant shrub species including toyon (*Heteromeles arbutifolia*), poison oak (*Toxicodendron diversilobum*), and elderberry. As the drainages descend from the hillsides and spread out, they become populated by canopy species like cottonwood, coast live oak, and black willow (*Salix gooddingii*) with a mulefat understory. The lowest-gradient portions of the drainages along Santiago Canyon Road are occupied by riparian forested Arroyo willow thickets dominated by willows (*Salix* spp.). The detention basin at the northwest corner of the EOIBSA appears to be a wetland feature and was covered primarily with English plantain (*Plantago lanceolata*).

The southern end of the EOIBSA, to the north and west of the landfill access road, was dominated (100% absolute cover) by Wild oat grassland interspersed with California sagebrush scrub. The wild oat grassland community was co-dominated by a mix of mustard (previous year's stalks) and non-native annual brome and oat grasses (*Bromus* spp. and *Avena* spp., respectively).

Disturbed areas within the EOIBSA consisted of old unpaved access roads, a former landfill parking area, and general fill areas. The unmaintained access roads and areas surrounding the existing paved roads were dominated by wild oats and mustard. There were some ornamental trees introduced on the edge of the parking area in the southern portion of the BSA such as eucalyptus (*Eucalyptus* spp.), Peruvian pepper tree (*Schinus molle*), and white silk floss tree (*Ceiba insignis*).



4.2.4 East Orange II

The following MCVII Alliances were observed during the biological surveys conducted within the EOIIBSA:

- *Adenostoma fasciculatum* Shrubland Alliance – Chamise chaparral
- *Artemisia californica* Shrubland Alliance – California sagebrush scrub
- *Avena fatua* Herbaceous Semi-Natural Alliance – Wild oats grasslands
- *Baccharis salicifolia* Shrubland Alliance – Mulefat thickets
- *Bromus diandrus* Herbaceus Semi-Natural Alliance – Annual brome grasslands
- *Quercus agrifolia* Woodland Alliance – Coast live oak woodland
- *Salix goodingii* Woodland Alliance – Black willow thickets
- *Salvia mellifera* Shrubland Alliance – Black sage scrub

The mountainous EOIIBSA is primarily vegetated by dense California sagebrush scrub and Chamise chaparral, which cover the upper hillslopes and ridges of the BSA. These communities are dominated by California sagebrush and chamise, respectively, but were interspersed with other native shrubs, principally black sage. Also interspersed in certain locations along the upper slopes of the BSA were southern coast live oak (*Quercus agrifolia* var. *oxyandenia*). Sparsely vegetated rocky outcrops occurred along some of the upper saddles along the ridgelines, as did areas of red sand substrate forming unique microhabitats in which California fuchsia (*Epilobium canum*) was observed.

At lower elevations of the EOIIBSA, Coast live oak woodlands occur along drainage channels and are interspersed with annual grasslands throughout the adjacent upland areas. In many areas throughout these lower elevations, the Coast live oak woodland habitat surrounding the drainage channels had an understory consisting of 90 to 100% ground cover of ripgut brome. Wild oats grasslands present within the BSA were a mixture of non-native oat and brome grasses and mustard. A section of willow riparian forest occurs in a low-gradient section of one of the drainages channels within the BSA. This section, adjacent to Santiago Canyon Road, consists of both black and red willows with a mulefat understory.



Table 1 Vegetation Communities and Land Cover Types Occurring within the BSAs

Vegetation Communities/Land Cover Types	Areas within BSAs (acres)			
	OCBSA	MPBSA	EOIBSA	EOIIBSA
MCVII VEGETATION COMMUNITIES				
Annual brome grassland	-	17.83	-	
Black sage scrub	-	-	25.78	
Black willow thickets	-	-	0.60	
Bush mallow scrub	-	0.90	-	-
California buckwheat scrub	-	-	5.12	
California sagebrush scrub*	-	-	260.61	278.44
Chamise chaparral	-	2.49	-	7.04
Coast live oak woodland	0.57	8.82	5.83	18.98
Coast prickly pear scrub*	-	1.48	0.51	-
Lemonade berry scrub*	-	-	22.64	-
Mulefat thickets*	-	2.45	-	
Poison oak scrub	-	-	6.52	-
Red brome grasslands	20.27	270.59	79.76	153.53
Red willow thickets	-	-	2.40	5.30
Upland mustards	-	-	76.77	-
Wild oats grasslands	-		2.40	
OTHER LAND COVER TYPES				
Disturbed/Developed	9.64	7.40	5.84	17.56
TOTAL	**30.48**	**311.96**	**494.78**	**480.85**

*Sensitive Vegetation Community

4.2.5 Soils

Prior to conducting the focused botanical survey and jurisdictional delineation, historic soils data from the Natural Resources Conservation Service (NRCS) was used to determine potential soil types that may occur within the BSAs and included determining where hydric soils have historically occurred (refer to Appendix A, Figure 3). Tables 2a-2d identify the soils historically known to occur within the four BSAs. Of the soils listed in Tables 2a-2d, two appear on the NRCS hydric soils list; Pits (MPBSA) and Riverwash (MPBSA and EOIIBSA).

Table 2a Historic Soil Units Occurring within the OCBSA

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
145	Cieneba-Rock outcrop complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	7.24
175	Myford sandy loam, 9 to 15 percent slopes	A moderately well drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from mixed; very high runoff; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	4.66
192	Rock outcrop-Cieneba complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	4.52
199	Soper loam, 15 to 30 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; loam (0-9”), gravelly clay loam (9-30”), weathered bedrock (30-59”)	0.28
200	Soper loam, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; loam (0-9”), gravelly clay loam (9-30”), weathered bedrock (30-59”)	1.13
202	Soper gravelly loam, 30 to 50 percent slopes, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 2,010 feet; parent material consists of residuum weathered from sandstone; high runoff; gravelly loam (0-8”), gravelly clay loam (8-29”), bedrock (29-79”)	8.85

Table 2b Historic Soil Units Occurring within the MPBSA

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
145	Cieneba-Rock outcrop complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	49.99
146	Corralitos loamy sand*	A somewhat excessively drained soil that occurs on alluvial fans at elevations between 30 to 1,000 feet; parent material consists of alluvium derived from mixed; negligible runoff; loamy sand (0-9”), stratified sand to loamy sand (9-60”)	47.64
154	Bosanko-Balcom complex, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 300 to 2,500 feet; parent material consists of residuum weathered from granite; not prone to flooding; clay (0-15”), clay, clay loam, silty clay (15-37”), weathered bedrock (15-27”)	4.76
185	Pits*	Parent material consists of igneous, metamorphic and sedimentary rock; extremely gravelly coarse sand (0-6”), extremely gravelly sand, extremely gravelly coarse sand, very gravelly coarse sand (6-60”)	8.23



Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
191	Riverwash*	Occurs on fans; parent material consists of sandy and gravelly alluvium; negligible runoff; gravelly sand (0-6”), stratified gravelly coarse sand to sandy loam (6-60”)	26.97
192	Rock outcrop-Cieneba complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	27.28
193	San Andreas sandy loam, 15 to 30 percent slopes, warm MAAT, MLRA 20	A well-drained soil that occurs on hillslopes and mountain slopes at elevations between 40 to 1,810 feet; parent material consists of residuum weathered from sandstone; high runoff; sandy loam (0-31”), bedrock (31-39”)	22.57
200	Soper loam, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; loam (0-9”), gravelly clay loam (9-30”), weathered bedrock (30-59”)	47.48
202	Soper gravelly loam, 30 to 50 percent slopes, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 2,010 feet; parent material consists of residuum weathered from sandstone; high runoff; gravelly loam (0-8”), gravelly clay loam (8-29”), bedrock (29-79”)	6.74
226	Yorba cobbly sandy loam, 30 to 50 percent slopes	A well-drained soil that occurs on terraces at elevations between 100 to 2,500 feet; parent material consists of sandy and gravelly alluvium derived from mixed; very high runoff; very cobbly sandy loam (0-11”), very gravelly sandy clay loam (11-40”), very gravelly sandy loam (40-63”)	61.42

* Indicates a NRCS-listed hydric soil

Table 2c Historic Soil Units Occurring within the EOIBSA

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
100	Alo clay, 9 to 15 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 0 to 1,460 feet; parent material consists of calcareous residuum weathered from sandstone and shale; very high runoff; clay (0-25”), bedrock (25-59”)	0.24
101	Alo clay, 15 to 30 percent slopes	A well-drained soil that occurs oh hills at elevations between 200 to 3,250 feet; parent material consists of residuum weathered from sedimentary rocky; very high runoff; clay (0-22”), weathered bedrock (22-59”)	13.66
102	Alo clay 30 to 50 percent slopes, warm MAAT, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 1,890 feet; parent material consists of residuum weathered from sandstone and shale; high runoff; clay (0-22”), bedrock (22-79”)	4.20
103	Alo variant clay, 9 to 15 percent slopes	A well-drained soil that occurs on hills at elevations between 200 to 700 feet; parent material consists of residuum weathered from sedimentary rock; runoff not classified; clay (0-40”), weathered bedrock (40-59”)	5.53



Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
104	Alo variant clay, 15 to 30 percent slopes	A well-drained soil that occurs on hills at elevations between 200 to 700 feet; parent material consists of residuum weathered from sedimentary rock; runoff not classified; clay (0-38”), weathered bedrock (38-59”)	53.029
105	Alo variant clay, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 200 to 700 feet; parent material consists of residuum weathered sedimentary rock; runoff not classified; clay (0-38”), weathered bedrock (38-59”)	13.55
108	Anaheim clay loam, 15 to 30 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of fine-grained residuum weathered from sandstone and shale; runoff not classified; clay loam (0-26”), weathered bedrock (26-59”)	2.59
109	Anaheim clay loam, 30 to 50 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 20 to 2,710 feet; parent material consists of fine-grained residuum weathered from sandstone and shale; very high runoff; clay loam (0-26”), bedrock (26-59”)	6.74
111	Balcom clay loam, 9 to 15 percent slopes	A well-drained soil that occurs on hills at varying elevations; parent material consists of calcareous residuum weathered from sandstone and shale; runoff not classified; clay loam (0-34”), weathered bedrock (34-59”)	11..03
114	Balcom-Rock outcrop complex, 15 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 650 to 4,000 feet; parent material consists of calcareous residuum weathered from sandstone and shale; not prone to flooding; clay loam (0-27”), weathered bedrock (27-59”)	4.80
126	Bosanko clay, 9 to 15 percent slopes	A well-drained soil that occurs on hills at elevations between 300 to 2,500 feet; parent material consists of residuum weathered from granite; runoff not classified; clay (0-25”), clay, clay loam, silty clay (25-37”), weathered bedrock (25-37”)	19.92
127	Bosanko clay, 15 to 30 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 120 to 1,280 feet; parent material consists of acid residuum weathered from igneous rock; not prone to flooding; clay (0-35”), bedrock (35-79”)	0.03
130	Bosanko-Balcom complex, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 300 to 2,500 feet; parent material consists of residuum weathered from granite; not prone to flooding; clay (0-15”), clay, clay loam, silty clay (15-37”), weathered bedrock (15-27”)	2.10
134	Calleguas clay loam, 50 to 75 percent slopes, eroded	A well-drained soil that occurs on hillslopes at elevations between 0 to 2,930 feet; parent material consists of residuum weathered from calcareous shale; very high runoff; clay loam (0-11”), very channery clay loam (11-15”), bedrock (15-42”)	104.57
141	Cieneba sandy loam, 15 to 30 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; runoff not classified; sandy loam (0-17”), weathered bedrock (17-59”)	14.58
142	Cieneba sandy loam, 30 to 75 percent slopes, eroded	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	7.61

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
173	Myford sandy loam, 2 to 9 percent slopes	A moderately well drained soil that occurs on terraces at elevations between 0 to 1,560 feet; parent material consists of alluvium derived from sandstone; high runoff; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	1.02
175	Myford sandy loam, 9 to 15 percent slopes	A moderately well drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from mixed; very high runoff; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	7.86
177	Myford sandy loam, 9 to 30 percent slopes, eroded	A moderately well drained soil that occurs on terraces at elevations between 0 to 2,100 feet; parent material consists of alluvium derived from sandstone; high runoff; sandy loam (0-7”), sandy clay (7-11”), sandy clay loam (11-64”), sandy loam (64-79”)	31.72
192	Rock outcrop-Cieneba complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	11.86
199	Soper loam, 15 to 30 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; loam (0-9”), clay loam (9-30”), weathered bedrock (30-59”)	2.42
200	Soper loam, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; loam (0-9”), gravelly clay loam (9-30”), weathered bedrock (30-59”)	38.73
202	Soper gravelly loam, 30 to 50 percent slopes, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 2,010 feet; parent material consists of residuum weathered from sandstone; high runoff; gravelly loam (0-8”), gravelly clay loam (8-29”), bedrock (29-79”)	26.51
203	Soper cobbly loam, 15 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; cobbly loam (0-9”), cobbly clay loam, cobbly sandy clay loam, cobbly loam (9-30”), weathered bedrock (9-30”)	41.84
204	Soper-Rock outcrop complex, 30 to 75 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 4,000 feet; parent material consists of residuum weathered from sandstone; runoff not classified; gravelly loam (0-4”), gravelly clay loam, gravelly sandy clay loam, gravelly loam (4-20”), weathered bedrock (4-20”)	7.64
207	Sorrento loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	A well-drained soil that occurs on alluvial fans at elevations between 0 to 1,340 feet; parent material consists of alluvium derived from sedimentary rock; medium runoff; loam (0-12”), silty clay loam (12-62”), sandy loam (62-72”)	60.75

Table 2d Historic Soil Units Occurring in the EOIIBSA

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
100	Alo clay, 9 to 15 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 0 to 1,460 feet; parent material consists of calcareous residuum weathered from sandstone and shale; very high runoff; clay (0-25”), bedrock (25-59”)	17.62
101	Alo clay 15 to 30 percent slopes	A well-drained soil that occurs oh hills at elevations between 200 to 3,250 feet; parent material consists of residuum weathered from sedimentary rocky; very high runoff; clay (0-22”), weathered bedrock (22-59”)	20.40
102	Alo clay, 30 to 50 percent slopes, warm MAAT, MLRA	A well-drained soil that occurs on hills at elevations between 10 to 1,890 feet; parent material consists of residuum weathered from sandstone and shale; high runoff; clay (0-22”), bedrock (22-79”)	4.12
107	Anaheim clay loam, 30 to 50 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 20 to 2,710 feet; parent material consists of fine-grained residuum weathered from sandstone and shale; very high runoff; clay loam (0-26”), bedrock (26-59”)	5.30
110	Anaheim clay loam, 50 to 75 percent slopes	A well-drained soil that occurs on hills at elevations between 10 to 2,500 feet; parent material consists of fine-grained residuum weathered from sandstone and shale; not prone to flooding; clay loam (0-21”), weathered bedrock (21-59”)	13.22
112	Balcom clay loam, 15 to 30 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 10 to 1,620 feet; parent material consists of calcareous residuum weathered from sandstone and shale; high runoff; clay loam (0-34”), bedrock (34-44”)	6.29
114	Balcom-Rock outcrop complex, 15 to 50 percent slopes	A well-drained soil that occurs on hillsat elevations between 650 to 4,000 feet; parent material consists of calcareous residuum weathered from sandstone and shale; not prone to flooding; clay loam (0-27”), weathered bedrock (27-59”)	18.81
132	Botella clay loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	A well-drained soil that occurs on alluvial fans at elevations between 80 to 1,450 feet; parent material consists of alluvium derived from sedimentary rock; medium runoff; clay loam (0-8”), silty clay loam (8-35”), clay loam (35-66”)	10.79
135	Capistrano sandy loam, 2 to 9 percent slopes	A well-drained soil that occurs on alluvial fans at elevations between 0 to 2,500 feet; parent material consists of alluvium derived from granite; not prone to flooding; sandy loam (0-27”), fine sandy loam (27-65”)	4.36
141	Cieneba sandy loam, 15 to 30 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; runoff not classified; sandy loam (0-17”), weathered bedrock (17-59”)	49.23
142	Cieneba sandy loam, 30 to 75 percent slopes, eroded	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	129.91



Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
173	Myford sandy loam, 2 to 9 percent slopes	A moderately well-drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from sandstone; not prone to flooding; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	8.83
175	Myford sandy loam, 9 to 15 percent slopes	A moderately well drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from mixed; very high runoff; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	28.84
176	Myford sandy loam, 15 to 30 percent slopes	A moderately well drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from mixed; not rone to flooding; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	2.13
177	Myford sandy loam, 9 to 30 percent slopes, eroded	A moderately well drained soil that occurs on terraces at elevations between 0 to 2,100 feet; parent material consists of alluvium derived from sandstone; high runoff; sandy loam (0-7”), sandy clay (7-11”), sandy clay loam (11-64”), sandy loam (64-79”)	0.38
191	Riverwash*	Occurs on fans; parent material consists of sandy and gravelly alluvium; negligible runoff; gravelly sand (0-6”), stratified gravelly coarse sand to sandy loam (6-60”)	18.49
192	Rock outcrop-Cieneba complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	19.46
193	193—San Andreas sandy loam, 15 to 30 percent slopes, warm MAAT, MLRA 20	A well-drained soil that occurs on hill slopes and mountain slopes at elevations between 40 to 1,810 feet; parent material consists of residuum weathered from sandstone; not prone to flooding; sandy loam (0-31”), bedrock (31-39”)	40.82
202	Soper gravelly loam, 30 to 50 percent slopes, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 2,010 feet; parent material consists of residuum weathered from sandstone; not prone to flooding; gravelly loam (0-8”), gravelly clay loam (8-29”), bedrock (8-29”)	30.34
203	Soper cobbly loam, 15 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2500 feet; parent material consists of residuum weathered from sandstone; not prone to flooding; cobbly loam (0-9”), cobbly clay loam, cobbly sandy clay loam, cobbly loam, weathered bedrock (9-30”)	44.53
207	Sorrento loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	A well-drained soil that occurs on alluvial fans at elevations between 0 to 1,340 feet; parent material consists of alluvium derived from sedimentary rock; not prone to flooding; loam (0-12”), silty clay loam (12-62”)	6.97

* Indicates a NRCS-listed hydric soil



4.2.6 Jurisdictional Waters/Wetlands

The National Wetlands Inventory has mapped the following types of riparian and wetland habitats within the BSAs (data is dated March 2006):

- OCBSA – no riverine/wetland habitats mapped
- MPBSA – R4SBA (Riverine, Intermittent, Streambed, Temporary Flooded) and PSSA (Palustrine, Scrub-Shrub, Temporary Flooded)
- EOIBSA – R4SBA (Riverine, Intermittent, Streambed, Temporary Flooded), R4SBAr (Riverine, Intermittent, Streambed, Temporary Flooded, Artificial Substrate), R4SBC (Riverine, Intermittent, Streambed, Seasonally Flooded), PSSA (Palustrine, Scrub-Shrub, Temporary Flooded), PSSAx (Palustrine, Scrub-Shrub, Temporary Flooded, Excavated), PSSAh (Palustrine, Scrub-Shrub, Temporary Flooded, Diked/Impounded), PEM1A (Emergent, Persistent, Temporary Flooded), and PEM1Ah (Emergent, Persistent, Temporary Flooded, Diked/Impounded)
- EOIIBSA - R4SBA (Riverine, Intermittent, Streambed, Temporary Flooded), PFOA (Palustrine, Forested, Temporary Flooded), PFOC (Palustrine, Forested, Seasonally Flooded), PFO/SSA (Palustrine, Forested/Sub Shrub, Temporary Flooded), and PSSA (Palustrine, Scrub-Shrub, Temporary Flooded),

Based on the data collected in the field, three types of jurisdictional features occur within the BSAs as summarized in Table 3). These include USACE/RWQCB wetland waters of the U.S., USACE/RWQCB non-wetland waters of the U.S., and CDFW jurisdictional waters.

Of the six soil test pits dug, Sampling Points WAS01 and WAS04 (EOIBSA) confirmed the presence of locally hydric soils. Vegetation occurring at Sampling Points WAS01 and WAS04 (EOIBSA) satisfied the 50/20 rule required to meet the hydrophytic vegetation threshold. A minimum of one primary or two secondary wetland hydrology indicators were observed at both WAS01 and WAS04. Therefore, conditions at these two locations met at least two of the three wetland criteria and were determined to constitute wetland waters of the U.S.

The impact acreages presented below in Table 3 were calculated based on preliminary project design.

Table 3 Acreage of Potential Jurisdictional Waters and Wetlands within the BSAs and Summary of Project Impacts

BSA*	Wetland Waters of the U.S. (acres)		Non-Wetland Waters of the U.S. (acres)		CDFW Jurisdictional Waters (acres)	
	Survey Area	Project Impact Areas	Survey Area	Project Impact Areas	Survey Area	Project Impact Areas
Oak Canyon	0	0	0	0	0	0
Mountain Park	0	0	1.003	0.007	3.369	0.011
East Orange I	0.179	0	2.937	0.004	10.521	0.008
East Orange II	0	0	0.233	0.001	0.621	0.005
Totals	**0.179**	**0**	**4.173**	**0.012**	**14.511**	**0.024**

*Acreages reflect the BSAs as defined in the Preliminary Jurisdictional Wetlands/Waters Report and differ in size from the BSAs defined in this report.

Federal Wetlands

Hydrophytic vegetation was present at several of the soil test pits and included species with a status of OBL, FACW, or FAC; refer to Appendix G for a complete list of all plant species observed and their indicator status. Hydrologic indicators observed during the delineation within the BSAs included the following: Saturation (A3), Sediment Deposits (B2) (Nonriverine), Drift Deposits (B3) (Nonriverine), Surface Soil Cracks (B6), Water-Stained Leaves (B9), Oxidized Rhizospheres along Living Roots (C3), Sediment Deposits (B2) (Riverine), Drift Deposits (B3) (Riverine), Drainage Patterns (B10), Saturation Visible on Aerial Imagery (C9), and FAC-Neutral Test (D5) – refer to Appendix E for detailed information on these and other indicators.

Based on Stantec's professional opinion following an assessment of hydrology, vegetation, and soils (Environmental Laboratory, 1987 and 2011), approximately 0.179 acre of potentially jurisdictional federal wetlands occur within the EOI BSA, none of which is expected to be impacted by the Project.

Federal Non-Wetlands Waters

Based on Stantec's professional opinion following an assessment of hydrology, soil characteristics, vegetation, and the limits of the OHWM, an approximate total of 4.173 acres of potentially jurisdictional non-wetland waters of the U.S. are estimated to occur within the BSAs. Proposed impacts to potentially jurisdictional non-wetland waters of the U.S. are as follows:

- Oak Canyon: No impact
- Mountain Park: 0.007 acres of impact
- East Orange I: 0.004 acres of impact
- East Orange II: 0.001 acres of impact



CDFW Jurisdictional Waters

Based on Stantec's professional opinion following an assessment of hydrology and the presence of bed and bank, there is a total of approximately 14.511 acres of CDFW Jurisdictional Waters present within the BSAs. Proposed impacts to CDFW jurisdictional waters are as follows:

- Oak Canyon: No impact
- Mountain Park: 0.011 acres of impact
- East Orange I: 0.008 acres of impact
- East Orange II: 0.005 acres of impact

4.3 COMMON WILDLIFE

4.3.1 Invertebrates and Gastropods

Focused insect surveys within the BSAs were not performed; however, a variety of common insects are known to occur in the area. Habitat conditions in the BSAs provide a suite of microhabitat conditions for a wide variety of terrestrial insects and other invertebrates. As in all ecological systems, invertebrates in the BSAs play a crucial role in a number of biological processes. They serve as the primary or secondary food source for a variety of bird, reptile, and mammal predators; they provide important pollination vectors for numerous plant species; they act as efficient components in controlling pest populations; and they support the naturally occurring maintenance of an area by consuming detritus and contributing to necessary soil nutrients. The reconnaissance surveys of the BSAs detected a wide variety of common and non-native invertebrates. Some of the orders identified in the BSAs included *Odonata* (dragonflies, damselflies), *Hemiptera* (true bugs), *Coleoptera* (beetles), *Diptera* (flies), *Lepidoptera* (moths and butterflies), *Hymenoptera* (wasps, bees and ants), and *Orthoptera* (grasshoppers).

4.3.2 Fish

Historically, the Santa Ana watershed is known to support several fish species; however, these are not expected to occur for any appreciable duration within the BSAs because aquatic habitat is only present for a short time during and immediately after substantial rain events.

4.3.3 Amphibians

Amphibians often require a source of standing or flowing water to complete their life cycle. However, some terrestrial species can survive in drier areas by remaining in moist environments found beneath leaf litter and fallen logs, or by burrowing into the soil. Amphibian species were not observed during the reconnaissance surveys within the BSAs. Species not observed in the BSAs but known to occur in the region include the Baja California treefrog (*Pseudacris hypochondriaca*), California toad (*Anaxyrus boreas halophilus*), California newt (*Taricha torosa*), and the non-native bullfrog (*Lithobates catesbeiana*). These species all require aquatic habitat for all or part of their life cycle, which is only present during and immediately after substantial rain events, and therefore are not likely to occur within either BSA outside of the rainy season, generally from November through March. These species are highly cryptic and often difficult to detect. Downed logs, bark, and other woody material present in limited portions of the BSAs, in various stages of



decay (often referred to as coarse woody debris) likely provide shelter and feeding sites for a variety of wildlife, including amphibians and reptiles (Maser and Trappe, 1984; Aubry et al., 1988).

4.3.4 Reptiles

The number and type of reptile species that may occur at a given site is related to a number of biotic and abiotic features. These include the diversity of plant communities, substrate, soil type, and presence of refugia such as rock piles, boulders, and native debris. Weather conditions were favorable during the surveys for reptile activity.

Reptiles observed within the BSAs during the surveys included western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), and two-striped garter snake (*Thamnophis hammondii*), a CDFW Species of Special Concern, in the southern portion of the EOIBSA. Although not observed, several other common reptiles likely occur in the BSAs. Many reptile species, even if present, are difficult to detect because they are cryptic and their life history characteristics (e.g., foraging, thermoregulatory behavior, fossorial nature, camouflage etc.) limit their ability to be observed during most surveys. Further, many species are only active within relatively narrow thermal limits, avoiding both cold and hot conditions, and most take refuge in microhabitats that are not directly visible to the casual observer, such as rodent burrows, in crevices, under rocks and boards, and in dense vegetation where they are protected from unsuitable environmental conditions and predators (USACE and CDFG, 2010). In some cases, they are only observed when flushed from their refugia. Although not detected in the BSAs, suitable habitat conditions for a number of common reptiles including western skink (*Plestiodon skiltonianus*), southern alligator lizard (*Elgaria multicarinata*), San Diego gopher snake (*Pituophis catenifer annectens*), California whipsnake (*Masticophis lateralis lateralis*), California kingsnake (*Lampropeltis californiae*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*) were observed within the BSAs at the time of the survey.

4.3.5 Birds

Birds were identified by sight and sound and were observed throughout each of the BSAs. Some of these included northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), western scrub jay (*Aphelocoma californica*), California towhee (*Melozone crissalis*), house finch (*Haemorhous mexicanus*), common raven (*Corvus corax*), and turkey vulture (*Cathartes aura*) (flyover). All avian species identified in the BSAs during the biological surveys are listed in Table 4. It is possible that many other birds use the BSAs either as wintering habitat, seasonal breeding, or as occasional migrants. Although not detected in the BSA suitable habitat conditions for a variety of common birds including spotted towhee (*Pipilo maculatus*), western bluebird (*Sialia mexicana*), white-crowned sparrow (*Zonotrichia leucophrys*), vermillion flycatcher (*Pyrocephalus rubinus*), and American robin (*Turdus migratorius*) were observed within the BSAs at the time of the survey.

4.3.6 Mammals

Generally, the distribution of mammals on a given site is associated with the presence of factors such as access to perennial water, topographical and structural components (e.g., rock piles, vegetation) that provide cover and support prey base, and the presence of suitable soils for fossorial mammals (e.g., sandy areas). Mammal species observed during the biological surveys within the BSAs included California ground squirrel (*Otospermophilus beecheyi*), Audubon's cottontail (*Sylvilagus audubonii*), mule deer (*Odocoileus hemionus*), and sign of coyote (*Canis latrans*), woodrat (*Neotoma* spp.), and Botta's pocket gopher (*Thomomys bottae*). Though not observed, a number of common mammals are expected to occur within the BSAs given the habitat conditions and species that are known to occur in



the Santa Ana Mountains. These may include Virginia opossum (*Didelphis virginiana*), mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), and raccoon (*Procyon lotor*). No special-status mammal species were observed in any of the four BSAs.

Although bats were not detected in the BSAs, they likely forage and roost within the riparian corridors within the BSAs. Many bats tend to concentrate foraging activities in riparian habitats similar to those present within and adjacent to the BSAs where insect abundance is high (CDFW, 2000).

Table 4 Wildlife Species Observed in the BSAs

Scientific Name	Common Name
Reptiles	
Sceloporus occidentalis	western fence lizard
Thamnophis hammondii	two-striped garter snake
Uta stansburiana	side-blotched lizard
Birds	
Accipiter striatus	sharp-shinned hawk
Aphelocoma californica	scrub jay
Ardea herodias	great blue heron
Baeolophus inornatus	oak titmouse
Bubo virginianus	great horned owl
Buteo jamaicensis	red-tailed hawk
Calypte anna	Anna's hummingbird
Cathartes aura	Turkey vulture (fly over)
Chamaea fasciata	wrentit
Chordeiles minor	common nighthawk
Circus cyaneus	northern harrier
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Dryocopus pileatus	pileated woodpecker
Falco sparverius	American kestrel
Haemorhous mexicanus	house finch
Melanerpes formicivorus	acorn woodpecker
Melozone crissalis	California towhee
Mimus polyglottos	northern mockingbird
Molothrus ater	brown-headed cowbird
Petrochelidon pyrrhonota	American cliff swallow
Polioptila caerulea	blue-gray gnatcatcher
Sayornis nigricans	black phoebe
Selasphorus sasin	Allen's hummingbird
Setophaga coronata	yellow-rumped warbler
Spinus psaltria	lesser goldfinch



Scientific Name	Common Name
Sturnus vulgaris	European starling
Turdus migratorius	American robin
Vireo huttoni	Hutton's vireo
Zenaida macroura	mourning dove
Mammals	
*Canis latrans**	coyote
Odocoileus hemionus	mule deer
Otospermophilus beecheyi	California ground squirrel
Neotoma spp.*	woodrat
Thomomys bottae	Botta's pocket gopher

* Sign observed (e.g., scat, tracks, middens, etc.)

5.0 SPECIAL STATUS BIOLOGICAL RESOURCES

The background information presented above, combined with field observations taken during the survey, was used to generate a list of special-status natural communities and special-status plant and animal taxa that either occur or may have the potential to occur within the two BSAs and/or adjacent habitats. For the purposes of this report, special-status taxa are defined as plants or animals that:

- Have been designated as either rare, threatened, or endangered by CDFW or the USFWS, and are protected under either the California or Federal ESAs;
- Are candidate species being considered or proposed for listing under these same acts;
- Are recognized as Species of Special Concern by the CDFW;
- Are ranked as CRPR 1, 2, 3 or 4 plant species;
- Are fully protected by the California Fish and Game Code, Sections 3511, 4700, 5050, or 5515; or
- Are of expressed concern to resource/regulatory agencies, or local jurisdictions.

5.1 SPECIAL-STATUS NATURAL COMMUNITIES

Special-status natural communities are defined by CDFW (2009) as, "...communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects." All vegetation within the state is ranked with an "S" rank, however only those that are of special concern (S1-S3 rank) are generally evaluated under the California Environmental Quality Act (CEQA). Three communities observed within the BSAs are listed with a rank of S3: black willow thickets (EOIBSA – 0.60 acre;), coast prickly pear scrub (MPBSA – 1.48 acres; EOIBSA – 0.51 acres), and lemonade berry scrub (EOIBSA – 22.64 acres). The Project Area occurs in the Central Sub-Area of the Central/Coastal Subregion Natural Community Conservation Plan and Habitat Conservation Plan



(NCCP/HCP) boundaries. This NCCP/HCP treats California sage scrub as a sensitive resource; therefore, for the purposes of this project impacts and mitigation, California sage scrub is considered a sensitive community.

5.2 DESIGNATED CRITICAL HABITAT

Critical habitat is defined by the USFWS (2018b) as "…a term defined and used in the Endangered Species Act. It is specific geographic areas that contain features essential to the conservation of an endangered or threatened species and that may require special management and protection. Critical habitat may also include areas that are not currently occupied by the species but will be needed for its recovery."

Several areas of critical habitat occur in the vicinity of the BSAs. The nearest is for Braunton's milk-vetch (*Astragalus brauntonii*), which occurs approximately 0.19 mile east of the MPBSA. Also, near the MPBSA are critical habitat areas for coastal California gnatcatcher (*Polioptila californica californica*) (0.33 mile east) and Santa Ana sucker (*Catostomus santaanae*) (0.36 mile north along the Santa Ana River). The nearest critical habitat areas to the EOIBSA are for coastal California gnatcatcher and San Diego fairy shrimp (*Branchinecta sandiegoensis*), which occur approximately 0.73-mile northwest and 0.97-mile northeast of the BSA, respectively. Critical habitat for arroyo toad (*Anaxyrus californicus*) occurs approximately 0.65 mile to the southeast and 1.08 miles to the northeast of the EOIIBSA.

5.3 SPECIAL-STATUS PLANTS

Table 5 presents a list of special-status plants, including federally- and state listed species and CRPR 1-4 species that are known to occur in the vicinity of the BSAs. During the botanical surveys conducted in May 2018, two special-status plant species were identified within the BSAs: many-stemmed dudleya (*Dudleya multicaulis*) and Peirson's morning glory (*Calystegia peirsonii*).

A records search of the CNDDB, the CNPS Online Inventory, and the Consortium of California Herbaria (CCH) was performed for special-status plant taxa and non-protocol plant surveys were conducted within the BSAs (refer to Appendix A, Figure 4). Each of the taxa identified in the record searches was assessed for their potential to occur within the BSAs based on the following criteria:

- Present: Taxa were observed within the BSAs during recent botanical surveys or population has been acknowledged by CDFW, USFWS, or local experts.
- High: Both a documented recent record (within 10 years) exists of the taxa within the BSAs or immediate vicinity (approximately 5 miles) and the environmental conditions (including soil type) associated with taxa presence occur within the BSAs.
- Moderate: Both a documented recent record (within 10 years) exists of the taxa within the BSAs or the immediate vicinity (approximately 5 miles) and the environmental conditions associated with taxa presence are marginal and/or limited within the Project Area or the BSAs are located within the known current distribution of the taxa and the environmental conditions (including soil type) associated with taxa presence occur within the BSAs.

- Low: A historical record (over 10 years) exists of the taxa within the BSAs or general vicinity (approximately 10 miles) and the environmental conditions (including soil type) associated with taxa presence are marginal and/or limited within the BSAs.
- Not Likely to Occur: The environmental conditions associated with taxa presence do not occur within the BSAs.

Table 5 Known and Potential Occurrences of Special-Status Plant Taxa within the BSAs

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Abronia villosa var. *aurita* chaparral sand-verbena	1B.1	Chaparral, coastal scrub, desert dunes. Sandy areas. 60-1570 m.	(Jan) Mar-Sep	**Moderate (MP, EOI, and EOII BSAs); Low (OCBSA)** Suitable substrate is largely absent from the BSAs; however sandy areas are present in some drainages within the MP, EOI, and EOII BSAs. Sandy substrates are absent from the OCBSA. The nearest recorded occurrence is less than 1-mile northwest of the OC and MP BSAs.
Astragalus brauntonii Braunton's milk-vetch	FE, 1B.1	Chaparral, valley grasslands, coastal sage scrub, closed-cone pine forest. Occurs in disturbed habitat; about 4-640 m.	Jan-Aug	**High (all BSAs)** Suitable habitat and disturbed areas occur within all BSAs. The nearest recorded occurrences are less than 1-mile northeast of the EOI and MP BSAs, 2 miles northwest of the EOIIBSA, and 1 mile northeast of the OCBSA.
Atriplex coulteri Coulter's saltbush	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland. Ocean bluffs, ridgetops, as well as alkaline low places. Alkaline or clay soils. 2-460 m.	Mar-Oct	**Moderate (EOI and EOII BSAs); Low (OC and MP BSAs)** Suitable habitat is present throughout the MP, EOI, and EOII BSAs; however, suitable clay substrates occur only within the EOI and EOII BSAs.
Baccharis malibuensis Malibu baccharis	1B.1	Chaparral, cismontane woodland, coastal scrub, riparian woodland; about 150-305 m.	Aug	**High (EOI and EOII BSAs); Moderate (MPBSA); Low (OCBSA)** Suitable habitat occurs throughout the MP, EOI, and EOII BSAs. The nearest recorded occurrence is within 2 miles northeast and north of EOIBSA and EOIIBSA, respectively.



Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Brodiaea filifolia thread-leaved brodiaea	FT, SE, 1B.1	Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools. Usually associated with annual grassland and vernal pools; often surrounded by shrubland habitats. Occurs in openings on clay soils. 15-1030 m.	Mar-Jun	**Moderate (EOI and EOII BSAs); Low (OC and MP BSAs)** Suitable habitat is present throughout all of the BSAs; however, suitable clay substrates occur only within the EOI and EOII BSAs.
Calochortus plummerae Plummer's mariposa lily	4.2	Granitic, rocky. Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grassland. 100-1700 m.	May-Jul	**Moderate (all BSAs)** Suitable habitat and substrates occur within all BSAs.
Calochortus weedii var. *intermedius* intermediate mariposa-lily	1B.2	Coastal scrub, chaparral, valley and foothill grassland. Dry, rocky calcareous slopes and rock outcrops. 60-1575 m.	May-Jul	**High (all BSAs)** Suitable habitat and substrates occur within all BSAs. The nearest recorded occurrence is less than 1 mile southeast and south of the OC and MP BSAs, respectively, less than 2 miles north of the EOIBSA, and less than 1 mile east of the EOIIBSA.
Calystegia felix lucky morning glory	1B.1	Historically associated with wetland and marshy places, but possibly in drier situations as well. Possibly silty loam and alkaline; meadows and seeps (sometimes alkaline), riparian scrub (alluvial); about 30-215 m.	Mar-Sep	**Moderate (EOI and EOII BSAs); Low (OC and MP BSAs)** Suitable habitat is absent from the OC and MP BSAs but does occur within the EOI and EOII BSAs. The EOI and EOII BSAs occur slightly higher than this species' known elevation range.
Calystegia peirsonii Peirson's morning glory	4.2	Chaparral, Chenopod scrub, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland. 30-1500 m.	Apr-Jun	**Observed** This species was observed within all of the BSAs.
Centromadia parryi ssp. *australis* southern tarplant	1B.1	Marshes and swamps (margins), valley and foothill grassland, vernal pools. Often in disturbed sites near the coast at marsh edges; also in alkaline soils sometimes with saltgrass. Sometimes on vernal pool margins. 0-975 m.	May-Nov	**Moderate (all BSAs)** Marginal habitat occurs within all BSAs.
Centromadia pungens ssp. *laevis* smooth tarplant	1B.1	Valley and foothill grassland, chenopod scrub, meadows and seeps, playas, riparian woodland. Alkali meadow, alkali scrub; also in disturbed places. 5-1170 m.	Apr-Sep	**Moderate (all BSAs)** Marginal habitat occurs within all BSAs.

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	Fed Proposed Threatened, 1B.1	Annual; sandy areas in coastal scrub and native grasslands; Los Angeles and Ventura Counties.; 135-1,070 m.	Apr-Jun	**High (MP, EOI, and EOII BSAs); Low (OCBSA)** Suitable habitat and substrates are present within the MP, EOI, and EOII BSAs. Suitable habitat present within the OCBSA, but substrates lacking. The nearest recorded occurrence are less than 1 mile east of EOIBSA and less than 1 mile west of EOIIBSA.
Chorizanthe polygonoides var. longispina long-spined spineflower	1B.2	Often clay; chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools; about 30-1530 m.	Apr-Jul	**High (OC and MP BSAs); Moderate (EOI and EOII BSAs)** Suitable habitat is present within all of the BSAs. The nearest recorded occurrences are within the boundaries of the OC and MP BSAs.
Comarostaphylis diversifolia ssp. *diversifolia* summer holly	1B.2	Chaparral, cismontane woodland. Often in mixed chaparral in California, sometimes post-burn. 30-945 m.	Apr-Jun	**Moderate (MP, EOI, and EOII BSAs); Low (OCBSA)** Suitable habitat and environmental conditions are present within the MP, EOI, and EOII BSAs.
Dudleya multicaulis many-stemmed dudleya	1B.2	Chaparral, coastal scrub, valley and foothill grassland. In heavy, often clayey soils or grassy slopes. 1-910 m.	Apr-Jul	**Observed (OC and MP BSAs); High (EOI and EOII BSAs)** Species was observed within the OC and MP BSAs). Suitable habitat and substrates occur within the EOI and EOII BSAs). The nearest recorded occurrences prior to the surveys were within the boundaries of MP and EOI BSAs, less than 1 mile east of the OCBSA, and less than 1 mile south of EOIIBSA.
Eriastrum densifolium ssp. *sanctorum* Santa Ana River woollystar	FE, SE, 1B.1	Sandy or gravelly; chaparral, coastal scrub (alluvial fan); about 91-610 m.	Apr-Sep	**High (MP, EOI, and EOII BSAs); Moderate (OCBSA)** Suitable habitat and substrates are present within the MP, EOI, and EOII BSAs. Marginal habitat occurs within the OCBSA. Suitable The nearest recorded occurrence is less than 1 mile east of the OC and MP BSAs.

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Hesperocyparis forbesii Tecate cypress	1B.1	Closed-cone coniferous forest, chaparral. Primarily on north-facing slopes; groves often associated with chaparral. On clay or gabbro. 60-1650 m.		**High (MP, EOI, and EOII BSAs); Low (OCBSA)** Suitable habitat and substrates are present within the MP, EOI, and EOII BSAs. The nearest recorded occurrence is less than 1 mile east of the OC and MP BSAs and 2 miles northeast of the EOIIBSA.
Horkelia cuneata var. *puberula* mesa horkelia	1B.1	Chaparral, cismontane woodland, coastal scrub. Sandy or gravelly sites. 15-1645 m.	Feb-Jul (Sep)	**Moderate (MP, EOI, and EOII BSAs); Low (OCBSA)** Suitable habitat and substrates are present within all BSAs, though habitat is marginal within the OCBSA.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	1B.1	Coastal salt marshes, playas, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. 1-1375 m.	Feb-Jun	**Low (all BSAs)** Marginal habitat is present within the BSAs, though preferred alkaline substrates absent.
Lepechinia cardiophylla San Miguel savory	1B.2	Closed-cone coniferous forest, chaparral, cismontane woodland; about 520-1370 m.	Apr-Jul	**Moderate (MPBSA); Low (OC, EOI, and EOII BSAs)** Suitable habitat is present within the MP and EOII BSAs, however all BSAs occur below this species' known elevation range. The nearest recorded occurrence is less than 1 mile east of the MPBSA and 1.5 miles east of the OCBSA.
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	4.3	Chaparral, coastal scrub. Dry soils, shrubland. 4-1435 m.	Jan-Jul	**High (MP, EOI, and EOII BSAs); Moderate (OCBSA)** Suitable habitat and substrates are present within the MP, EOI, and EOII BSAs; marginal habitat occurs within the OCBSA. The nearest recorded occurrence is less than 1 south of the OC and MP BSAs and 1.5 miles south of the EOI and EOII BSAs.
Monardella australis ssp. *jokerstii* Jokerst's monardella	1B.1	Steep scree or talus slopes between breccia, secondary alluvial benches along drainages and washes; chaparral, lower montane coniferous forest; about 1350-1750 m.	Jul-Sep	**Low (all BSAs)** Suitable habitat occurs within the MP and EOII BSAs; however, all BSAs occur well below this species' known elevation range. Closest known occurrence is approximately 4.3 miles northeast of the MPBSA.



Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Monardella hypoleuca ssp. *intermedia* intermediate monardella	1B.3	Chaparral, cismontane woodland, lower montane coniferous forest (sometimes). Often in steep, brushy areas. 195-1675 m.	Apr-Sep	**High (all BSAs)** Suitable habitat is present within all of the BSAs. The nearest recorded occurrences are less than 1 mile south of the OC and MP BSAs and 1 mile south of the EOIIBSA.
Monardella macrantha ssp. *hallii* Hall's monardella	1B.3	Broadleafed upland forest, chaparral, lower montane coniferous forest, cismontane woodland, valley and foothill grassland. Dry slopes and ridges in openings. 700-1800 m.	Jun-Oct	**Low (all BSAs)** Suitable habitat is present within all BSAs; however, all BSAs are significantly lower than this species' known elevation range.
Nama stenocarpa mud nama	2B.2	Marshes and swamps. Lake shores, river banks, intermittently wet areas. 5-500 m.	Jan-Jul	**Low (EOI and EOII BSAs); Not Likely to Occur (OC and MP BSAs)** Marginal habitat is present within the EOI and EOII BSAs. Suitable habitat does not occur within the OC and MP BSAs.
Nasturtium gambelii Gambel's water cress	FE, ST, 1B.1	Marshes and swamps (freshwater or brackish); about 5-330 m.	Apr-Oct	**Not Likely to Occur (all BSAs)** Suitable habitat is not present within the BSAs.
Nolina cismontana chaparral nolina	1B.2	Chaparral, coastal scrub. Primarily on sandstone and shale substrates; also known from gabbro. 140-1100 m.	(Mar) May-Jul	**High (all BSAs)** Suitable habitat and substrates are present within the MP, EOI, and EOII BSAs. Marginal habitat occurs within the OCBSA. The nearest recorded occurrences are within the boundaries of the OC and MP BSAs and 1.5 miles northeast of the EOIIBSA.
Penstemon californicus California beardtongue	1B.2	Sandy; chaparral, lower montane coniferous forest, pinyon and juniper woodland; about 1170-2300 m.	May-Jun (Aug)	**Low (all BSAs)** Suitable habitat is present within the MP and EOII BSAs; however, all BSAs occur well below this species' known elevation range. Closest known occurrence is approximately 1.7 miles southwest of the OCBSA.
Pentachaeta aurea ssp. *allenii* Allen's pentachaeta	1B.1	Valley and foothill grasslands, coastal scrub. Openings in scrub or grassland. 75-520 m.	Mar-Jun	**High (MP and EOII BSAs); Moderate (OC and EOI BSAs)** Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are within the boundary of the EOIIBSA and 1.5 miles southeast of the MPBSA.



Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Phacelia keckii Santiago Peak phacelia	1B.3	Closed-cone coniferous forest, chaparral. Open areas, sometimes along creeks. 545-1525 m.	May-Jun	**Low (all BSAs)** Suitable habitat is present within the MP and EOII BSAs; however, all BSAs occur below this species' known elevation range.
Pseudognaphalium leucocephalum white rabbit-tobacco	2B.2	Riparian woodland, cismontane woodland, coastal scrub, chaparral. Sandy, gravelly sites. 35-515 m.	(Jul) Aug-Nov (Dec)	**Moderate (all BSAs)** Suitable habitat and substrates are present within all of the BSAs.
Senecio aphanactis chaparral ragwort	2B.2	Chaparral, cismontane woodland, coastal scrub. Drying alkaline flats. 20-855 m.	Jan-Apr (May)	**Low (all BSAs)** Suitable habitat is present within the MP, EOI, and EOII BSAs and marginal habitat occurs within the OCBSA; however, suitable substrate is not present within the BSAs.
Sidalcea neomexicana salt spring checkerbloom	2B.2	Playas, chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub; alkali springs and marshes; 3-2380 m.	Mar-Jun	**Low (all BSAs)** Suitable habitat is present within the MP, EOI, and EOII BSAs. Marginal habitat occurs within the OCBSA. However, preferred alkaline conditions do not occur within the BSAs.
Symphyotrichum defoliatum San Bernardino aster	1B.2	Meadows and seeps, cismontane woodland, coastal scrub, lower montane coniferous forest, marshes and swamps, valley and foothill grassland. Vernally mesic grassland or near ditches, streams and springs; disturbed areas. 3-2045 m.	Jul-Nov	**Not Likely to Occur (all BSAs)** Suitable habitat is present within the BSAs; however, mesic conditions do not occur within areas of suitable habitat.



5.4 SPECIAL-STATUS WILDLIFE

Special-status taxa include those listed as threatened or endangered under the federal or California Endangered Species Acts, taxa proposed for such listing, Species of Special Concern, and other taxa that have been identified by the USFWS, CDFW, or local jurisdictions as unique or rare and which have the potential to occur within the BSAs. A single special-status wildlife species, two-striped garter snake, was observed within EOIBSA during the biological surveys conducted for the Project.

The CNDDB was queried for occurrences of special-status wildlife taxa within the USGS topographical quadrangles in which the BSAs occur and the eight surrounding quadrangles, as discussed above in Section 2.0 (refer to Appendix A, Figure 4a, b, and c). The specific habitat requirements and the locations of known occurrences of each special-status wildlife taxa were the principal criteria used for inclusion in the list of taxa potentially occurring within the BSAs. Table 6 summarizes the special-status wildlife taxa known to regionally occur and their potential for occurrence in the BSAs. Each of the taxa identified in the database reviews/searches were assessed for its potential to occur within the BSAs based on the following criteria:

- Present: Taxa (or sign) were observed in the BSAs or in the same watershed (aquatic taxa only) during the most recent surveys, or a population has been acknowledged by CDFW, USFWS, or local experts.
- High: Habitat (including soils) for the taxa occurs on site and a known occurrence occurs within the BSAs or adjacent areas (within 5 miles of the Project Area) within the past 20 years; however, these taxa were not detected during the most recent surveys.
- Moderate: Habitat (including soils) for the taxa occurs on site and a known regional record occurs within the database search, but not within 5 miles of the BSAs or within the past 20 years; or a known occurrence occurs within 5 miles of the BSAs and within the past 20 years and marginal or limited amounts of habitat occurs on site; or the taxa's range includes the geographic area and suitable habitat exists.
- Low: Limited habitat for the taxa occurs on site and no known occurrences were found within the database search and the taxa's range includes the geographic area.
- Not Likely to Occur: The environmental conditions associated with taxa presence do not occur within the BSAs.



Table 6 Known and Potential Occurrence of Special-Status Wildlife within the BSAs

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
INVERTEBRATES					
Bombus crotchii	Crotch bumble bee	**SA**	Coastal California east to the sierra-cascade crest and south into Mexico. Food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.	Suitable food plants occur within all of the BSAs. The nearest recorded occurrences are approximately 7.5 miles southeast of the EOIIBSA, 6 miles southwest of the EOIBSA, 7 miles east of the MPBSA, and 8 miles east of the OCBSA.	**Moderate (all BSAs)**
Branchinecta sandiegonensis	San Diego fairy shrimp	**FE**	Endemic to San Diego and Orange County mesas. Vernal pools.	Vernal pool habitat is not present within the BSAs. The nearest recorded occurrences are approximately 1 mile north the EOIBSA, 3 miles northwest of the EOIIBSA, and 3 miles south of the MP and OC BSAs.	**Low (all BSAs)**
Streptocephalus woottoni	Riverside fairy shrimp	**FE**	Endemic to western Riverside, Orange, and San Diego counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season.	Wetland habitat occurring within the EOIBSA may be suitable for this species. The OC, MP, and EOII BSAs do not support suitable habitat. The nearest recorded occurrences are approximately 4.5 miles south of the EOIIBSA, 6 miles southeast of the EOIBSA, and greater than 10 miles south of the MP and OC BSAs.	**Moderate (EOIBSA); Low (OC, MP, and EOII BSAs)**
FISH					
Catostomus santaanae	Santa Ana sucker	**SSC**	Endemic to Los Angeles basin south coastal streams; habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.	Ephemeral drainages within the MP, EOI, and EOII BSAs may provide suitable habitat during wet periods. Suitable habitat is not present within the OCBSA. The nearest recorded occurrences are less than 1 mile north of the OC and MP BSAs, approximately 4 miles northwest of the EOIBSA, and 5 miles northwest of the EOIIBSA.	**Moderate (MP, EOI, and EOII BSAs); Not Expected to Occur (OCBSA)**
Gila orcuttii	arroyo chub	**SSC**	Native to streams from Malibu creek to San Luis Rey river basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mojave and San Diego river basins. Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	Ephemeral drainages within the MP, EOI, and EOII BSAs may provide suitable habitat during wet periods. Suitable habitat is not present within the OCBSA. The nearest recorded occurrences are approximately 6 miles northeast of the MPBSA, 7 miles northeast of the OCBSA, 9 miles southeast of the EOIIBSA, and greater than 10 miles southeast of the EOIBSA.	**Moderate (MP, EOI, and EOII BSAs); Not Expected to Occur (OCBSA)**



Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
Oncorhynchus mykiss irideus pop. 10	steelhead - southern California Distinct Population Segment (DPS)	**FE**	Inhabits seasonally accessible rivers and streams. Requires sufficient flows in their natal streams to be able to return from oceans and lakes to spawn. Federal listing refers to populations from Santa Maria River south to southern extent of range (San Mateo Creek in San Diego County). Southern steelhead likely have greater physiological tolerance to warmer water and more variable conditions.	Ephemeral drainages within the MP, EOI, and EOII BSAs may provide suitable habitat during wet periods. Suitable habitat is not present within the OCBSA. The nearest recorded occurrence is greater than 10 miles from the BSAs.	**Moderate (MP, EOI, and EOII BSAs); Not Expected to Occur (OCBSA)**
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	**SSC**	Headwaters of the Santa Ana and San Gabriel Rivers. May be extirpated from the Los Angeles river system. Requires permanent flowing streams with summer water temps of 17-20 C. Usually inhabits shallow cobble and gravel riffles.	No permanent waters occur within the BSAs. The nearest recorded occurrences are approximately 4 miles southeast of the EOIIBSA, 6 miles southeast of the EOIBSA, and greater than 10 miles southeast of the OC and MP BSAs.	**Not Expected to Occur (all BSAs)**
AMPHIBIANS					
Anaxyrus californicus	arroyo toad	**FE, SSC**	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range.	During wet conditions, the lower reaches of drainages within the MP, EOI, and EOII BSAs may provide suitable habitat. The nearest recorded occurrences are approximately 2 miles southeast of the EOIBSA, 4 miles southeast of the EOIIBSA, 8 miles southeast of the MPBSA, and 9 miles southeast of the OCBSA.	**High (EOI and EOII BSAs); Moderate (MPBSA); Not Expected to Occur (OCBSA)**
Lithobates pipiens	northern leopard frog	**SSC**	Native range is east of Sierra Nevada-Cascade crest. Near permanent or semi-permanent water in a variety of habitats. Highly aquatic species. Shoreline cover and submerged and emergent aquatic vegetation are important habitat characteristics.	The EOI and EOII BSAs contain marginally suitable habitat, though flows within drains are largely ephemeral. The OC and MP BSAs do not contain suitable habitat. The nearest recorded occurrences are within the boundaries of the EOIBSA, less than 1 mile west of the EOIIBSA, 4 miles northeast of the MPBSA, and 6 miles northeast of the OCBSA; however, these observations were more than 20 years ago.	**Moderate (EOI and EOII BSAs); Low (OC and MP BSAs)**
Spea hammondii	western spadefoot	**SSC**	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools and other temporary rain pools, cattle tanks, and occasionally pools of intermittent streams are essential for breeding and egg-laying.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are within the boundaries of the EOIBSA, approximately 1 mile south of the OC and MP BSAs, and 1.5 miles and 3 miles west and northwest, respectively, of the EOIIBSA.	**High (all BSAs)**

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
Taricha torosa	Coast Range newt	**SSC**	Coastal drainages from Mendocino County to San Diego County. Lives in terrestrial habitats and will migrate over 1 km to breed in ponds, reservoirs and slow-moving streams.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are within the boundaries of each of the BSAs.	**High (all BSAs)**
REPTILES					
Anniella stebbinsi	Southern California legless lizard	**SSC**	Generally, south of the transverse range, extending to northwestern Baja California, occurs in sandy or loose loamy soils under sparse vegetation; disjunct populations in the Tehachapi and Piute mountains in Kern County; variety of habitats; generally, in moist, loose soil, they prefer soils with a high moisture content.	Suitable habitat is present within all the BSAs. The closest knowb occurrence is approximately 0.5 miles southest of the EOII BSA.	**High (all BSAs)**
Arizona elegans occidentalis	California glossy snake	**SSC**	Patchily distributed from the eastern portion of San Francisco bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular Ranges, south to Baja California. Generalist reported from a range of scrub and grassland habits, often with loose or sandy soils.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are 9 miles south of the EOIIBSA, and greater than 10 miles south of the OC, MP, and EOI BSAs.	**Moderate (EOIIBSA); Low (OC, MP, and EOI BSAs)**
Aspidoscelis hyperythra	orange-throated whiptail	**WL**	Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats. Prefers washes and other sandy areas with patches of bush and rocks. Perennial plants necessary for its major food: termites.	Suitable habitat occurs within the BSAs. There are known records from both the MPBSA and EOI BSA.	**High (all BSAs)**
Aspidoscelis tigris stejnegeri	coastal whiptail	**SSC**	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky.	Suitable habitat and substrates occur within all of the BSAs. The nearest recorded occurrences are less than 1 mile south of the MP and OC BSAs, approximately 1 mile south of the EOIIBSA, and 2 miles north of the EOIBSA.	**High (all BSAs)**
Crotalus ruber	red-diamond rattlesnake	**SSC**	Chaparral, woodland, grassland, and desert areas from coastal San Diego County to the eastern slope of the mountains. Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are approximately 1 mile south of the EOIIBSA, 2 miles north of the EOIBSA, and 2.5 miles south of the OC and MP BSAs.	**High (all BSAs)**

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
Emys marmorata	western pond turtle	**SSC**	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	Suitable permanent aquatic habitat occurs within or in the vicinity of the EOI and sEII BSAs. No suitable aquatic habitat occurs within or near the OC and MP BSAs. The nearest recorded occurrences are approximately 1 mile south of the EOIIBSA, 2 miles north of the EOIBSA, and 2.5 miles south of the OC and MP BSAs.	**High (EOI and EOII BSAs); Moderate (OC and MP BSAs)**
Lampropeltis zonata (pulchra)	California mountain kingsnake (San Diego population)	**WL**	Restricted to the San Gabriel and San Jacinto Mountains of Southern California. Inhabits a variety of habitats, including valley-foothill hardwood, coniferous, chaparral, riparian, and wet meadows.	Marginally suitable habitat occurs within the BSAs. The closest known occurrences are approximately 5 miles to the east of the BSAs.	**Moderate (all BSAs)**
Phrynosoma blainvillii	coast horned lizard	**SSC**	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are within the boundaries of the MPBSA, less than 1 mile east of the OCBSA, approximately 4 miles north of the EOIBSA, and 5 miles east of the EOIIBSA.	**High (all BSAs)**
Salvadora hexalepis virgultea	coast patch-nosed snake	**SSC**	Brushy or shrubby vegetation in coastal southern California. Require small mammal burrows for refuge and overwintering sites.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are approximately 1 mile southwest of the OC and MP BSAs, 1 mile south of the EOIIBSA, and 2 miles north of the EOIBSA.	**High (all BSAs)**
Thamnophis hammondii	two-striped gartersnake	**SSC**	Coast California form vicinity of Salinas to northwest Baja California. From sea level to about 7000 ft. elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	Suitable habitat with perennial water occurs within the EOI and EOII BSAs. Marginal habitat (due to absence of perennial water) occurs within the OC and MP BSAs. The nearest recorded occurrences are approximately 1 mile northeast of the EOIBSA, 2 miles northwest of the EOIIBSA, and 4 miles south of the OC and MP BSAs.	**Observed (EOIBSA); High (EOIIBSA); Moderate (OC and MP BSAs)**
BIRDS					
Accipiter cooperii	Cooper's hawk	**WL**	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	Suitable habitat occurs within the BSAs except for the OCBSA. The nearest recorded occurrence to the BSAs is approximately 1.2 miles to the west.	**High (MP, EOI, and EOII BSAs) Low (OCBSA)**

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
Agelaius tricolor (nesting colony)	tricolored blackbird	**SC, SSC, BCC**	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate and foraging area with insect prey within a few km of the colony.	Marginal habitat occurs within the EOI and EOII BSAs. No suitable habitat is present within the OC and MP BSAs. The nearest recorded occurrences are approximately 1 mile west of the EOIBSA, 3 miles west of the EOIIBSA, and 5 miles southwest of the OC and MP BSAs.	**Moderate (EOI and EOII BSAs); Low (OC and MP BSAs)**
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	**WL**	Resident in southern California coastal sage scrub and sparse mixed chaparral. Frequents relatively steep, often rocky hillsides with grass and forb patches.	Suitable habitat is present within all of the BSAs except for the OCBSA. The closest known occurrence is approximately 2 miles to the west of the BSAs.	**Moderate (MP, EOI and EOII BSAs); Low (OCBSA)**
Ammodramus savannarum	grasshopper sparrow	**SSC**	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are approximately 3 miles northwest of the OC and MP BSAs, 8 miles north of the EOIBSA, and 8.5 miles south of the EOIIBSA.	**High (OC and MP BSAs); Moderate (EOI and EOII BSAs)**
Aquila chrysaetos	golden eagle	**FP, WL**	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Suitable foraging habitat occurs within all of the BSAs, though optimal nesting habitat is not present. The nearest recorded occurrences are less than 1 mile north of the MPBSA, approximately 1 mile north of the OCBSA, 6 miles north of the EOIBSA, and 7.5 miles north of the EOIIBSA.	**High – foraging (OC and MP BSAs); Moderate – foraging (EOI and EOII BSAs)**
Ardea Herodias	great blue heron	**SA**	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas; marshes, lake margins, tide-flats, rivers and streams, wet meadows.	Suitable nesting habitat does not occur within the BSAs; however, this species may occur as a transient. The nearest recorded occurrences are approximately 7 miles west of the OC and MP BSAs, 8 miles northwest of the EOIBSA, and greater than 10 miles northwest of the EOIIBSA.	**Moderate – as a transient (all BSAs)**
Asio otus	long-eared owl	**SSC**	Riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land, productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	Suitable habitat occurs within the MP, EOI, and EOII BSAs, though not within the OCBSA. The nearest recorded occurrences are approximately 1.5 miles southwest of the OC and MP BSAs, 3 miles north of the EOIBSA, and 4.5 miles northwest of the EOIIBSA.	**High (MP, EOI, and EOII BSAs); Moderate (OCBSA)**



Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Athene cunicularia	burrowing owl	**SSC**	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Marginal habitat occurs within all of the BSAs. The nearest recorded occurrences are approximately 5.5 miles northeast of the MPBSA, 6.5 miles northeast of the OCBSA, 9.5 miles northeast of the EOIIBSA, and greater than 10 miles northeast of the EOIBSA.	**Moderate (all BSAs)**
Buteo regalis	ferruginous hawk	**WL**	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Marginally suitable foraging habitat occurs within the BSAs; no nesting habitat is present. Closest known records are approximately 5.5 miles south of the BSAs.	**Low (Foragin in all BSAs)** **Not Likely to Occur Nesting, in all BSAs)**
Buteo swainsoni	Swainson's hawk	**ST**	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Suitable habitat occurs within the MP, EOI, and EOII BSAs. Marginal habitat is present within the OCBSA. The nearest recorded occurrences are approximately 5 miles northeast of the OC and MP BSAs and 9 miles northeast of the EOI and EOII BSAs.	**High (MPBSA); Moderate (OC, EOI, and EOII BSAs)**
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	**SSC, BCC**	Southern California coastal sage scrub. Wrens require tall opuntia cactus for nesting and roosting.	Suitable habitat occurs within the MP, EOI, and EOII BSAs. Marginal habitat is present within the OCBSA. The nearest recorded occurrences are approximately 2 miles west of the OC, MP, and EOI BSAs and 2 miles northwest of the EOIIBSA.	**High (MP, EOI, and EOII BSAs); Moderate (OCBSA)**
Circus cyaneus	northern harrier	**SSC**	Coastal salt and freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienegas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	No suitable habitat occurs within the BSAs. The nearest recorded occurrence is greater than 10 miles to the southeast of the BSAs.	**Not Expected to Occur (all BSAs)**
Coccyzus americanus occidentalis	western yellow-billed cuckoo	**FT, SE**	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	Suitable habitat occurs within the EOI and EOII BSAs, marginal habitat occurs within the MPBSA, and no suitable habitat is present within the OCBSA. The nearest recorded occurrences are approximately 5 miles northeast of the OC and MP BSAs, 7 miles southwest of the EOIBSA, and 8 miles southwest of the EOIIBSA.	**Moderate (MP, EOI, and EOII BSAs); Low (OCBSA)**



Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Coturnicops noveboracensis	yellow rail	**SSC**	Summer resident in eastern Sierra Nevada in Mono County. Freshwater marshlands.	No suitable habitat occurs within the BSAs; however, species may occur as a transient based on known observations in the region. The nearest recorded occurrences are approximately 3 miles east of the OC and MP BSAs, 6 miles northeast of the EOIIBSA, and 7 miles northeast of the EOIBSA.	**Low – as a transient (all BSAs)**
Elanus leucurus	white-tailed kite	**FP**	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are approximately1 mile west of the OC and MP BSAs, 1.5 miles west of the EOIBSA, and 3.5 miles west of the EOIIBSA.	**High (all BSAs)**
Empidonax traillii extimus	southwestern willow flycatcher	**FE, SE**	Riparian woodlands in southern California.	Suitable habitat occurs within the EOI and EOII BSAs; marginal habitat occurs within the MPBSA; and no suitable habitat is present within the OCBSA. The nearest recorded occurrences are approximately 5 miles northeast of the OC and MP BSAs and 9 miles northeast of the EOI and EOII BSAs.	**Moderate (MP, EOI, and EOII BSAs); Moderate – as a transient (OCBSA)**
Eremophila alpestris actia	California horned lark	**WL**	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills. Short-grass prairie, “bald” hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	Limited suitable habitat occurs within the BSAs. Closest known occurrence is approximately 6 miles to the southeast.	**Low (All BSAs)**
Falco peregrinus anatum	American peregrine falcon	**Delisted, Delisted, FP**	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Suitable habitat occurs within the MP, EOI, and EOII BSAs. Marginal habitat is present within the OCBSA. The nearest recorded occurrences are less than 1 mile west of the EOIBSA and approximately 2 miles west of the OC, MP, and EOII BSAs.	**High (MP, EOI, and EOII BSAs); Moderate (OCBSA)**

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
Haliaeetus leucocephalus	bald eagle	**Delisted, SE, FP**	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	Suitable nesting habitat occurs within the EOI and EOII BSAs – these BSAs are in close proximity to Irvine Lake, which provides foraging habitat for this species. Suitable nesting habitat occurs within the MPBSA; however, this BSA is further from foraging resources. No suitable nesting habitat is present within the OCBSA. The nearest recorded occurrences are less than 1 mile north of the EOIIBSA, approximately 1.5 miles northeast of the EOIBSA, and 5 miles south of the OC and MP BSAs.	**High (EOI and EOII BSAs); Moderate – as a transient (OC and MP BSAs)**
Icteria virens	yellow-breasted chat	**SSC**	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests, in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft. of ground.	Suitable habitat occurs within the EOI and EOII BSAs. No suitable habitat is present within the OC and MP BSAs. The nearest recorded occurrences are approximately 3.5 miles northwest of the OC and MP BSAs, 4 miles south of the EOIIBSA, and 5 miles southeast of the EOIBSA.	**High (EOI and EOII BSAs); Moderate – as a transient (OC and MP BSAs)**
Laterallus jamaicensis coturnicolus	California black rail	**ST, FP**	Inhibits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	No suitable permanent habitat occurs within the BSAs; however, based on the EOI and EOII BSAs proximity to Irvine Lake, this species may occur in those areas as a transient. Species may also occur as a transient within the OC and MP BSAs based on nearby observations. The nearest recorded occurrences are approximately 2 miles west of the EOIBSA, 4 miles southwest of the OC and MP BSAs, and 4 miles west of the EOIIBSA.	**High – as a transient (all BSAs)**
Passerculus sandwichensis beldingi	Belding's savannah sparrow	**SE**	Inhabits coastal salt marshes, from Santa Barbara south through San Diego County. Nests in *Salicornia* on and about margins of tidal flats.	No suitable habitat occurs within the BSAs. The nearest recorded occurrence is greater than 10 miles southwest of the BSAs.	**Not Expected to Occur (all BSAs)**
Polioptila californica californica	coastal California gnatcatcher	**FT, SSC**	Obligate, permanent resident of coastal sage scrub below 2500 ft. in southern California. Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	Suitable habitat occurs within the MP, EOI, and EOII BSAs and marginal habitat occurs within the OCBSA. The nearest recorded occurrence is within the boundaries of the OC, EOI, and EOII BSAs and less than 1 mile west of the MPBSA.	**High (all BSAs)**



Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
Rallus obsoletus levipes	light-footed Ridgway's rail	**FE, SE, FP**	Found in salt marshes traversed by tidal sloughs, where cordgrass and pickleweed are the dominant vegetation. Requires dense growth of either pickleweed or cordgrass for nesting or escape cover; feeds on molluscs and crustaceans.	No suitable habitat occurs within the BSAs. The nearest recorded occurrence is greater than 10 miles southwest of the BSAs.	**Not Expected to Occur (all BSAs)**
Setophaga petechia	yellow warbler	**SSC**	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	Suitable habitat occurs within the EOI and EOII BSAs. Due to distance from water, no suitable habitat is present within the OC and MP BSAs. The nearest recorded occurrences are approximately 3 miles west of the OC and MP BSAs, 7 miles northwest of the EOIBSA, and 9 miles northwest of the EOIIBSA.	**Moderate (EOI and EOII BSAs); Moderate – as a transient (OC and MP BSAs)**
Sternula antillarum browni	California least tern	**FE, SE, FP**	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	No suitable habitat occurs within the BSAs. The nearest recorded occurrences are approximately 7 miles west of the OC and MP BSAs, 8 miles northwest of the EOIBSA, and 10 miles northwest of the EOIIBSA.	**Not Expected to Occur (all BSAs)**
Vireo bellii pusillus	least Bell's vireo	**FE, SE**	Summer resident of southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, *Baccharis*, mesquite.	Suitable habitat occurs within the MP, EOI, and EOII BSAs. No suitable habitat is present within the OCBSA; however, this species may occur within this BSA as a transient based on nearby observations. The nearest recorded occurrences are within the boundaries of the EOIIBSA, less than 1 mile west of the EOIBSA, and less than 1 mile north of the OC and MP BSAs.	**High (MP, EOI, and EOII BSAs); High – as a transient (OCBSA)**
MAMMALS					
Antrozous pallidus	pallid bat	**SSC**	Desert, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats form high temperatures. Very sensitive to disturbance of roosting sits.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are less than 1 mile north of the EOIBSA, approximately 2 miles north of the EOIIBSA, and 2 miles south of the OC and MP BSAs.	**High (all BSAs)**
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	**SSC**	Coastal scrub, chaparral, grasslands, sagebrush, etc. in western San Diego County. Sandy herbaceous areas, usually in association with rocks or coarse gravel.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are approximately 5 miles southeast of the EOIIBSA, 6.5 miles east of the MPBSA, 7 miles southeast of the EOIBSA, and 7.5 miles east of the OCBSA.	**High (EOIIBSA); Moderate (OC, MP, and EOI BSAs)**

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
Choeronycteris mexicana	Mexican long-tongued bat	**SSC**	Occasionally found in San Diego County, which is on the periphery of their range. Feeds on nectar and pollen of night-blooming succulents. Roosts in relatively well-lit caves, and in and around buildings.	The BSAs are at the edge of this species' known range and contain marginal habitat. The nearest recorded occurrences are approximately 4 miles southwest of the EOIBSA, 5.5 miles southwest of the EOIIBSA, and 8 miles southwest of the OC and MP BSAs; however, these observations were more than 20 years ago.	**Low (all BSAs)**
Dipodomys stephensi	Stephens' kangaroo rat	**FE, ST**	Primarily annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover. Prefers buckwheat, chamise, brome grass and filaree. Will burrow into firm soil.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are greater than 10 miles east of the EOI and EOII BSAs and greater than 10 miles northeast of the OC and MP BSAs.	**Moderate (all BSAs)**
Eumops perotis californicus	western mastiff bat	**SSC**	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Suitable habitat occurs within all of the BSAs. The nearest recorded occurrences are less than 1 mile northeast of the EOIBSA, less than 1 mile south of the EOIIBSA, approximately 1 mile northwest of the OCBSA, and 1 mile northeast of the MPBSA.	**High (all BSAs)**
Lasiurus xanthinus	western yellow bat	**SSC**	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees, particularly palms. Forages over water and among trees.	Suitable habitat occurs within the MP, EOI, and EOII BSAs. No suitable habitat is present within the OCBSA. The nearest recorded occurrences are approximately 7 miles east of the MPBSA, 8 miles east of the OCBSA, 9 miles northeast of the EOIIBSA, and greater than 10 miles northeast of the EOIBSA.	**Moderate (MP, EOI, and EOII BSAs); Low (OCBSA)**
Myotis yumanensis	Yuma myotis	**SA**	Optimal habitats are open forests and woodlands with sources of water over which to feed. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings or crevices.	Suitable habitat and nearby sources of water occur within or in the vicinity of the EOI and EOII BSAs. Suitable habitat is present within the OC and MP BSAs; however, no sources of water for foraging occur within or adjacent to those BSAs. The nearest recorded occurrences are approximately 3 miles west of the OC and MP BSAs, 6 miles northwest of the EOIBSA, and 8 miles northwest of the EOIIBSA.	**Moderate (all BSAs)**



Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	**Common Name**				
Neotoma lepida intermedia	San Diego desert woodrat	**SSC**	Coastal scrub of southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. They are particularly abundant in rock outcrops, rocky cliffs, and slopes.	Suitable habitat and substrates occur within the MP, EOI, and EOII BSAs. Marginal habitat is present within the OCBSA. The nearest recorded occurrences are approximately 5 miles southeast of the EOIIBSA, 7 miles southeast of the EOIBSA, and greater than 10 miles southeast of the OC and MP BSAs.	**High (EOIIBSA); Moderate (MP and EOI BSAs); Low (OCBSA)**
Nyctinomops femorosaccus	pocketed free-tailed bat	**SSC**	Variety of arid areas in southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian, etc. rocky areas with high cliffs.	Ideal habitats do not occur within the BSAs. The nearest recorded occurrences are approximately 7 miles east of the MPBSA, 8 miles east of the OCBSA, and greater than 10 miles northeast of the EOI and EOII BSAs.	**Low (all BSAs)**
Onychomys torridus ramona	southern grasshopper mouse	**SSC**	Desert areas, especially scrub habitats with friable soils for digging. Prefers low to moderate shrub cover. Feeds almost exclusively on arthropods, especially scorpions and orthopteran insects.	Suitable desert habitats do not occur within the BSAs. The nearest recorded occurrences are approximately 5 miles southeast of the EOIIBSA, 7.5 miles southeast of the EOIBSA, and greater than 10 miles southeast of the OC and MP BSAs.	**Moderate (EOIIBSA); Low (OC, MP, and EOI BSAs)**

Federal Rankings:
FE = Federally Endangered
FT = Federally Threatened
BCC = USFWS Bird of Conservation Concern

State Rankings:
SE= State Endangered
ST = State Threatened
FP = Fully Protected
SA = CDFW Special Animal
WL = CDFW Watch List
SSC = Species of Special Concern

5.5 WILDLIFE CORRIDORS AND SPECIAL LINKAGES

Linkages and corridors facilitate regional animal movement and are generally centered in or around waterways, riparian corridors, flood control channels, contiguous habitat, and upland habitat. Drainages generally serve as movement corridors because wildlife can move easily through these areas, and fresh water is available. Corridors also offer wildlife unobstructed terrain for foraging and for dispersal of young individuals.

As the movements of wildlife species are more intensively studied using radio-tracking devices, there is mounting evidence that some wildlife species do not necessarily restrict their movements to some obvious landscape element, such as a riparian corridor. For example, recent radio-tracking and tagging studies of Coast Range newts, California red-legged frogs, southwestern pond turtles, and two-striped garter snakes found that long-distance dispersal involved radial or perpendicular movements away from a water source with little regard to the orientation of the assumed riparian "movement corridor" (Hunt, 1993; Rathbun et al., 1992; Bulger et al., 2002; Trenham, 2002; Ramirez, 2002, 2003a, 2003b). Likewise, carnivores do not necessarily use riparian corridors as movement corridors, frequently moving overland in a straight line between two points when traversing large distances (Newmark, 1995; Beier, 1993, 1995; Noss, et al., 1996; Noss et al., no date). In general, the following corridor functions can be utilized when evaluating impacts to wildlife movement corridors:

- Movement corridors are physical connections that allow wildlife to move between patches of suitable habitat. Simberloff et al. (1992) and Beier and Loe (1992) correctly state that, for most species, we do not know what corridor traits (length, width, adjacent land use, etc.) are required for a corridor to be useful. But, as Beier and Loe (1992) also note, the critical features of a movement corridor may not be its physical traits but rather how well a particular piece of land fulfills several functions, including allowing dispersal, plant propagation, genetic interchange, and recolonization following local extirpation.

- Dispersal corridors are relatively narrow, linear landscape features embedded in a dissimilar matrix that links two or more areas of suitable habitat that would otherwise be fragmented and isolated from one another by rugged terrain, changes in vegetation, or human-altered environments. Corridors of habitat are essential to the local and regional population dynamics of a species because they provide physical links for genetic exchange and allow animals to access alternative territories as dictated by fluctuating population densities.

- Habitat linkages are broader connections between two or more habitat areas. This term is commonly used as a synonym for a wildlife corridor (Meffe and Carroll, 1997). Habitat linkages may themselves serve as source areas for food, water, and cover, particularly for small- and medium-size animals.

- Travel routes are usually landscape features, such as ridgelines, drainages, canyons, or riparian corridors within larger natural habitat areas that are used frequently by animals to facilitate movement and provide access to water, food, cover, den sites, or other necessary resources. A travel route is generally preferred by a species because it provides the least amount of topographic resistance in moving from one area to another yet still provides adequate food, water, or cover (Meffe and Carroll, 1997).

- Wildlife crossings are small, narrow areas of limited extent that allow wildlife to bypass an obstacle or barrier. Crossings typically are manmade and include culverts, underpasses, drainage pipes, bridges, and tunnels to provide access past roads, highways, pipelines, or other physical obstacles. Wildlife crossings often represent



"choke points" along a movement corridor because useable habitat is physically constricted at the crossing by human-induced changes to the surrounding areas (Meffe and Carroll, 1997).

5.5.1 Wildlife Movement in the BSA

The BSAs are located at the western edge of a large area of generally undeveloped open space that facilitates unimpeded wildlife movement and provides "live-in habitat" for a variety of species. Due to the lack of significant development to within the BSAs and the Santa Ana Mountains to the east and southeast, wildlife movement is generally unconstrained throughout that area. Wildlife movement in lands to the west and north is heavily impacted by urban development. In addition, California State Routes 241 (to the west) and 91 (to the north of the OC and MP BSAs) likely serve as barriers to terrestrial wildlife movement.

Within the BSAs, the lack of structures or other significant development and the presence of relatively intact habitat and features such as ephemeral drainages and unpaved roads all facilitate wildlife passage. However, the BSAs do not occur within any known wildlife movement corridor or habitat linkage (Penrod et al, 2001).



6.0 REFERENCES

Aubry, K. B., L. L. C. Jones, and P. A. Hall. 1988. Use of woody debris by plethodontid salamanders in Douglas-fir in Washington. Pages 32-37 in R. C. Szabo, K. E. Severson, and D. R. Patton, technical coordinators. Management of amphibians, reptiles and small mammals in North America. General technical report RM-166. U.S. Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, D.H. Wilken (eds.) 2012. The Jepson Manual: Vascular Plants of California, 2nd ed. University Press, Berkeley, California.

Beier, P. 1993. Determining minimum habitat areas and habitat corridors for cougars. Conservation Biology, 7: 94-108.

_____. 1995. Dispersal of juvenile cougars in fragmented habitat. Journal of Wildlife Management 59:228–237.

Beier, P. and S. Loe. 1992. A checklist for evaluating impacts to wildlife movement corridors. Wildlife Society Bulletin 20: 434-440.

Bulger, J., N. Scott, and R. Seymour. 2002. Terrestrial activity and conservation of adult California red-legged frogs (*Rana aurora draytonii*) in coastal forests and grasslands. Biol. Conservation 15: 234-245.

CDFW (California Department of Fish and Wildlife). 2018a. RAREFIND database ed.3.1.1. Electronic database managed by the California Natural Diversity Data Base, Wildlife Data and Habitat Analysis Branch, California Department of Fish and Wildlife. Sacramento, CA.

_____. 2018b. State and Federally Listed Endangered and Threatened Animals of California. August.

_____. 2018c. Special Animals List. November.

_____. 2018d. California Natural Diversity Data Base List of California Sensitive Natural Terrestrial Communities. https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities

_____. 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. Sacramento, California.

_____. 2000. “Spotted Bat.” California Wildlife Habitat Relationships System California Department of Fish and Game California Interagency Wildlife Task Group.

_____. 1994. A Field Guide to Lake and Streambed Alteration Agreements Section 1600-1607, California Department of Fish and Game Code. Environmental Services Division. Sacramento, California. January.

County of Orange. 2015. County of Orange General Plan – Chapter VI Resources Element. Orange County Public Works, Planning and Development Services Department. 2005, amended 2015.

_____. 1996. Natural Community Conservation Plan & Habitat Conservation Plan – County of Orange Central & Coastal Subregion – Parts I & II: NCCP/HCP. Environmental Management Agency. July 17, 1996.

CNPS (California Native Plant Society). 2018. Inventory of rare and endangered plants. California Native Plant Society. Sacramento. Online: http://www.cnps.org/inventory. Accessed May 2018.

CCH (Consortium of California Herbaria). 2018. California Vascular Plant Online Database. [online]: http://ucjeps.berkeley.edu/consortium/

Environmental Laboratory. 2011. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Vickburg, MS: U.S. Army Engineer Research and Development Center. <http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/trel08-28.pdf>.

_____. 1987. Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1). Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Flora of North America (1993+), Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 16+ vols. New York and Oxford. Vol. 1, 1993; vol. 2, 1993; vol. 3, 1997; vol. 4, 2003; vol. 5, 2005; vol. 7, 2010; vol. 8, 2009; vol. 19, 2006; vol. 20, 2006; vol. 21, 2006; vol. 22, 2000; vol. 23, 2002; vol. 24, 2007; vol. 25, 2003; vol. 26, 2002; vol. 27, 2007.

Hunt, L.E. 1993. Relocation and movements of southwestern pond turtles (*Clemmys marmorata pallida*), upper Santa Ynez River, Santa Barbara County, California. Prep. for the City of Santa Barbara and U.S. Forest Service. 135 pp.

Maser, C. and J.M. Trappe, tech eds. 1984. The seen and unseen world of the fallen tree. Gen. Tech. Rep. PNW-164. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 56 pp.

Meffe, G.K. and C.R. Carroll. 1997. Principles of conservation biology. Sinauer Associates, New York, NY.

Nelson, J.R. 1987. Rare plant surveys: techniques for impact assessment. Pages 159-166 in T.S. Elias (ed.), Conservation and Management of Rare and Endangered Plants. California Native Plant Society, Sacramento, California.

Newmark, W. 1995. Extinction of mammal populations in western North American national parks. Conservation Biology, 9: 512-526.

Noss, R., P. Beier, and W. Shaw. No date. Evaluation of the Coal Canyon biological corridor, Los Angeles, Orange, Riverside, and San Bernardino counties, California. Unpub. ms. 19 pp

Noss, R., H. Quigley, M. Hornocker, T. Merrill, and P. Paquet. 1996. Conservation biology and carnivore conservation in the Rocky Mountains. Conservation Biology, 10:949-963.



Penrod, K., R. Hunter, and M. Merrifield. 2001. Missing Linkages: Restoring Connectivity to the California Landscape, Conference Proceedings. Co-sponsored by California Wilderness Coalition, The Nature Conservancy, U.S. Geological Survey, Center for Reproduction of Endangered Species, and California State Parks.

Ramirez, R. 2003a. Arroyo toad (*Bufo californicus*) radio telemetry study, San Juan Creek, Orange County, California. Prep. for Rancho Mission Viejo LLC, San Juan Capistrano, CA. October. 64 pp.

_____. 2003b. Arroyo toad (*Bufo californicus*) hydrogeomorphic habitat baseline analysis/radio telemetry study, Rancho Las Flores, San Bernardino County, CA. November. 110 pp.

_____. 2002. Arroyo toad (*Bufo californicus*) radio telemetry and pitfall trapping studies, Little Horsethief Canyon, Summit Valley Ranch, San Bernardino County, California. Prep. for CALTRANS, Dept. of Transportation, San Bernardino, CA. April. 92 pp.

Rathbun, G.N. Siepel, and D. Holland. 1992. Nesting behavior and movements of western pond turtles (*Clemmys marmorata*). Southwestern Naturalist 37(3):319-324.

Sawyer, J.O., T. Keeler-Wolf and J.M. Evens. 2009. Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, California.

Simberloff, D., J.A. Farr, J. Cox and D.W. Mehlman. 1992. Movement corridors: Conservation bargains or poor investments? Conservation Biology 6(4): 493-504.

Trenham, P. 2002. Herpetologist, USGS. Conversation regarding dispersal movements of radio-tagged California newts (*Taricha torosa*) in Monterey County, California. June.

USACE and CDFG (United States Army Corps of Engineers and California Department of Fish and Game). 2010. Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan Joint Environmental Impact Statement and Environmental Impact Report. SCH No. 2000011025.

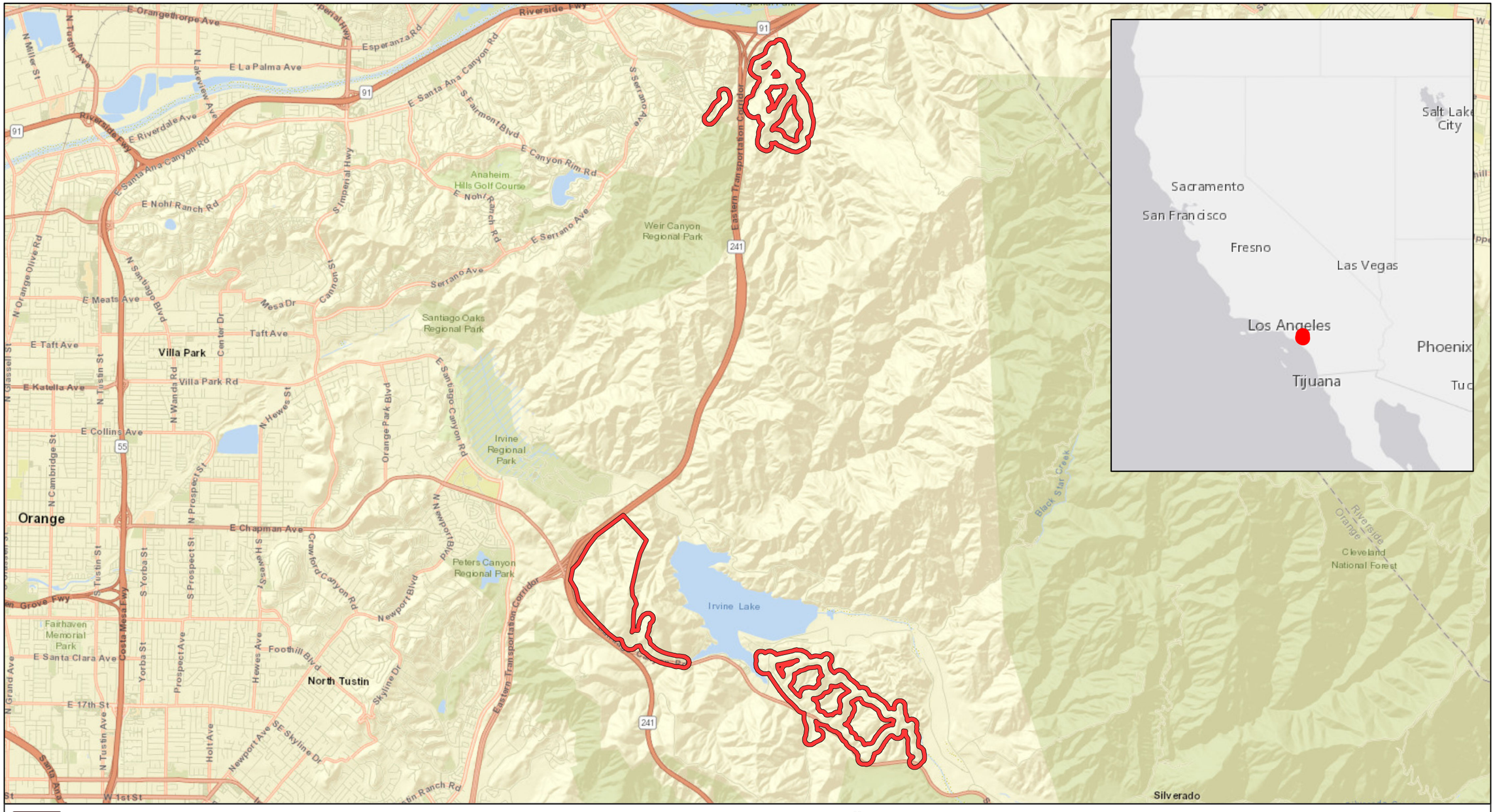
USDA (U.S. Department of Agriculture). 2018. Web Soil Survey. Natural Resources Conservation Service. http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

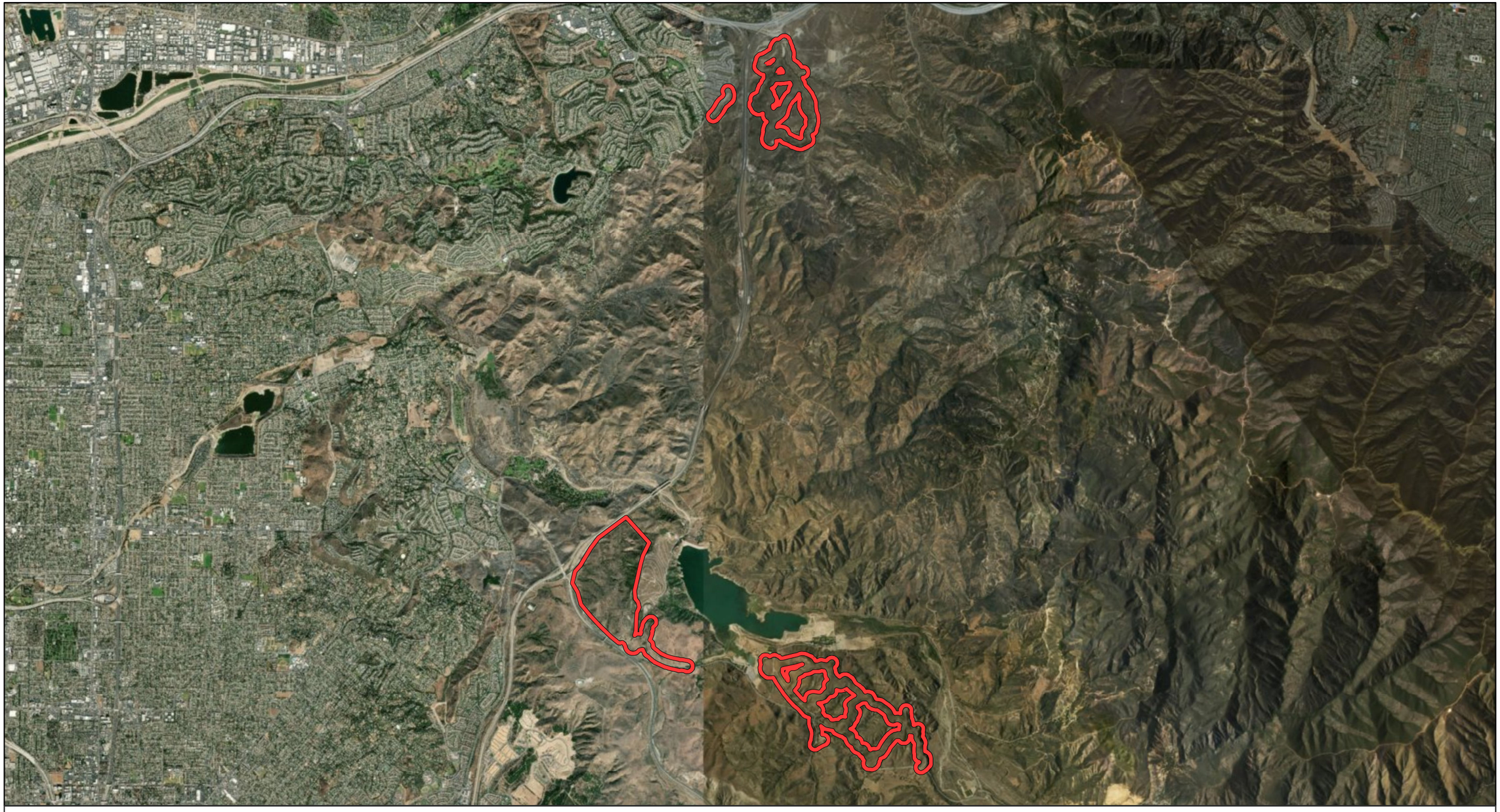
USFWS (United States Fish and Wildlife Service). 2018a. Wetland Mapper. National Wetlands Inventory. Washington, D.C.: USFWS. https://www.fws.gov/wetlands/data/mapper.html.

_____. 2018b. Critical Habitat – Frequently Asked Questions. Accessed online at https://www.fws.gov/endangered/what-we-do/critical-habitats-faq.html. Accessed on March 24, 2019.



Appendix A FIGURES


Project Site
N
0
2,800
5,600
Feet
1:17,307,056 (At original document size of 8.5x11)
Notes
1. WGS 1984 Web Mercator Auxiliary Sphere
2. Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Stantec
Project Location
Santiago Canyon/Anaheim, CA
Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27
Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report
Figure No.
1
Title
Project Location
Salt Lake City
Sacramento
San Francisco
Fresno
Las Vegas
Los Angeles
Phoenix
Tijuana
Riverside
Orange
Cleveland National Forest
Black Star Creek
Irvine Lake
Peters Canyon Regional Park
Irvine Regional Park
Santiago Oaks Regional Park
Weir Canyon Regional Park
Anaheim Hills Golf Course
Villa Park
Orange
North Tustin
Silverado
Riverside Fwy
Eastern Transportation Corridor
E Orangethorpe Ave
E La Palma Ave
E Santa Ana Canyon Rd
E Riverdale Ave
E Nohl Ranch Rd
E Serrano Ave
Serrano Ave
E Canyon Rim Rd
S Fairmont Blvd
S Serrano Ave
S Imperial Hwy
Esperanza Rd
N Lakeview Ave
N Miller St
N Tustin Ave
N Orange Olive Rd
N Santiago Blvd
E Meats Ave
Mesa Dr
Cannon St
Taft Ave
E Taft Ave
E Katella Ave
Villa Park Rd
N Wanda Rd
Center Dr
N Hewes St
E Collins Ave
E Chapman Ave
Orange Park Blvd
E Santiago Canyon Rd
N Newport Blvd
Newport Blvd
Crawford Canyon Rd
Foothill Blvd
Skyline Dr
Newport Ave SE
Holt Ave
Hewes Ave
Prospect Ave
S Prospect St
N Prospect St
S Yorba St
Yorba St
Costa Mesa Fwy
Grand Ave
N Cambridge St
N Cassell St
E Santa Clara Ave
E 17th St
W 1st St
Fairhaven Memorial Park
Santa Ana
91
241
55



Biological Resources Survey Area

N

0 2,800 5,600 Feet

1:66,665 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

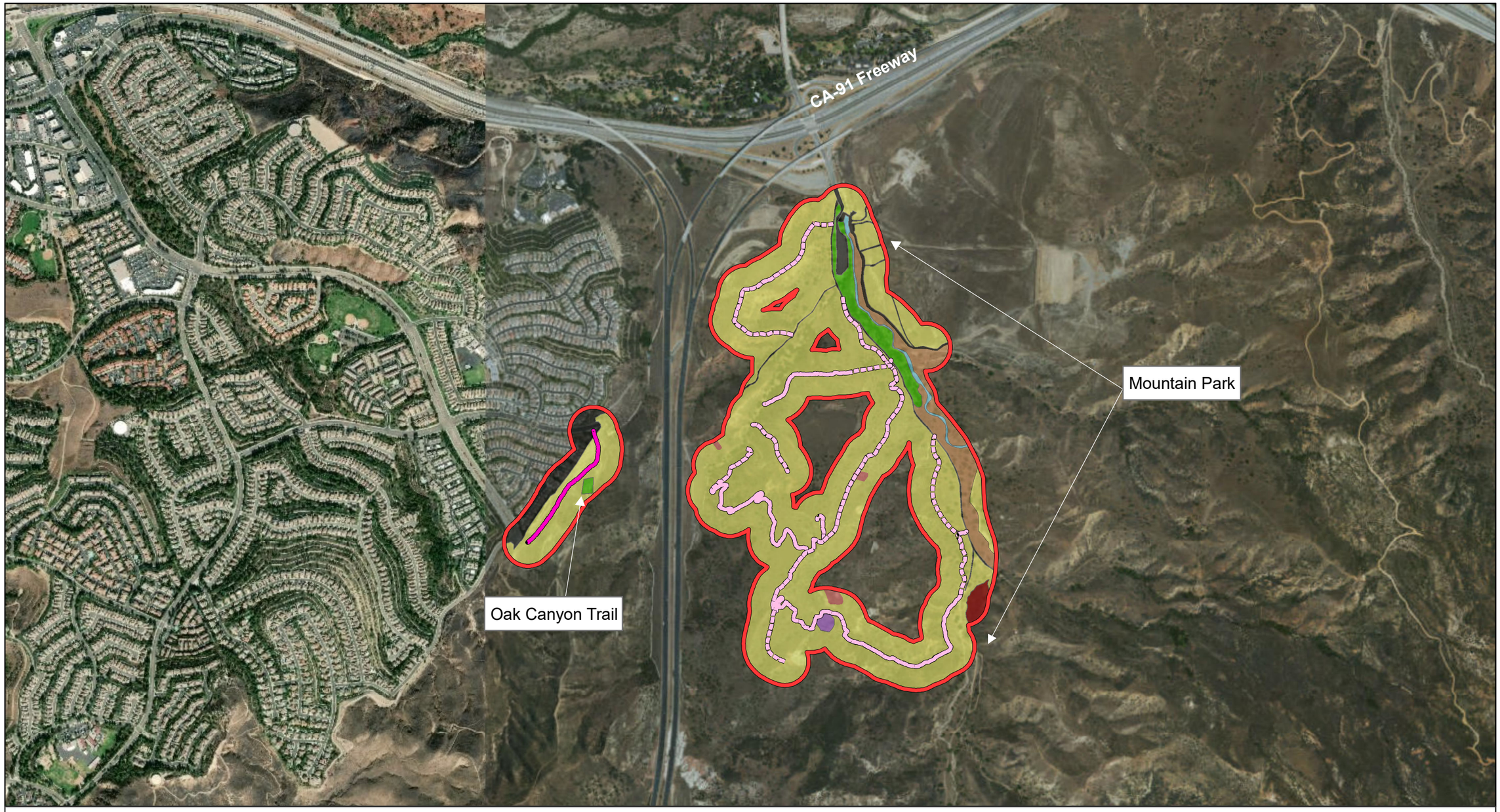
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2

Title

Vegetation Communities and Land Cover Types - Project Overview



- Mountain Park Trail
- Oak Canyon Trail
- Biological Resources Survey Area
- Adenostoma fasciculatum Shrubland Alliance--Chamise chaparral
- Baccharis salicifolia Shrubland Alliance--Mulefat thickets
- Bromus diandrus Herbaceus Semi-Natural Alliance-- Annual brome grassland
- Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands
- Disturbed/Developed
- Malacothamnus fasciculatus Shrubland Alliance – Bush mallow scrub
- Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub
- Quercus agrifolia Woodland Alliance-- Coast live oak woodland

N

0 640 1,280 Feet

1:15,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2a

Title

Jurisdictional Waters - Oak Canyon Trail and Mountain Park Overview

East Orange I

East Orange II

East Orange I - Primary Trail
East Orange I - Secondary Trail
East Orange II Trail
Biological Resources Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Avena (barbata, fatua) Herbaceous Semi-Natural Alliance -- Wild oats grasslands
Brassica nigra and other mustards Herbaceous Semi-Natural Alliance -- Upland mustards
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub
Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub
Quercus agrifolia Woodland Alliance -- Coast live oak woodland
Rhus integrifolia Shrubland Alliance – Lemonade berry scrub
Salix gooddingii Woodland Alliance - Black willow thickets
Salix laevigata Woodland Alliance – Red willow thickets
Salvia mellifera Alliance
Toxicodendron diversilobum Shrubland Alliance -- Poison oak scrub

N

0 1,000 2,000 Feet

1:24,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2b

Title

Vegetation Communities and Land Cover Types - East Orange I and II Overview



Oak Canyon Trail

Biological Resources Survey Area

Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands

Disturbed/Developed

Quercus agrifolia Woodland Alliance-- Coast live oak woodland

N

0 130 260 Feet

1:3,075 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

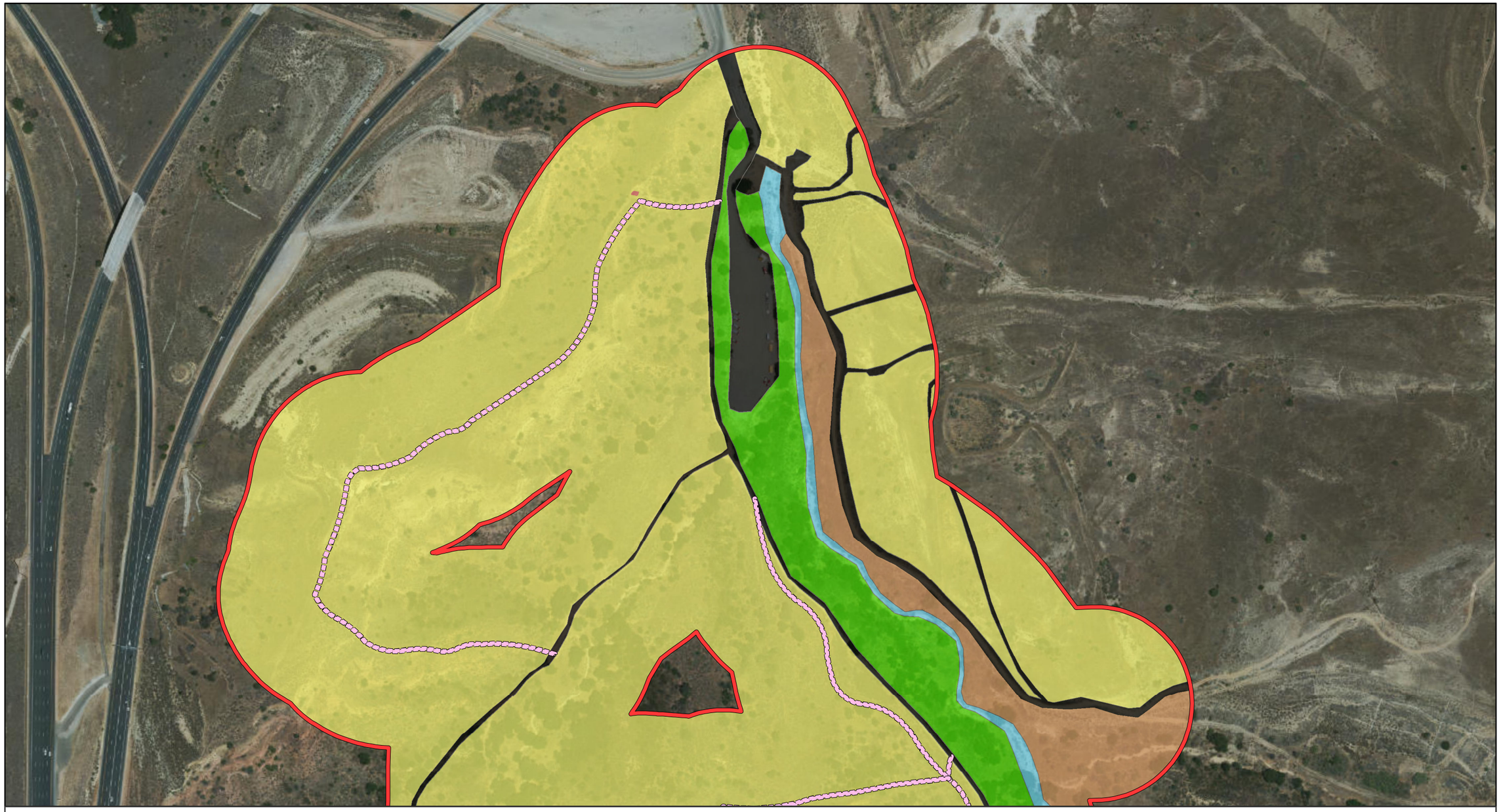
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2c

Title

Vegetation Communities and Land Cover Types - Oak Canyon Trail



- Mountain Park Trail
- Biological Resources Survey Area
- Baccharis salicifolia Shrubland Alliance--Mulefat thickets
- Bromus diandrus Herbaceous Semi-Natural Alliance-- Annual brome grassland
- Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands
- Disturbed/Developed
- Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub
- Quercus agrifolia Woodland Alliance-- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

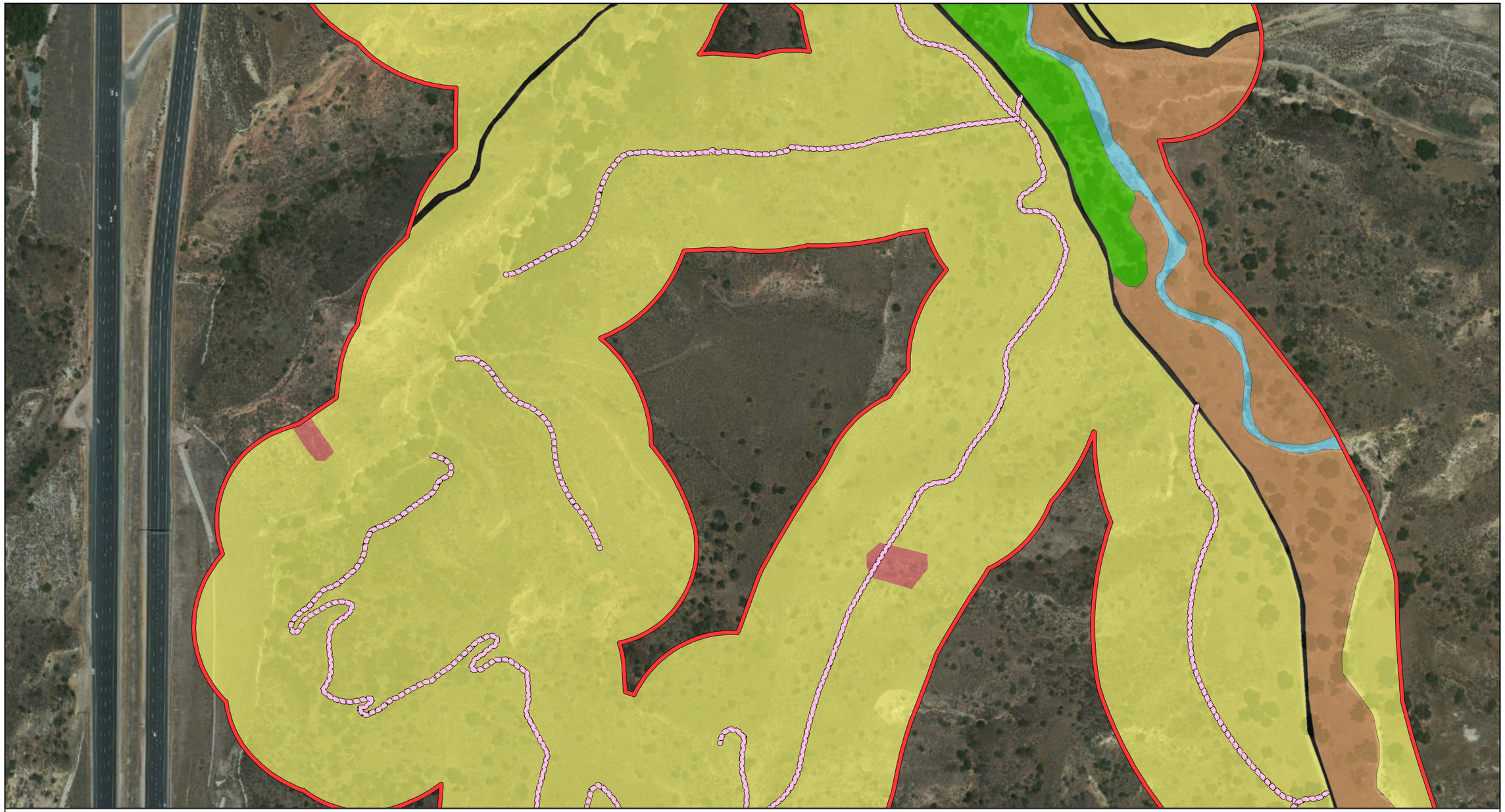
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2d

Title

Vegetation Communities and Land Cover Types - Mountain Park



- Mountain Park Trail
- Biological Resources Survey Area
- Baccharis salicifolia Shrubland Alliance--Mulefat thickets
- Bromus diandrus Herbaceus Semi-Natural Alliance-- Annual brome grassland
- Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands
- Disturbed/Developed
- Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub
- Quercus agrifolia Woodland Alliance-- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

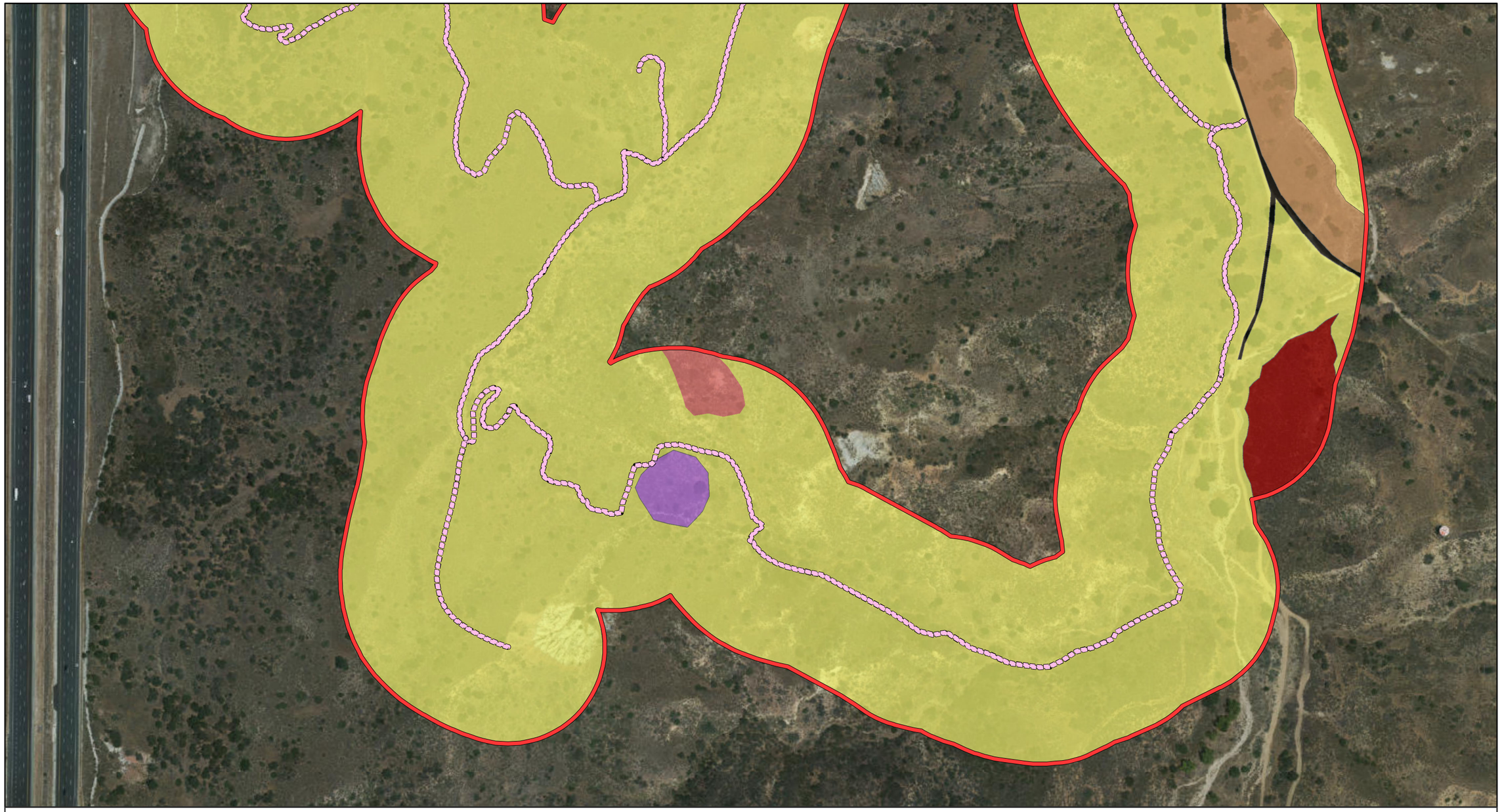
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2e

Title

Vegetation Communities and Land Cover Types - Mountain Park



- Mountain Park Trail
- Biological Resources Survey Area
- Adenostoma fasciculatum Shrubland Alliance--Chamise chaparral
- Bromus diandrus Herbaceus Semi-Natural Alliance-- Annual brome grassland
- Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands
- Disturbed/Developed
- Malacothamnus fasciculatus Shrubland Alliance – Bush mallow scrub
- Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2f

Title

Vegetation Communities and Land Cover Types - Mountain Park



East Orange I - Primary Trail
East Orange I - Secondary Trail
Biological Resources Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Quercus agrifolia Woodland Alliance -- Coast live oak woodland
Rhus integrifolia Shrubland Alliance – Lemonade berry scrub
Salix gooddingii Woodland Alliance - Black willow thickets

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2g

Title

Vegetation Communities and Land Cover Types - East Orange I

East Orange I - Primary Trail

East Orange I - Secondary Trail

Biological Resources Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Avena (barbata, fatua) Herbaceous Semi-Natural Alliance -- Wild oats grasslands

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub

Rhus integrifolia Shrubland Alliance – Lemonade berry scrub

Salvia mellifera Alliance

Toxicodendron diversilobum Shrubland Alliance -- Poison oak scrub

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2h

Title

Vegetation Communities and Land Cover Types - East Orange I



East Orange I - Primary Trail
East Orange I - Secondary Trail
Biological Resources Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Brassica nigra and other mustards Herbaceous Semi-Natural Alliance -- Upland mustards
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub
Quercus agrifolia Woodland Alliance -- Coast live oak woodland
Salvia mellifera Alliance

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location
Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.
2i

Title
Vegetation Communities and Land Cover Types - East Orange I

East Orange I - Primary Trail

Biological Resources Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Brassica nigra and other mustards Herbaceous Semi-Natural Alliance -- Upland mustards

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub

Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub

Salix laevigata Woodland Alliance – Red willow thickets

Salvia mellifera Alliance

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2j

Title

Vegetation Communities and Land Cover Types - East Orange I

East Orange I - Primary Trail

East Orange I - Secondary Trail

Biological Resources Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub

Rhus integrifolia Shrubland Alliance – Lemonade berry scrub

Salvia mellifera Alliance

Toxicodendron diversilobum Shrubland Alliance -- Poison oak scrub

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JY on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

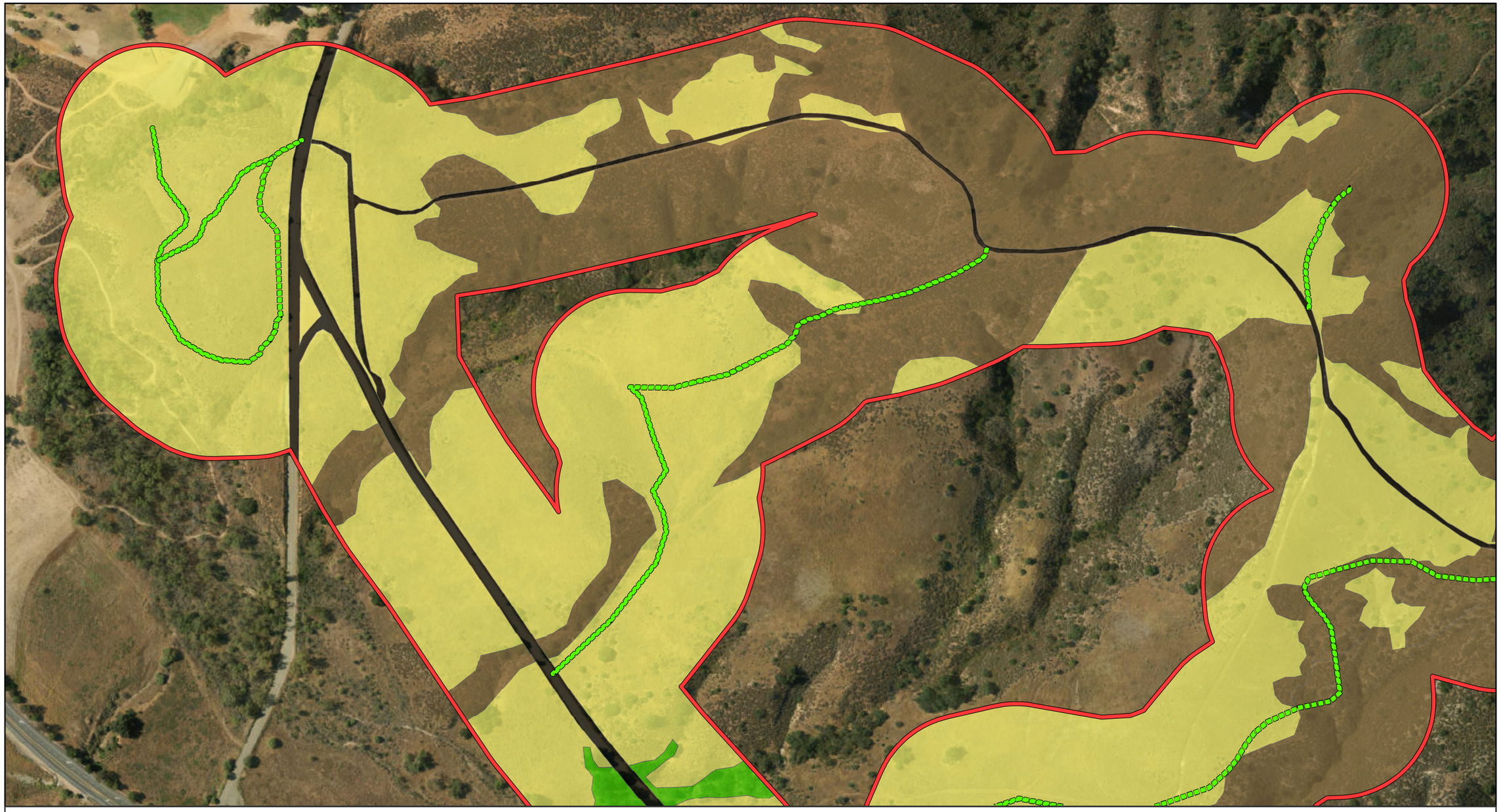
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2k

Title

Vegetation Communities and Land Cover Types - East Orange I



East Orange II Trail
Biological Resources Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Quercus agrifolia Woodland Alliance -- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location
Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.
2I

Title
Vegetation Communities and Land Cover Types - East Orange II

East Orange II Trail

Biological Resources Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Quercus agrifolia Woodland Alliance -- Coast live oak woodland

Salix laevigata Woodland Alliance – Red willow thickets

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

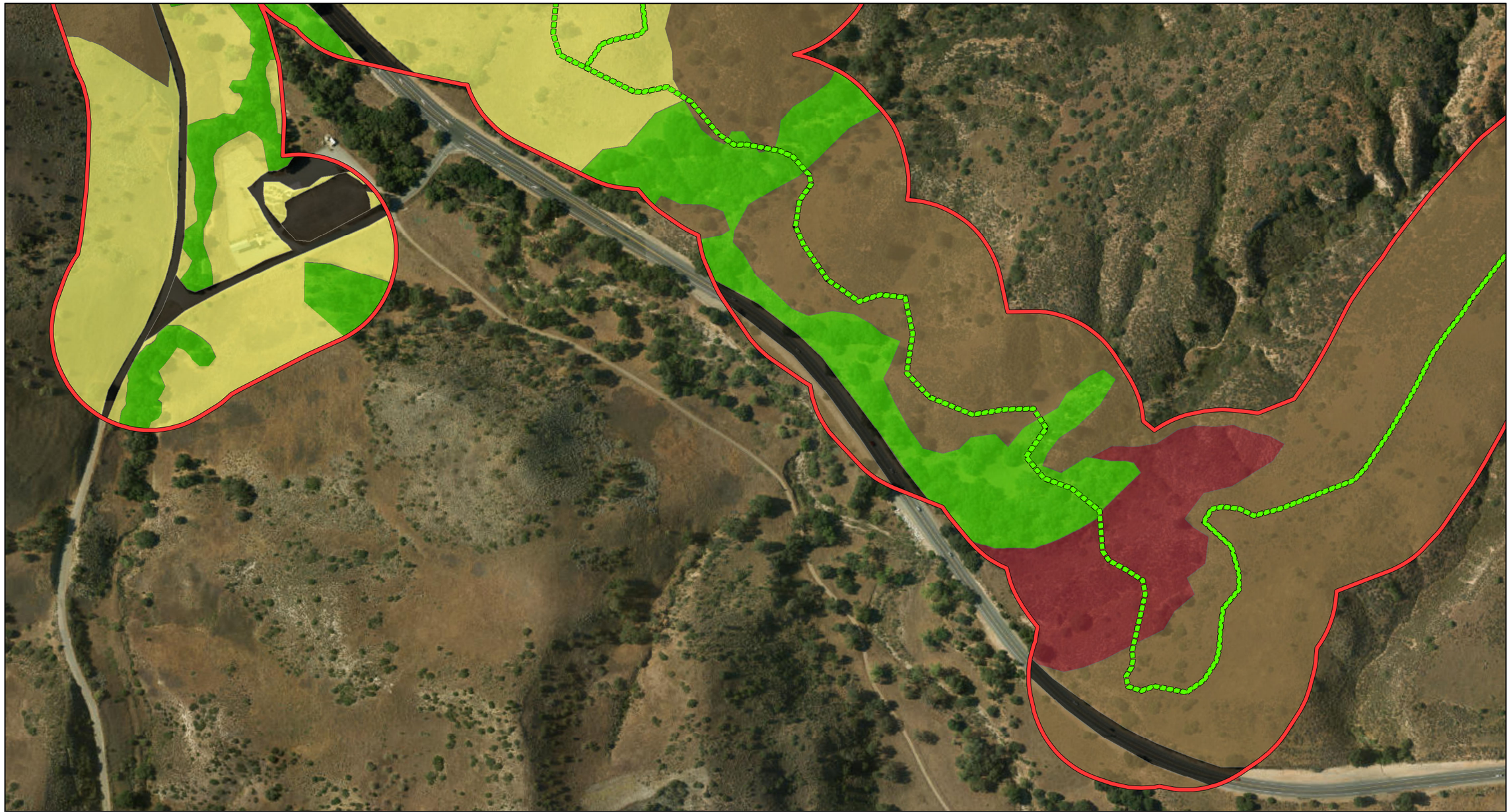
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2m

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail
Biological Resources Survey Area
Adenostoma fasciculatum Shrubland Alliance -- Chamise chaparral
Artemisia californica Shrubland Alliance – California sagebrush scrub
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Quercus agrifolia Woodland Alliance -- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

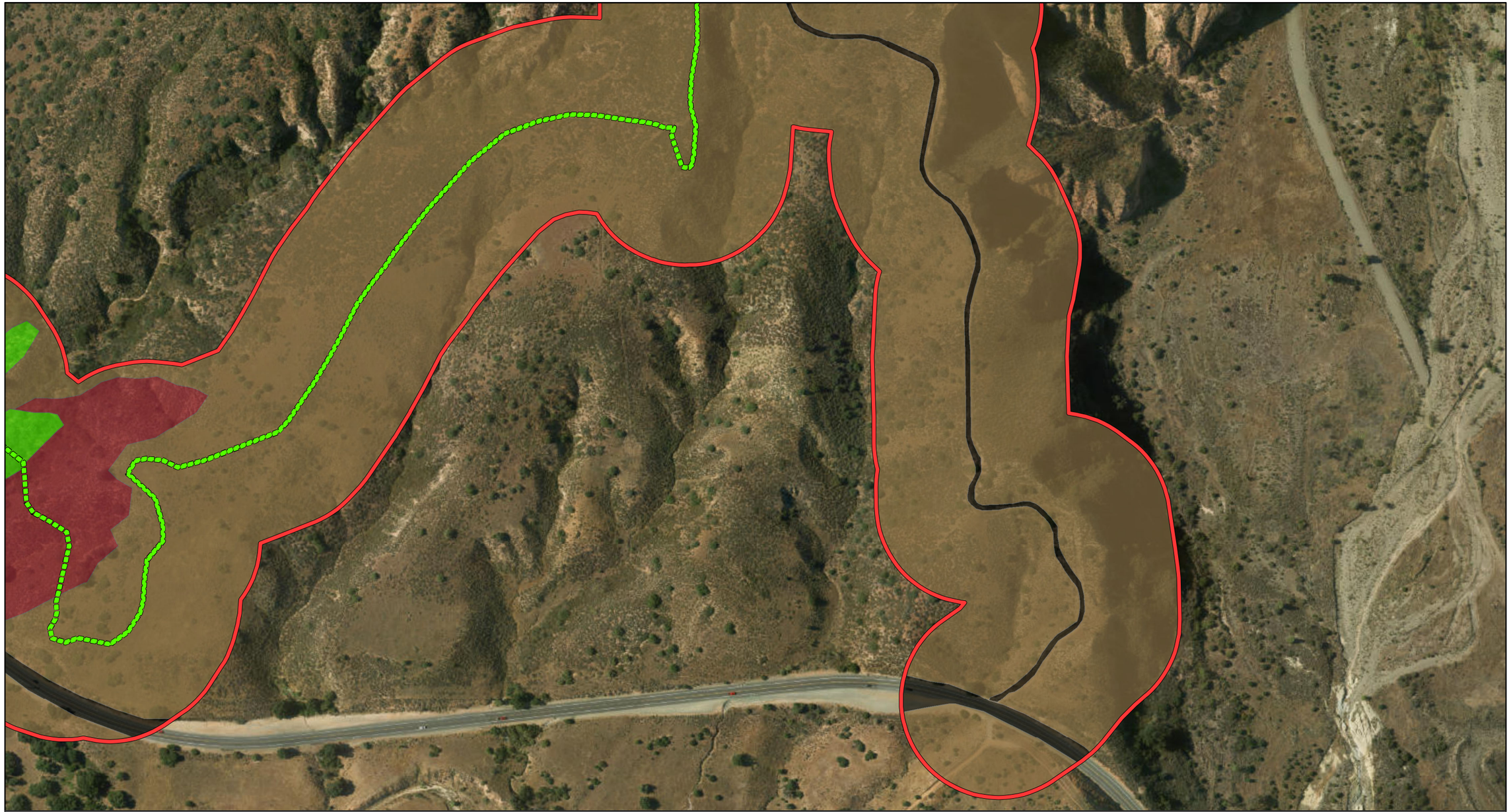
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2n

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Biological Resources Survey Area

Adenostoma fasciculatum Shrubland Alliance -- Chamise chaparral

Artemisia californica Shrubland Alliance – California sagebrush scrub

Disturbed/Developed

Quercus agrifolia Woodland Alliance -- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

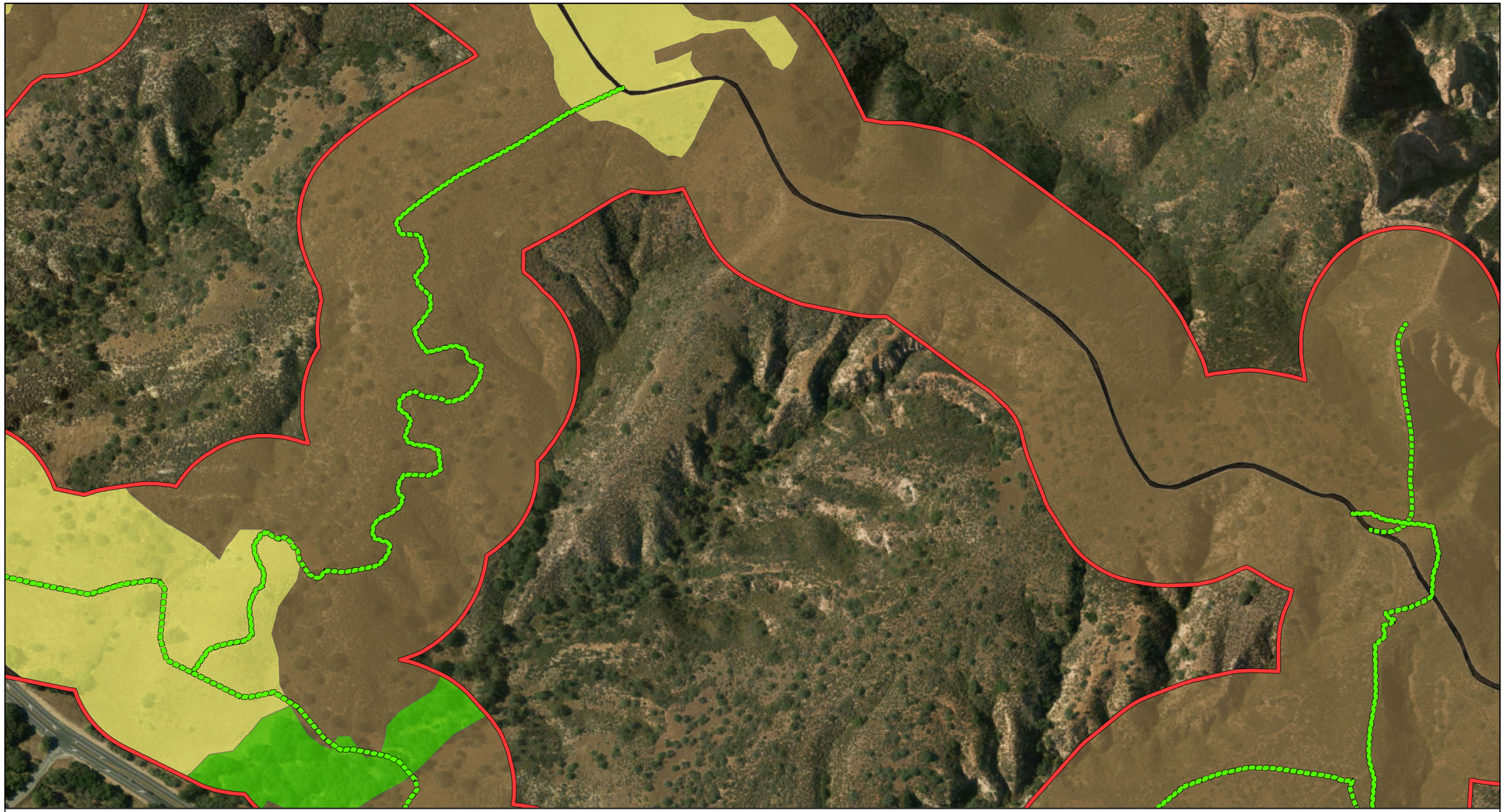
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2o

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Biological Resources Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Quercus agrifolia Woodland Alliance -- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

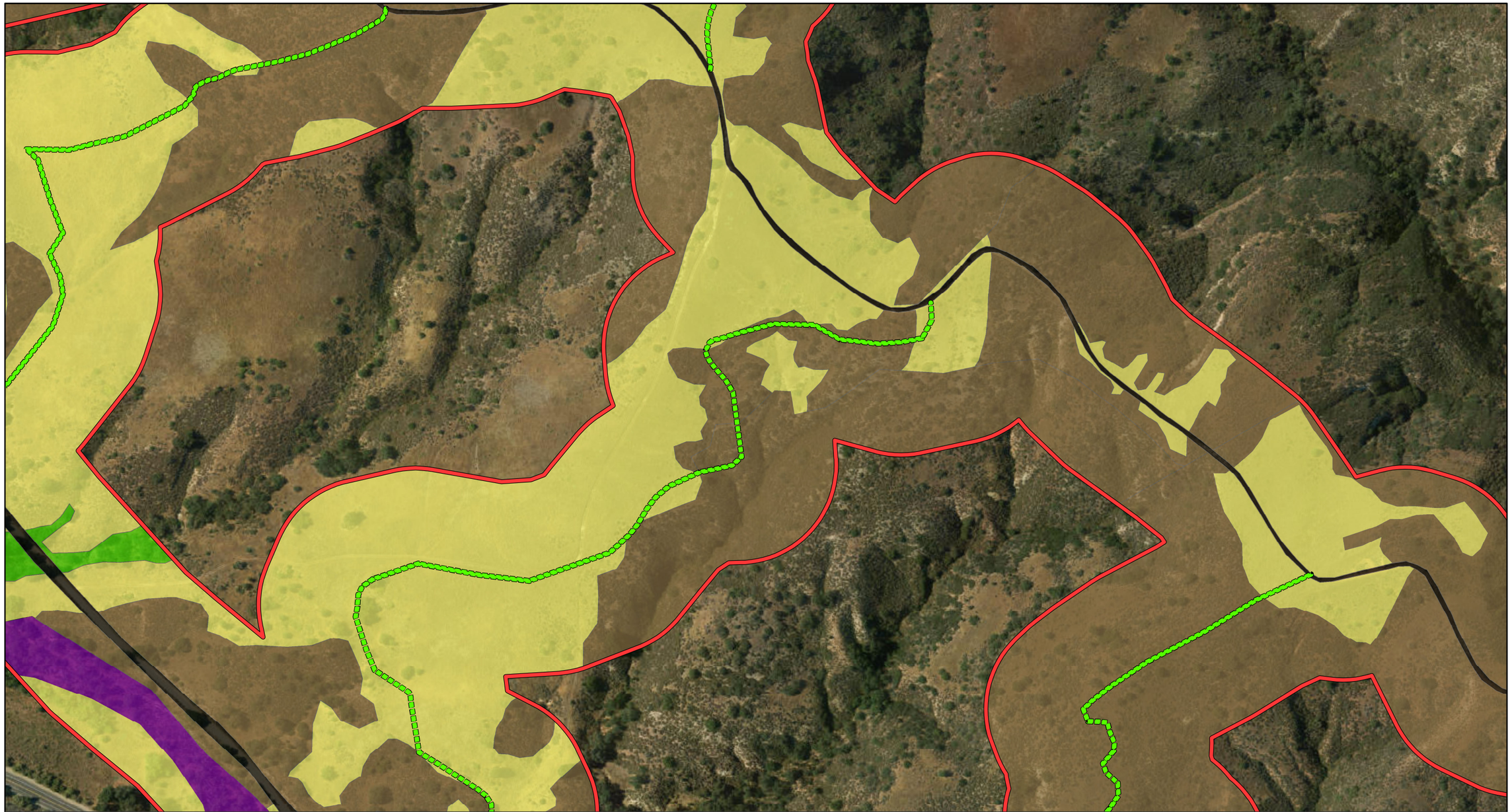
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2p

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail
Biological Resources Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Quercus agrifolia Woodland Alliance -- Coast live oak woodland
Salix laevigata Woodland Alliance – Red willow thickets

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location
Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.
2q

Title
Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Biological Resources Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2r

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Biological Resources Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

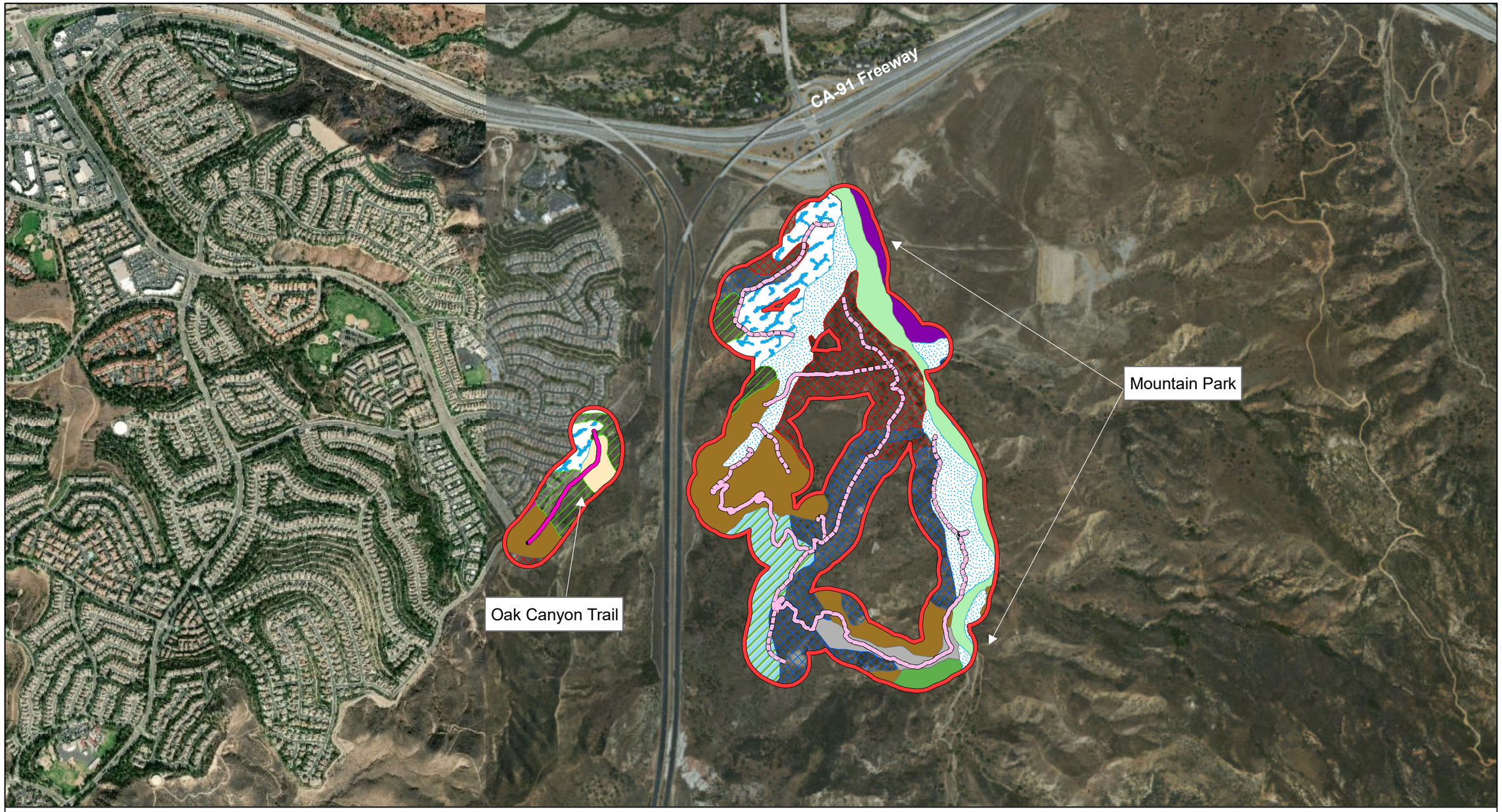
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

2s

Title

Vegetation Communities and Land Cover Types - East Orange II



Mountain Park Trail
Oak Canyon Trail
Biological Resources Survey Area

MUSYM

145
146
154
175
185
191
192
193
197
199
200
202
226

N

0 640 1,280 Feet

1:15,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3a

Title

Historic Soil Types - Oak Canyon Trail and Mountain Park Overview

East Orange I

East Orange II

East Orange I - Primary Trail
East Orange I - Secondary Trail
East Orange II Trail
Biological Resources Survey Area

MUSYM

100
101
102
103
104
105
107
108
109
110
111
112
114
126
127
130
132
134
135
141
142
173
175
176
177
191
192
193
199
200
202
203
204
207

N

0 1,000 2,000 Feet

1:24,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

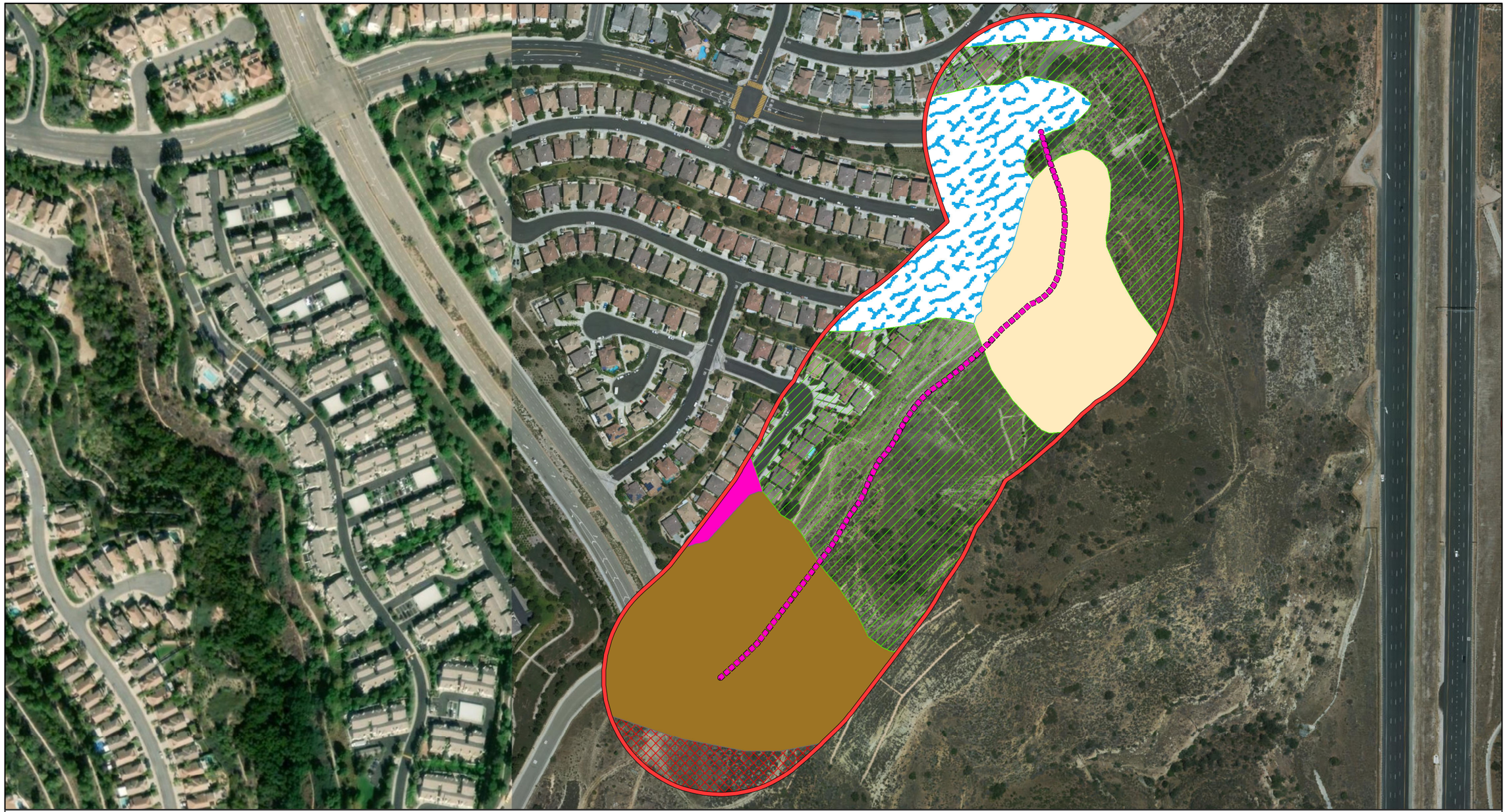
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3b

Title

Historic Soil Types - Oak Canyon Trail and Mountain Park Overview



Oak Canyon Trail

Biological Resources Survey Area

MUSYM

145

175

192

199

200

202

N

0 130 260 Feet

1:3,075 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

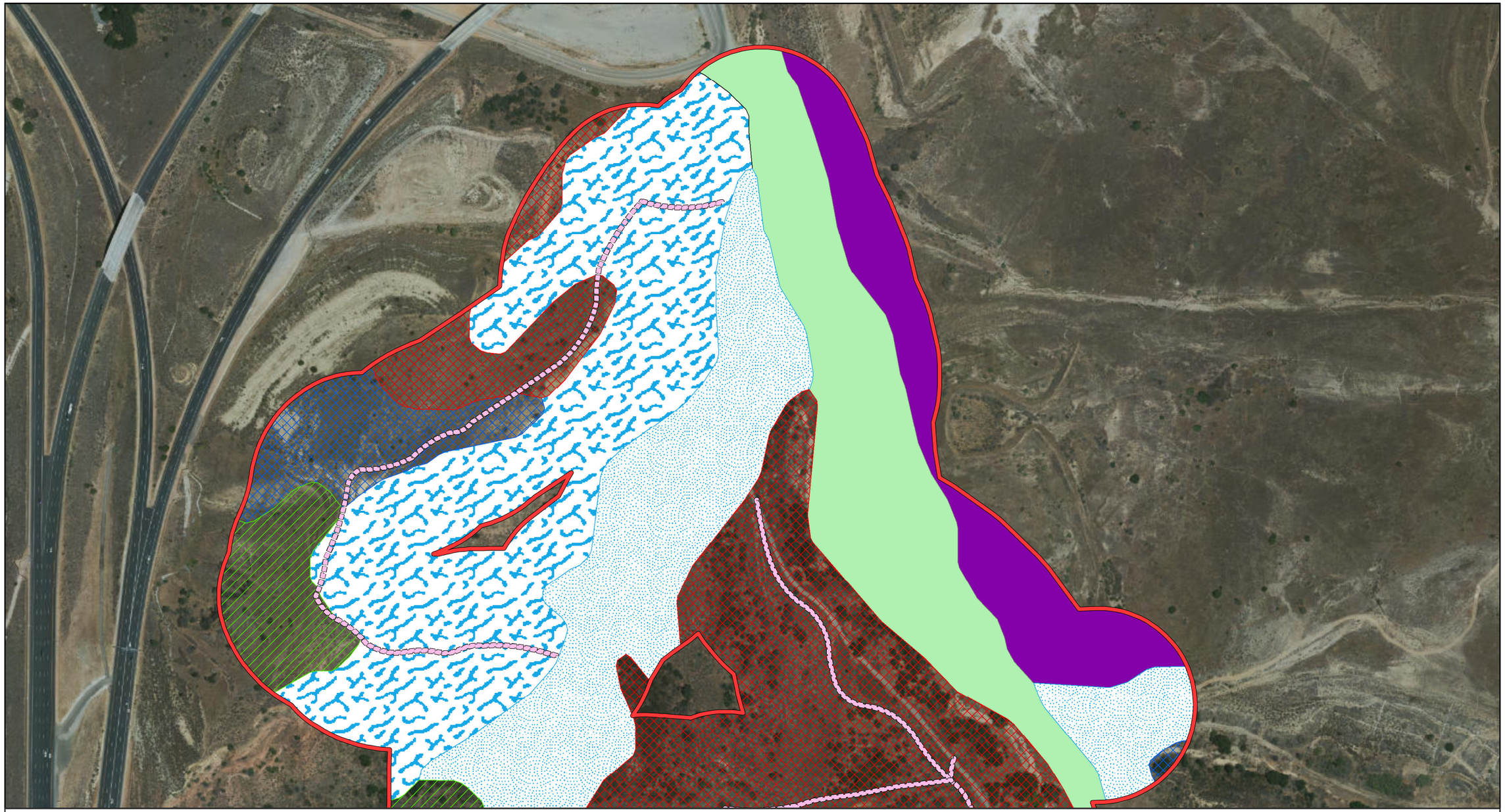
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3c

Title

Historic Soil Types - Oak Canyon Trail



Mountain Park Trail
Biological Resources Survey Area

MUSYM

146
185
191
192
200
202
226

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

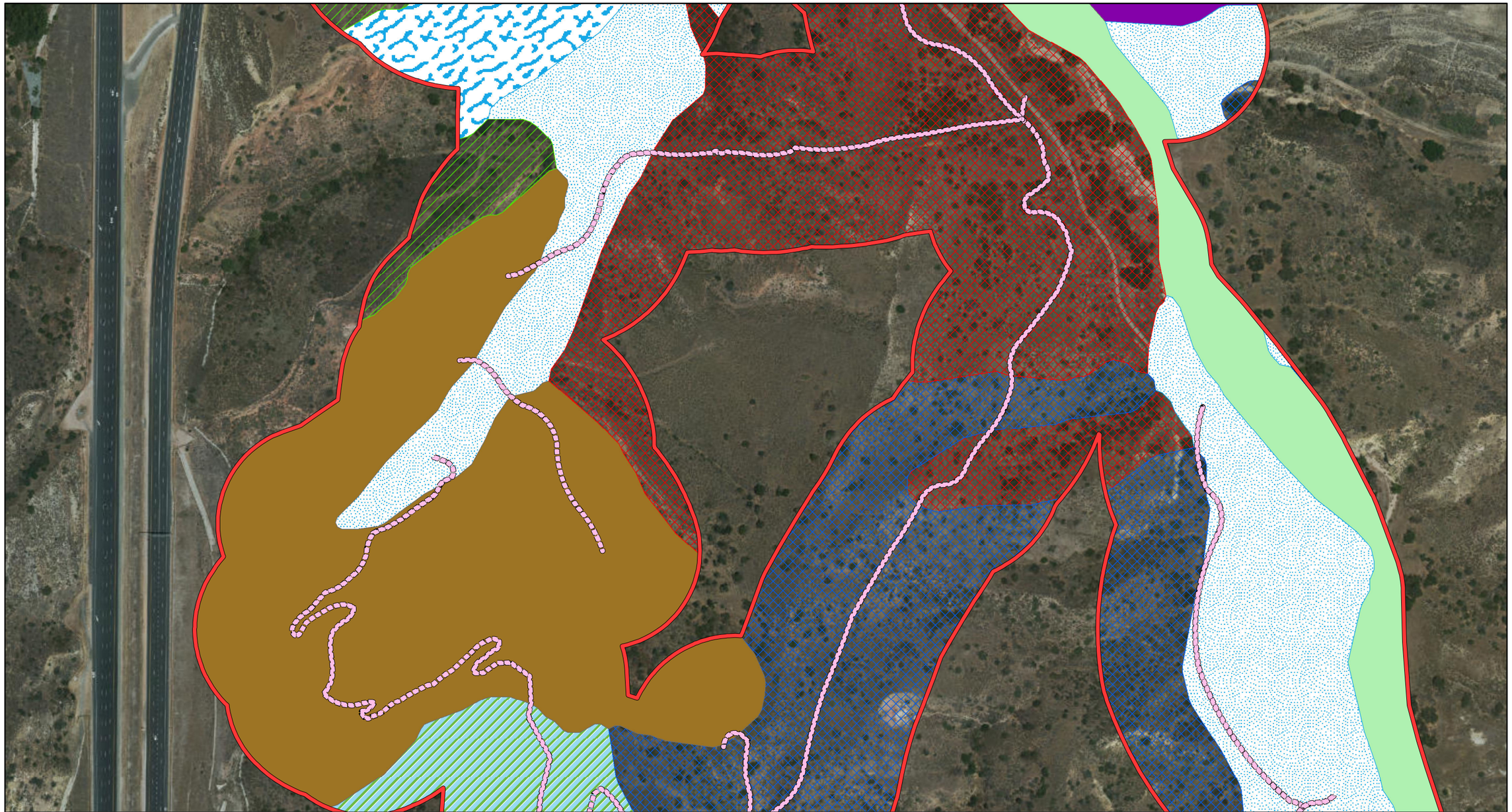
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3d

Title

Historic Soil Types - Mountain Park



Mountain Park Trail

Biological Resources Survey Area

MUSYM

145

146

185

191

192

193

200

202

226

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

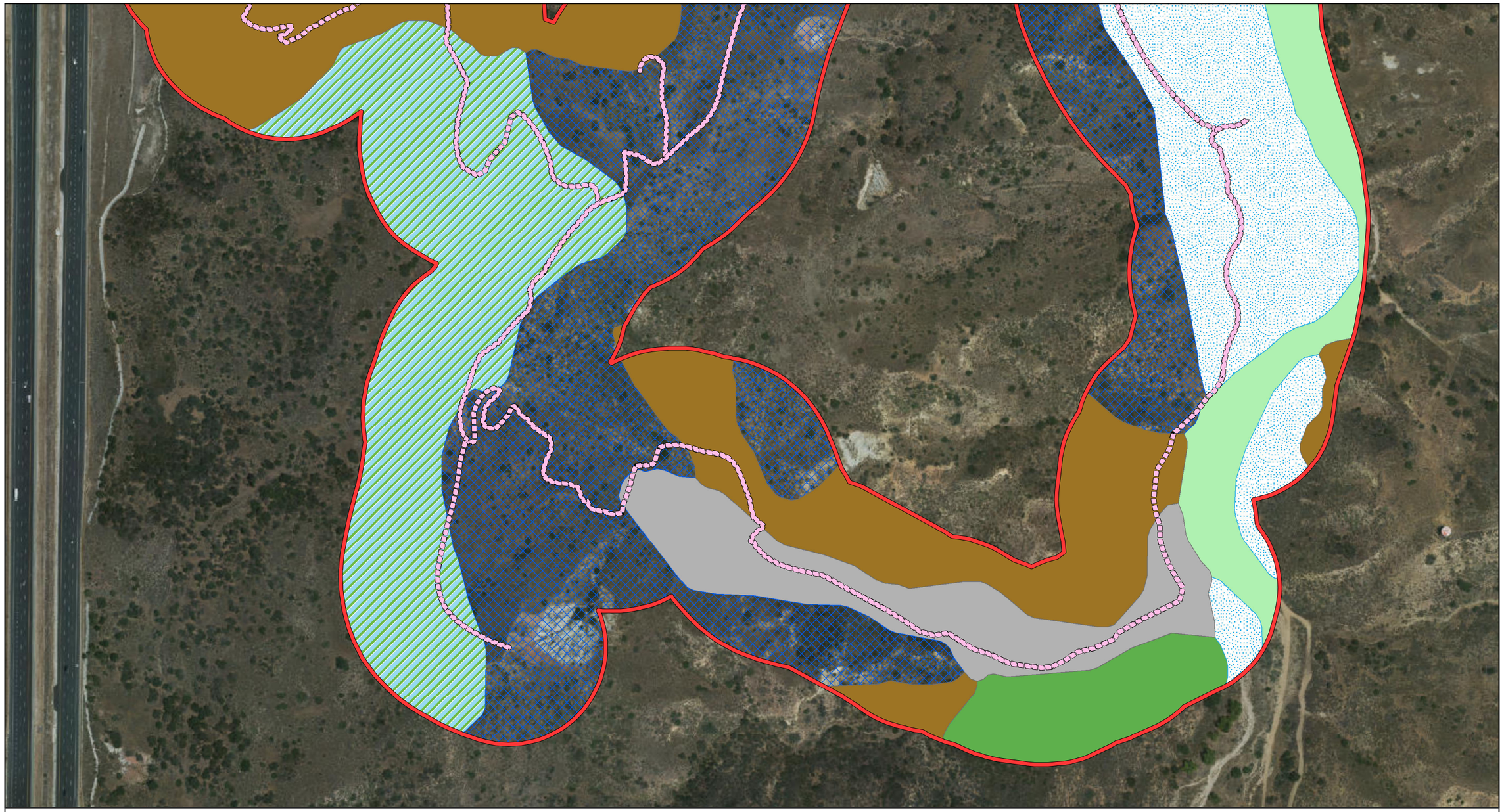
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3e

Title

Historic SoilTypes - Mountain Park



Mountain Park Trail

Biological Resources Survey Area

MUSYM

145

146

154

191

193

197

226

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

4f

Title

Historic SoilTypes - Mountain Park

East Orange I - Primary Trail

East Orange I - Secondary Trail

Biological Resources Survey Area

MUSYM

100

102

103

104

105

111

134

141

173

175

177

200

202

203

207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3g

Title

Historic Soil Types - East Orange I

East Orange I - Primary Trail
East Orange I - Secondary Trail
Biological Resources Survey Area

MUSYM

100
102
103
104
105
111
134
141
173
175
177
200
202
203
207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3h

Title

Historic SoilTypes - East Orange I

East Orange I - Primary Trail
East Orange I - Secondary Trail
Biological Resources Survey Area

MUSYM

101
104
109
111
126
134
141
142
175
177
200
202
203
207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

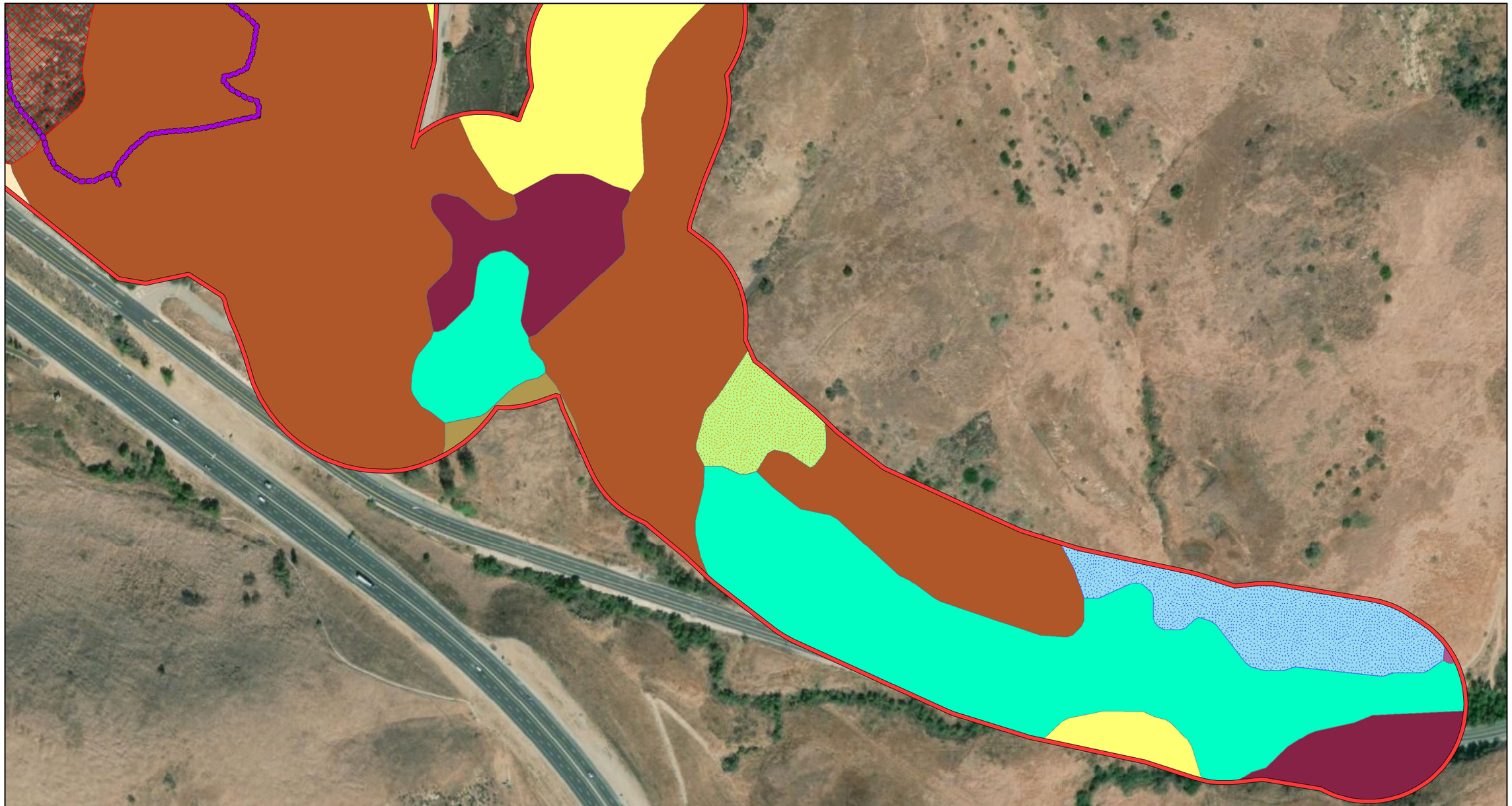
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3i

Title

Historic Soil Types - East Orange I



East Orange I - Primary Trail

Biological Resources Survey Area

MUSYM

101

109

114

126

127

130

134

173

175

200

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3j

Title

Historic Soil Types - East Orange I

East Orange I - Primary Trail

East Orange I - Secondary Trail

Biological Resources Survey Area

MUSYM

100

102

103

104

105

111

134

141

175

177

200

202

203

207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

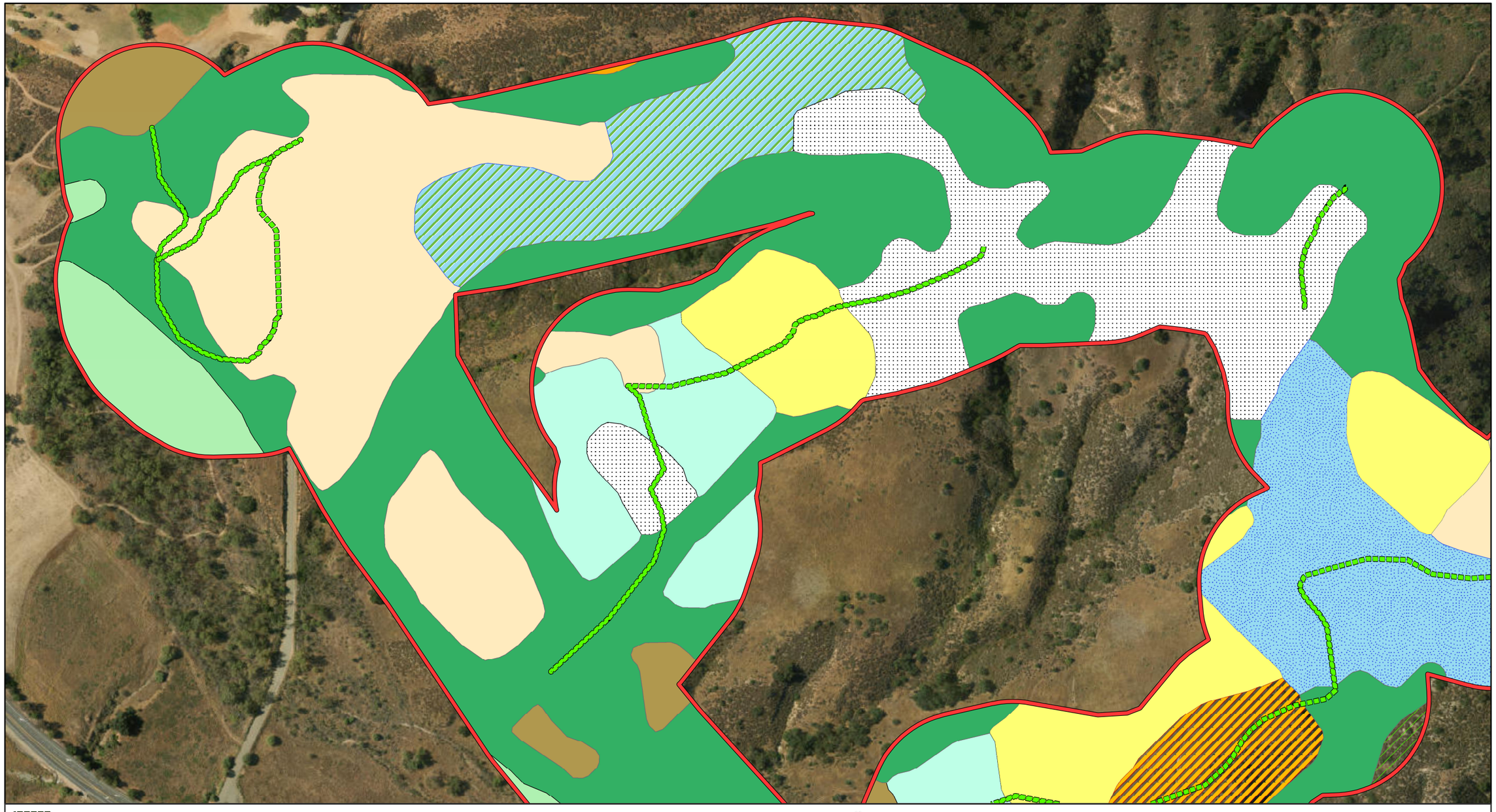
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3k

Title

Historic Soil Types - East Orange I



East Orange II Trail

Biological Resources Survey Area

MUSYM

100
101
112
114
141
142
173
175
177
191
193
202

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

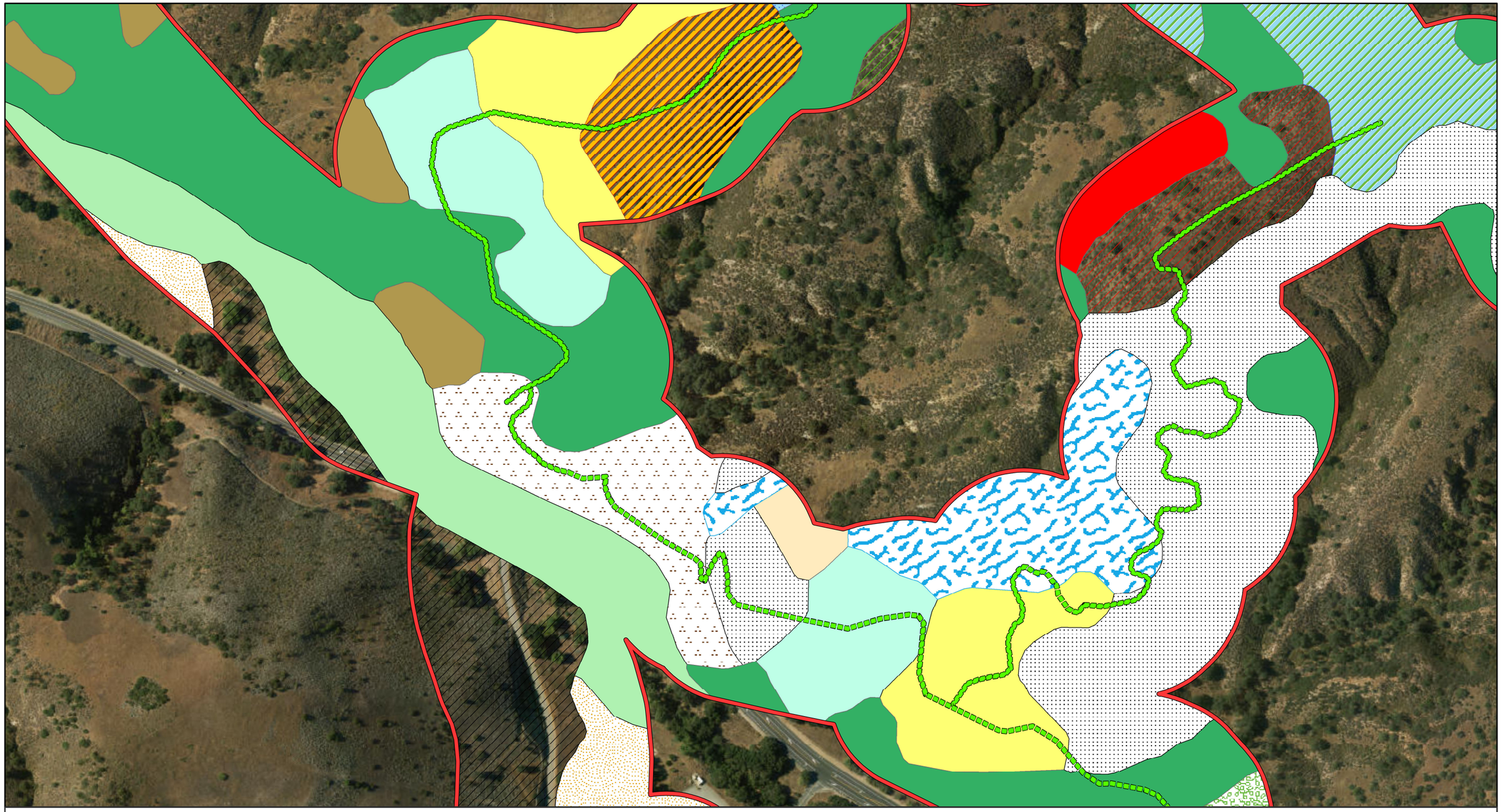
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3I

Title

Historic Soil Types - East Orange II



East Orange II Trail
Biological Resources Survey Area

MUSYM

100
101
107
110
112
114
132
141
142
173
175
176
191
192
193
202
203
207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location
Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.
3m

Title
Historic Soil Types - East Orange II

East Orange II Trail

Biological Resources Survey Area

MUSYM

100

101

102

110

132

135

141

142

173

175

191

193

202

203

207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3n

Title

Historic Soil Types - East Orange II

East Orange II Trail

Biological Resources Survey Area

MUSYM

135

142

173

175

192

193

202

203

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3o

Title

Historic Soil Types - East Orange II

East Orange II Trail

Biological Resources Survey Area

MUSYM

100

101

107

112

141

142

175

176

192

193

202

203

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3p

Title

Historic Soil Types - East Orange II

East Orange II Trail

Biological Resources Survey Area

MUSYM

100
101
107
110
112
114
132
141
142
173
175
176
177
191
192
193
202

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3q

Title

Historic Soil Types - East Orange II

East Orange II Trail

Biological Resources Survey Area

MUSYM

- 100
- 101
- 114
- 141
- 142
- 173
- 175
- 177
- 191
- 193

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

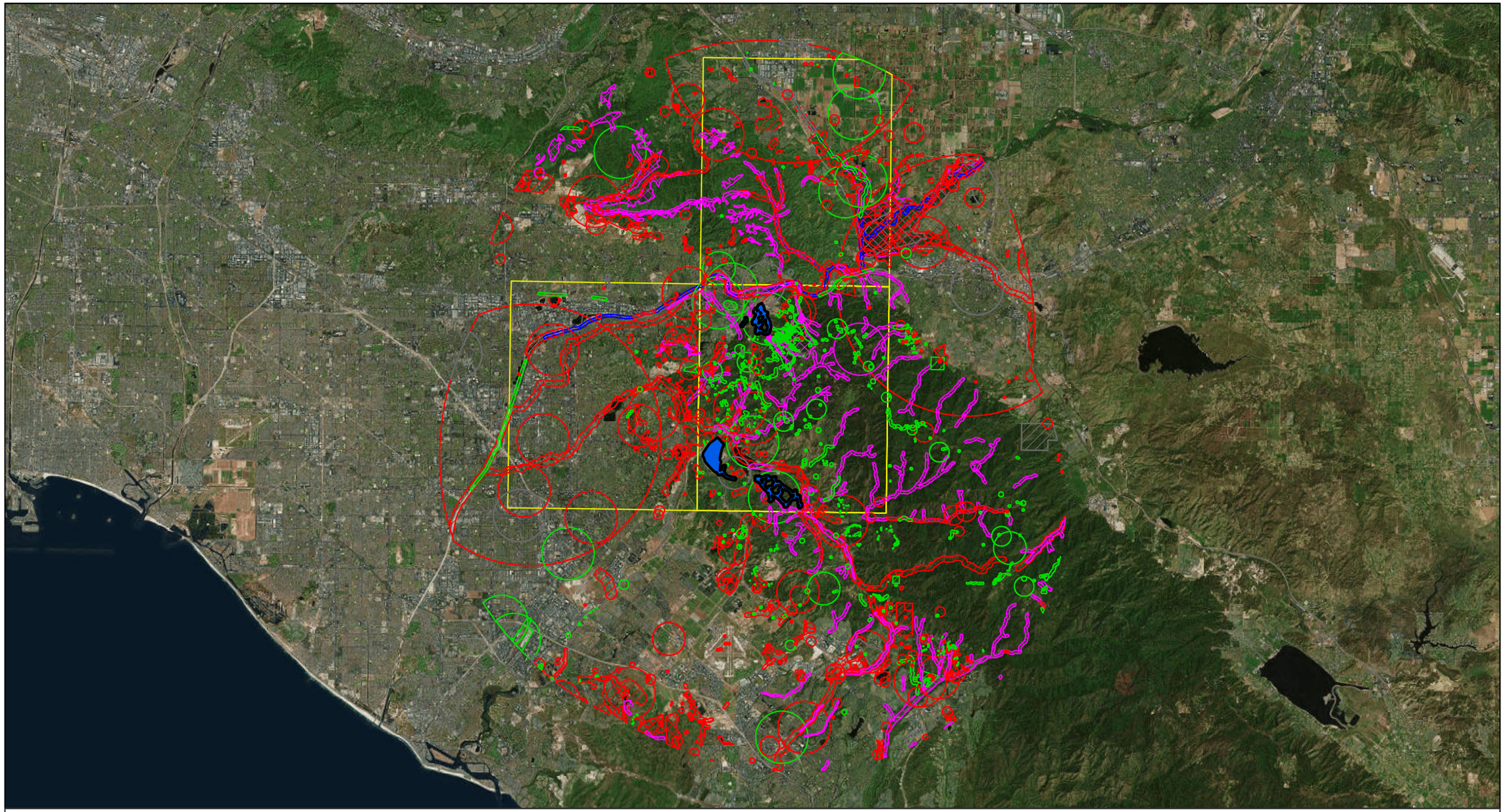
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

3r

Title

Historic Soil Types - East Orange II



Biological Resources Survey Area
Plant (80m)
Plant (specific)
Plant (non-specific)
Plant (circular)
Animal (80m)
Animal (specific)
Animal (non-specific)
Animal (circular)
Terrestrial Comm. (80m)
Terrestrial Comm. (specific)
Terrestrial Comm. (non-specific)
Terrestrial Comm. (circular)
Aquatic Comm. (80m)
Aquatic Comm. (specific)
Aquatic Comm. (non-specific)
Aquatic Comm. (circular)
Multiple (80m)
Multiple (specific)
Multiple (non-specific)
Multiple (circular)
Sensitive EO's (Commercial only)

N

0 10,000 20,000 Feet

1:240,068 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by SR on 2019-03-26
Independent Review by JV on 2019-03-26

Client/Project

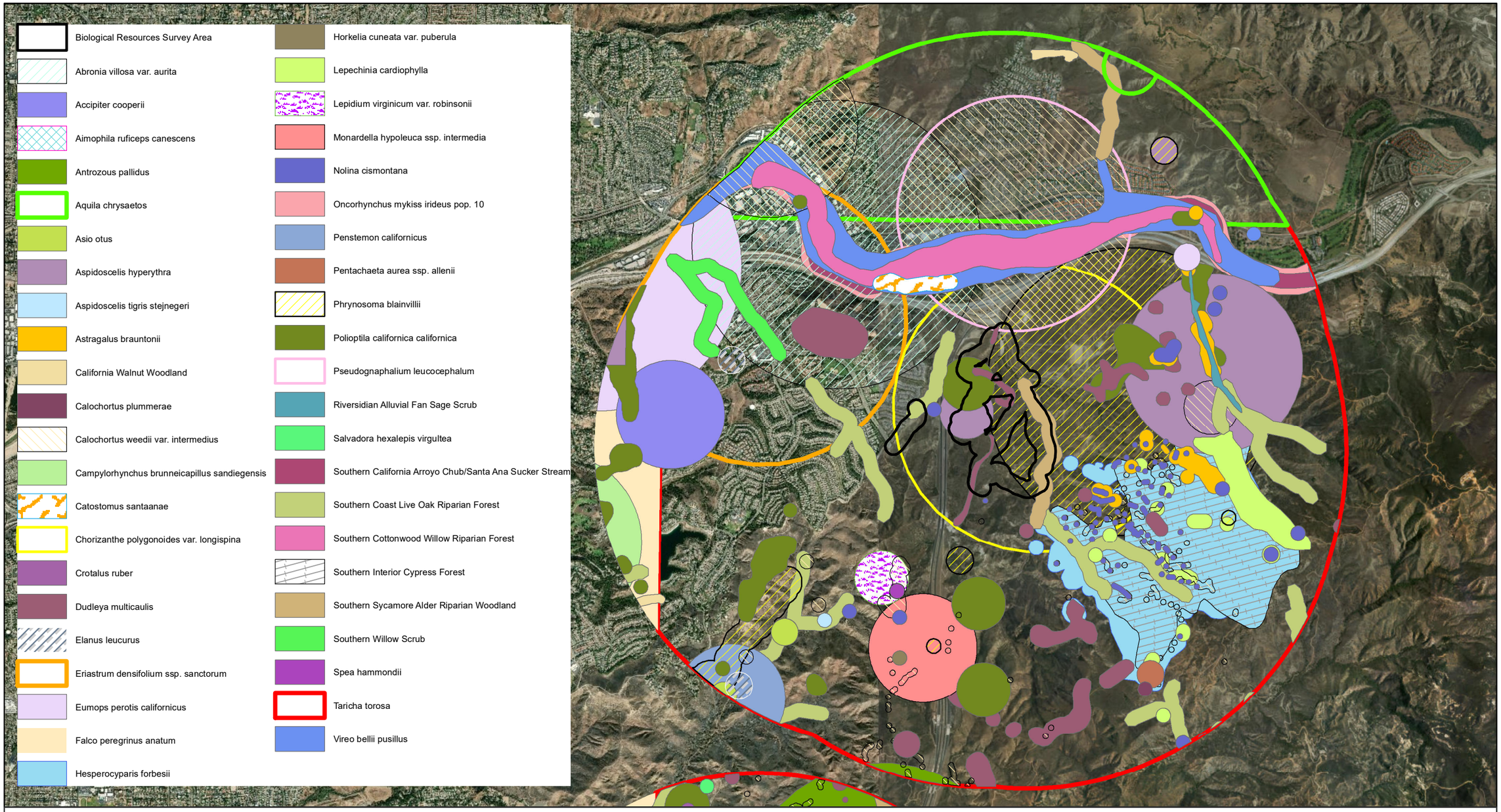
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

4a

Title

CNDDB - 10 Mile Search Radius



N

0 1,800 3,600 Feet

1:43,377 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by SR on 2019-03-26
Independent Review by JV on 2019-03-26

Client/Project

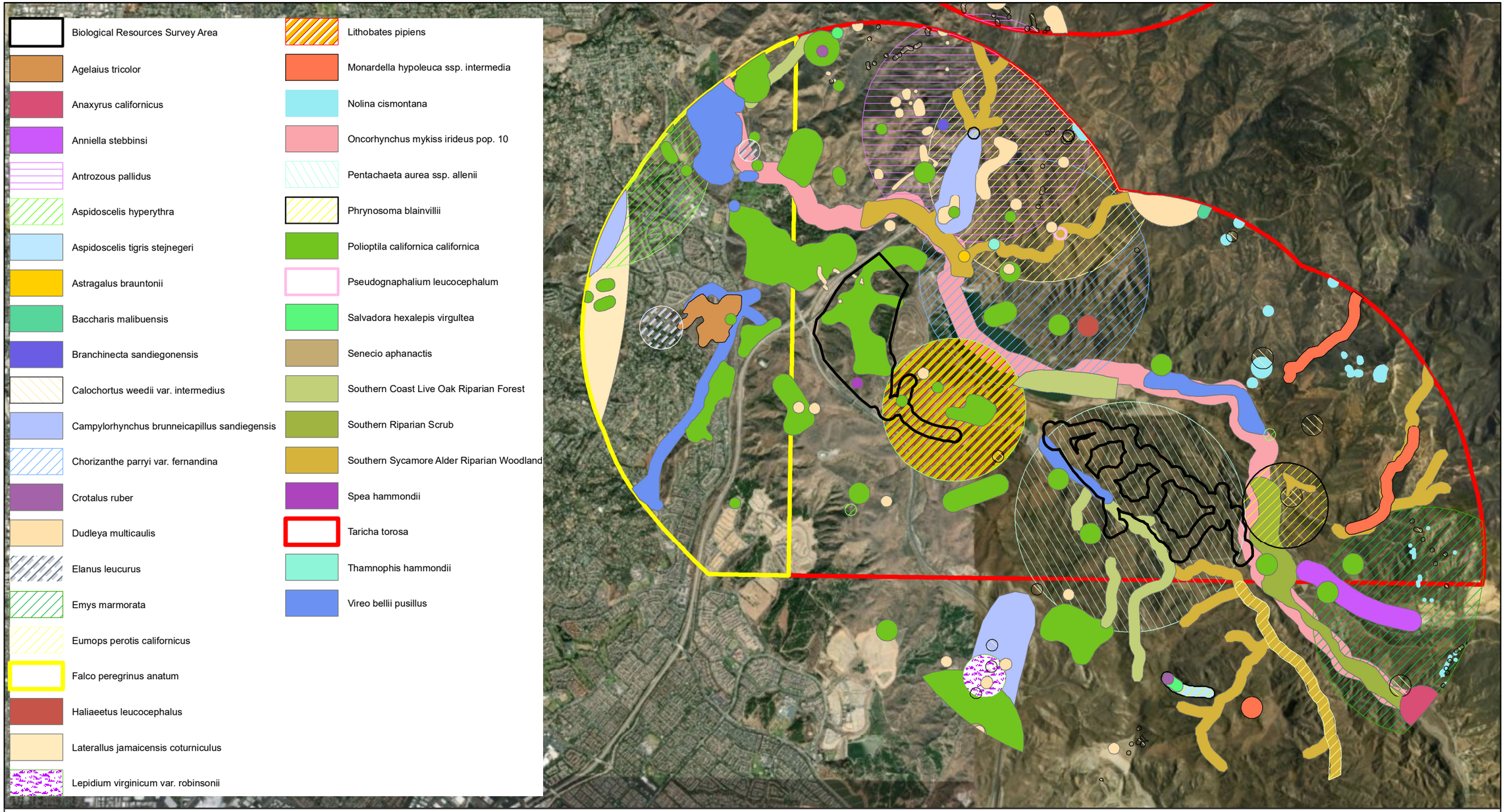
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

4b

Title

CNDDB - 2 Mile Search Radius



N

0 2,300 4,600 Feet

1:54,635 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by SR on 2019-03-26
Independent Review by JV on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Biological Resources Technical Report

Figure No.

4c

Title

CNDDB - 2 Mile Search Radius

Appendix B SITE PHOTOGRAPHS

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 1



Oak Canyon BSA – looking southwest at drainage basin and berm.

Photo 2



Oak Canyon BSA – looking northwest at drainage basin and berm.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 3



Mountain Park BSA – looking upstream from top of bank of dry streambed, typical of upper reaches of larger drainage channels on site.

Photo 4



Mountain Park BSA – a typical hillslope view of red brome grassland with early successional shrub species.

STANTEC CONSULTING SERVICES INC.
PHOTOGRAPHIC RECORD

Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 5



Mountain Park BSA – looking north at a slope exhibiting typical red brome grassland and prickly pear scrub habitats.

Photo 6



Mountain Park BSA – looking east at typical area of burned coast live oak woodland habitat.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 7



East Orange I BSA – looking northeast at typical California sagebrush scrub habitat in eastern portion of BSA with drainages and detention basin near the intersection of SRs 241 and 261.

Photo 8



East Orange I BSA – looking east at typical wild oats grasslands with overstory of previous year's mustard stalks.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 9



East Orange I BSA – looking downstream at typical steeply-incised drainage located in the upper elevations of the northern portion of the BSA.

Photo 10



East Orange I BSA – looking south at Wetland 1, an isolated Palustrine Scrub-Shrub (PSS) feature with low-lying mulefat thicket habitat.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 11



East Orange I BSA – close-up of Wetland 2, a Palustrine Forested (PFO) feature along Santiago Canyon Road connected to an ephemeral drainage, with Arroyo willow thickets habitat.

Photo 12



East Orange I BSA – looking south at Wetland 3, a Palustrine Emergent (PEM) feature developed within an excavated detention basin.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 13



East Orange I BSA – looking upstream at one of two substantial northward-trending drainages in the northern half of the BSA. Typical California sage scrub habitat on dry slope of ravine with Coast live oak habitat within the drainage channel in the background.

Photo 14



East Orange II BSA – looking south at Wild oats grasslands habitat typical of much of the lower elevations within the BSA.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 15



East Orange II BSA – looking south at a representative ravine in the upper elevations within the BSA with Chamise chaparral habitat.

Photo 16



East Orange II BSA – looking north at Annual brome grasslands habitat in the lower elevations within the BSA with Coast live oak woodland habitat along the hillside and drainage channel in the background.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: IRRMP	**Photographers:** J. Seamands, R. Brown

Photo 17



East Orange II BSA – looking upstream at a representative ephemeral drainage in the lower elevations of the BSA with typical Coast live oak woodland habitat.

Photo 18



East Orange II BSA – typical California sage scrub habitat occupying steep slopes of upper elevations within the BSA.

Appendix C PLANT COMPENDIUM

Project BSAs Plant Compendium

Species Name	Common Name	OCBSA	MPBSA	EOIBSA	EOIIBSA
Acmispon americanus	American deerweed	X	X	X	X
Acmispon glaber	deerweed	X	X	X	X
Acmispon grandiflorus	large leaved lotus		X		
Acmispon micranthus	small flowered lotus	X			
Acmispon wrangelianus	Chilean trefoil		X		
Acourtia microcephala	sacapellote	X	X	X	X
Adenostoma fasciculatum	chamise	X	X		X
Ailanthus altissima	tree of heaven		X		
Agrostis stolonifera	spreading bent	X			
Amaranthus blitoides	mat amaranth		X	X	X
Ambrosia acanthicarpa	annual bursage	X	X		
Ambrosia confertiflora	weak leaved burweed		X		
Ambrosia psilostachya	perennial ragweed		X	X	X
Amsinckia intermedia	common fiddleneck	X	X		
Amsinckia menziesii	small flowered fiddleneck			X	X
Antirrhinum kelloggii	Kellogg's snapdragon		X		
Antirrhinum nuttallianum	Nuttall's snapdragon		X		
Artemisia californica	California sagebrush	X	X	X	X
Artemisia douglasiana	mugwort		X	X	X
Artemisia dracunculus	wild tarragon			X	
Arundo donax	giant reed		X		
Asclepias californica	California milkweed			X	
Asclepias eriocarpa	Indian milkweed		X	X	X
Asclepias fascicularis	narrow-leaf milkweed		X		
Atriplex canescens	fourwing saltbush		X		
Atriplex semibaccata	Australian saltbush	X		X	X
Avena barbata	slim oat	X	X	X	X
Avena fatua	wild oat	X	X	X	X
Baccharis pilularis	coyote brush	X		X	X
Baccharis salicifolia	mulefat	X	X	X	X
Baccharis sarothroides	broom baccharis				X
Bebbia juncea	sweetbush	X	X	X	
Bloomeria crocea	golden stars	X	X	X	X
Bothriochloa laguroides	silver beardgrass				X
Brickellia californica	California brickellbush	X	X	X	
Bromus diandrus	ripgut brome	X	X	X	X
Bromus hordeaceus	soft chess		X	X	X

Species Name	Common Name	OCBSA	MPBSA	EOIBSA	EOIIBSA
Bromus madritensis var. *rubens*	red brome	X	X	X	X
Calandrinia menziesii	red maids				X
Calochortus splendens	splendid mariposa lily	X	X	X	X
Calystegia macrostegia	island morning glory	X			
Calystegia peirsonii	Peirson's morning glory	X	X	X	X
Camissoniopsis robusta	robust sun cup		X		
Capsella bursa-pastoris	sheperd's purse				X
Carduus pycnocephalus	Italian thistle				X
Castilleja foliolosa	Texas paintbrush		X	X	
Ceanothus crassifolius	hoary leaved ceanothus		X		X
Ceiba insignis	white floss silk tree			X	
Centaurea melitensis	tocalote	X	X	X	X
Cercocarpus betuloides	birch leaf mountain mahogany		X	X	
Chaenactis artemisiifolia	white pincushion	X	X		X
Chaenactis glabriuscula	common yellow chaenactis		X		X
Chenopodium album	lamb's quarters	X	X		
Chenopodium murale	nettle leaf goosefoot		X	X	
Chlorogalum pomeridianum	soap plant	X	X		
Chorizanthe staticoides	Turkish rugging	X			
Cirsium occidentale	western thistle			X	X
Claytonia perfoliata	miner's lettuce	X			
Clematis ligusticifolia	creek clematis				X
Collinsia heterophylla	Chinese houses		X		
Corethrogyne filaginifolia	common sandaster	X	X	X	X
Cotula coronopifolia	brass buttons	X	X		
Croton californicus	California croton		X		X
Croton setiger	turkey-mullein		X	X	X
Cryptantha intermedia	common cryptantha	X	X	X	X
Cucurbita foetidissima	calabazilla		X	X	X
Cuscuta californica	California dodder		X	X	X
Cylindropuntia californica	California cholla				X
Cynara cardunculus	artichoke thistle			X	X
Cynodon dactylon	Bermuda grass	X		X	X
Cyperus difformis	variable flatsedge				X
Datura wrightii	jimsonweed		X	X	X
Deinandra fasciculata	clustered tarweed	X	X	X	X
Dendromecon rigida	bush poppy				X
Descurainia pinnata	yellow tansy mustard		X		

Species Name	Common Name	OCBSA	MPBSA	EOIBSA	EOIIBSA
Dichelostemma capitatum	blue dicks	X	X	X	X
Distichlis spicata	salt grass		X		
Dudleya cymosa	canyon dudleya			X	
Dudleya lanceolata	southern California dudleya	X	X		X
Dudleya multicaulis	many stemmed dudleya	X	X		
Dudleya pulverulenta	chalk dudleya			X	X
Ehrendorferia ochroleuca	yellow bleeding heart		X		
Elymus condensatus	giant wild rye	X	X	X	X
Elymus glaucus	blue wild rye	X	X		
Elymus hispidus	intermediate wheatgrass	X	X	X	X
Elymus triticoides	beardless wild rye	X	X	X	X
Emmenanthe penduliflora	whispering bells	X	X		
Encelia actoni	Acton encelia		X		
Encelia californica	bush sunflower		X	X	X
Encelia farinosa	brittlebush		X	X	
Epilobium canum	California fuchsia		X		X
Eriastrum sapphirinum	sapphire eriastrum	X	X	X	X
Ericameria palmeri	Palmer's goldenbush			X	X
Erigeron canadensis	Canada horseweed	X	X	X	X
Erigeron foliosus	leafy daisy	X	X	X	X
Eriodictyon crassifolium	thick leaved yerba santa		X	X	X
Eriogonum elongatum	longstem buckwheat	X		X	
Eriogonum fasciculatum	California buckwheat	X	X	X	
Eriophyllum confertiflorum	yellow yarrow	X	X	X	X
Erodium brachycarpum	white stemmed filaree	X			X
Erodium cicutarium	red stemmed filaree	X	X	X	X
Eschscholzia caespitosa	foothill poppy	X	X	X	X
Eschscholzia californica	California poppy		X		
Eucalyptus citriodora	lemon scented gum			X	
Eucalyptus polyanthemos	silver dollar gum			X	
Eucrypta chrysanthemifolia	spotted eucrypta	X	X	X	X
Euphorbia albomarginata	rattlesnake sandmat			X	X
Foeniculum vulgare	fennel	X		X	X
Fraxinus dipetala	California ash			X	
Funastrum cynanchoides	fringed twinevine		X	X	X
Galium andrewsii	phlox leaved bedstraw		X		X
Galium angustifolium	narrow leaved bedstraw	X	X	X	X
Gazania linearis	treasure flower	X	X	X	
Gilia angelensis	chaparral gilia		X	X	

Species Name	Common Name	OCBSA	MPBSA	EOIBSA	EOIIBSA
Grindelia camporum	gumweed			X	
Gutierrezia californica	matchweed			X	X
Hazardia squarrosa	saw toothed goldenbush	X	X	X	X
Helianthus annuus	common sunflower		X		
Helianthus californicus	California sunflower			X	X
Heliotropium curassavicum	seaside heliotrope		X	X	X
Hesperoyucca whipplei	chaparral yucca	X	X	X	X
Heteromeles arbutifolia	toyon	X	X	X	X
Heterotheca grandiflora	telegraph weed	X		X	X
Hirschfeldia incana	mustard	X	X	X	X
Hordeum murinum	foxtail barley		X	X	X
Isocoma menziesii	white flowered goldenbush	X			
Juglans californica	southern California black walnut				X
Juncus balticus	wire rush		X		
Juniperus californica	California juniper		X		
Keckiella antirrhinoides	Chaparral beard tongue		X	X	X
Keckiella cordifolia	heart leaved keckiella		X	X	X
Kochia scoparia	summer cypress		X		
Lactuca serriola	prickly lettuce	X	X	X	X
Lathyrus vestitus	common Pacific pea				X
Lepidium densiflorum	common pepperweed	X	X		X
Lepidospartum squamatum	California scalebroom	X	X	X	X
Limonium sinuatum	statice			X	
Lonicera interrupta	chaparral honeysuckle		X		
Lotus corniculatus	bird's foot trefoil	X			X
Lupinus bicolor	bicolored lupine	X	X		X
Lupinus hirsutissimus	stinging lupine		X		
Lupinus latifolius	broad leaf lupine			X	
Lupinus longifolius	long leaf bush lupine			X	X
Lupinus microcarpus	chick lupine			X	
Lysimachia arvensis	scarlet pimpernel	X	X		X
Malacothamnus fasciculatus	chaparral bush mallow	X	X	X	X
Malacothrix saxatilis	cliff aster	X	X	X	X
Malosma laurina	laurel sumac	X	X	X	X
Marah macrocarpa	chilicothe	X	X	X	X
Marrubium vulgare	white horehound		X	X	X
Medicago polymorpha	California burclover		X		X
Melaleuca quinquenervia	broad-leaved paperbark			X	
Melica imperfecta	Coast Range melic			X	

Species Name	Common Name	OCBSA	MPBSA	EOIBSA	EOIIBSA
Melilotus albus	white sweetclover	X	X	X	X
Melilotus indicus	annual yellow sweetclover		X		
Mimulus aurantiacus	sticky monkeyflower	X	X	X	X
Mirabilis laevis	desert wishbone bush		X	X	X
Nicotiana glauca	tree tobacco	X	X	X	X
Oenothera speciosa	Mexican evening primrose	X			
Oenothera suffrutescens	wild honeysuckle			X	
Opuntia ficus-indica	tuna cactus			X	
Opuntia littoralis	prickly pear	X	X	X	X
Paeonia californica	California peony		X		
Pennisetum purpureum	elephant grass		X	X	
Persicaria lapathifolia	common knotweed		X		
Phacelia cicutaria	caterpillar phacelia	X	X	X	X
Phacelia minor	California bluebell		X		
Phacelia parryi	Parry's phacelia		X		X
Phoradendron leucarpum	American mistletoe		X		X
Pinus halepensis	Aleppo pine	X		X	
Plantago lanceolata	English plantain			X	
Platanus racemosa	California sycamore		X	X	X
Plecostachys serpyllifolia	petite-licorice		X		
Poa secunda	pine bluegrass	X	X		X
Polygonum aviculare	yard knotweed		X		
Polypodium californicum	California polypody		X		
Polypogon monspeliensis	rabbit's-foot grass	X			
Populus fremontii	Fremont cottonwood	X	X	X	
Prunus ilicifolia	holly leaf cherry	X	X	X	X
Prunus persica	peach			X	
Pseudognaphalium californicum	ladies' tobacco		X	X	X
Pseudognaphalium canescens	Wright's cudweed			X	X
Pseudognaphalium microcephalum	Wright's cudweed		X	X	
Quercus agrifolia	coast live oak	X	X	X	X
Quercus agrifolia var. *oxyadenia*	southern coast live oak				X
Quercus berberidifolia	inland scrub oak		X		X
Rhus aromatica	fragrant sumac		X		X
Rhus glabra	smooth sumac			X	X
Rhus integrifolia	lemonade berry	X	X	X	X
Rhus ovata	sugar bush		X	X	X

Species Name	Common Name	OCBSA	MPBSA	EOIBSA	EOIIBSA
Ribes californicum	California gooseberry				X
Ricinus communis	castor bean		X		
Robinia var.	locust			X	
Romneya coulteri	Coulter's matilija poppy		X		
Rosa californica	California rose		X		X
Rubus ursinus	California blackberry			X	
Rumex crispus	curly dock	X			X
Salix gooddingii	black willow	X	X	X	X
Salix lasiolepis	arroyo willow			X	X
Salsola tragus	Russian thistle	X	X	X	X
Salvia apiana	white sage	X	X	X	X
Salvia columbariae	chia sage	X	X		X
Salvia leucophylla	purple sage				X
Salvia mellifera	black sage	X	X	X	X
Sambucus nigra	black elderberry	X	X	X	X
Schinus molle	Peruvian pepper tree			X	
Schinus terebinthifolia	Brazilian pepper tree			X	
Schismus barbatus	old han schismus	X	X	X	X
Scrophularia californica	California figwort	X	X	X	X
Searsia lancea	African sumac				X
Selaginella bigelovii	Bigelow's moss fern			X	X
Senecio vulgaris	common groundsel		X		
Setaria viridis	green foxtail	X			
Silene laciniata	cardinal catchfly	X	X		
Silybum marianum	milk thistle	X	X	X	X
Sisymbrium orientale	Indian hedge mustard		X		
Sisyrinchium bellum	blue eyed grass				X
Solanum douglasii	Douglas' nightshade		X	X	X
Solanum xanti	purple nightshade	X	X		X
Sonchus arvensis	perennial sow thistle				X
Sonchus asper	spiny sowthistle	X	X	X	
Sonchus oleraceus	common sowthistle	X	X	X	X
Stephanomeria exigua	small wirelettuce	X			
Stephanomeria virgata	twiggy wreath plant		X		
Stipa lepida	foothill needle grass	X	X	X	X
Stipa miliacea	smilo grass			X	X
Symphoricarpos albus	common snowberry				X
Tamarix ramosissima	tamarisk	X	X	X	X
Tetradymia comosa	hairy horsebrush		X		

Species Name	Common Name	OCBSA	MPBSA	EOIBSA	EOIIBSA
Toxicodendron diversilobum	poison oak	X	X	X	X
Tragopogon dubius	yellow salsify		X		
Trichostema lanceolatum	vinegarweed		X		
Trifolium pratense	red clover	X			
Trifolium repens	white clover		X		
Trifolium wormskioldii	cow clover		X		
Typha latifolia	broadleaf cattail	X			
Uropappus lindleyi	silver puffs	X			
Urtica dioica	stinging nettle		X		X
Veronica persica	bird's eye speedwel		X		
Vicia villosa	hairy vetch				X
Washingtonia robusta	California fan palm	X		X	X
Xanthium spinosum	spiny cocklebur		X		
Xanthium strumarium	cocklebur		X	X	X

Appendix CJURISDICTIONAL DELINEATION REPORT

Interim Resource and Recreation Management Plan

Draft Jurisdictional Wetlands/Waters Delineation Report

Report Date

Prepared for:

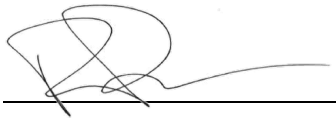
County of Orange
Orange County Parks
Planning and Design Division
13042 Old Myford Road
Irvine, California 92602

Prepared by:

Stantec Consulting Services Inc.
290 Conejo Ridge Avenue
Thousand Oaks, CA 91361

Sign-off Sheet

This document entitled Draft Jurisdictional Wetland/Waters Delineation Report was prepared by Stantec Consulting Services Inc. (“Stantec”) for the account of Orange County Parks (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by 

(signature)

Rocky Brown, Associate Biologist

Reviewed by 

(signature)

StephAnnie Roberts, Senior Project Manager

Approved by 

(signature)

Jared Varonin, Principal Biologist

Table of Contents

ABBREVIATIONS ..... **III**

1.0 INTRODUCTION **1**
1.1 PURPOSE OF THE REPORT 1
1.2 PROJECT LOCATION 1
1.2.1 Oak Canyon 1
1.2.2 Mountain Park 1
1.2.3 East Orange I 1
1.2.4 East Orange II 2
1.3 PROJECT DESCRIPTION 2
1.3.1 Construction 2
1.3.2 Operations and Maintenance 2

2.0 EXISTING SITE CONDITIONS **2**
2.1 TOPOGRAPHY AND SURROUNDING LAND USES 2
2.1.1 Oak Canyon 2
2.1.2 Mountain Park 3
2.1.3 East Orange I 3
2.1.4 East Orange II 3
2.2 VEGETATION COMMUNITIES AND LAND COVER TYPES 3
2.2.1 Oak Canyon 4
2.2.2 Mountain Park 4
2.2.3 East Orange I 5
2.2.4 East Orange II 6
2.3 CLIMATE 7
2.4 HYDROLOGY AND GEOMORPHOLOGY 8
2.5 GEOLOGY 8
2.6 SOILS 9

3.0 REGULATORY BACKGROUND **14**

4.0 WATERS/WETLANDS DELINEATION **14**
4.1 DELINEATION METHODOLOGY 14
4.2 RESULTS 16

5.0 SUMMARY AND CONCLUSIONS **18**

6.0 REFERENCES **19**

LIST OF APPENDICES

APPENDIX A FIGURES **A.1**

APPENDIX B SITE PHOTOGRAPHS **B.1**

APPENDIX C HISTORIC SOILS INFORMATION C.1
APPENDIX D REGULATORY BACKGROUND D.1
APPENDIX E FIELD DATA SHEETS..... E.1
APPENDIX F ARID WEST INDICATOR TABLES F.1
APPENDIX G PLANT COMPENDIUM WITH WETLAND INDICATOR STATUS G.1

Abbreviations

amsl	above mean sea level
BSA	Biological Study Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CWA	Clean Water Act
EOIBSA	East Orange I Biological Study Area
EOIIBSA	East Orange II Biological Study Area
GPS	Global Positioning System
IROS	Irvine Ranch Open Space
IRRMP	Interim Resource and Recreation Management Plan
MCVII	Manual of California Vegetation, Second Edition
MPBSA	Mountain Park Biological Study Area
NCCP	Natural Community Conservation Plan
NRCS	Natural Resources Conservation Service
OCBSA	Oak Canyon BSA
OC Parks	Orange County Parks
OHWM	Ordinary High Water Mark
RWQCB	Regional Water Quality Control Board
TNW	Traditionally Navigable Water
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey



1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report presents the findings of an investigation of potential jurisdictional features conducted by Stantec Consulting Services Inc. (Stantec) for the Irvine Ranch Open Space (IROS) 2014 Donation Interim Resource and Recreation Management Plan (IRRMP) (Project) in Orange County, CA (refer to Appendix A, Figure 1). The assessment of jurisdictional wetlands, other "waters of the U.S.," waters of the State, and California Department of Fish and Wildlife (CDFW) jurisdictional waters was conducted on May 15 through 17 and June 27, 2018, by Stantec. The investigation included four distinct parcels donated to the County of Orange by the Irvine Company to be preserved as permanently-protected open space: Oak Canyon, Mountain Park, East Orange I, and East Orange II. The Biological Study Areas (BSAs), which include each parcel and a surrounding 100-foot buffer zone are defined as the Oak Canyon Biological Study Area (OCBSA), Mountain Park Biological Study Area (MPBSA), East Orange I Biological Study Area (EOIBSA), and East Orange II Biological Study Area (EOIIBSA) (refer to Appendix A, Figure 2 for a depiction of the BSAs). This assessment was conducted to determine the extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CDFW that occur within 100 feet of the areas in the BSAs proposed for the development of walking trails.

1.2 PROJECT LOCATION

The four BSAs are located in eastern Orange County, California. All of the BSAs are situated within the western half of the U.S. Geological Survey (USGS) Black Star Canyon 7.5-minute topographic quadrangle with the individual BSA locations described in further detail below and depicted in Appendix A, Figure 2. A photographic log for the survey has been included in Appendix B.

1.2.1 Oak Canyon

The OCBSA is situated between California State Route (SR) 241 and a residential development to the west. The approximately 30-acre BSA abuts the residential development to the east, extending approximately 0.4 mile in a northeast to southwest direction from Oak Canyon Drive to South Weir Canyon Road.

1.2.2 Mountain Park

The MPBSA is situated along the east side of SR 241, immediately south of its intersection with SR 91. In general, it spans the area between SR 241 and the unpaved road leading south from Gypsum Canyon Road, extending approximately 1.2 miles to the south. This BSA is approximately 312 acres in size.

1.2.3 East Orange I

The EOIBSA is situated immediately east of SR 241 adjacent to its intersection with SR 261. The main portion of the approximately 495-acre BSA occupies the open space between SR 241 and the now-closed Santiago Canyon Landfill, just west of Irvine Lake. A smaller spur reaches out from the southern end of the BSA, extending approximately 0.75 mile to the east-southeast, north of and adjacent to Santiago Canyon Road (S18).

1.2.4 East Orange II

The EOIIBSA is situated in open space to the southeast of Irvine Lake and just northeast of Santiago Canyon Road. A small section of the approximately 481-acre BSA extends to the south of Santiago Canyon Road, along Blue Diamond Haul Road and encompassing the Irvine Ranch Augustine Staging Area.

1.3 PROJECT DESCRIPTION

1.3.1 Construction

The Project includes the construction and maintenance of a system of unpaved hiking trails throughout the four BSAs. The Project will employ various heavy-duty earthmoving equipment (e.g., compact excavators, ride-on earthmovers) for development of staging areas, new trails, and parking lot areas. Specialized tools (e.g., power wheelbarrows, brush mowers, rock drills, chainsaws) will also be utilized for tree and vegetation removal as necessary, as well as removal of other debris. Construction activities will be planned to minimize vegetation removal and replacement; however, some vegetation removal is anticipated.

1.3.2 Operations and Maintenance

During operations, the Project will require routine park maintenance activities, such as:

- removal of unhealthy or dead trees and limbs
- signage repair (due to age and/or vandalism)
- mowing and pruning around trails and parking lot areas
- weed control through herbicide application or mechanized tools
- trailside litter pickup and trash collection
- bridge inspections

2.0 EXISTING SITE CONDITIONS

2.1 TOPOGRAPHY AND SURROUNDING LAND USES

The four BSAs are located within the western foothills of the Santa Ana Mountains and generally consist of hilly terrain with associated ridges, valleys, and gullies. Elevations and surrounding land use for each BSA are described below.

2.1.1 Oak Canyon

The OCBSA has a lower basin area and an upper hillslope area and ranges in elevation from approximately 950 feet above mean sea level (amsl) along the eastern boundary of the southern portion of the BSA to 675 feet amsl in the stormwater detention basin in the northern portion of the BSA. This basin receives flows diverted away from the adjacent residential area. A large berm runs north/south through the middle of the BSA separating the residential development to the west from the open space and drainage features to the east. The eastern side of the BSA also has unpaved access roads and concrete viaducts. The OCBSA is bordered to the west by residential development and to the north,

east, and south by undeveloped land, though SR 241 separates the BSA from the wider area of open space to the east.

2.1.2 Mountain Park

The MPBSA is composed of two general landforms: lowland canyon areas and surrounding hillslopes and ridgetops, ranging in elevation from approximately 980 feet amsl in the southwest portion of the BSA to 400 feet amsl in the north, at the intersection of East Santa Ana Canyon and Gypsum Canyon Roads. The land to the south and east of the MPBSA is in Orange County Parks (OC Parks) Open Space and Natural Community Conservation Plan (NCCP) Reserve, with the I-91 freeway and SR 241 bordering the BSA to the north and west, respectively, with urban development beyond. Irvine Valencia Growers currently leases two small areas totaling approximately five acres in the northern portion of the MPBSA to Orange County Fire Control for use as storage yards.

2.1.3 East Orange I

The mountainous EOIBSA ranges in elevation from approximately 1,250 feet amsl in the east central portion of the BSA to 725 feet amsl in the northernmost corner. Lands surrounding the EOIBSA generally include OC Parks Open Space and NCCP Reserve. This BSA is bound to the north by SR 261, to the west and south by Santiago Canyon Road and SR 241, and to the east by the now-closed Santiago Canyon Landfill. Further east beyond the landfill is Irvine Lake and a temporary use area for private radio-controlled aviation.

2.1.4 East Orange II

The mountainous EOIIBSA ranges from approximately 1,225 feet amsl along the ridgelines in the southeastern portion of the BSA to 800 feet amsl in the in the northwest corner of the BSA. The EOIIBSA is situated approximately 1.5 miles to the southeast of the EOIBSA and is also largely surrounded by OC Parks Open Space and NCCP Reserve lands. It is bound to the north by the private radio-controlled aviation area and to the south, east, and west by undeveloped lands with Santiago Canyon Road traversing along its southern boundary.

2.2 VEGETATION COMMUNITIES AND LAND COVER TYPES

Generally, mapping and description of plant communities follows the classification system described in the second edition of A Manual of California Vegetation (MCVII) (Sawyer et al., 2009). Species scientific and common names correspond to those described in the second edition of The Jepson Manual (Baldwin et al., 2012). Within the BSAs, Stantec biologists mapped 16 plant communities defined by Sawyer et al. (2009) and four additional land cover types: English plantain herbaceous, rock outcrop, unvegetated streambed, and disturbed/developed land. A discussion of the conditions present within each BSA is included below, summarized in Table 1, and depicted in Appendix A, Figure 3.

Land Cover Types

DEVELOPED/DISTURBED LAND

Common to all four BSAs, this classification was used to map portions of the BSAs that are developed, including residential developments, paved and unpaved roads, concrete drainage ditches, and landscaped areas heavily dominated by ornamental species. In general these areas are unvegetated or vegetation is generally sparse. Where

vegetated, these areas are generally composed of ruderal pioneer plant species that readily colonize open disturbed soil and thrive as a result of anthropogenic impacts. Some of the plants present within this cover type included red-stem filaree, tocalote (*Centaurea melitensis*), wild oats (*Avena fatua*), and other non-native grasses and forbs.

Vegetation Communities

2.2.1 Oak Canyon

The following MCVII Alliances were observed during the biological surveys conducted within the OCBSA:

- *Bromus rubens* Herbaceous Semi-Natural Alliance – Red brome grasslands
- *Quercus agrifolia* Woodland Alliance – Coast live oak woodland

The OCBSA has been burned relatively recently as evidenced by the presence of blackened substrate and fire scarred woody vegetation. The vegetation community was dominated by early successional, non-native, graminoid and forbs, (80% to 90% absolute aerial coverage) including the invasive species red brome (*Bromus madritensis* var. *rubens*), redstem filaree (*Erodium cicutarium*), and white sweetclover (*Melilotus alba*). In general, the vegetation cover on the hillslopes and ridges was less dense, with more granite based, gravelly substrates.

Toward the northern portion of the berm area of the OCBSA, ornamental herbaceous species such as treasure flower (*Gazania linearis*) and Mexican evening primrose (*Oenothera speciosa*) proliferated. There was also a small coast live oak (*Quercus agrifolia*) woodland on a steep hillslope drain, much of the which was fire scarred. Early successional shrub re-sprouting was observed and included native forb and shrub species including chamise (*Adenostoma fasciculatum*) and deerweed (*Acmispon glaber*).

2.2.2 Mountain Park

The following MCVII Alliances were observed during the biological surveys conducted within the MPBSA:

- *Adenostoma fasciculatum* Shrubland Alliance – Chamise chaparral
- *Avena fatua* Herbaceous Semi-Natural Alliance – Wild oats grasslands
- *Baccharis salicifolia* Shrubland Alliance – Mulefat thickets
- *Bromus diandrus* Herbaceus Semi-Natural Alliance – Annual brome grasslands
- *Bromus rubens* Herbaceous Semi-Natural Alliance – Red brome grasslands
- *Malacothamnus fasciculatus* Shrubland Alliance – Bush mallow scrub
- *Opuntia littoralis* Shrubland Alliance – Coast prickly pear scrub
- *Quercus agrifolia* Woodland Alliance – Coast live oak woodland

Artemisia californica Shrubland Alliance – California sagebrush scrub was also observed, but areas occupied by this community were too small of a mapping unit to include separately in this discussion.

The entire MPBSA was recently burned, as evidenced by the presence of early successional annual grasses and forbs, fire scarred shrub re-sprouts, fire scarred prickly pear (*Opuntia littoralis*), and standing fire scarred coast live oak trees. Due to the disturbance resulting from the fire, there was a high diversity of spring annual herbs within the BSA. The hillslopes and ridges within the MPBSA primarily consisted of early successional grasses and forb species communities, with the presence of fire scar shrubs re-sprouts. Homogenous shrub communities were nearly absent and were punctuated by an occasional fire-scarred prickly pear present on steep slopes or small patches of resprouting chaparral mallow (*Malacothamnus fasciculatus*). Other typical fire-scarred shrub re-sprouts observed consisted of lemonade berry (*Rhus integrifolia*) and laurel sumac (*Malosma laurina*). Red brome was the dominant annual grass community that occupied over 60% of the entire BSA, and smaller headwater drains were also covered in annual grasses. Common forbs observed consisted of mustard (*Hirschfeldia incana*), common eucrypta (*Eucrypta chrysanthemifolia*), and a mix of phacelia species (*Phacelia* spp.).

The coast live oak woodlands that occupy over 20% of the BSA, generally associated with ephemeral drainages, had an aerial canopy coverage of between 10% to 30%. In addition to coast live oak trees, other common canopy species within the riparian habitat included cottonwood (*Populus fremontii*) and western sycamore (*Platanus racemosa*). Where present, the shrub understory consisted of elderberry (*Sambucus nigra*), yerba santa (*Eriodictyon crassifolium*), and California sagebrush (*Artemisia californica*). Ground cover within the oak woodlands was dominated by a mix of annual grass species including ripgut brome (*Bromus diandrus*), wild oat (*Avena fatua*), and red brome at approximately 95% to 100% absolute cover. The thick grasslands would generally occupy floodplains extending to the toe of the hillslope. The streambed in the downstream (northern) end of the MPBSA was mostly unvegetated while the upper reaches were generally composed of a mulefat thicket (*Baccharis salicifolia*) understory. In some locations within the drainage channels, rock rip-rap lined the streams' bed and banks.

2.2.3 East Orange I

The following MCVII Alliances were observed during the biological surveys conducted within the EOIBSA:

- *Artemisia californica* Shrubland Alliance – California sagebrush scrub
- *Avena fatua* Herbaceous Semi-Natural Alliance – Wild oats grasslands
- *Malosma laurina* Shrubland Alliance – Laurel sumac scrub
- *Opuntia littoralis* Shrubland Alliance – Coast prickly pear scrub
- *Quercus agrifolia* Woodland Alliance – Coast live oak woodland
- *Rhus integrifolia* Shrubland Alliance – Lemonade berry scrub
- *Salix goodingii* Woodland Alliance – Black willow thickets

Baccharis salicifolia Shrubland Alliance – Mulefat thickets were also observed, but areas occupied by this community were too small of a mapping unit to include separately in this discussion.

The EOIBSA is comprised of rugged, mountainous terrain with deep drainage features and is covered primarily by California sagebrush scrub interspersed with wild oat (*Avena fatua*) grassland. These two communities represented

almost 90% percent of the land cover throughout this BSA. Along with California sagebrush, co-dominant shrub species within the California sagebrush scrub habitat consisted of black sage (*Salvia melifera*), California buckwheat (*Eriogonum fasciculatum*), and deerweed, all growing to a height of 3 to 4 feet. On the west-facing hillslopes in the northeast portion of the BSA, Lemonade berry scrub was the dominant strata, in which a near monoculture of lemonade berry was growing to 6 to 8 inches in height.

In general, the headwaters of the drainages within the EOIBSA were occupied by Laurel sumac scrub comprised primarily of laurel sumac with codominant shrub species including toyon (*Heteromeles arbutifolia*), poison oak (*Toxicodendron diversilobum*), and elderberry. As the drainages descend from the hillsides and spread out, they become populated by canopy species like cottonwood, coast live oak, and black willow (*Salix gooddingii*) with a mulefat understory. The lowest-gradient portions of the drainages along Santiago Canyon Road are occupied by riparian forested willows (*Salix* sp.). The detention basin at the northwest corner of the EOIBSA appears to be a wetland feature and was covered primarily with English plantain (*Plantago lanceolata*).

The southern end of the EOIBSA, to the north and west of the landfill access road, was dominated (100% absolute cover) by Wild oat grassland interspersed with California sagebrush scrub. The wild oat grassland community was co-dominated by a mix of mustard (previous year's stalks) and non-native annual brome and oat grasses (*Bromus* spp. and *Avena* spp., respectively).

Disturbed areas within the EOIBSA consisted of old unpaved access roads, a former landfill parking area, and general fill areas. The unmaintained access roads and areas surrounding the existing paved roads were dominated by wild oats and mustard. There were some ornamental trees introduced on the edge of the parking area in the southern portion of the BSA such as eucalyptus (*Eucalyptus* spp.), Peruvian pepper tree (*Schinus molle*), and white silk floss tree (*Ceiba insignis*).

2.2.4 East Orange II

The following MCVII Alliances were observed during the biological surveys conducted within the EOIIBSA:

- *Adenostoma fasciculatum* Shrubland Alliance – Chamise chaparral
- *Artemisia californica* Shrubland Alliance – California sagebrush scrub
- *Avena fatua* Herbaceous Semi-Natural Alliance – Wild oats grasslands
- *Baccharis salicifolia* Shrubland Alliance – Mulefat thickets
- *Bromus diandrus* Herbaceus Semi-Natural Alliance – Annual brome grasslands
- *Quercus agrifolia* Woodland Alliance – Coast live oak woodland
- *Salix goodingii* Woodland Alliance – Black willow thickets
- *Salvia mellifera* Shrubland Alliance – Black sage scrub

The mountainous EOIIBSA is primarily vegetated by dense California sagebrush scrub and Chamise chaparral, which cover the upper hillslopes and ridges of the BSA. These communities are dominated by California sagebrush and

chamise, respectively, but were interspersed with other native shrubs, principally black sage. Also interspersed in certain locations along the upper slopes of the BSA were southern coast live oak (*Quercus agrifolia* var. *oxyandenia*). Sparsely vegetated rocky outcrops occurred along some of the upper saddles along the ridgelines, as did areas of red sand substrate forming unique microhabitats in which California fuchsia (*Epilobium canum*) was observed.

At lower elevations of the EOIIBSA, Coast live oak woodlands occur along drainage channels and are interspersed with annual grasslands throughout the adjacent upland areas. In many areas throughout these lower elevations, the Coast live oak woodland habitat surrounding the drainage channels had an understory consisting of 90% to 100% ground cover of ripgut brome. Wild oats grasslands present within the BSA were a mixture of non-native oat and brome grasses and mustard. A section of willow riparian forest occurs in a low-gradient section of one of the drainages channels within the BSA. This section, adjacent to Santiago Canyon Road, consists of both black and red willows with a mulefat understory.

Table 1 Vegetation Communities and Land Cover Types Occurring within the BSAs

	Areas within BSAs (acres)			
Vegetation Communities/Land Cover Types	**OCBSA**	**MPBSA**	**EOIBSA**	**EOIIBSA**
MCVII VEGETATION COMMUNITIES				
Annual brome grassland	-	7.388	-	-
Black sage scrub	-	-	25.697	-
Black willow thickets	-	-	0.598	-
Bush mallow scrub	-	0.501	-	-
California buckwheat scrub		-	5.091	-
California sagebrush scrub	-	-	260.614	2.628
Chamise chaparral	-	0.247	-	95.575
Coast live oak woodland	0.058	5.700	5.829	6.299
Coast prickly pear scrub	-	0.350	-	-
Lemonade berry scrub	-	-	22.643	-
Mulefat thickets	-	0.953	-	-
Poison oak scrub	-	-	6.521	-
Red brome grasslands	7.932	110.389	79.762	64.403
Red willow thickets	-	-	0.398	1.265
Upland mustards		-	29.127	-
Wild oats grasslands	-		2.398	-
OTHER LAND COVER TYPES				
Disturbed/Developed	0.740	4.957	5.080	10.613
TOTAL:	**8.730**	**130.485**	**443.759**	**180.783**

2.3 CLIMATE

The weather of inland Orange County is characteristic of the Mediterranean climate typical of southern California that is distinguished by warm, dry summers and wetter, cooler winter months with relatively low amounts of rainfall. According to the Santa Ana Fire Station weather station, the nearest active weather station to the BSAs, the annual high temperature average is 75.8ºF (degrees Fahrenheit) and the annual low temperature average is 52.0ºF. The region typically receives an average annual rainfall of 12.49 inches; with the majority of rainfall occurring November through April. This data was collected during the period of record of 1903 to 2016. (Western Regional Climate Center, 2019).

2.4 HYDROLOGY AND GEOMORPHOLOGY

The BSAs are located within the Santa Ana River Watershed (HUC 18070203). The Santa Ana River Watershed is the largest stream system in southern California, with over 50 named tributaries encompassing approximately 2,650 square miles in parts of San Bernardino, Riverside, Orange, and Los Angeles Counties. Within Orange County, this watershed covers approximately 210 square miles, making it the largest watershed in the County. The Santa Ana River begins almost 75 miles away in the San Bernardino Mountains and crosses central Orange County before emptying into the Pacific Ocean (Orange County, 2019). The San Gabriel, San Bernardino and San Jacinto Mountains encircle the arid Inland Empire lowland on the north and east. The Santa Ana Mountains and Chino Hills divide the Inland Empire from the Orange County coastal plain; the Santa Ana Canyon is the only natural break in the range between the two lowlands (USGS, 2017).

The Orange County portion of the watershed includes portions of the cities of Anaheim, Brea, Huntington Beach, Orange, Placentia, Santa Ana, Villa Park, and Yorba Linda (Orange County, 2019). Within the County, the river flows across a vast, gently sloping alluvial fan created from its own sediments and thus its drainage basin is extremely narrow because the surrounding land slopes away from the river bed. Santiago Creek is the largest subsidiary tributary to the Santa Ana River within Orange County.

2.5 GEOLOGY

The OCBSA and MPBSA are located within the City of Yorba Linda, California and the EOIBSA and EOIIBSA are located within the unincorporated area of Silverado. These areas are located within the north-central region of Orange County in the foothills of the Santa Ana Mountains. This region of Orange County is part of the Peninsular Range Natural Province of southern California, a system of northwesterly trending ridges that extend from the Transverse Ranges south into Baja California. The topography of this province is characterized by irregular coastal plain in the west, as well as prominent ridges, peaks, valleys and subdued upland areas as one moves south and east (Jahns, 1954). The general topography of the BSAs is comprised of rolling foothills intersected by ephemeral and perennial drainages, with slope between 10 and 30 degrees.

All four of the BSAs occur within the Black Star Canyon USGS 7.5-minute quadrangle. This quadrangle covers an area of about 62 square miles at the northern end of the Santa Ana Mountains. Most of the quadrangle is in Orange County except for about five square miles of unevaluated terrain in the northeastern corner that lies in Riverside County. The mapped area includes portions of the cities of Anaheim, Orange, and Yorba Linda, as well as unincorporated portions of Orange County. The Santa Ana River and Santiago Creek drain the northern and central portions of the quadrangle. These two drainage systems are separated by the eastern part of the Peralta Hills, a west-trending projection of the Santa Ana Mountains that includes the Anaheim Hills community within the City of Anaheim. Southeast of Santiago Creek is an upland area of unincorporated Orange County that includes a prominent monocline of Puente Formation, locally named Loma Ridge. Elevations in the Black Star Canyon Quadrangle range from about 380 feet at the mouth of Santa Ana Canyon, near the northwestern corner of the quadrangle, to 3,045 feet at Sierra Peak in the Santa Ana Mountains, on the county line in the northeastern portion of the quadrangle (California Department of Conservation, 2000).

The southwestern quarter of the quadrangle, where relief is moderate, consists of rolling hills underlain by Miocene sedimentary rocks. Elevations here range from 440 to 1,332 feet. The present and ancestral drainages of Santiago

Creek generally define an erosional separation between areas underlain by sedimentary rocks of contrasting ages. Resistant Mesozoic metavolcanic and metasedimentary rocks underlie the higher elevations of the Santa Ana Mountains in the eastern part of the quadrangle. The foothill section of the Santa Ana Mountains has been sculpted by erosion into a maze of canyons and tributary gullies—including Black Star Canyon, a tributary of Santiago Creek that has been referred to locally as the "Grand Canyon of the Santa Ana Mountains" (California Department of Conservation, 2000).

The Black Star Quadrangle is nearly bisected by the north-south Orange County Eastern Transportation Corridor (SR 241). The northern border of the study area is accessible from the Riverside Freeway (SR 91), which follows the southern bank of the Santa Ana River, through Santa Ana Canyon (California Department of Conservation, 2000).

Dense commercial development covers the floor of the Santa Ana River valley. Residential development in recent years has taken place mainly along the lower slopes and ridgetops in the northwestern part of the Black Star Canyon Quadrangle, west of the Eastern Transportation Corridor. Most residential development in the upland areas consists of major projects that required substantial grading and drainage modification prior to construction (California Department of Conservation, 2000).

2.6 SOILS

Prior to conducting the delineation, historic soils data from the Natural Resources Conservation Service (NRCS) was used to determine potential soil types that may occur within the BSAs and included determining where hydric soils have historically occurred (refer to Appendix A, Figure 3). Characteristics of soils present on the site are summarized in Appendix C. Tables 2a through 2d identify the soils historically known to occur within the four BSAs. Of the soils listed in Tables 2a through 2d, two appear on the NRCS hydric soils list, each of which occurs within the MPBSA and one within the EOIIBSA: Pits and Riverwash.

Table 2a Historic Soil Units Occurring within the Oak Canyon BSA

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
145	Cieneba-Rock outcrop complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7"), weathered bedrock (7-59")	2.17
175	Myford sandy loam, 9 to 15 percent slopes	A moderately well drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from mixed; very high runoff; sandy loam (0-12"), sandy clay (12-18"), sandy clay loam (18-71"), sandy loam (71-79")	2.52
192	Rock outcrop-Cieneba complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7"), weathered bedrock (7-59")	0.59
202	Soper gravelly loam, 30 to 50 percent slopes, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 2,010 feet; parent material consists of residuum weathered from sandstone; high runoff; gravelly loam (0-8"), gravelly clay loam (8-29"), bedrock (29-79")	3.45

Table 2b Historic Soil Units Occurring within the Mountain Park BSA

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
145	Cieneba-Rock outcrop complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	19.24
146	Corralitos loamy sand*	A somewhat excessively drained soil that occurs on alluvial fans at elevations between 30 to 1,000 feet; parent material consists of alluvium derived from mixed; negligible runoff; loamy sand (0-9”), stratified sand to loamy sand (9-60”)	29.03
154	C	A well-drained soil that occurs on terraces at elevations between 200 to 2,500 feet; parent material consists of sandy alluvium; not prone to flooding; gravelly clay loam (0-10”), gravelly clay, cobbly clay, stratified very cobbly sand to very gravelly sand (10-38”)	0.76
185	Pits*	Parent material consists of igneous, metamorphic and sedimentary rock; extremely gravelly coarse sand (0-6”), extremely gravelly sand, extremely gravelly coarse sand, very gravelly coarse sand (6-60”)	0.52
191	Riverwash*	Occurs on fans; parent material consists of sandy and gravelly alluvium; negligible runoff; gravelly sand (0-6”), stratified gravelly coarse sand to sandy loam (6-60”)	10.38
192	Rock outcrop-Cieneba complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	10.11
193	San Andreas sandy loam, 15 to 30 percent slopes, warm MAAT, MLRA 20	A well-drained soil that occurs on hillslopes and mountain slopes at elevations between 40 to 1,810 feet; parent material consists of residuum weathered from sandstone; high runoff; sandy loam (0-31”), bedrock (31-39”)	9.53
197	Soboba gravelly loamy sand, 0 to 5 percent slopes.....	An excessively drained soil that occurs on alluvial fans at elevations between 30 to 4,200 feet; parent material consists of sandy and gravelly alluvium derived from mixed; not prone to flooding; gravelly loamy sand (0-10”), very gravelly sand (10-60”)	6.63
200	Soper loam, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; loam (0-9”), gravelly clay loam (9-30”), weathered bedrock (30-59”)	21.71
202	Soper gravelly loam, 30 to 50 percent slopes, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 2,010 feet; parent material consists of residuum weathered from sandstone; high runoff; gravelly loam (0-8”), gravelly clay loam (8-29”), bedrock (29-79”)	1.65
226	Yorba cobbly sandy loam, 30 to 50 percent slopes	A well-drained soil that occurs on terraces at elevations between 100 to 2,500 feet; parent material consists of sandy and gravelly alluvium derived from mixed; very high runoff; very cobbly sandy loam (0-11”), very gravelly sandy clay loam (11-40”), very gravelly sandy loam (40-63”)	20.93

* Indicates a NRCS-listed hydric soil



Table 2c Historic Soil Units Occurring within the East Orange I BSA

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
100	Alo clay, 9 to 15 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 0 to 1,460 feet; parent material consists of calcareous residuum weathered from sandstone and shale; very high runoff; clay (0-25”), bedrock (25-59”)	0.24
101	Alo clay, 15 to 30 percent slopes	A well-drained soil that occurs oh hills at elevations between 200 to 3,250 feet; parent material consists of residuum weathered from sedimentary rocky; very high runoff; clay (0-22”), weathered bedrock (22-59”)	5.53
102	Alo clay 30 to 50 percent slopes, warm MAAT, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 1,890 feet; parent material consists of residuum weathered from sandstone and shale; high runoff; clay (0-22”), bedrock (22-79”)	4.20
103	Alo variant clay, 9 to 15 percent slopes	A well-drained soil that occurs on hills at elevations between 200 to 700 feet; parent material consists of residuum weathered from sedimentary rock; runoff not classified; clay (0-40”), weathered bedrock (40-59”)	5.53
104	Alo variant clay, 15 to 30 percent slopes	A well-drained soil that occurs on hills at elevations between 200 to 700 feet; parent material consists of residuum weathered from sedimentary rock; runoff not classified; clay (0-38”), weathered bedrock (38-59”)	52.21
105	Alo variant clay, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 200 to 700 feet; parent material consists of residuum weathered sedimentary rock; runoff not classified; clay (0-38”), weathered bedrock (38-59”)	13.55
108	Anaheim clay loam, 15 to 30 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of fine-grained residuum weathered from sandstone and shale; runoff not classified; clay loam (0-26”), weathered bedrock (26-59”)	2.59
109	Anaheim clay loam, 30 to 50 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 20 to 2,710 feet; parent material consists of fine-grained residuum weathered from sandstone and shale; very high runoff; clay loam (0-26”), bedrock (26-59”)	3.60
111	Balcom clay loam, 9 to 15 percent slopes	A well-drained soil that occurs on hills at non-classified elevations; parent material consists of calcareous residuum weathered from sandstone and shale; runoff not classified; clay loam (0-34”), weathered bedrock (34-59”)	11.03
114	Balcom-Rock outcrop complex, 15 to 50 percent slopes	A well-drained soil that occurs on hillsat elevations between 650 to 4,000 feet; parent material consists of calcareous residuum weathered from sandstone and shale; not prone to flooding; clay loam (0-27”), weathered bedrock (27-59”)	0.42
126	Bosanko clay, 9 to 15 percent slopes	A well-drained soil that occurs on hills at elevations between 300 to 2,500 feet; parent material consists of residuum weathered from granite; runoff not classified; clay (0-25”), clay, clay loam, silty clay (25-37”), weathered bedrock (25-37”)	9.17
130	Bosanko-Balcom complex, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 300 to 2,500 feet; parent material consists of residuum weathered from granite; not prone to flooding; clay (0-15”), clay, clay loam, silty clay (15-37”), weathered bedrock (15-27”)	0.58
134	Calleguas clay loam, 50 to 75 percent slopes, eroded	A well-drained soil that occurs on hillslopes at elevations between 0 to 2,930 feet; parent material consists of residuum weathered from calcareous shale; very high runoff; clay loam (0-11”), very channery clay loam (11-15”), bedrock (15-42”)	83.10

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
141	Cieneba sandy loam, 15 to 30 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; runoff not classified; sandy loam (0-17”), weathered bedrock (17-59”)	14.59
142	Cieneba sandy loam, 30 to 75 percent slopes, eroded	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	7.61
173	Myford sandy loam, 2 to 9 percent slopes	A moderately well drained soil that occurs on terraces at elevations between 0 to 1,560 feet; parent material consists of alluvium derived from sandstone; high runoff; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	0.49
175	Myford sandy loam, 9 to 15 percent slopes	A moderately well drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from mixed; very high runoff; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	7.86
177	Myford sandy loam, 9 to 30 percent slopes, eroded	A moderately well drained soil that occurs on terraces at elevations between 0 to 2,100 feet; parent material consists of alluvium derived from sandstone; high runoff; sandy loam (0-7”), sandy clay (7-11”), sandy clay loam (11-64”), sandy loam (64-79”)	31.72
192	Rock outcrop-Cieneba complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	11.86
199	Soper loam, 15 to 30 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; loam (0-9”), clay loam (9-30”), weathered bedrock (30-59”)	2.43
200	Soper loam, 30 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; loam (0-9”), gravelly clay loam (9-30”), weathered bedrock (30-59”)	38.73
202	Soper gravelly loam, 30 to 50 percent slopes, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 2,010 feet; parent material consists of residuum weathered from sandstone; high runoff; gravelly loam (0-8”), gravelly clay loam (8-29”), bedrock (29-79”)	26.51
203	Soper cobbly loam, 15 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2,500 feet; parent material consists of residuum weathered from sandstone; runoff not classified; cobbly loam (0-9”), cobbly clay loam, cobbly sandy clay loam, cobbly loam (9-30”), weathered bedrock (9-30”)	41.84
204	Soper-Rock outcrop complex, 30 to 75 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 4,000 feet; parent material consists of residuum weathered from sandstone; runoff not classified; gravelly loam (0-4”), gravelly clay loam, gravelly sandy clay loam, gravelly loam (4-20”), weathered bedrock (4-20”)	7.64
207	Sorrento loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	A well-drained soil that occurs on alluvial fans at elevations between 0 to 1,340 feet; parent material consists of alluvium derived from sedimentary rock; medium runoff; loam (0-12”), silty clay loam (12-62”), sandy loam (62-72”)	60.75

Table 2d Historic Soil Units Occurring in the East Orange II BSA

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
100	Alo clay, 9 to 15 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 0 to 1,460 feet; parent material consists of calcareous residuum weathered from sandstone and shale; very high runoff; clay (0-25”), bedrock (25-59”)	6.86
101	Alo clay 15 to 30 percent slopes	A well-drained soil that occurs oh hills at elevations between 200 to 3,250 feet; parent material consists of residuum weathered from sedimentary rocky; very high runoff; clay (0-22”), weathered bedrock (22-59”)	9.66
102	Alo clay, 30 to 50 percent slopes, warm MAAT, MLRA	A well-drained soil that occurs on hills at elevations between 10 to 1,890 feet; parent material consists of residuum weathered from sandstone and shale; high runoff; clay (0-22”), bedrock (22-79”)	0.70
107	Anaheim clay loam, 30 to 50 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 20 to 2,710 feet; parent material consists of fine grained residuum weathered from sandstone and shale; very high runoff; clay loam (0-26”), bedrock (26-59”)	3.29
110	Anaheim clay loam, 50 to 75 percent slopes	A well-drained soil that occurs on hills at elevations between 10 to 2,500 feet; parent material consists of fine grained residuum weathered from sandstone and shale; not prone to flooding; clay loam (0-21”), weathered bedrock (21-59”)	4.25
112	Balcom clay loam, 15 to 30 percent slopes	A well-drained soil that occurs on hillslopes at elevations between 10 to 1,620 feet; parent material consists of calcareous residuum weathered from sandstone and shale; high runoff; clay loam (0-34”), bedrock (34-44”)	3.28
114	Balcom-Rock outcrop complex, 15 to 50 percent slopes	A well-drained soil that occurs on hillsat elevations between 650 to 4,000 feet; parent material consists of calcareous residuum weathered from sandstone and shale; not prone to flooding; clay loam (0-27”), weathered bedrock (27-59”)	8.94
132	Botella clay loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	A well-drained soil that occurs on alluvial fans at elevations between 80 to 1,450 feet; parent material consists of alluvium derived from sedimentary rock; medium runoff; clay loam (0-8”), silty clay loam (8-35”), clay loam (35-66”)	3.43
135	Capistrano sandy loam, 2 to 9 percent slopes	A well-drained soil that occurs on alluvial fans at elevations between 0 to 2,500 feet; parent material consists of alluvium derived from granite; not prone to flooding; sandy loam (0-27”), fine sandy loam (27-65”)	1.01
141	Cieneba sandy loam, 15 to 30 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; runoff not classified; sandy loam (0-17”), weathered bedrock (17-59”)	24.56
142	Cieneba sandy loam, 30 to 75 percent slopes, eroded	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	35.19
173	Myford sandy loam, 2 to 9 percent slopes	A moderately well-drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from sandstone; not prone to flooding; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	1.37

Map Unit Symbol	Map Unit Name	Description	Acres Within BSA
175	Myford sandy loam, 9 to 15 percent slopes	A moderately well drained soil that occurs on terraces at an approximate elevation of 1,500 feet; parent material consists of alluvium derived from mixed; very high runoff; sandy loam (0-12”), sandy clay (12-18”), sandy clay loam (18-71”), sandy loam (71-79”)	15.15
191	Riverwash*	Occurs on fans; parent material consists of sandy and gravelly alluvium; negligible runoff; gravelly sand (0-6”), stratified gravelly coarse sand to sandy loam (6-60”)	5.76
192	Rock outcrop-Cieneba complex, 30 to 75 percent slopes	A somewhat excessively drained soil that occurs on hills at elevations between 500 to 4,000 feet; parent material consists of residuum weathered from granite; medium runoff; sandy loam (0-7”), weathered bedrock (7-59”)	4.09
193	193—San Andreas sandy loam, 15 to 30 percent slopes, warm MAAT, MLRA 20	A well-drained soil that occurs on hill slopes and mountain slopes at elevations between 40 to 1,810 feet; parent material consists of residuum weathered from sandstone; not prone to flooding; sandy loam (0-31”), bedrock (31-39”)	19.30
202	Soper gravelly loam, 30 to 50 percent slopes, MLRA 20	A well-drained soil that occurs on hills at elevations between 10 to 2,010 feet; parent material consists of residuum weathered from sandstone; not prone to flooding; gravelly loam (0-8”), gravelly clay loam (8-29”), bedrock (8-29”)	12.36
203	Soper cobbly loam, 15 to 50 percent slopes	A well-drained soil that occurs on hills at elevations between 100 to 2500 feet; parent material consists of residuum weathered from sandstone; not prone to flooding; cobly loam (0-9”), cobbly clay loam, cobbly sandy clay loam, cobbly loam, weathered bedrock (9-30”)	16.87
207	Sorrento loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	A well-drained soil that occurs on alluvial fans at elevations between 0 to 1,340 feet; parent material consists of alluvium derived from sedimentary rock; not prone to flooding; loam (0-12”), silty clay loam (12-62”)	4.74

* Indicates a NRCS-listed hydric soil

3.0 REGULATORY BACKGROUND

The USACE Regulatory Program regulates activities pursuant to Section 404 of the federal Clean Water Act (CWA); the CDFW regulates activities under California Fish and Game Code Sections 1600-1607; and the RWQCB regulates activities under Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act. Refer to Appendix D for additional details on regulatory authorities and background.

4.0 WATERS/WETLANDS DELINEATION

4.1 DELINEATION METHODOLOGY

This section describes the methods employed by Stantec during the survey conducted on May 15-17 and June 27, 2018, to determine the extent of potentially jurisdictional wetlands and/or waters that occur within the four BSAs. Prior to conducting the field assessment, Stantec reviewed current and historic aerial photographs, detailed topographic maps, and soil maps of the BSA (USDA, 2018), the National Wetlands Inventory (USFWS, 2018), and local and state hydric soil lists (NRCS, 2018a and 2018b) to evaluate the potential active channels and wetland features that may



occur within each BSA. During the field assessment, hydrophytic vegetation and hydrologic features were mapped over recent aerial photograph base maps using the Esri® Collector for ArcGIS app on an Apple® iPad® coupled with a Bad Elf® GNSS Surveyor sub-meter external global positioning system (GPS) unit (refer to Appendix A, Figure 4). Mapping was further refined in the office using ArcGIS (version 10.4) with aerial photograph base maps with an accuracy of one foot, and the total jurisdictional area for each regulatory jurisdiction was calculated. Field Data Sheets collected during the survey are included as Appendix E.

Federal Wetlands/Waters

Jurisdictional non-wetland "waters of the U.S." were delineated based on the limits of the ordinary high water mark (OHWM) as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetative characteristics. Where present, jurisdictional wetlands are delineated using a routine determination in accordance with the methods outlined in the USACE Wetland Delineation Manual (Environmental Laboratory, 1987) and the Arid West Supplement (Environmental Laboratory, 2011). The determination of whether an area may be considered a federally-jurisdictional wetland is based on the presence of three parameters: dominant hydrophytic vegetation, wetland hydrology, and hydric soils. Refer to Appendix F, Tables 1 and 2 (Potential Geomorphic and Vegetative Indicators of Ordinary High Water Marks for the Arid West) for a list of key physical features used in determining the OHWM.

CDFW Jurisdictional Waters

CDFW jurisdiction was delineated to the top of the banks of the channel and/or to the edge of contiguous riparian canopy/riparian habitat. Within portions of the each BSA, the CDFW jurisdictional boundary mirrors the OHWM; however, for the most part the tops of the banks extend beyond the OHWM. Therefore, the total acreage of CDFW jurisdictional waters within each BSA is greater than the acreage of federal jurisdictional waters.

4.1.1.1 Wetland Vegetation

Vegetation percent cover was visually estimated for plant species in each of the four strata (tree, sapling/shrub, herb, and woody vine), and species in each stratum were ranked based on canopy dominance (USACE, 2016). Species with a total percent cover of at least 50 percent and species with 20 percent coverage within each stratum were recorded on the Field Data Sheets (50/20 Rule). Wetland indicator status was assigned to each dominant species using the USACE Arid West Regional Wetland Plant List (2016); the California subregion of the National List of Vascular Plant Species that Occur in Wetlands: 1996 National Summary (USFWS, 1997); and Wetland Plants of Specialized Habitats in the Arid West (USACE 2007). If greater than 50 percent of the dominant species from all strata were Obligate, Facultative-Wetland, or Facultative species, the criteria for wetland vegetation was considered met (refer to Appendix E, Table 3).

4.1.1.2 Wetland Hydrology

The presence of wetland hydrology was evaluated by recording the extent of observed primary and secondary indicators, as listed in Appendix F, Tables 4 and 5 (Environmental Laboratory, 2011). Wetland hydrology indicators are divided into two categories (primary and secondary indicators) and the presence of one primary indicator from any of the groups is considered evidence of wetland hydrology. If only secondary indicators are present, two or more must be observed to conclude the presence of wetland hydrology. Indicators are intended to be one-time observations of site

conditions representing evidence of wetland hydrology when hydrophytic vegetation and hydric soils are present (Environmental Laboratory, 2011).

4.1.1.3 Wetland Soils

Soils data from the NRCS was referenced to determine if hydric soils have been previously documented and/or historically occurred in or near the BSAs. Based on this review, hydric soils were had only been previously mapped within the MP and EOII BSAs. Conditions indicative of hydric soils were not observed in potential jurisdictional areas within the MPBSA but were within the EOI and EOII BSAs. A total of six soil test pits (WAS01 through WAS06) were excavated in distinct locations within these two BSAs to investigate these areas: five in the EOIBSA and one in the EOIIBSA. The locations of each soil test pit attempted are depicted in Appendix A, Figure 4. Routine small area delineations, the type of delineation chosen for these sites based on USACE guidance, recommend that a soil test pit be excavated within each distinct habitat type in the area to be surveyed (not applicable for upland portions of the BSAs). Appendix F, Tables 6 and 7, includes a complete list of hydric soils indicators.

4.2 RESULTS

Plants observed within the four BSAs are listed in Appendix G, along with their wetland indicator status.

The National Wetlands Inventory has mapped the following types of riparian and wetland habitats within the BSAs (data is dated March 2006):

- OCBSA – no riverine/wetland habitats mapped
- MPBSA – R4SBA (Riverine, Intermittent, Streambed, Temporary Flooded), and PSSA (Palustrine, Scrub-Shrub, Temporary Flooded)
- EOIBSA – R4SBA (Riverine, Intermittent, Streambed, Temporary Flooded), R4SBAr (Riverine, Intermittent, Streambed, Temporary Flooded, Artificial Substrate), R4SBC (Riverine, Intermittent, Streambed, Seasonally Flooded), PSSA (Palustrine, Scrub-Shrub, Temporary Flooded), PSSAx (Palustrine, Scrub-Shrub, Temporary Flooded, Excavated), PSSAh (Palustrine, Scrub-Shrub, Temporary Flooded, Diked/Impounded), PEM1A (Emergent, Persistent, Temporary Flooded), and PEM1Ah (Emergent, Persistent, Temporary Flooded, Diked/Impounded)
- EOIIBSA - R4SBA (Riverine, Intermittent, Streambed, Temporary Flooded), PFOA (Palustrine, Forested, Temporary Flooded), PFOC (Palustrine, Forested, Seasonally Flooded), PFO/SSA (Palustrine, Forested/Sub Shrub, Temporary Flooded), and PSSA (Palustrine, Scrub-Shrub, Temporary Flooded)

Based on the data collected in the field, three types of jurisdictional features occur within the BSAs (Table 3 below and Appendix A, Figure 4). These include USACE/RWQCB wetland waters of the U.S., USACE/RWQCB non-wetland waters of the U.S., and CDFW jurisdictional waters.

Of the six soil test pits dug, Sampling Points WAS01 and WAS04 (EOIBSA) confirmed the presence of locally hydric soils. Vegetation occurring at Sampling Points WAS01 and WAS04 (EOIBSA) satisfied the 50/20 rule required to meet the hydrophytic vegetation threshold. A minimum of one primary or two secondary wetland hydrology indicators were



observed at both WAS01 and WAS04. Therefore, conditions at these two locations met at least two of the three wetland criteria and were determined to constitute wetland waters of the U.S.

The impact acreages presented below in Table 3 were calculated based on preliminary Project design.

Table 3 Acreage of Potential Jurisdictional Waters and Wetlands within the BSAs and Summary of Project Impacts

BSA	Wetland Waters of the U.S. (acres)		Non-Wetland Waters of the U.S. (acres)		CDFW Jurisdictional Waters (acres)	
	Survey Area	Project Impact Areas	Survey Area	Project Impact Areas	Survey Area	Project Impact Areas
Oak Canyon	0	0	0	0	0	**0**
Mountain Park	0	0	1.003	0.007	3.369	0.011
East Orange I	0.179	0	2.937	0.004	10.521	0.008
East Orange II	0	0	0.233	0.001	0.621	0.005
Totals	**0.179**	**0**	**4.173**	**0.012**	**14.511**	**0.024**

Federal Wetlands

Hydrophytic vegetation was present at several of the soil test pits and included species with a status of OBL, FACW, or FAC; refer to Appendix G for a complete list of all plant species observed and their indicator status. Hydrologic indicators observed during the delineation within the BSAs included the following: Saturation (A3), Sediment Deposits (B2) (Nonriverine), Drift Deposits (B3) (Nonriverine), Surface Soil Cracks (B6), Water-Stained Leaves (B9), Oxidized Rhizospheres along Living Roots (C3), Sediment Deposits (B2) (Riverine), Drift Deposits (B3) (Riverine), Drainage Patterns (B10), Saturation Visible on Aerial Imagery (C9), and FAC-Neutral Test (D5) – refer to Appendix E for detailed information on these and other indicators.

Based on Stantec's professional opinion following an assessment of hydrology, vegetation, and soils (Environmental Laboratory, 1987 and 2011), approximately 0.179 acres of potentially jurisdictional federal wetlands occur within the BSAs. None of the wetland areas are expected to be impacted by the Project.

Federal Non-Wetlands Waters

Based on Stantec's professional opinion following an assessment of hydrology, soil characteristics, vegetation, and the limits of the OHWM, an approximate total of 4.173 acres of potentially jurisdictional non-wetland waters of the U.S. are estimated to occur within the BSAs. Proposed impacts to potentially jurisdictional non-wetland waters of the U.S. are as follows:

- Oak Canyon: No impact
- Mountain Park: 0.007 acres of impact

- East Orange I: 0.004 acres of impact
- East Orange II: 0.001 acres of impact

CDFW Jurisdictional Waters

Based on Stantec's professional opinion following an assessment of hydrology and the presence of bed and bank, there is a total of approximately 14.511 acres of CDFW Jurisdictional Waters present within the BSAs. Proposed impacts to CDFW jurisdictional waters are as follows:

- Oak Canyon: No impact
- Mountain Park: 0.011 acres of impact
- East Orange I: 0.008 acres of impact
- East Orange II: 0.005 acres of impact

5.0 SUMMARY AND CONCLUSIONS

The four BSAs support USACE/RWQCB wetland and non-wetland waters of the U.S. and CDFW jurisdictional waters. Surface water was not present within any drainage during the survey event; however, based on Stantec's professional opinion following an assessment of hydrology, soil characteristics, vegetation, and the limits of the OHWM, there are approximately 0.179 acres of wetland waters of the U.S. and 4.173 acres of non-wetland waters of the U.S., in total, present within the BSAs.

As identified in Table 3 above, no potentially jurisdictional wetland waters of the U.S would be impacted by the Project.

Approximately 0.012 acres of potentially jurisdictional non-wetland waters of the U.S. would be impacted by the Project; of these, approximately 0.007 acres occur within the MPBSA, 0.004 within the EOIBSA and 0.001 within the EOIIBSA.

Following an assessment of hydrology and the presence of bed and bank, it was estimated that there is a total of 14.511 acres of CDFW jurisdictional waters is present within the BSAs. Approximately 0.023 acres of CDFW jurisdictional waters would be impacted by the Project; of these, approximately 0.011 acres occur within the MPBSA, approximately 0.008 occur within the EOIBSA, and approximately 0.004 occur within the EOIIBSA.

Project-related impacts to jurisdictional areas will require the Project proponent to procure regulatory permits from the USACE, CDFW, and RWQCB. These include a Clean Water Act Section 401 and 404 and CDFW Lake and Streambed Alteration Agreement permits.

The conclusions presented above represent Stantec's professional opinion based on our knowledge and experience with the applicable regulatory agencies, including their technical guidance documents and manuals. However, the USACE, CDFW, and RWQCB have final authority in determining the status and presence of jurisdictional wetlands/waters and the extent of their boundaries.

6.0 REFERENCES

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, D.H. Wilken (eds.) 2012. The Jepson Manual: Vascular Plants of California, 2nd ed. University Press, Berkeley, California.

California Department of Conservation, Divisions of Mines and Geology. 2000. Seismic Hazard Zone Report for the Black Star Canyon 7.5-Minute Quadrangle, Orange County, California.

Environmental Laboratory. 2011. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Vickburg, MS: U.S. Army Engineer Research and Development Center. <http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/trel08-28.pdf>.

_____. 1987. Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1). Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Jahns, R. H. 1954. Geology of Southern California. Geologic Guide No. 5. Northern Part of the Peninsular Range Province. California Department of Natural Resources, Division of Mines, Bulletin 170, Guide No. 5.

NRCS. 2018a. National Hydric Soil List by State. Accessed online. Accessed October 2018.

_____. 2018b. Official Soil Series Descriptions. Accessed online. Accessed October 2018.

Orange County. 2019. Santa Ana River Watershed. Orange County Public Works, OC Watersheds. Accessed online at: http://www.ocwatersheds.com/programs/ourws/snariver. Accessed on March 17, 2019.

Sawyer, J.O., T. Keeler-Wolf and J.M. Evens. 2009. Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, California.

USACE (U.S. Army Corps of Engineers). 2016. Arid West 2016 Reginal Wetland Plant List. ed. R. W. Lichvar. ERDC/CRREL TR-12-11. Hanover, NH: Cold Regions Research and Engineering Laboratory.

_____. 2007a (January 31). *Memorandum: Interim Guidance for Amendments to the National Historic Preservation Act and the Advisory Council on Historic Preservation (ACHP) Implementing Regulations.* Washington, D.C.: USACE.

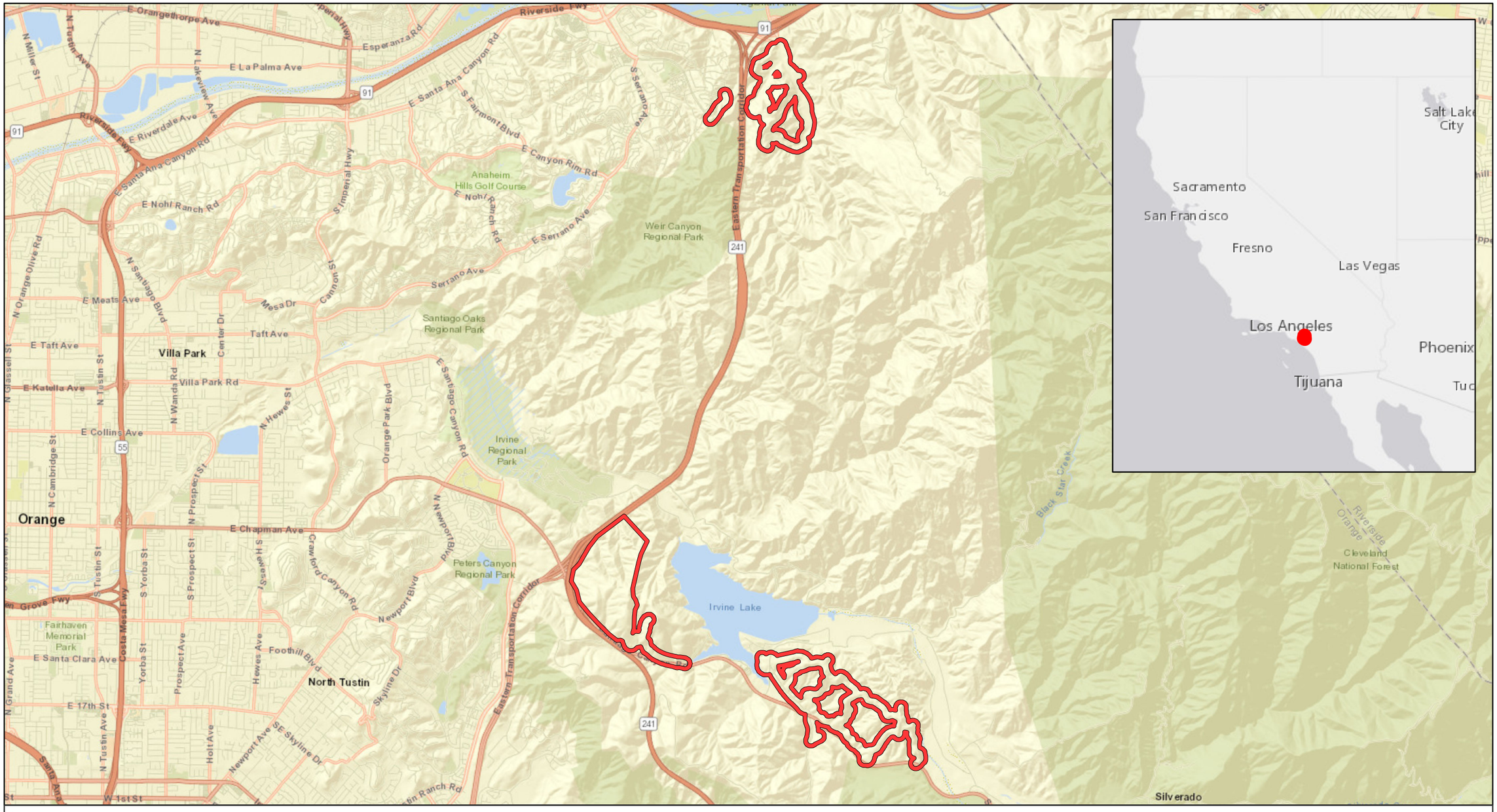
USDA (U.S. Department of Agriculture). 2018. Web Soil Survey. Natural Resources Conservation Service. http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

USFWS (U.S. Fish and Wildlife Service). 2018. Wetland Mapper. National Wetlands Inventory. Washington, D.C.: USFWS. https://www.fws.gov/wetlands/data/mapper.html.

United States Geological Survey (USGS). 2017. Santa Ana Basin. National Water Quality Assessment Program. United States Department of the Interior, USGS. Accessed online at: http://ca.water.usgs.gov /sana_nawqa/index.html. Accessed on March 17, 2019.

Western Regional Climate Center. 2019. http://www.wrcc.dri.edu. Accessed March 17, 2019.

Appendix A FIGURES


Project Site
N
0
2,800
5,600
Feet
1:17,307,056 (At original document size of 8.5x11)
Notes
1. WGS 1984 Web Mercator Auxiliary Sphere
2. Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Stantec
Project Location
Santiago Canyon/Anaheim, CA
Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27
Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report
Figure No.
1
Title
Project Location
Orange
Villa Park
North Tustin
Silverado
Irvine Lake
Anaheim Hills Golf Course
Weir Canyon Regional Park
Santiago Oaks Regional Park
Irvine Regional Park
Peters Canyon Regional Park
Cleveland National Forest
Fairhaven Memorial Park
Eastern Transportation Corridor
Riverside Fwy
Salt Lake City
Sacramento
San Francisco
Fresno
Las Vegas
Los Angeles
Phoenix
Tijuana



Jurisdictional Delineation Survey Area

N

0 2,800 5,600 Feet

1:66,665 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

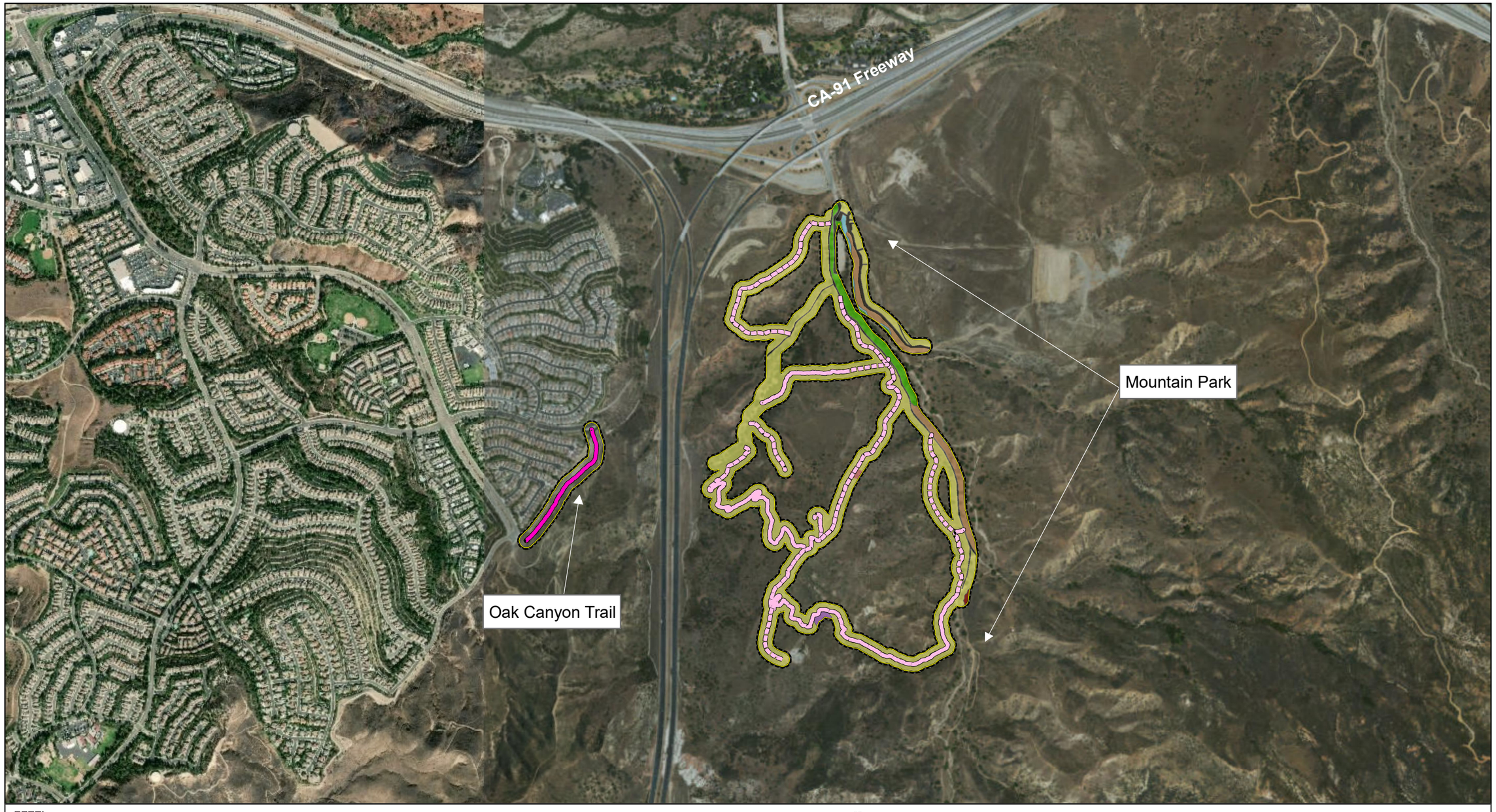
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2

Title

Vegetation Communities and Land Cover Types - Project Overview



- Mountain Park Trail
- Oak Canyon Trail
- Jurisdictional Delineation Survey Area
- Adenostoma fasciculatum Shrubland Alliance--Chamise chaparral
- Baccharis salicifolia Shrubland Alliance--Mulefat thickets
- Bromus diandrus Herbaceus Semi-Natural Alliance-- Annual brome grassland
- Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands
- Disturbed/Developed
- Malacothamnus fasciculatus Shrubland Alliance – Bush mallow scrub
- Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub
- Quercus agrifolia Woodland Alliance-- Coast live oak woodland

N

0 640 1,280 Feet

1:15,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2a

Title

Jurisdictional Waters - Oak Canyon Trail and Mountain Park Overview

East Orange I

East Orange II

East Orange I - Primary Trail
East Orange I - Secondary Trail
East Orange II Trail
Jurisdictional Delineation Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Avena (barbata, fatua) Herbaceous Semi-Natural Alliance -- Wild oats grasslands
Brassica nigra and other mustards Herbaceous Semi-Natural Alliance -- Upland mustards
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub
Quercus agrifolia Woodland Alliance -- Coast live oak woodland
Rhus integrifolia Shrubland Alliance – Lemonade berry scrub
Salix gooddingii Woodland Alliance - Black willow thickets
Salix laevigata Woodland Alliance – Red willow thickets
Salvia mellifera Alliance
Toxicodendron diversilobum Shrubland Alliance -- Poison oak scrub

N

0 1,000 2,000 Feet

1:24,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

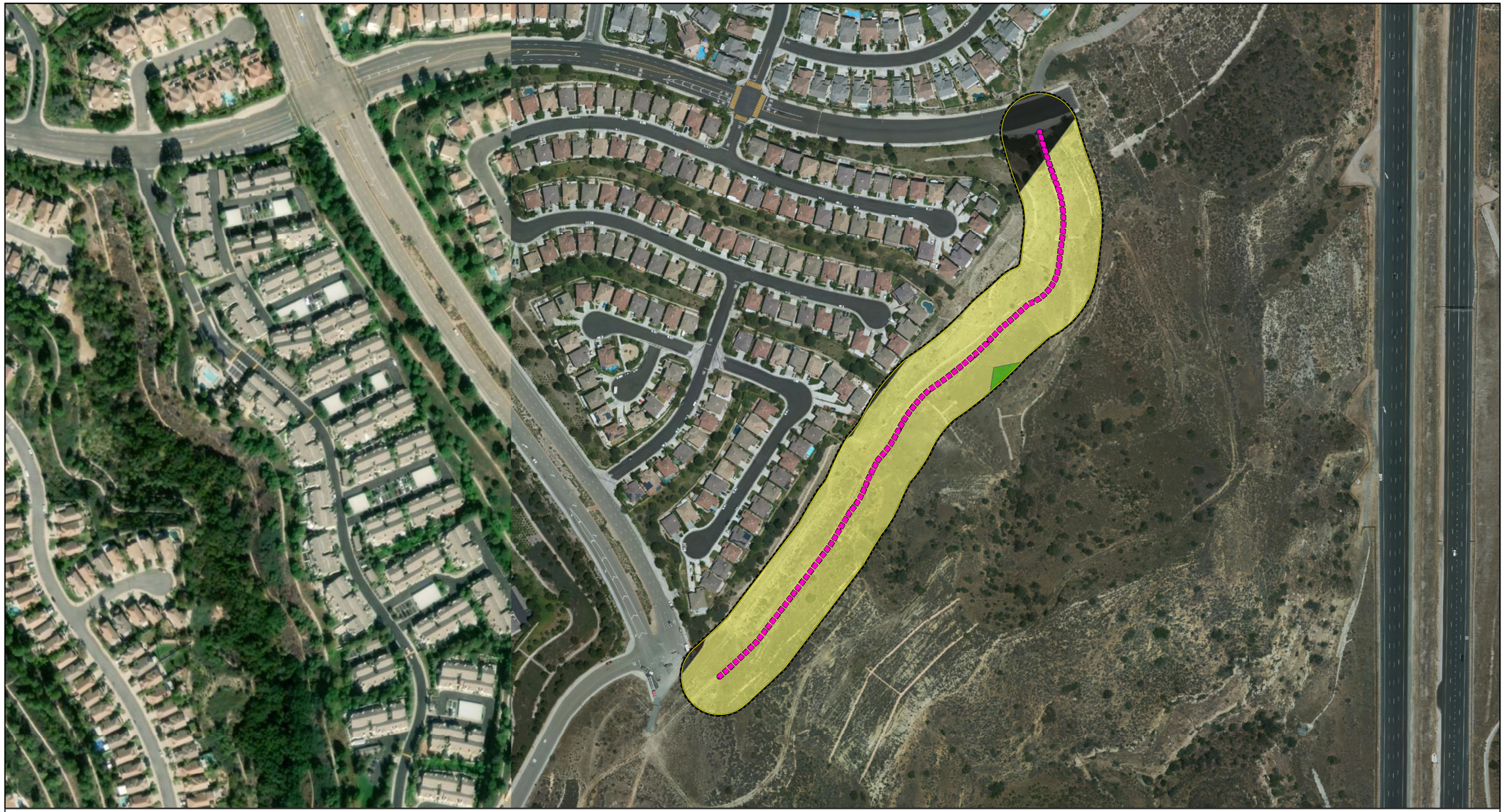
Project Location
Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.
2b

Title
Vegetation Communities and Land Cover Types - East Orange I and II Overview



Oak Canyon Trail

Jurisdictional Delineation Survey Area

Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands

Disturbed/Developed

Quercus agrifolia Woodland Alliance-- Coast live oak woodland

N

0 130 260 Feet

1:3,075 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

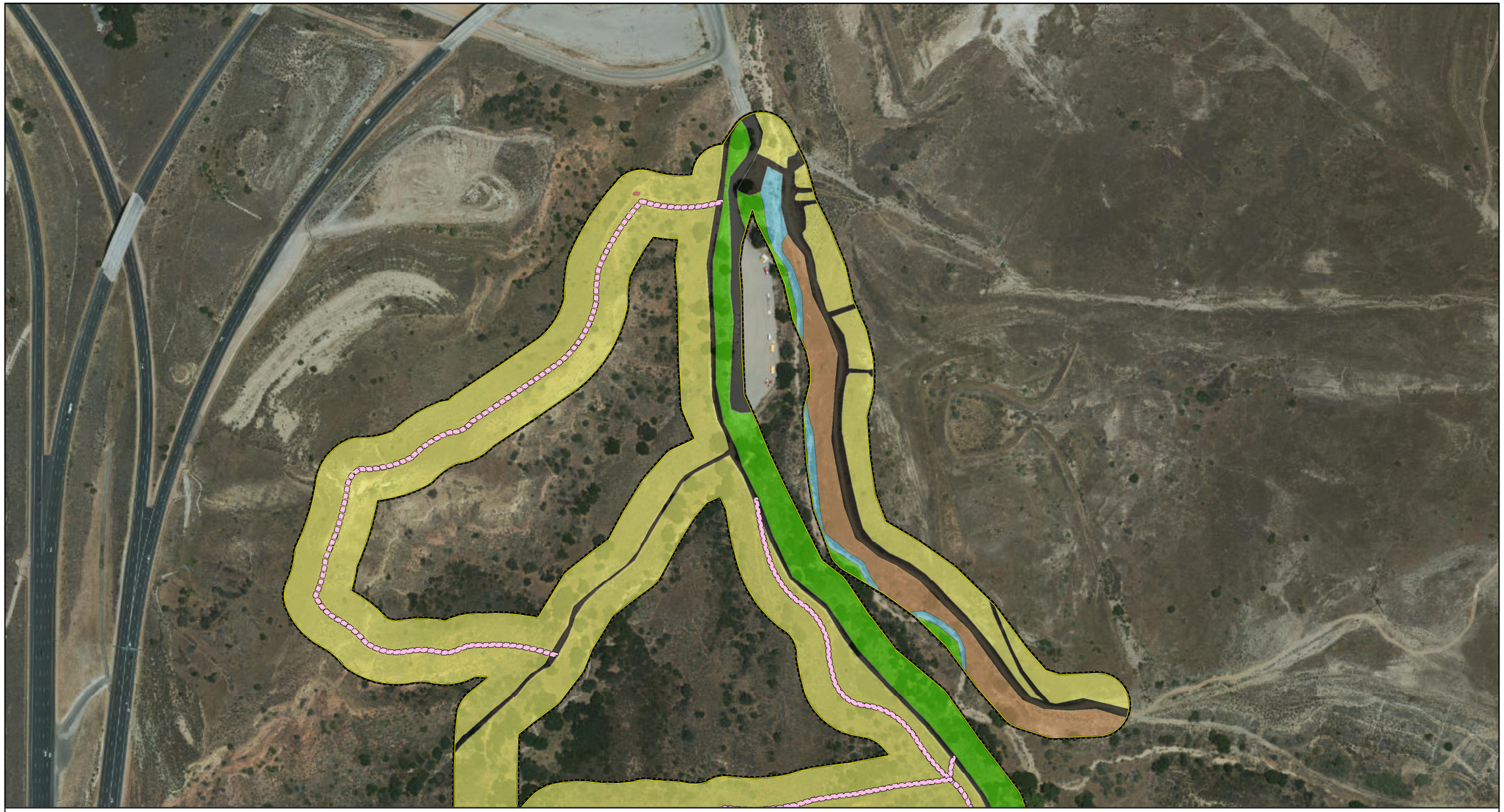
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2c

Title

Vegetation Communities and Land Cover Types - Oak Canyon Trail



- Mountain Park Trail
- Jurisdictional Delineation Survey Area
- Baccharis salicifolia Shrubland Alliance--Mulefat thickets
- Bromus diandrus Herbaceous Semi-Natural Alliance-- Annual brome grassland
- Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands
- Disturbed/Developed
- Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub
- Quercus agrifolia Woodland Alliance-- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2d

Title

Vegetation Communities and Land Cover Types - Mountain Park



- Mountain Park Trail
- Jurisdictional Delineation Survey Area
- Baccharis salicifolia Shrubland Alliance--Mulefat thickets
- Bromus diandrus Herbaceus Semi-Natural Alliance-- Annual brome grassland
- Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands
- Disturbed/Developed
- Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub
- Quercus agrifolia Woodland Alliance-- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

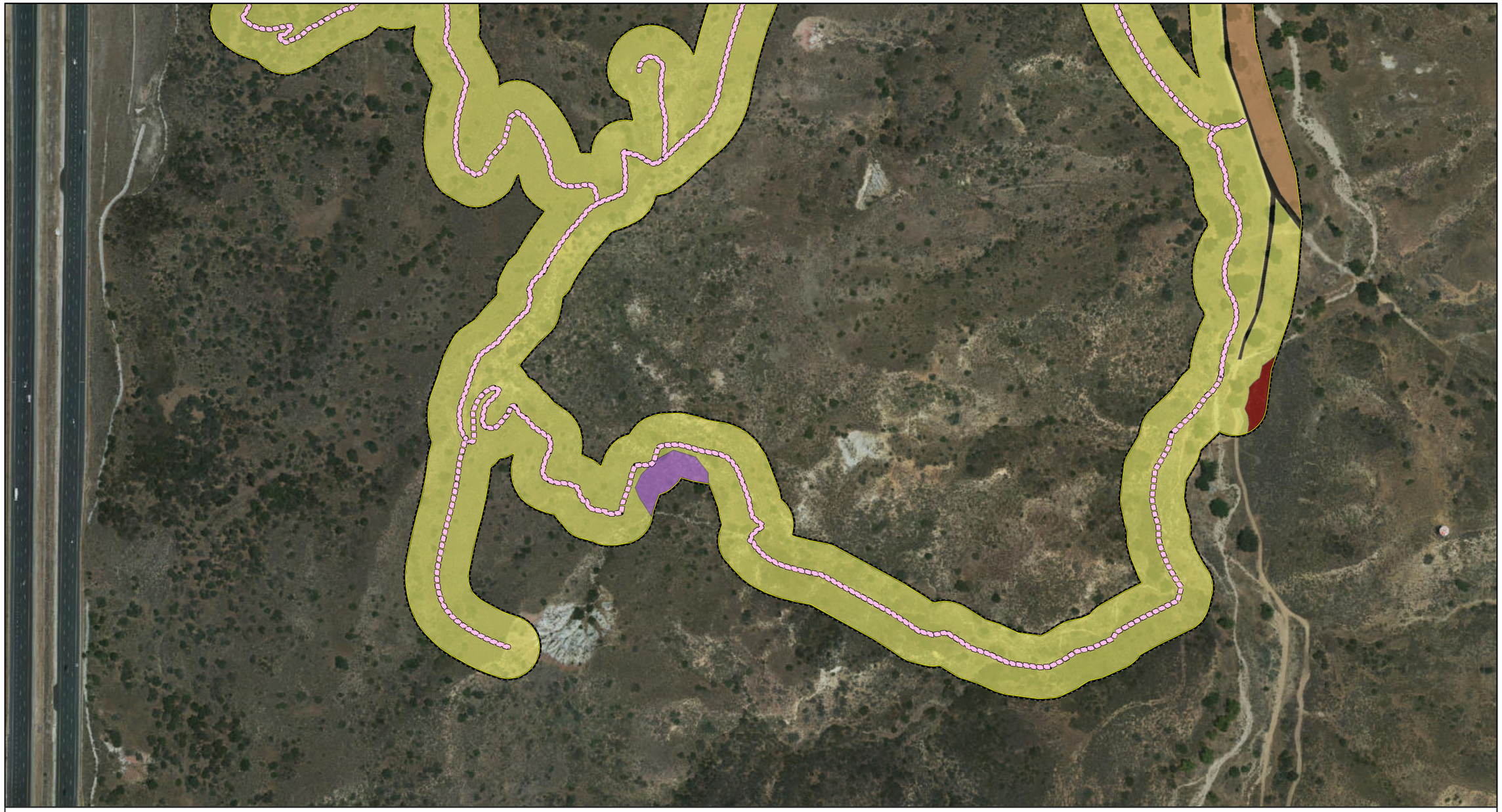
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2e

Title

Vegetation Communities and Land Cover Types - Mountain Park



- Mountain Park Trail
- Jurisdictional Delineation Survey Area
- Adenostoma fasciculatum Shrubland Alliance--Chamise chaparral
- Bromus diandrus Herbaceus Semi-Natural Alliance-- Annual brome grassland
- Bromus rubens Herbaceous Semi-Natural Alliance--Red brome grasslands
- Disturbed/Developed
- Malacothamnus fasciculatus Shrubland Alliance – Bush mallow scrub
- Opuntia littoralis Shrubland Alliance--Coast prickly pear scrub

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2f

Title

Vegetation Communities and Land Cover Types - Mountain Park



East Orange I - Primary Trail
East Orange I - Secondary Trail
Jurisdictional Delineation Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Quercus agrifolia Woodland Alliance -- Coast live oak woodland
Rhus integrifolia Shrubland Alliance – Lemonade berry scrub
Salix gooddingii Woodland Alliance - Black willow thickets

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

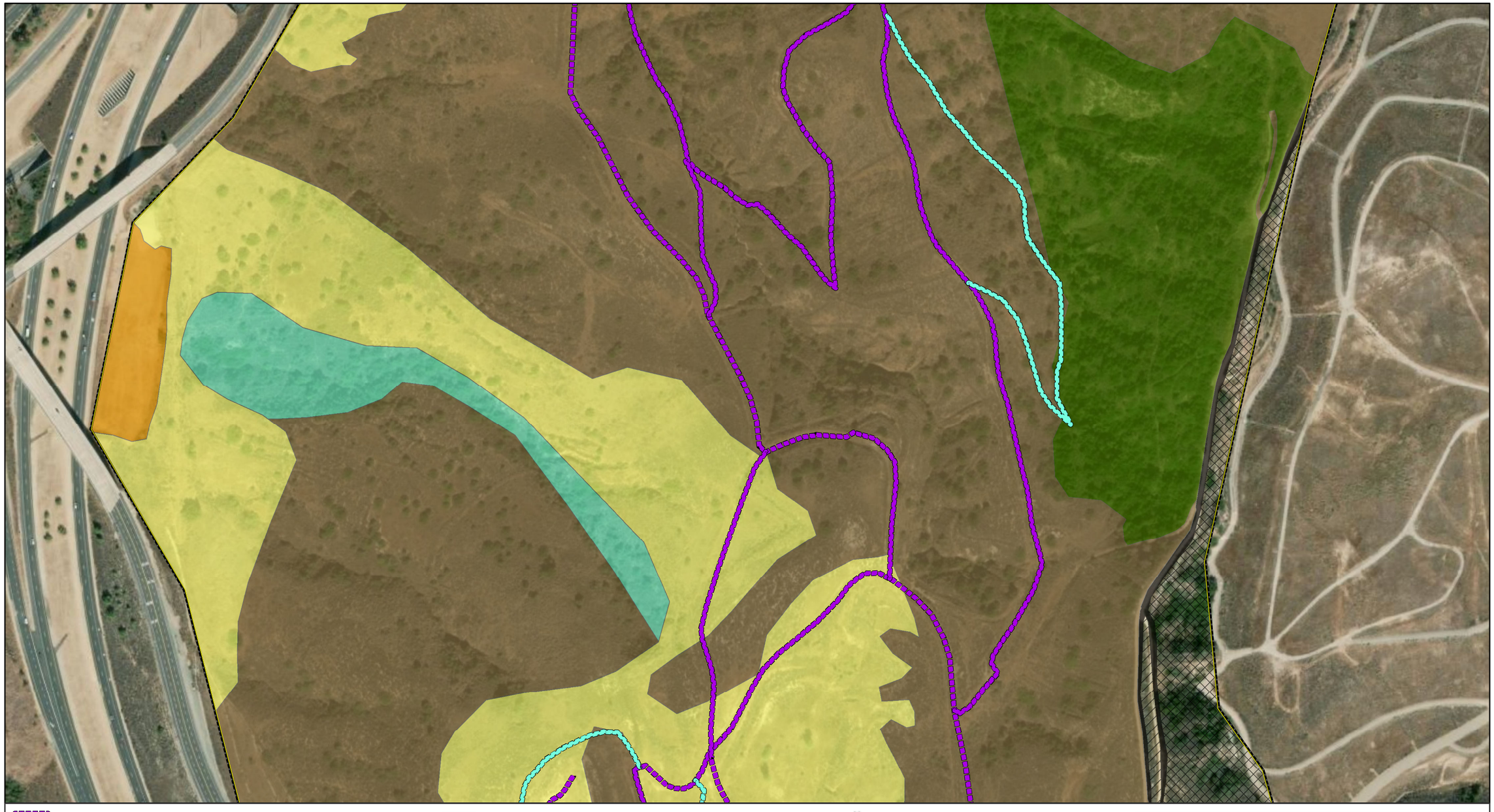
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2g

Title

Vegetation Communities and Land Cover Types - East Orange I



East Orange I - Primary Trail
East Orange I - Secondary Trail
Jurisdictional Delineation Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Avena (barbata, fatua) Herbaceous Semi-Natural Alliance -- Wild oats grasslands
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub
Rhus integrifolia Shrubland Alliance – Lemonade berry scrub
Salvia mellifera Alliance
Toxicodendron diversilobum Shrubland Alliance -- Poison oak scrub

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

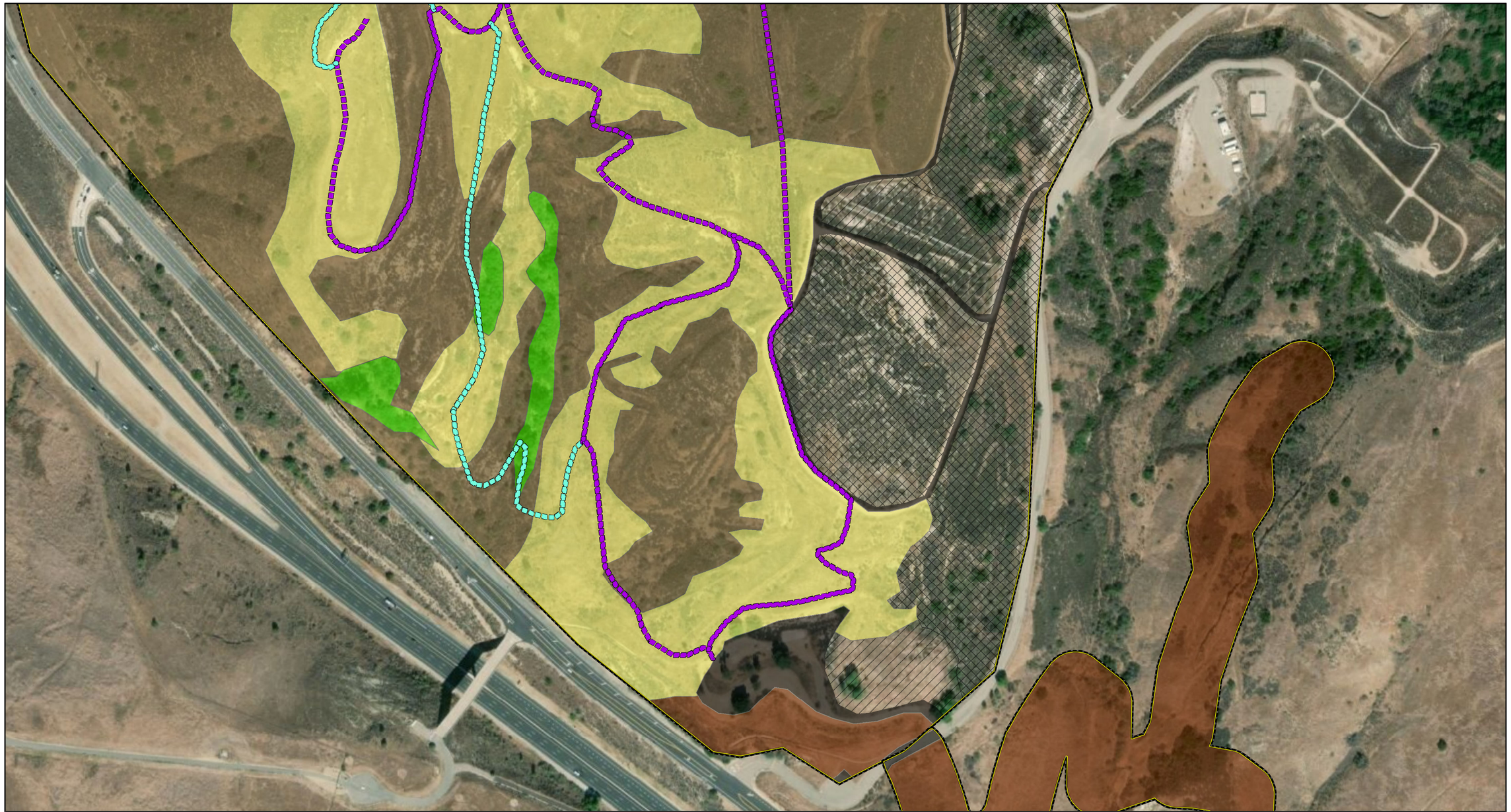
Project Location
Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.
2h

Title
Vegetation Communities and Land Cover Types - East Orange I



East Orange I - Primary Trail
East Orange I - Secondary Trail
Jurisdictional Delineation Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Brassica nigra and other mustards Herbaceous Semi-Natural Alliance -- Upland mustards
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub
Quercus agrifolia Woodland Alliance -- Coast live oak woodland
Salvia mellifera Alliance

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2i

Title

Vegetation Communities and Land Cover Types - East Orange I



East Orange I - Primary Trail

Jurisdictional Delineation Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Brassica nigra and other mustards Herbaceous Semi-Natural Alliance -- Upland mustards

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub

Salix laevigata Woodland Alliance – Red willow thickets

Salvia mellifera Alliance

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

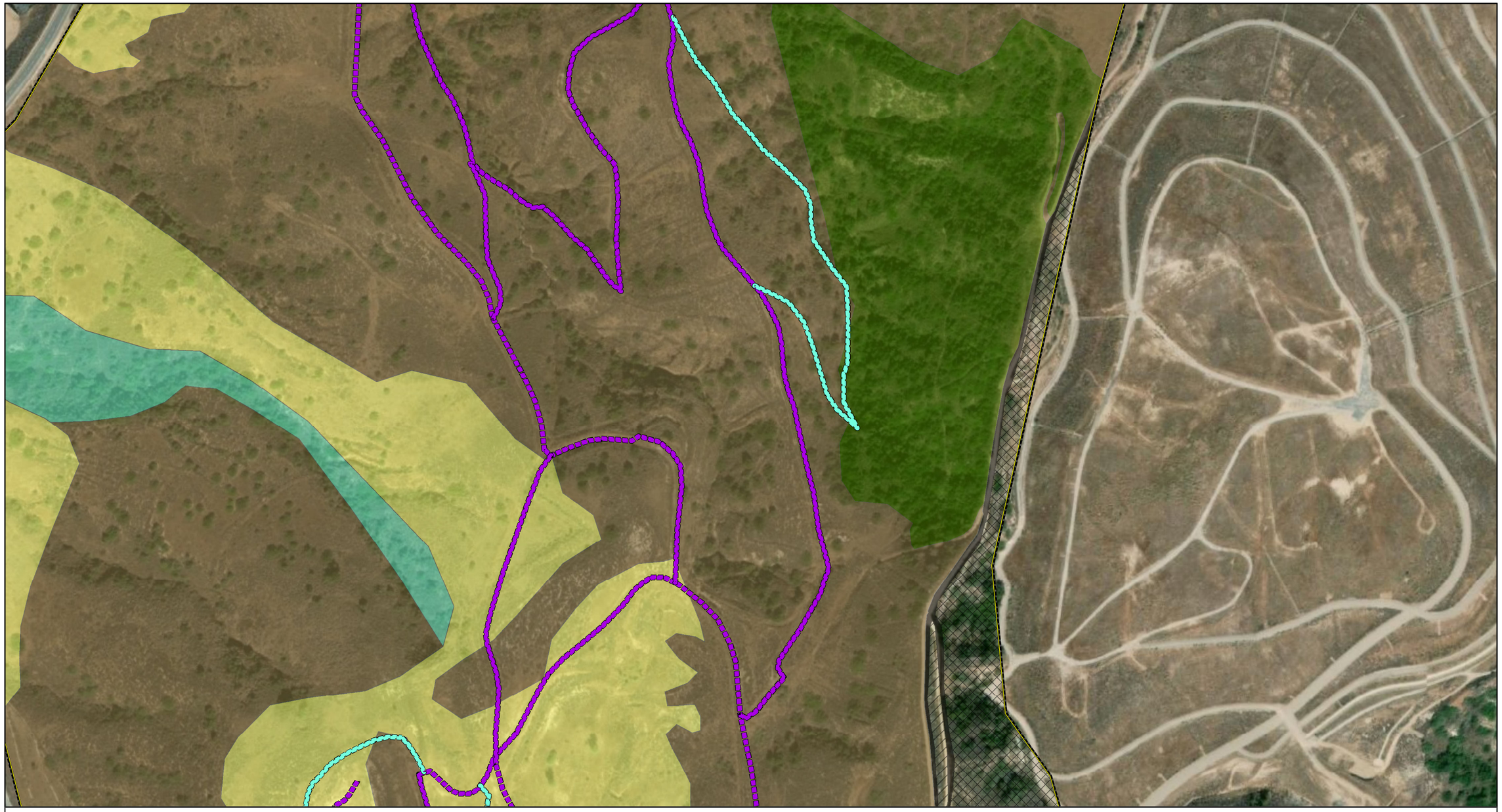
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2j

Title

Vegetation Communities and Land Cover Types - East Orange I



East Orange I - Primary Trail
East Orange I - Secondary Trail
Jurisdictional Delineation Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Eriogonum fasciculatum Shrubland Alliance – California buckwheat scrub
Rhus integrifolia Shrubland Alliance – Lemonade berry scrub
Salvia mellifera Alliance
Toxicodendron diversilobum Shrubland Alliance -- Poison oak scrub

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

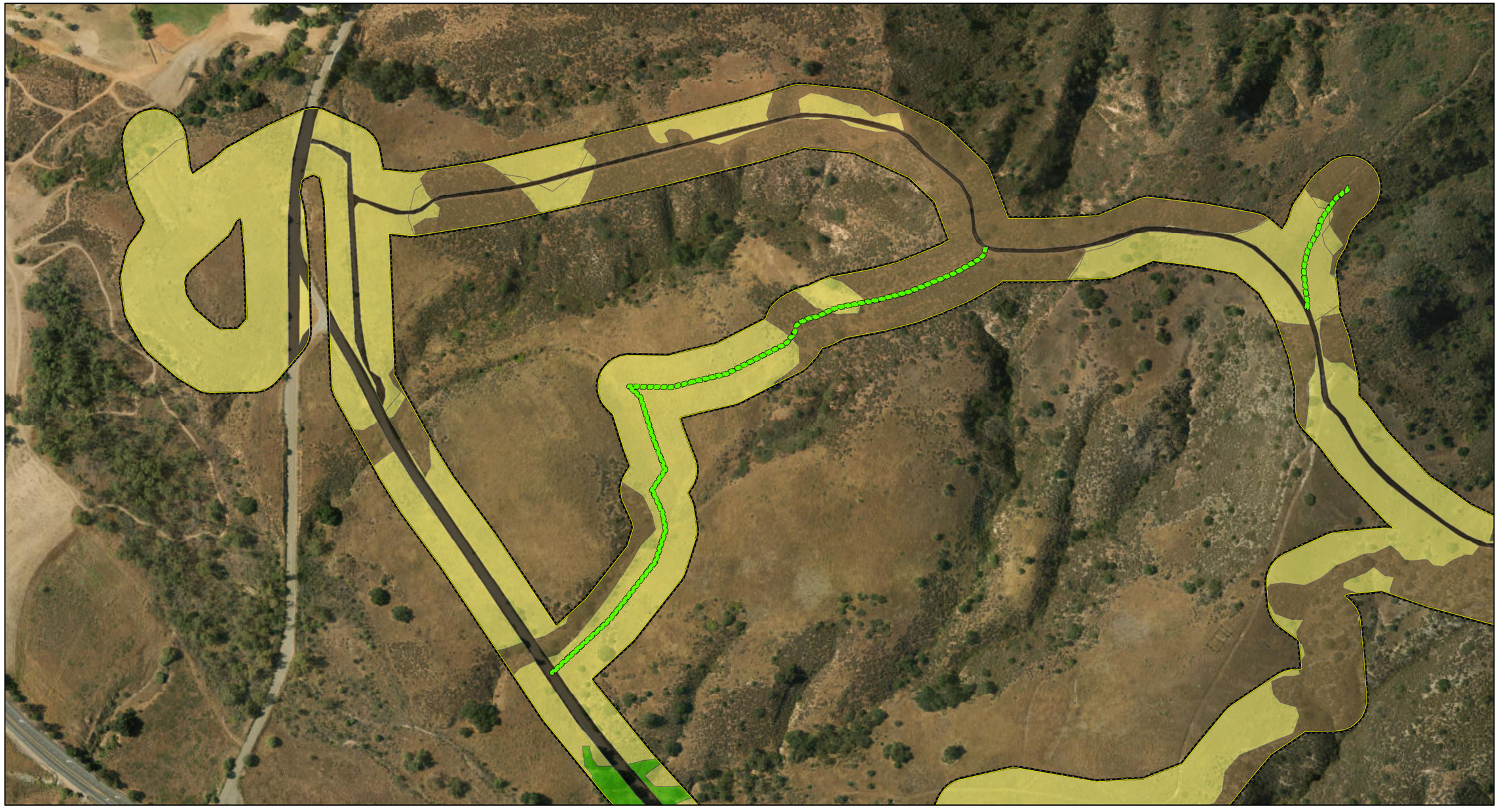
Project Location
Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.
2k

Title
Vegetation Communities and Land Cover Types - East Orange I



East Orange II Trail
Jurisdictional Delineation Survey Area
Artemisia californica Shrubland Alliance – California sagebrush scrub
Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands
Disturbed/Developed
Quercus agrifolia Woodland Alliance -- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

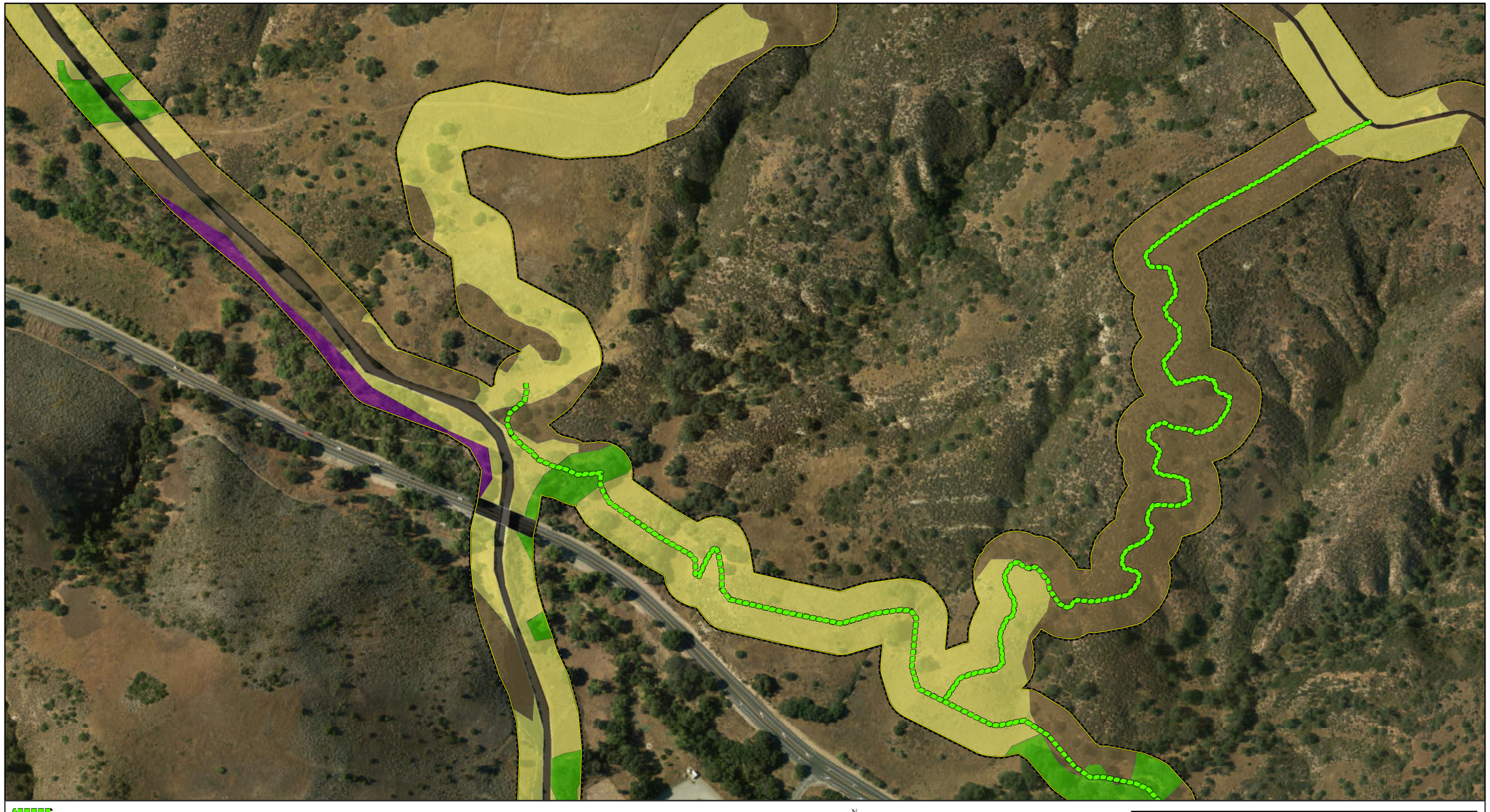
Project Location
Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.
2I

Title
Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Quercus agrifolia Woodland Alliance -- Coast live oak woodland

Salix laevigata Woodland Alliance – Red willow thickets

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

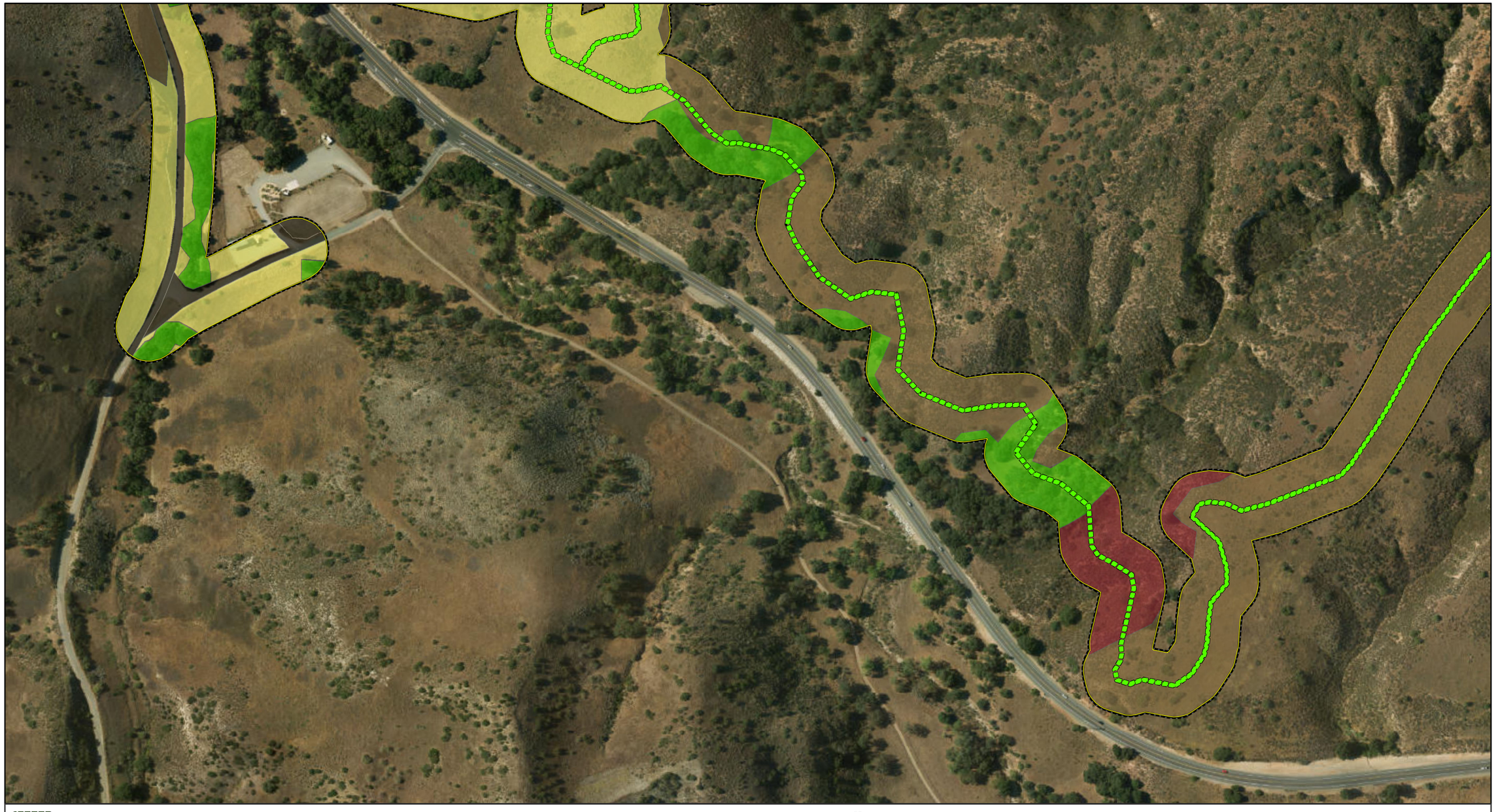
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2m

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Adenostoma fasciculatum Shrubland Alliance -- Chamise chaparral

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Quercus agrifolia Woodland Alliance -- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2n

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Adenostoma fasciculatum Shrubland Alliance -- Chamise chaparral

Artemisia californica Shrubland Alliance – California sagebrush scrub

Disturbed/Developed

Quercus agrifolia Woodland Alliance -- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2o

Title

Vegetation Communities and Land Cover Types - East Orange II

East Orange II Trail

Jurisdictional Delineation Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Quercus agrifolia Woodland Alliance -- Coast live oak woodland

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2p

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

Quercus agrifolia Woodland Alliance -- Coast live oak woodland

Salix laevigata Woodland Alliance – Red willow thickets

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2q

Title

Vegetation Communities and Land Cover Types - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Artemisia californica Shrubland Alliance – California sagebrush scrub

Bromus rubens Herbaceous Semi-Natural Alliance -- Red brome grasslands

Disturbed/Developed

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-27
Technical Review by JV on 2019-03-27
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

2r

Title

Vegetation Communities and Land Cover Types - East Orange II



Jurisdictional Delineation Survey Area

N

0 2,800 5,600 Feet

1:66,665 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

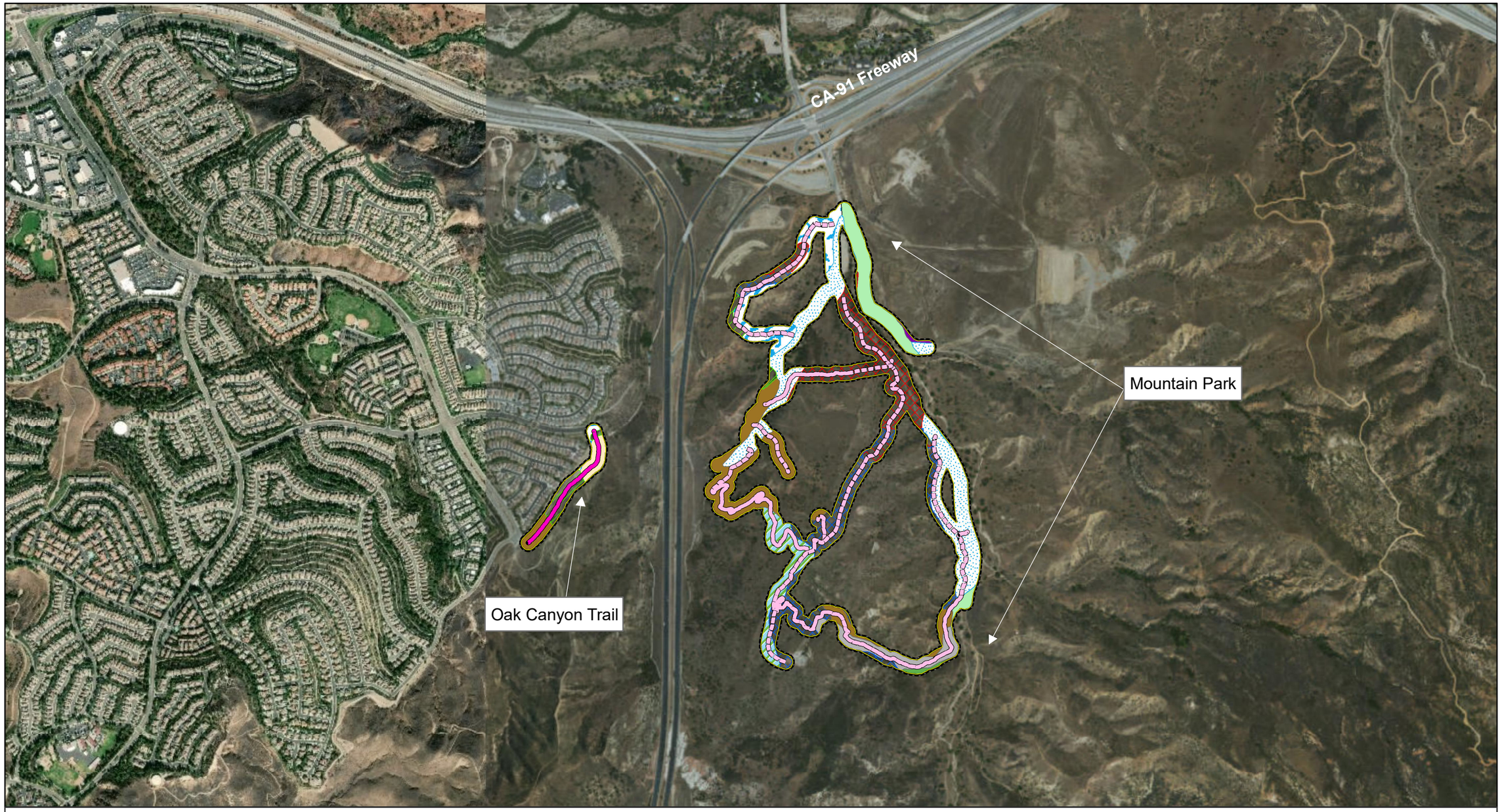
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3

Title

Historic Soil Types - Project Overview



Mountain Park Trail
Oak Canyon Trail
Jurisdictional Delineation Survey Area

MUSYM

145
146
154
175
185
191
192
193
197
200
202
226

N

0 640 1,280 Feet

1:15,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

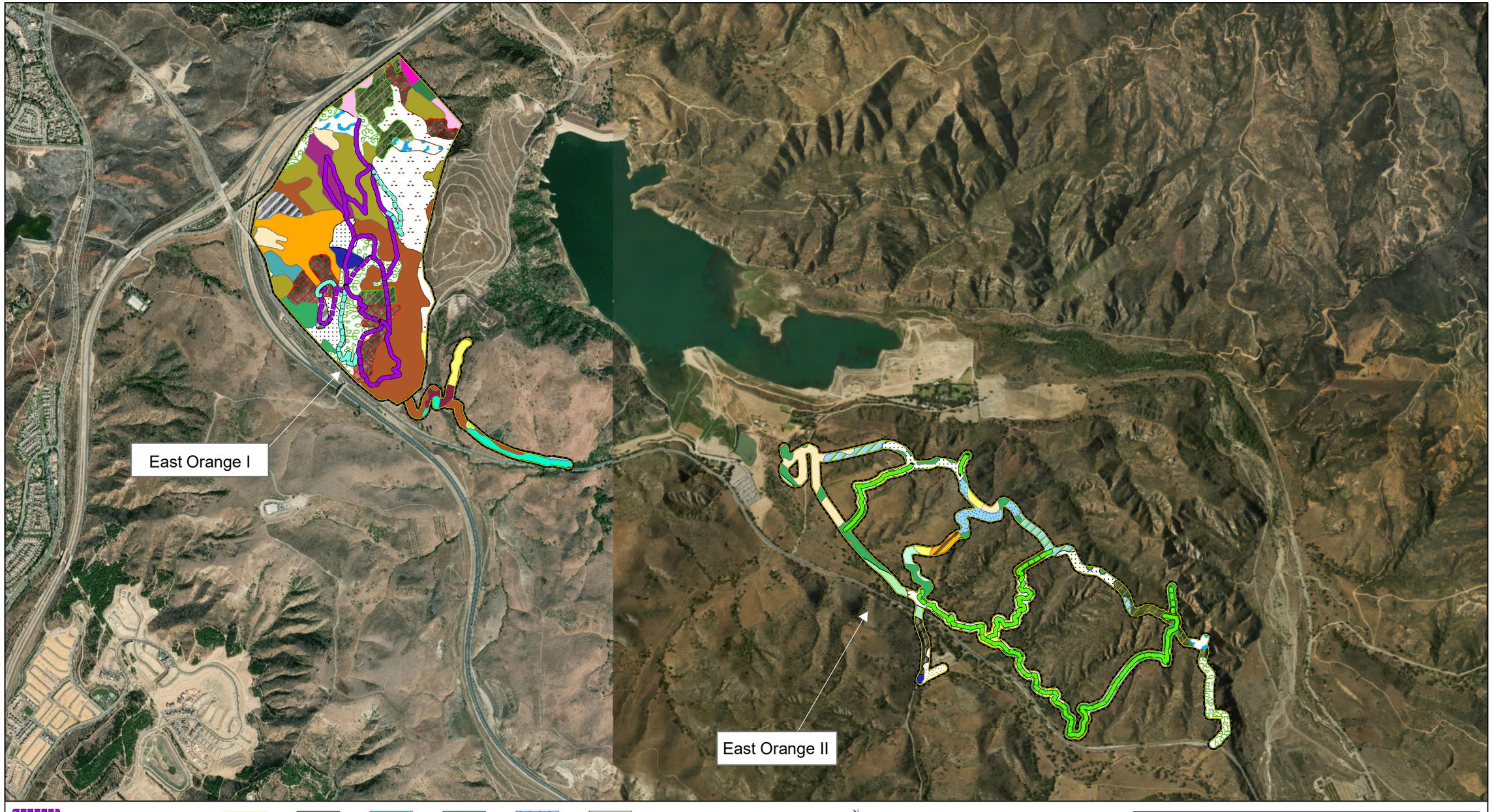
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3a

Title

Historic Soil Types - Oak Canyon Trail and Mountain Park Overview



East Orange I - Primary Trail
East Orange I - Secondary Trail
East Orange II Trail
Jurisdictional Delineation Survey Area

MUSYM

100, 101, 102, 103, 104, 105, 107, 108, 109, 110, 111, 112, 114, 126, 130, 132, 134, 135, 141, 142, 173, 175, 177, 191, 192, 193, 199, 200, 202, 203, 204, 207

N

0 1,000 2,000 Feet

1:24,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

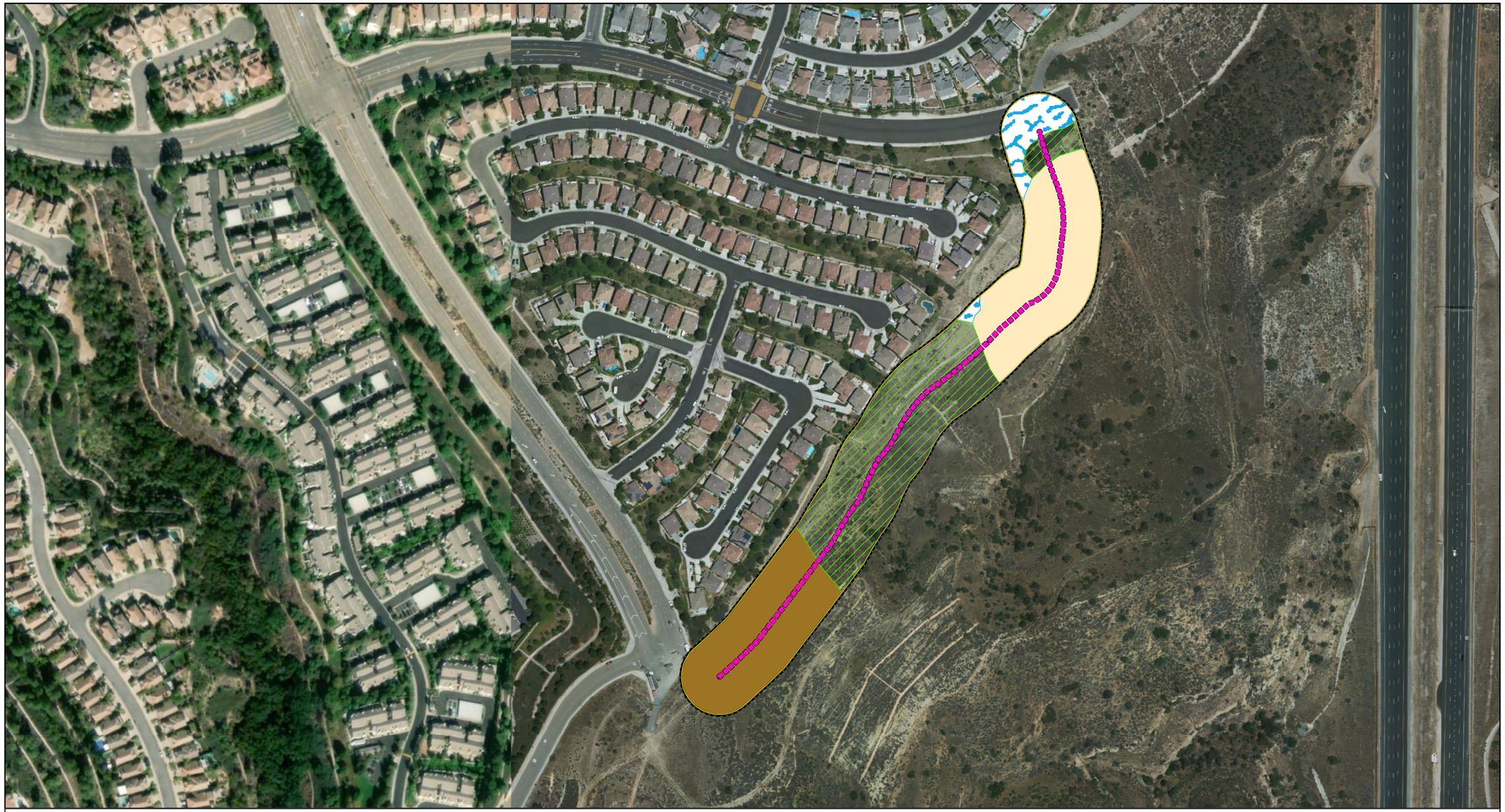
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3b

Title

Historic Soil Types - Oak Canyon Trail and Mountain Park Overview



Oak Canyon Trail

Jurisdictional Delineation Survey Area

MUSYM

145

175

192

202

N

0 130 260 Feet

1:3,075 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

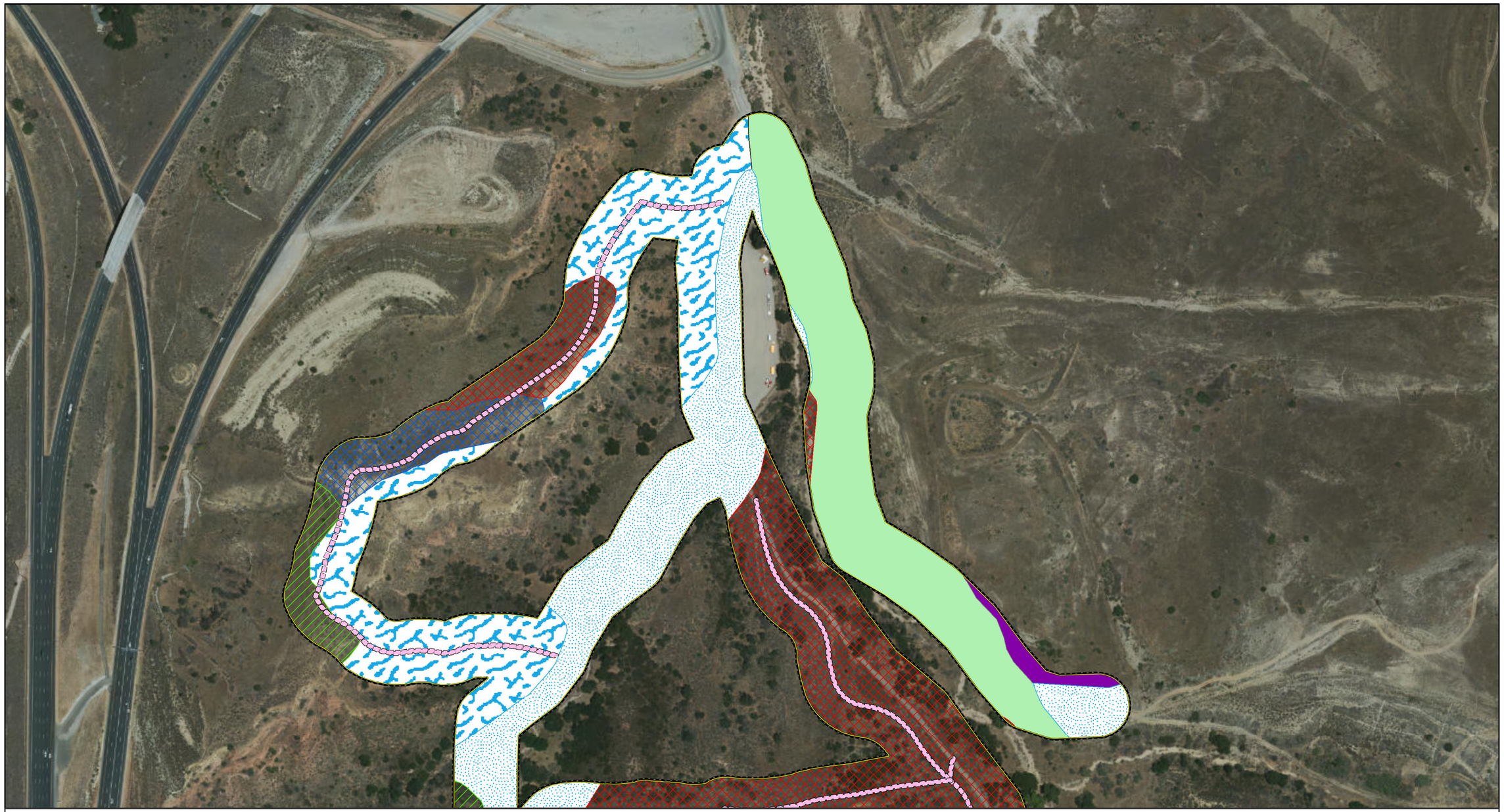
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3c

Title

Historic Soil Types - Oak Canyon Trail



Mountain Park Trail
Jurisdictional Delineation Survey Area

MUSYM

146
185
191
192
200
202
226

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SK on 2019-03-27

Client/Project

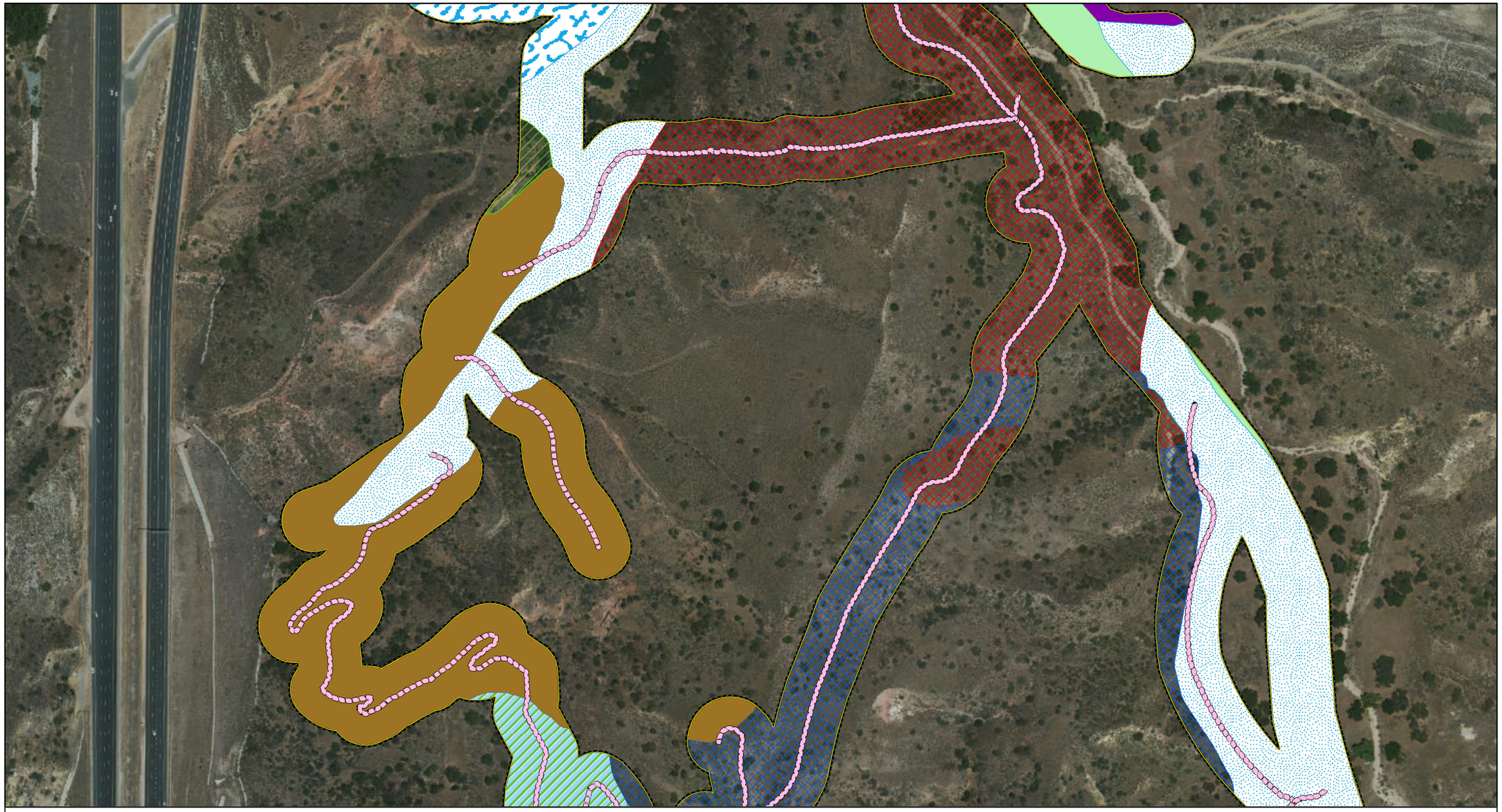
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3d

Title

Historic Soil Types - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

MUSYM

145

146

185

191

192

193

200

202

226

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3e

Title

Historic SoilTypes - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

MUSYM

145

146

154

191

193

197

226

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM – Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

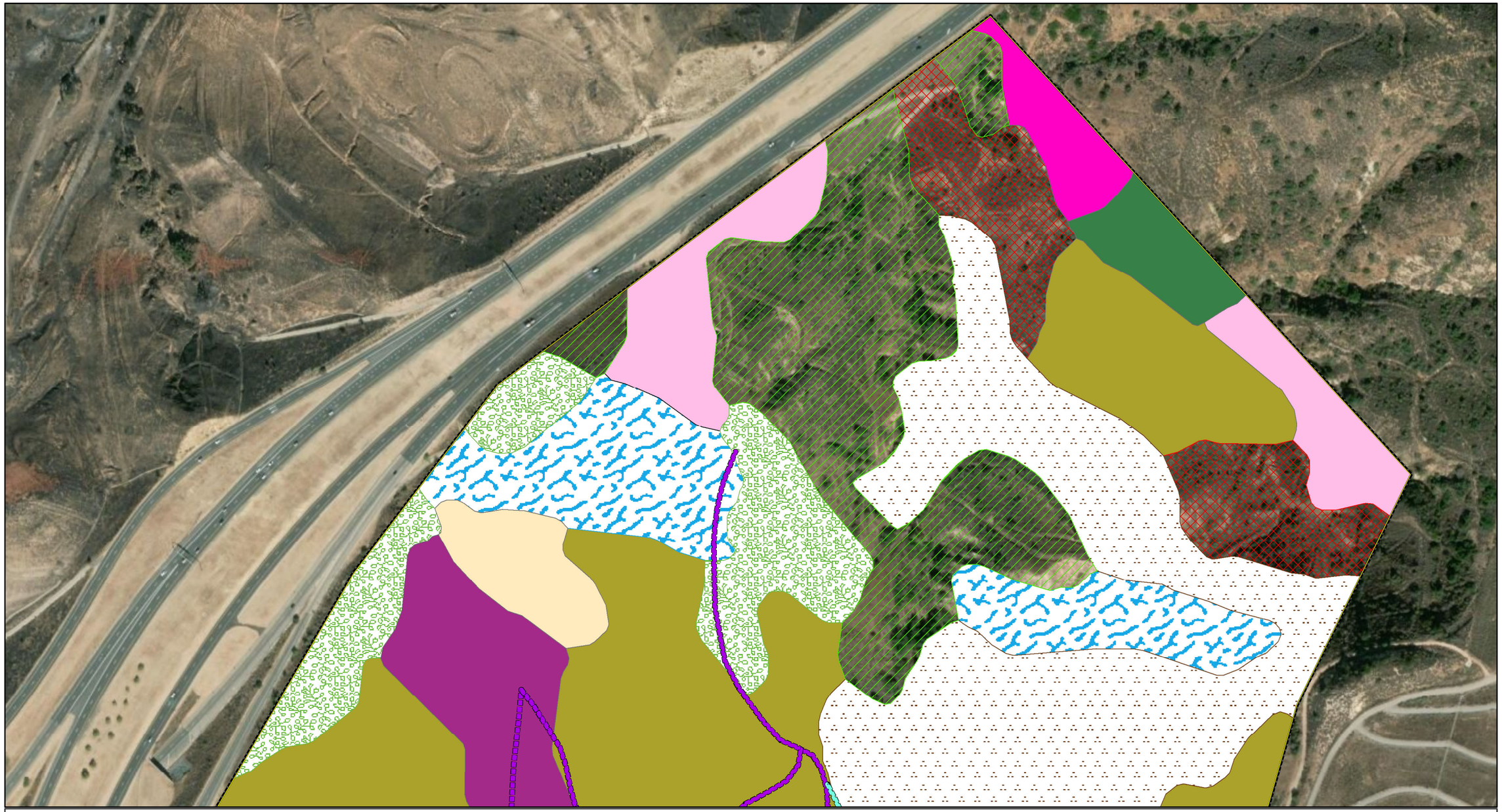
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3f

Title

Historic SoilTypes - Mountain Park



East Orange I - Primary Trail
East Orange I - Secondary Trail
Jurisdictional Delineation Survey Area

MUSYM

104
105
108
175
192
199
200
202
203
204
207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3g

Title

Historic Soil Types - East Orange I



East Orange I - Primary Trail
East Orange I - Secondary Trail
Jurisdictional Delineation Survey Area

MUSYM

100
102
103
104
105
111
134
141
173
175
177
200
202
203
207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3h

Title

Historic SoilTypes - East Orange I

East Orange I - Primary Trail
East Orange I - Secondary Trail
Jurisdictional Delineation Survey Area

MUSYM

101
104
109
111
126
134
141
142
175
177
200
202
203
207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3i

Title

Historic Soil Types - East Orange I

East Orange I - Primary Trail

Jurisdictional Delineation Survey Area

MUSYM

101

109

114

126

130

134

175

200

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3j

Title

Historic Soil Types - East Orange I

East Orange I - Primary Trail

East Orange I - Secondary Trail

Jurisdictional Delineation Survey Area

MUSYM

100

102

103

104

105

111

134

141

175

177

200

202

203

207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3k

Title

Historic Soil Types - East Orange I

East Orange II Trail

Jurisdictional Delineation Survey Area

MUSYM

100

101

112

114

141

142

173

175

191

193

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3I

Title

Historic Soil Types - East Orange II

East Orange II Trail

Jurisdictional Delineation Survey Area

MUSYM

100

101

107

110

112

114

132

141

142

173

191

192

193

203

207

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

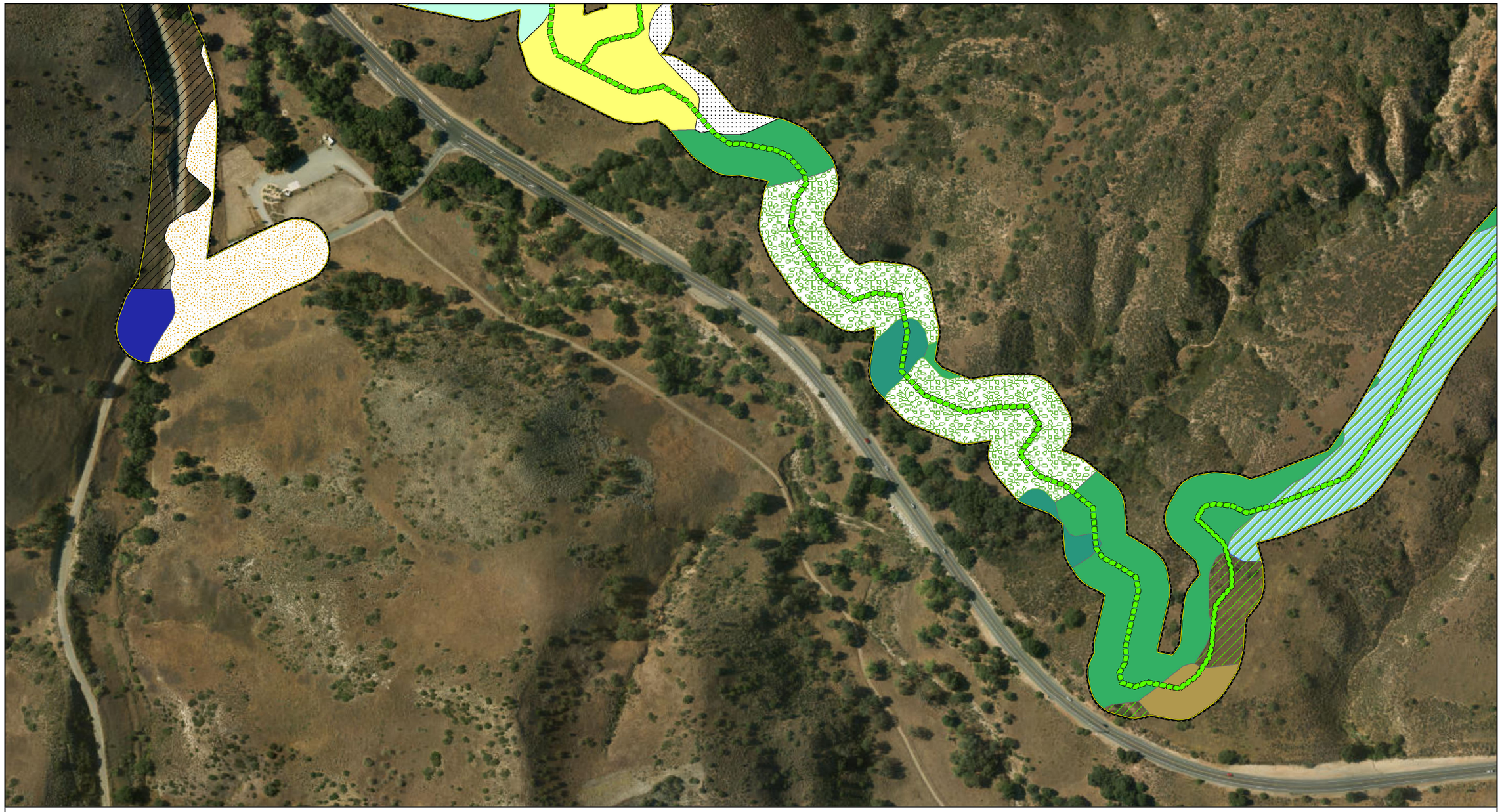
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3m

Title

Historic Soil Types - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

MUSYM

100

101

102

110

132

135

141

142

173

193

202

203

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3n

Title

Historic Soil Types - East Orange II

East Orange II Trail

Jurisdictional Delineation Survey Area

MUSYM

135

142

173

192

193

202

203

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

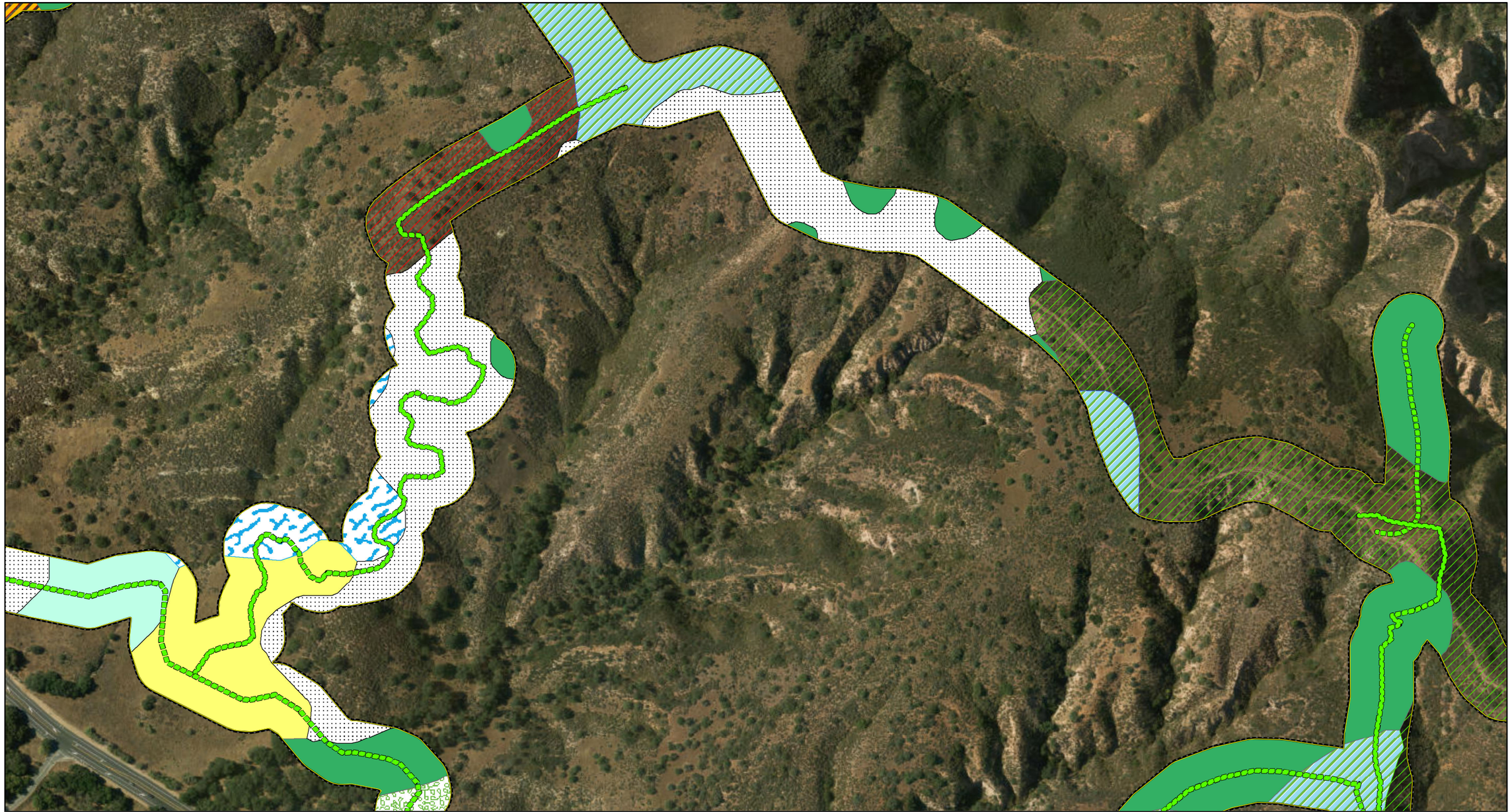
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3o

Title

Historic Soil Types - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

MUSYM

100
101
107
112
141
142
192
193
202
203

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3p

Title

Historic Soil Types - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

MUSYM

100

101

107

112

114

141

142

173

175

191

193

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3q

Title

Historic Soil Types - East Orange II

East Orange II Trail

Jurisdictional Delineation Survey Area

MUSYM

100

101

114

141

142

173

175

191

193

N

0 150 300 Feet

1:3,700 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-26
Technical Review by JV on 2019-03-26
Independent Review by SR on 2019-03-27

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

3r

Title

Historic Soil Types - East Orange II



Jurisdictional Delineation Survey Area

N

0 2,800 5,600 Feet

1:66,665 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4

Title

Jurisdictional Waters - Project Overview



Jurisdictional Delineation Survey Area

N

0 640 1,280 Feet

1:15,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4a

Title

Jurisdictional Waters - Oak Canyon Trail and Mountain Park Overview



Jurisdictional Delineation Survey Area

N

0 1,000 2,000 Feet

1:24,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4b

Title

Jurisdictional Waters - East Orange I and II Overview



Oak Canyon Trail

Jurisdictional Delineation Survey Area

N

0 100 200 Feet

1:2,519 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

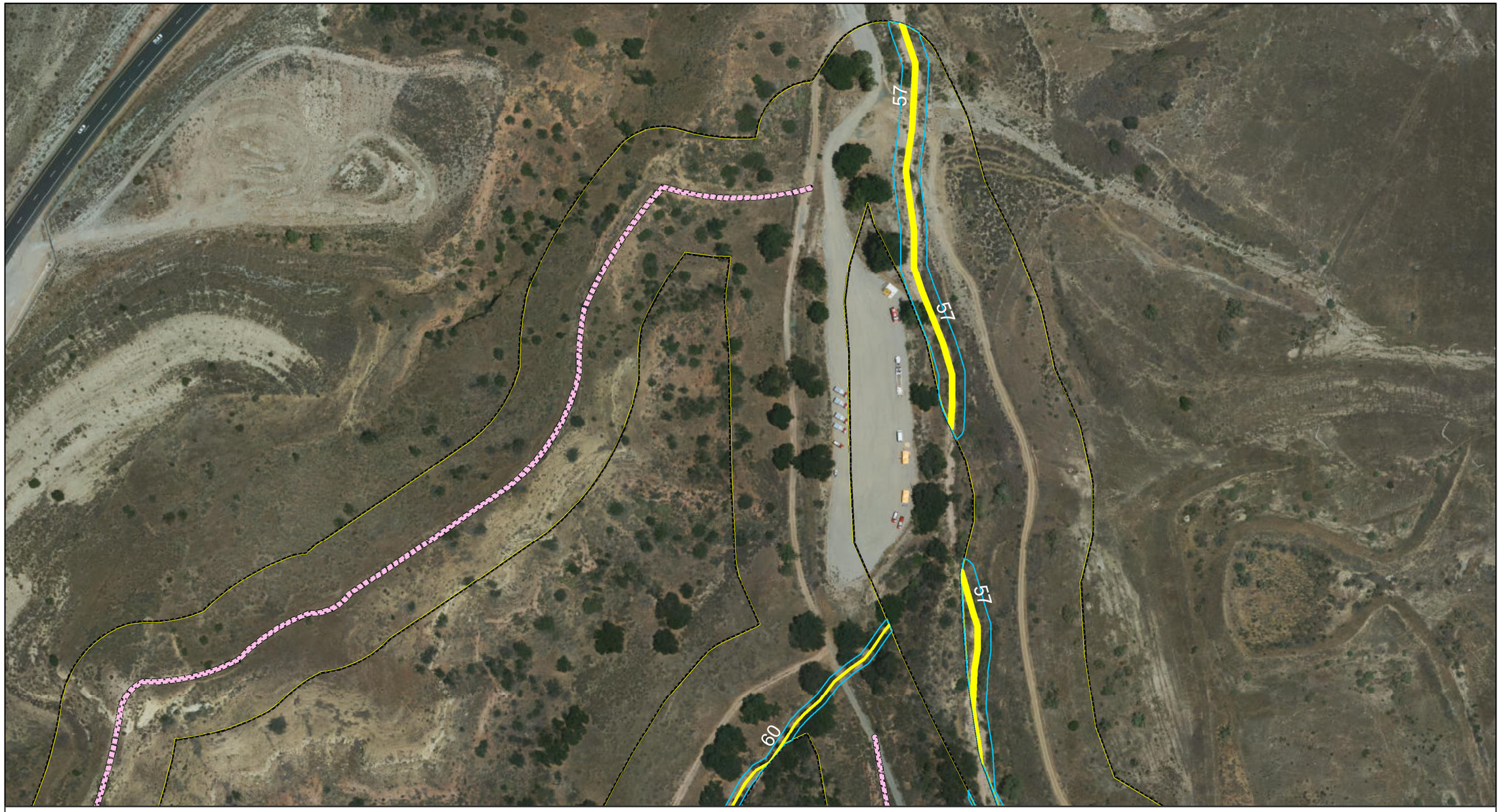
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4c

Title

Jurisdictional Waters - Oak Canyon Trail



Mountain Park Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by JV on 2018-11-26
Technical Review by RB on 2018-11-27
Independent Review by SR on 2018-11-27

Client/Project

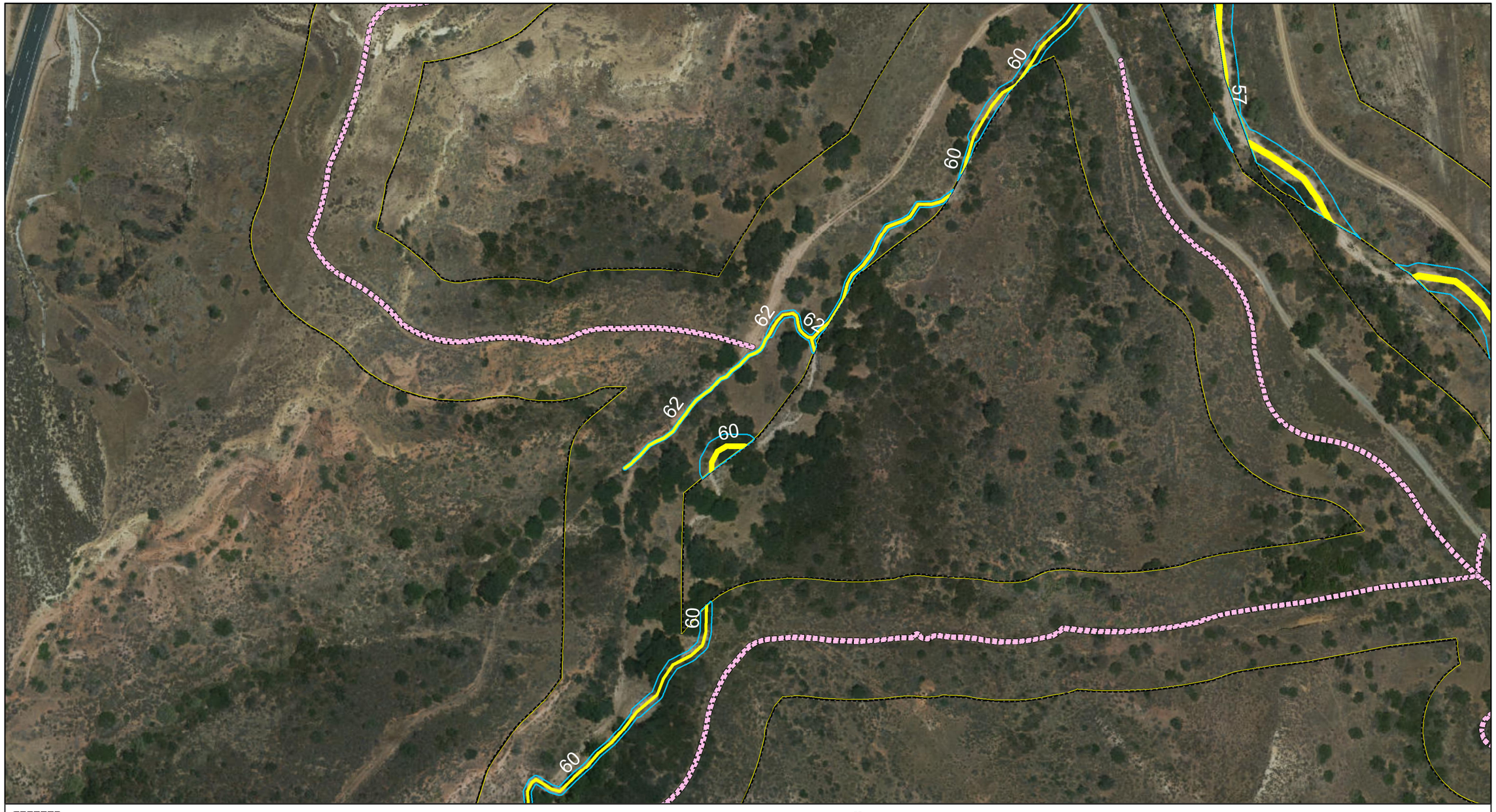
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4d

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

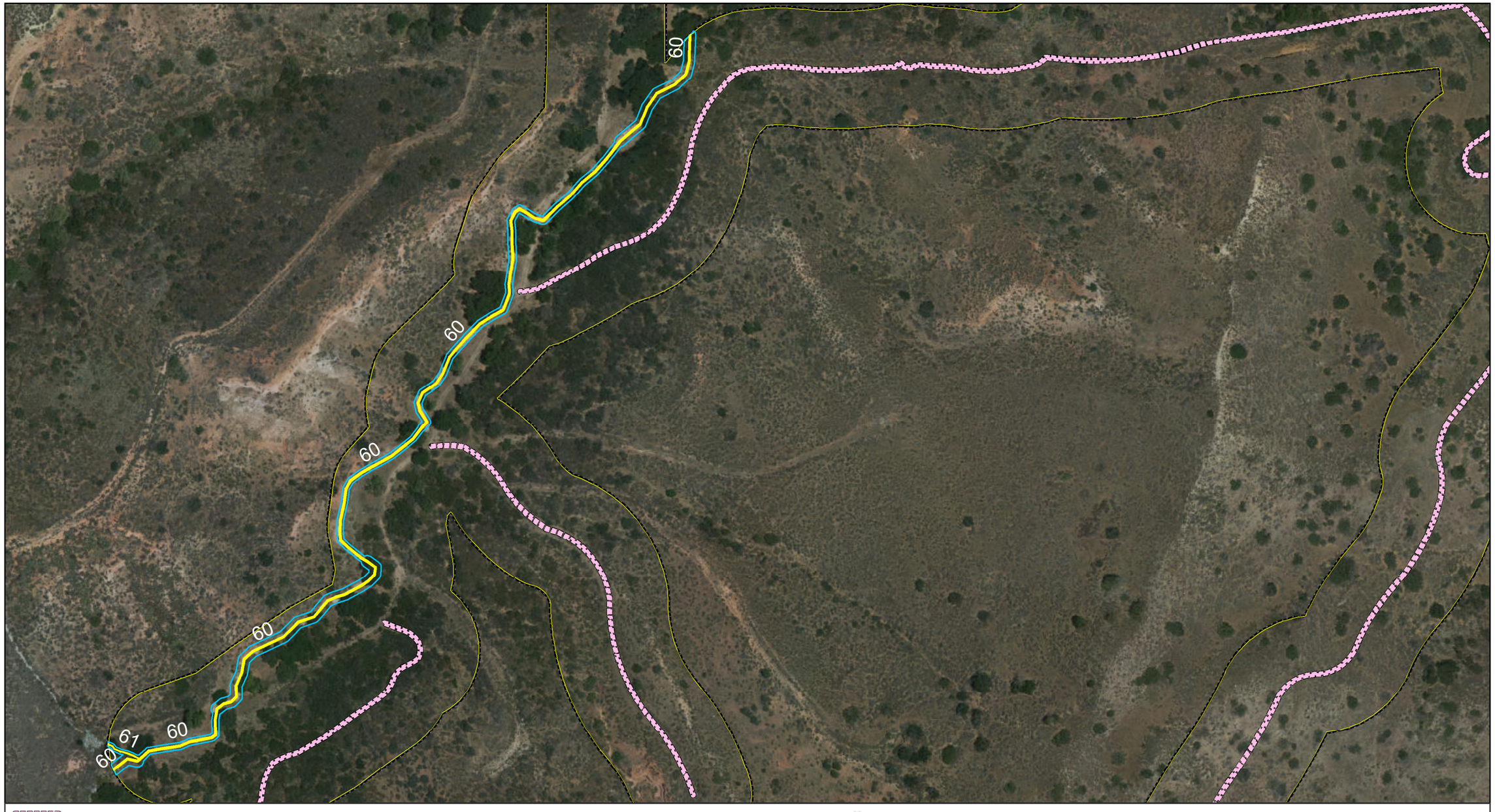
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4e

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

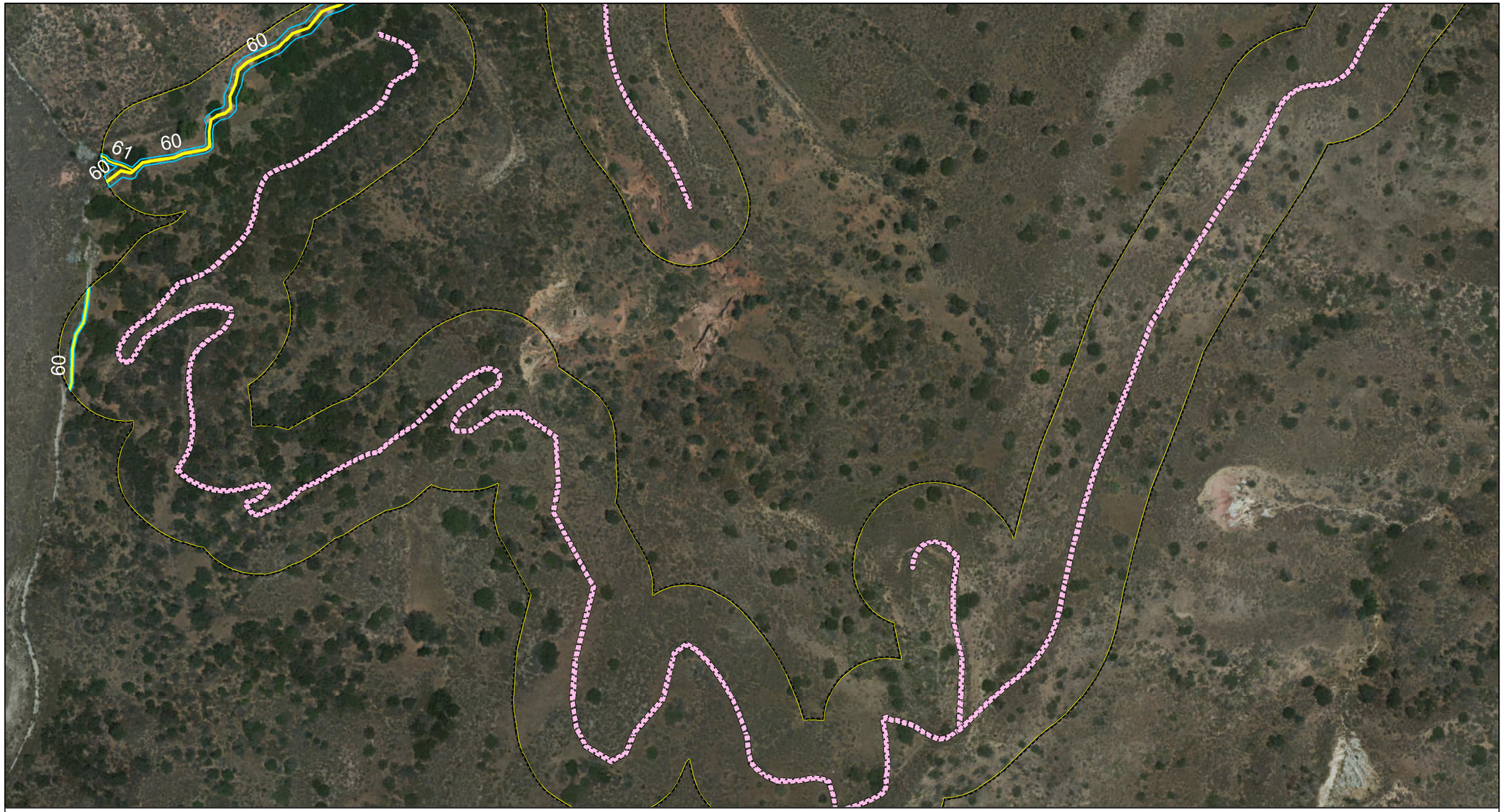
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4f

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

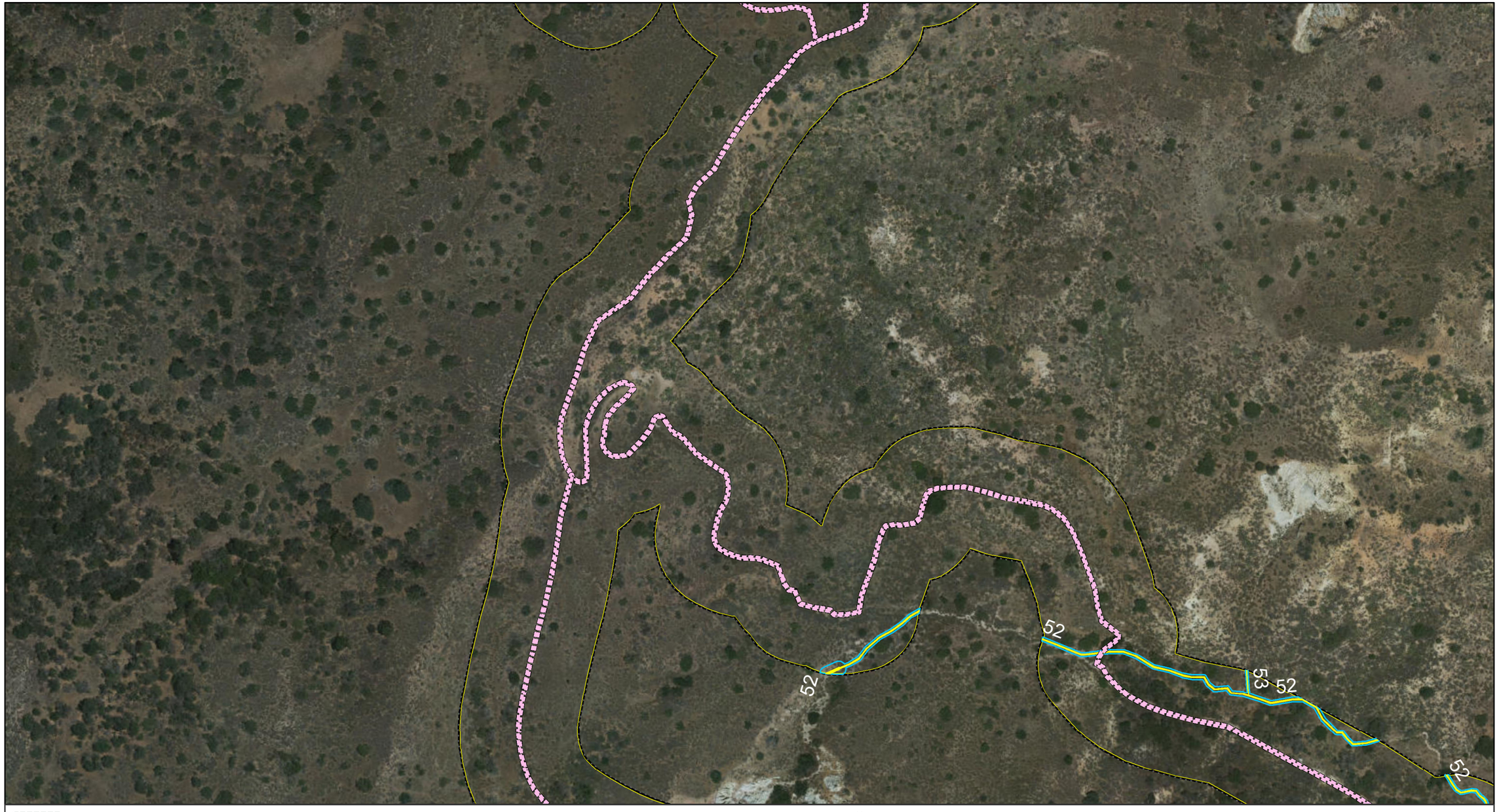
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4g

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

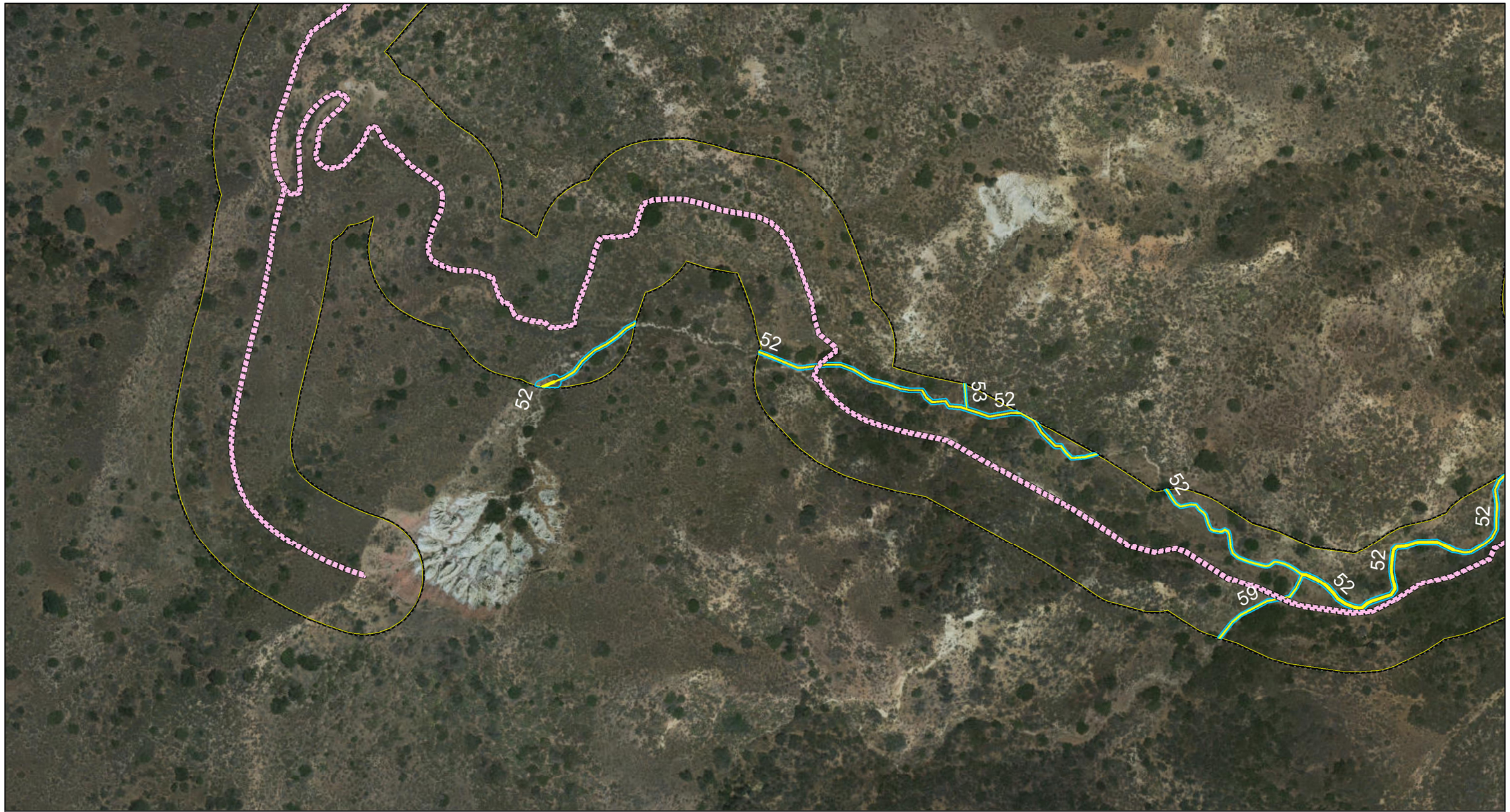
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4h

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

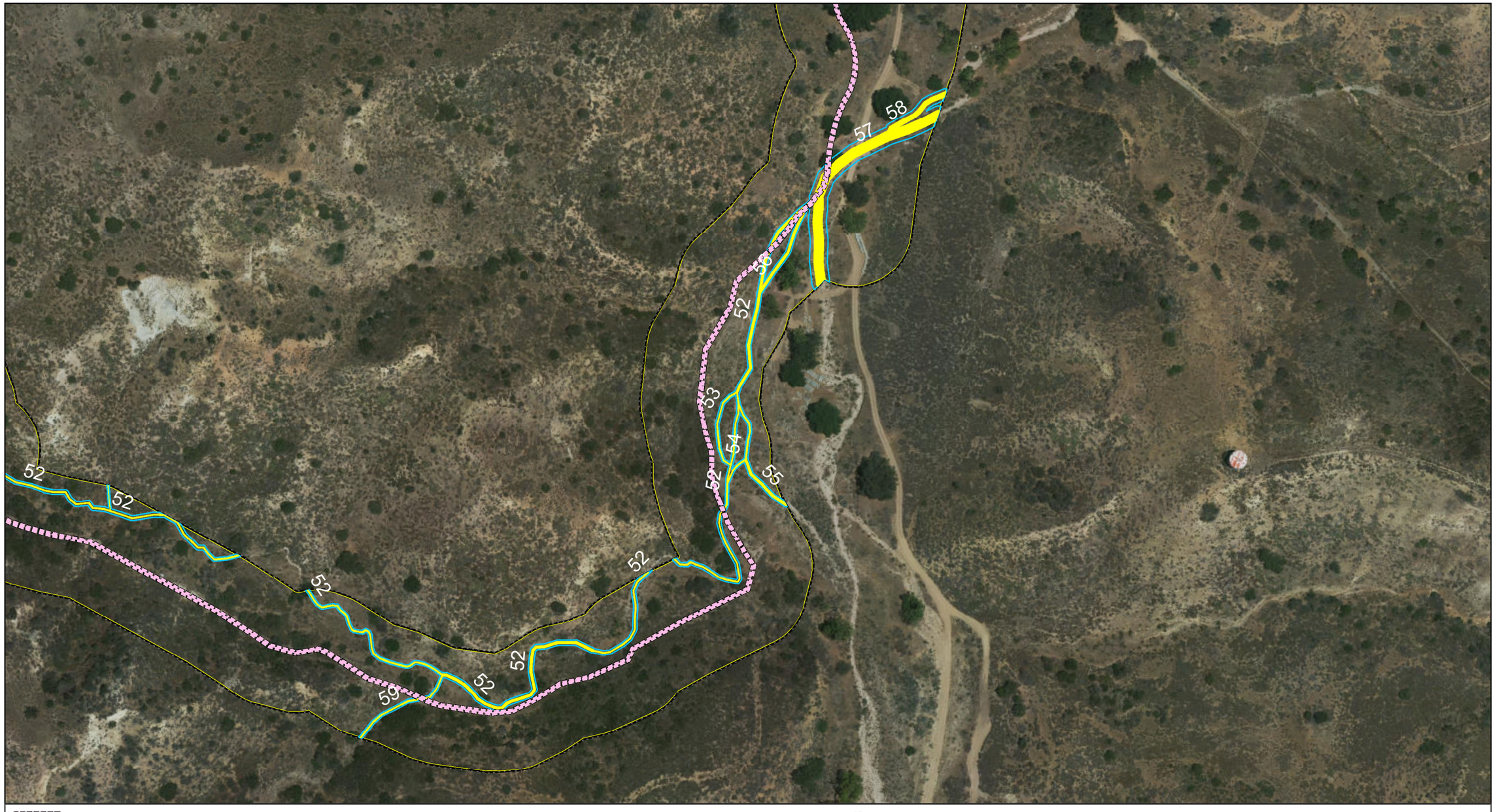
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4i

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

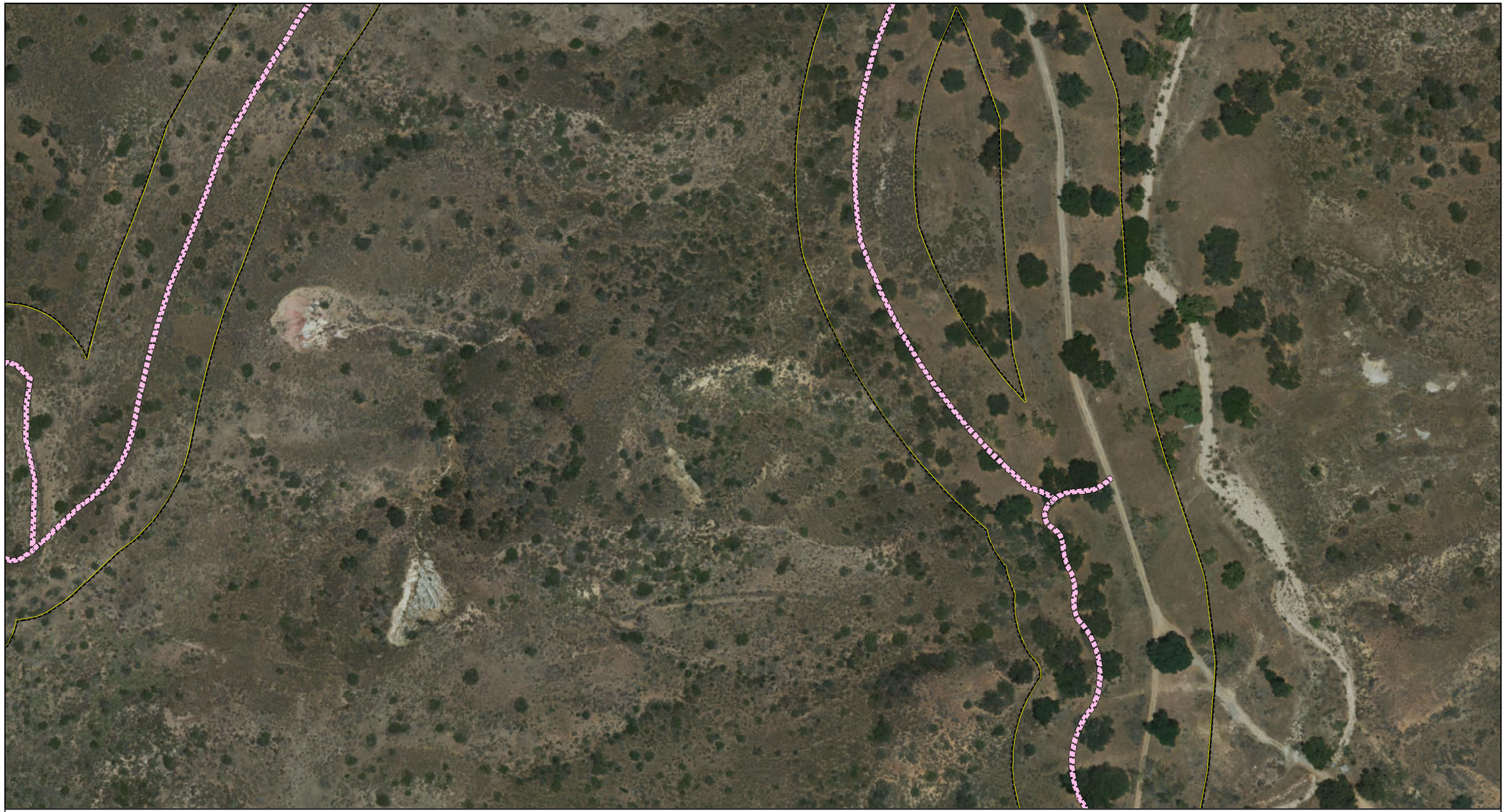
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4j

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4k

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SK on 2019-03-26

Client/Project

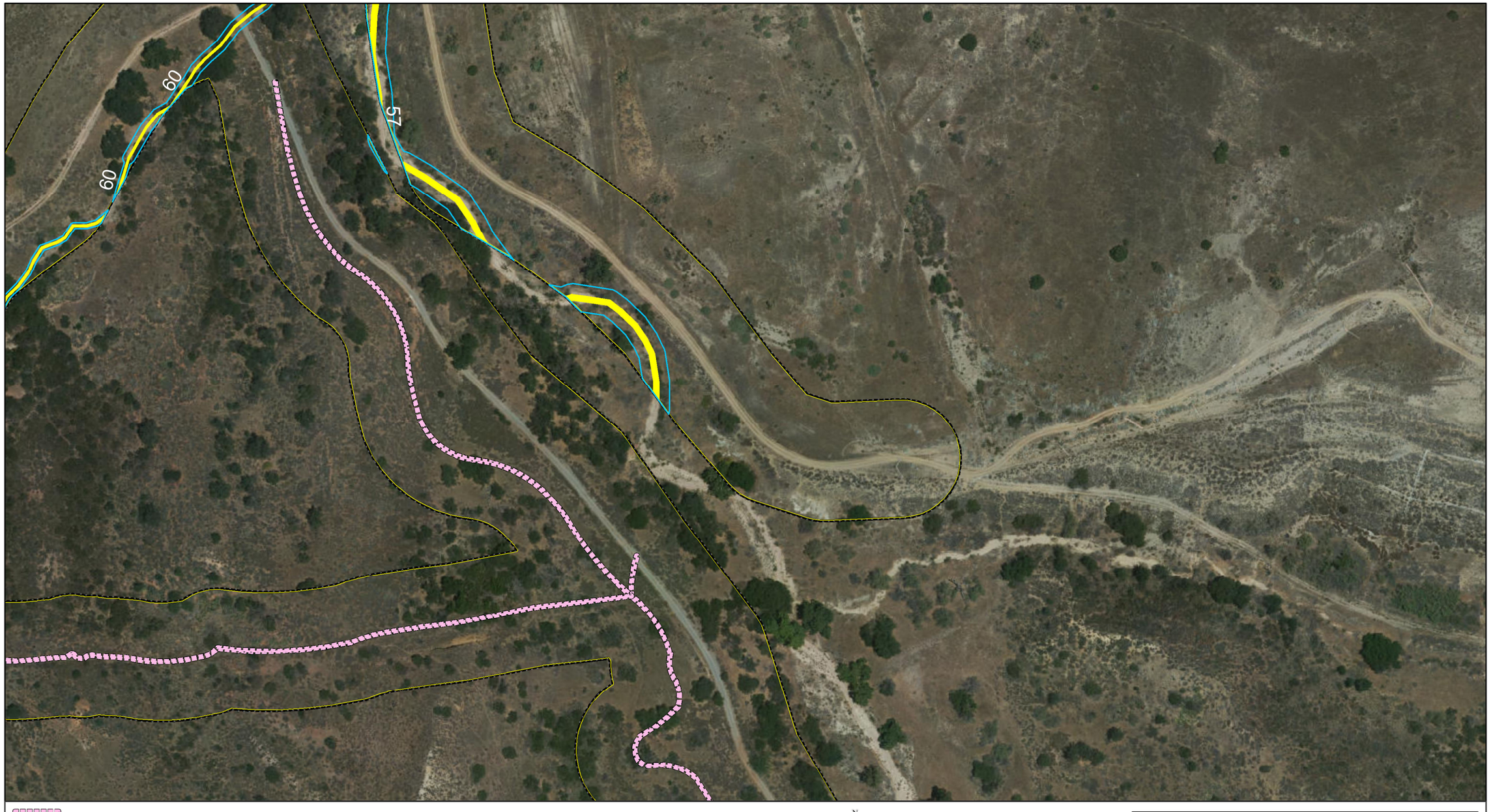
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4I

Title

Jurisdictional Waters - Mountain Park



Mountain Park Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

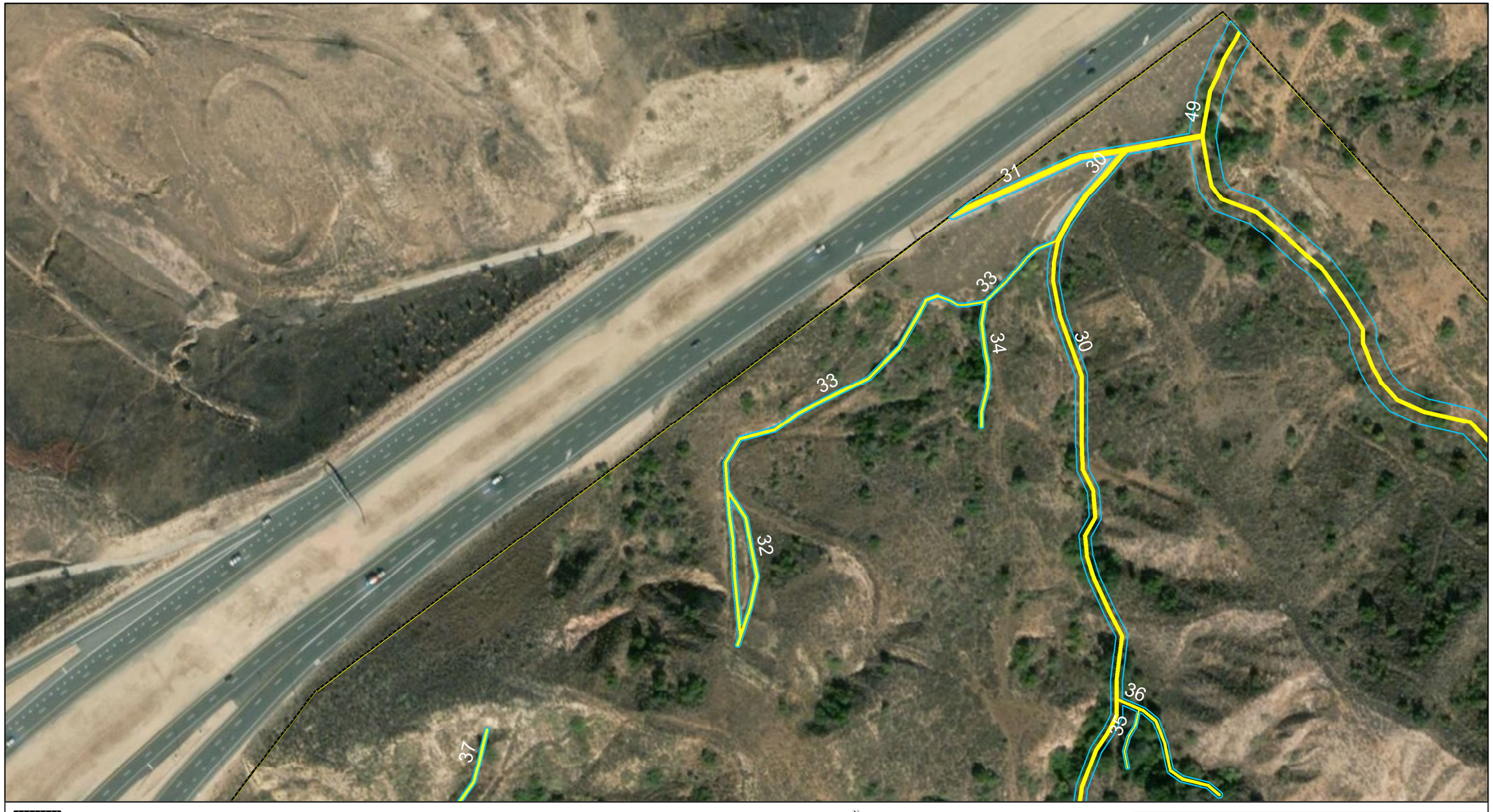
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4m

Title

Jurisdictional Waters - Mountain Park



Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4n

Title

Jurisdictional Waters - East Orange I



East Orange I - Primary Trail

East Orange I - Secondary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

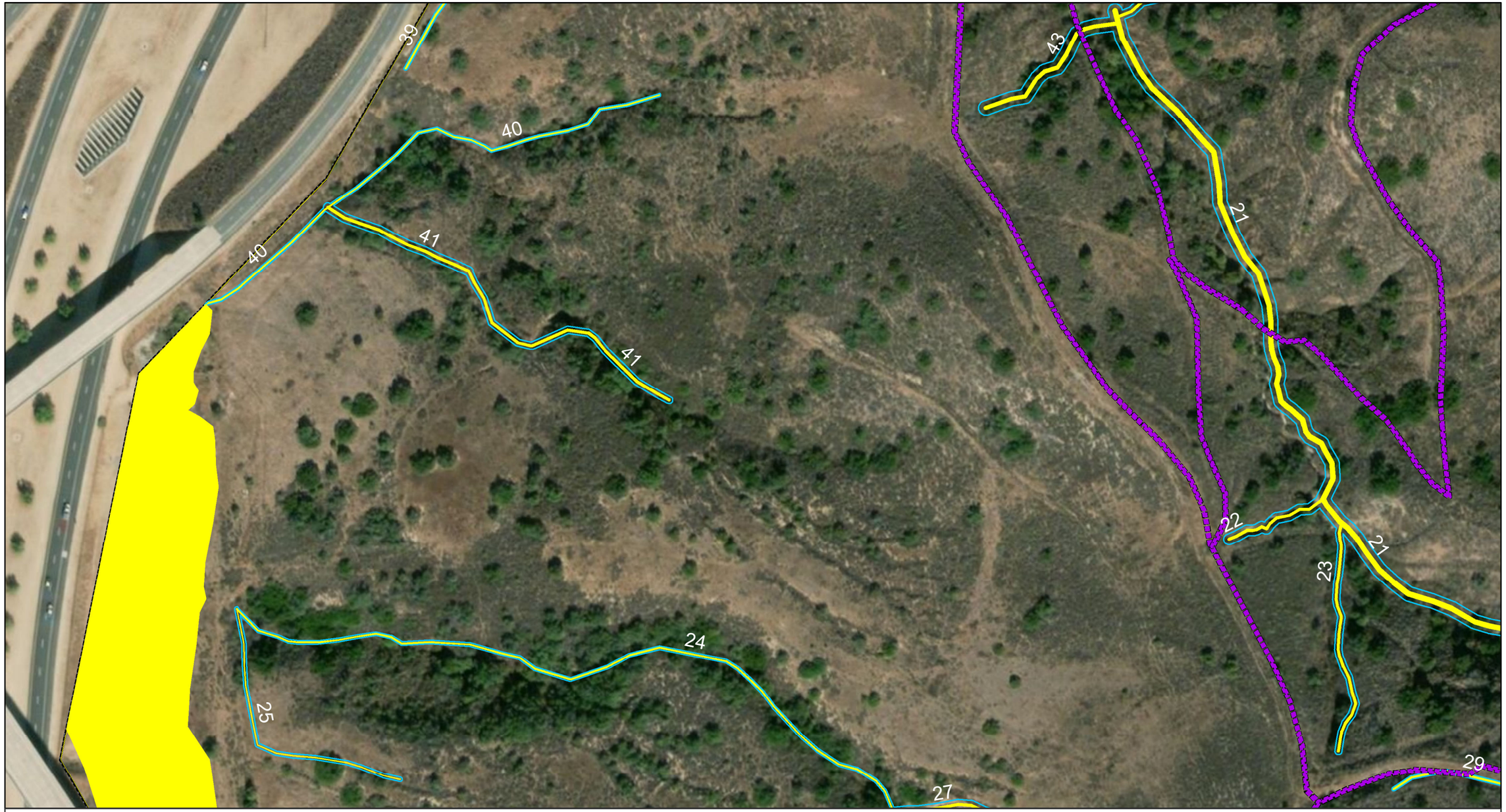
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4o

Title

Jurisdictional Waters - East Orange I



East Orange I - Primary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

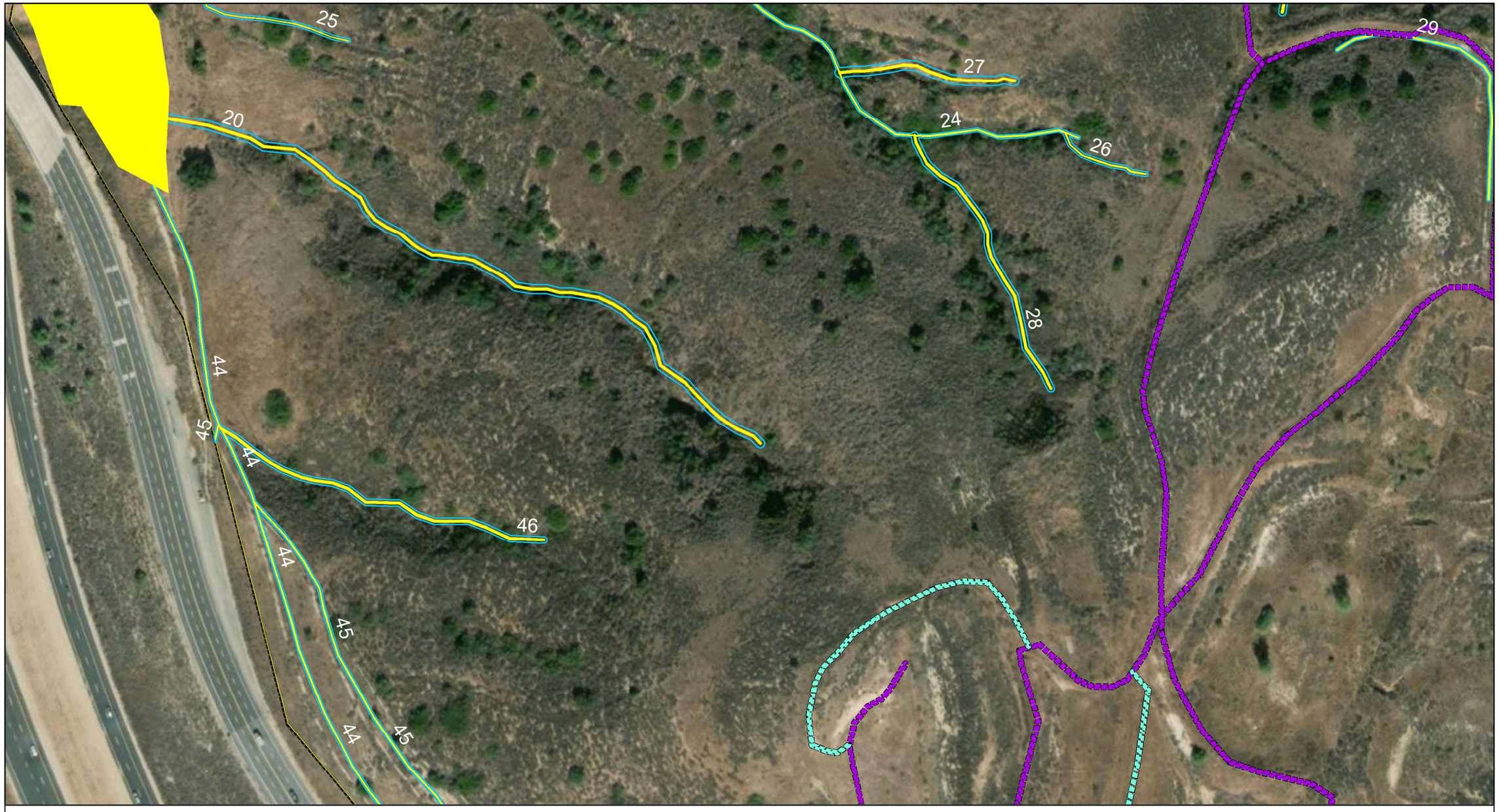
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4p

Title

Jurisdictional Waters - East Orange I



East Orange I - Primary Trail

East Orange I - Secondary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

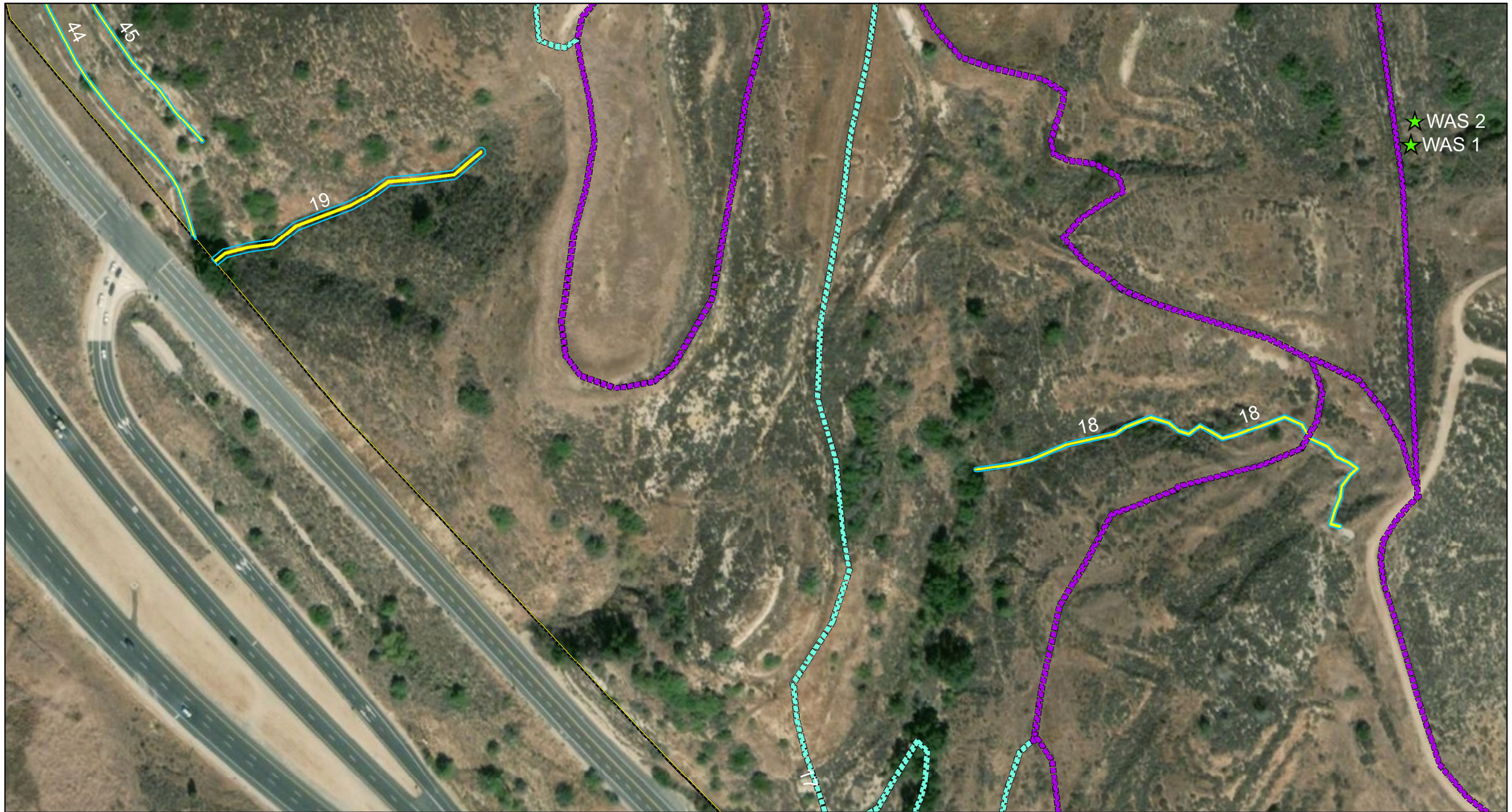
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4q

Title

Jurisdictional Waters - East Orange I



Soil Pits

East Orange I - Primary Trail

East Orange I - Secondary Trail

CDFW Jurisdictional Waters

Federal Non-Wetland "Waters of the U.S."

Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4r

Title

Jurisdictional Waters - East Orange I



East Orange I - Primary Trail

East Orange I - Secondary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

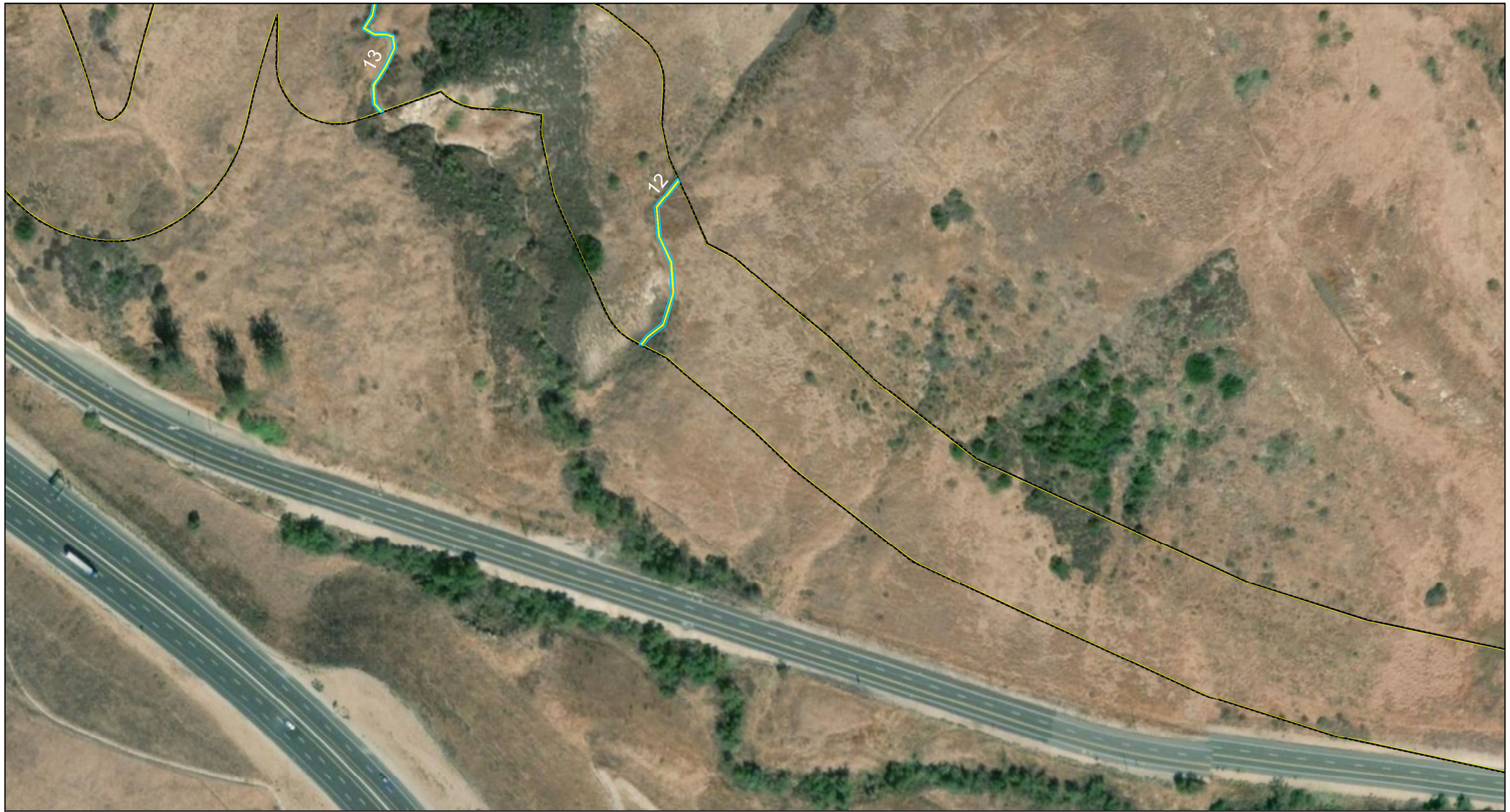
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4s

Title

Jurisdictional Waters - East Orange I



Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4t

Title

Jurisdictional Waters - East Orange I



Soil Pits

Federally Jurisdictional Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4u

Title

Jurisdictional Waters - East Orange I



East Orange I - Primary Trail

East Orange I - Secondary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

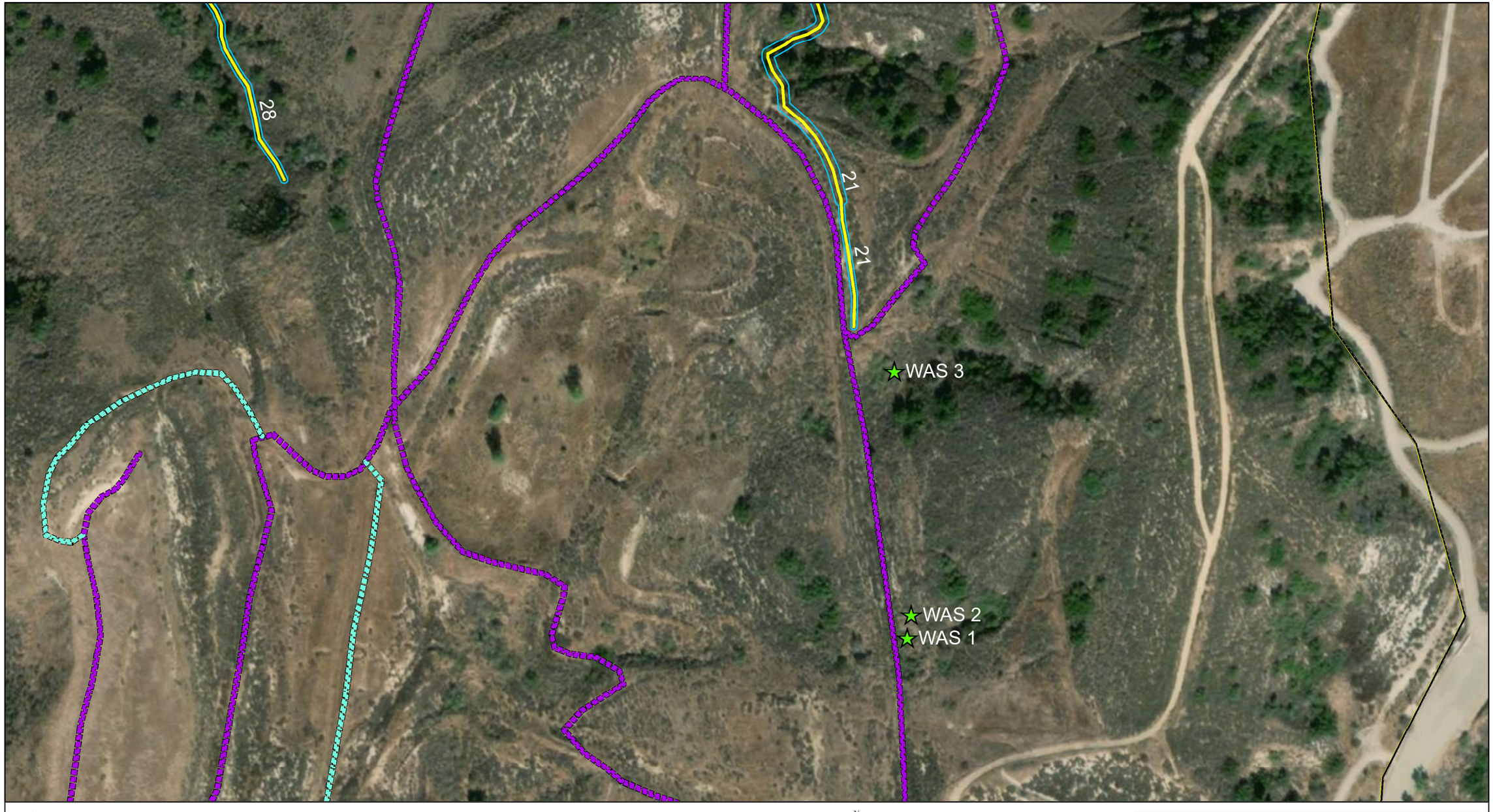
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4v

Title

Jurisdictional Waters - East Orange I



Soil Pits

East Orange I - Primary Trail

East Orange I - Secondary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

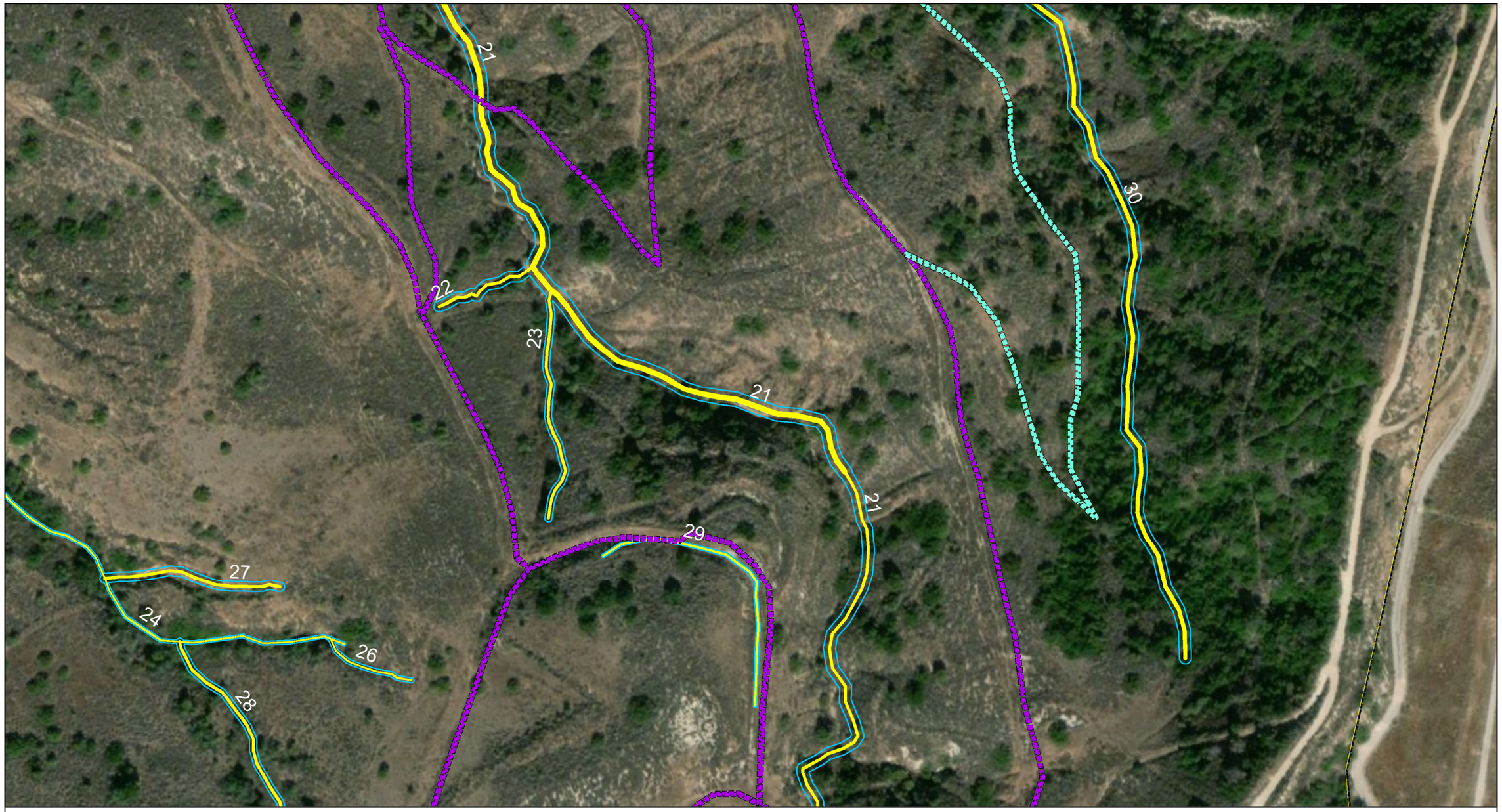
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4w

Title

Jurisdictional Waters - East Orange I



East Orange I - Primary Trail

East Orange I - Secondary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes

1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

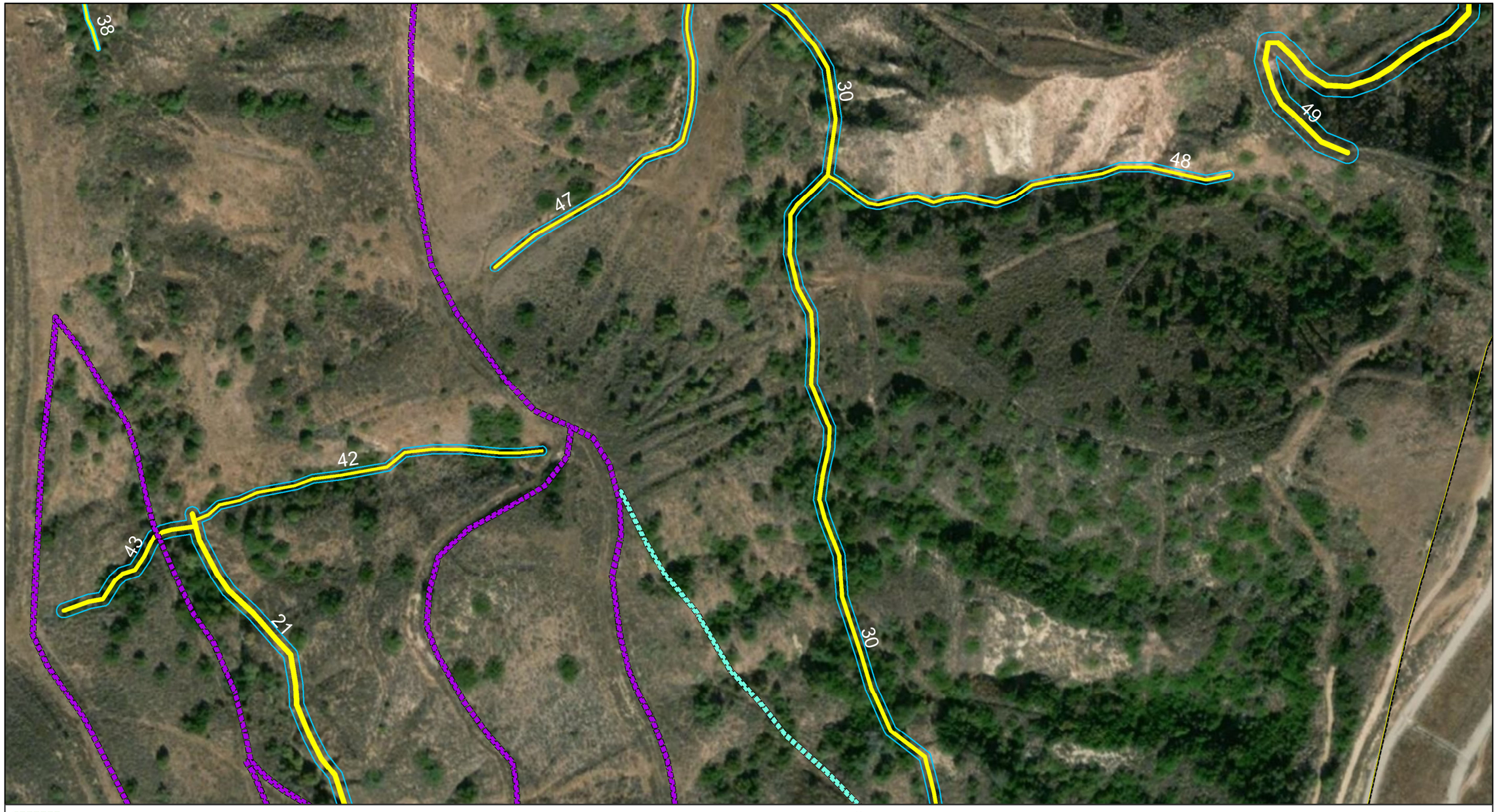
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4x

Title

Jurisdictional Waters - East Orange I



East Orange I - Primary Trail

East Orange I - Secondary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

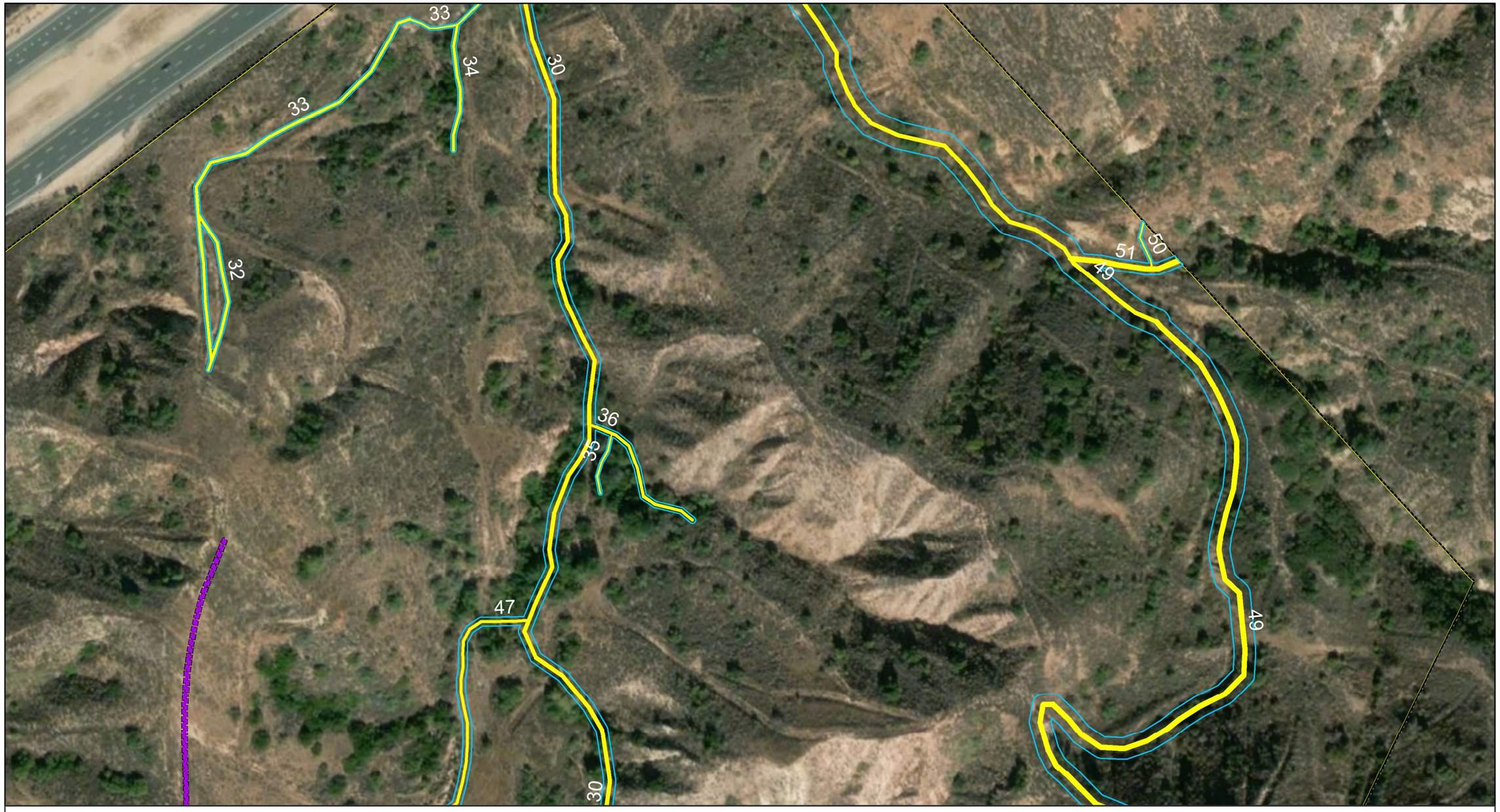
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4y

Title

Jurisdictional Waters - East Orange I



East Orange I - Primary Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

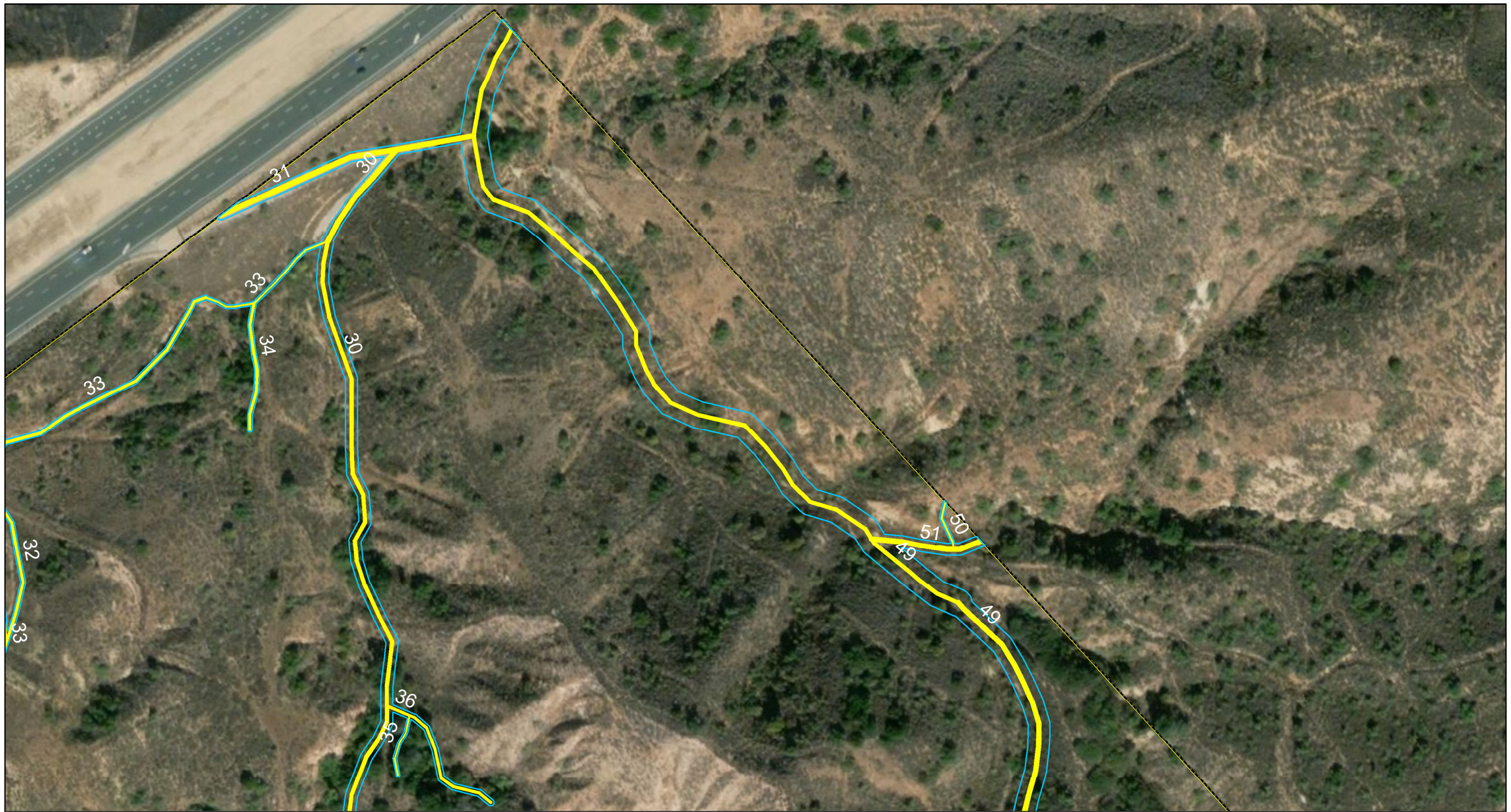
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4z

Title

Jurisdictional Waters - East Orange I



Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4aa

Title

Jurisdictional Waters - East Orange I



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4bb

Title

Jurisdictional Waters - East Orange II



Soil Pits

East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. MUSYM - Refer to Section 2 of the Preliminary Jurisdictional Delineation Report for more information on MUSYM in the Survey Area.

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4cc

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4dd

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4ee

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

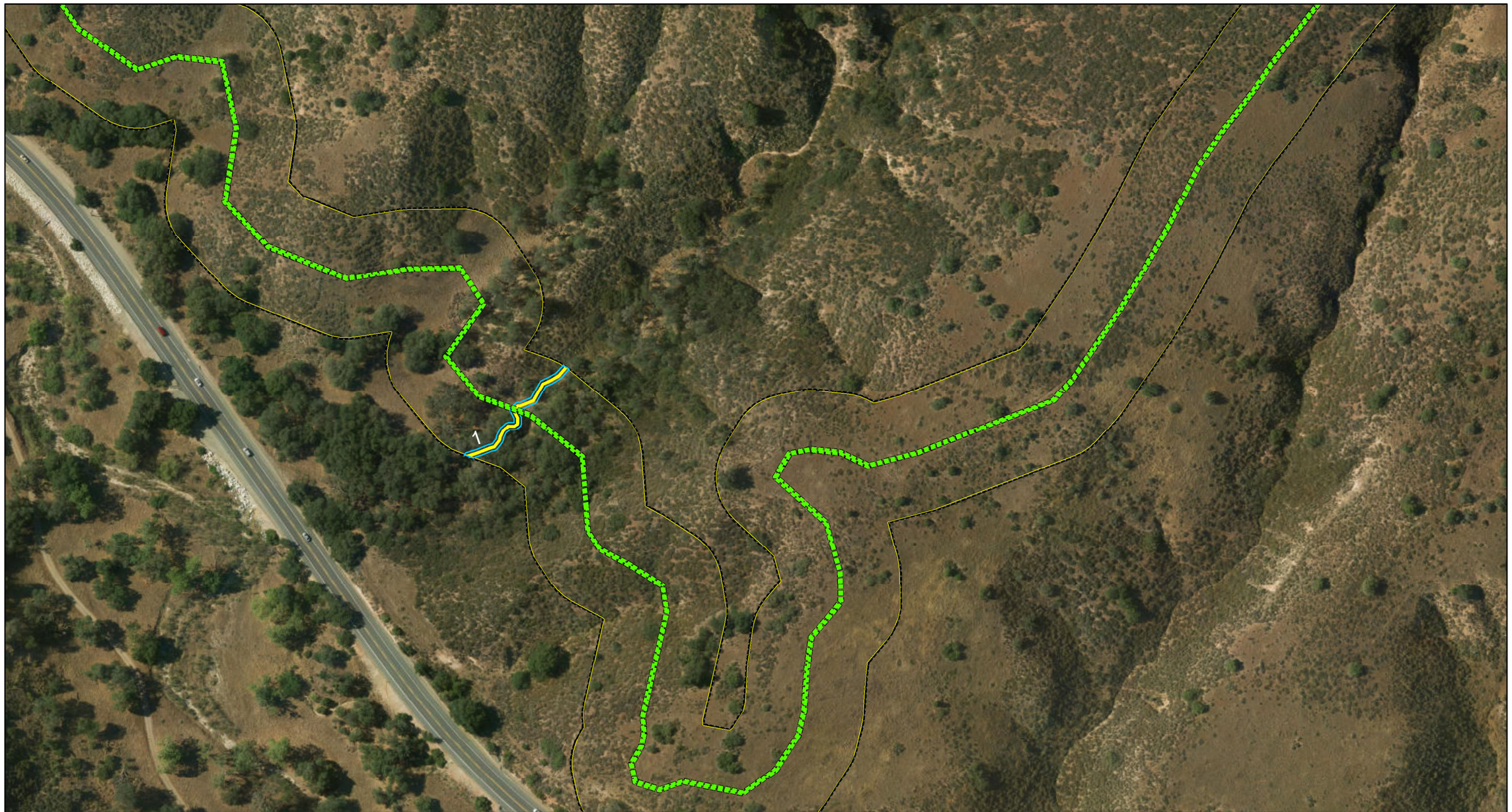
Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4ff

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4gg

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4hh

Title

Jurisdictional Waters - East Orange II

East Orange II Trail

Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4ii

Title

Jurisdictional Waters - East Orange II



Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4jj

Title

Jurisdictional Waters - East Orange II



Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4kk

Title

Jurisdictional Waters - East Orange II

East Orange II Trail

Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SK on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4II

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4mm

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4nn

Title

Jurisdictional Waters - East Orange II



Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4oo

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4pp

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4qq

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4rr

Title

Jurisdictional Waters - East Orange II



East Orange II Trail

Jurisdictional Delineation Survey Area

Federal Non-Wetland "Waters of the U.S."

CDFW Jurisdictional Waters

N

0 80 160 Feet

1:2,000 (At original document size of 8.5x11)

Notes
1. NAD 1983 CORS96 StatePlane California VI FIPS 0406 Ft US
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

Project Location

Santiago Canyon/ Anaheim, CA

Prepared by DL on 2019-03-25
Technical Review by JV on 2019-03-25
Independent Review by SR on 2019-03-26

Client/Project

Orange County Parks
Interim Recreation and Resource Management Plan
Mountain Park, East Orange I and II, and Oak Canyon Trail
Preliminary Jurisdictional Wetlands/Waters Report

Figure No.

4ss

Title

Jurisdictional Waters - East Orange II

Appendix B SITE PHOTOGRAPHS

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 1



Oak Canyon BSA – looking southwest at drainage basin and berm.

Photo 2



Oak Canyon BSA – looking northwest at drainage basin and berm.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 3



Mountain Park BSA – looking upstream from top of bank of dry streambed, typical of upper reaches of larger drainage channels on site.

Photo 4



Mountain Park BSA – a typical hillslope view of red brome grassland with early successional shrub species.

STANTEC CONSULTING SERVICES INC.
PHOTOGRAPHIC RECORD

Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 5



Mountain Park BSA – looking north at a slope exhibiting typical red brome grassland and prickly pear scrub habitats.

Photo 6



Mountain Park BSA – looking east at typical area of burned coast live oak woodland habitat.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 7



East Orange I BSA – looking northeast at typical California sagebrush scrub habitat in eastern portion of BSA with drainages and detention basin near the intersection of SRs 241 and 261.

Photo 8



East Orange I BSA – looking east at typical wild oats grasslands with overstory of previous year's mustard stalks.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 9



East Orange I BSA – looking downstream at typical steeply-incised drainage located in the upper elevations of the northern portion of the BSA.

Photo 10



East Orange I BSA – looking south at Wetland 1, an isolated Palustrine Scrub-Shrub (PSS) feature with low-lying mulefat thicket habitat.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 11



East Orange I BSA – close-up of Wetland 2, a Palustrine Forested (PFO) feature along Santiago Canyon Road connected to an ephemeral drainage, with Arroyo willow thickets habitat.

Photo 12



East Orange I BSA – looking south at Wetland 3, a Palustrine Emergent (PEM) feature developed within an excavated detention basin.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 13



East Orange I BSA – looking upstream at one of two substantial northward-trending drainages in the northern half of the BSA. Typical California sage scrub habitat on dry slope of ravine with Coast live oak habitat within the drainage channel in the background.

Photo 14



East Orange II BSA – looking south at Wild oats grasslands habitat typical of much of the lower elevations within the BSA.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 15



East Orange II BSA – looking south at a representative ravine in the upper elevations within the BSA with Chamise chaparral habitat.

Photo 16



East Orange II BSA – looking north at Annual brome grasslands habitat in the lower elevations within the BSA with Coast live oak woodland habitat along the hillside and drainage channel in the background.

STANTEC CONSULTING SERVICES INC. PHOTOGRAPHIC RECORD	
Client: OC Parks	**Job Number:** 185804191
Site Name: Irvine Ranch Open Space	**Photographers:** J. Seamands, R. Brown

Photo 17



East Orange II BSA – looking upstream at a representative ephemeral drainage in the lower elevations of the BSA with typical Coast live oak woodland habitat.

Photo 18



East Orange II BSA – typical California sage scrub habitat occupying steep slopes of upper elevations within the BSA.

Appendix C HISTORIC SOILS INFORMATION

Orange County and Part of Riverside County, California

100—Alo clay, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hcl7
Elevation: 0 to 1,460 feet
Mean annual precipitation: 11 to 19 inches
Mean annual air temperature: 61 to 65 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Alo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alo

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous residuum weathered from sandstone and shale

Typical profile

A1 - 0 to 2 inches: clay
A2 - 2 to 15 inches: clay
Bkss - 15 to 25 inches: clay
Cr1 - 25 to 41 inches: bedrock
Cr2 - 41 to 59 inches: bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 20 to 39 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Bosanko, clay
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Anaheim, clay loam
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Balcom, clay loam
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

101—Alo clay, 15 to 30 percent slopes, dry

Map Unit Setting
National map unit symbol: 2y8sm
Elevation: 20 to 1,720 feet
Mean annual precipitation: 13 to 16 inches
Mean annual air temperature: 64 to 65 degrees F
Frost-free period: 360 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Alo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alo

Setting
Landform: Ridges
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Crest, side slope

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from calcareous sandstone or shale

Typical profile

A - 0 to 15 inches: clay
Bkss - 15 to 22 inches: clay
Cr - 22 to 59 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 22 to 26 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Bonsall, clay

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Balcom, clay loam

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Anaheim, clay loam

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Crest, side slope

Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

102—Alo clay, 30 to 50 percent slopes, warm MAAT, MLRA 20

Map Unit Setting

National map unit symbol: 2tyzn
Elevation: 10 to 1,890 feet
Mean annual precipitation: 12 to 21 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 300 to 360 days
Farmland classification: Not prime farmland

Map Unit Composition

Alo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alo

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

A - 0 to 15 inches: clay
Bkss - 15 to 22 inches: clay
Cr - 22 to 79 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 30 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Anaheim

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Balcom

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Calleguas

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Bosanko

Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

103—Alo variant clay, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hclb
Elevation: 200 to 700 feet

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 280 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Alo variant and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alo Variant

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 26 inches: clay
H2 - 26 to 40 inches: clay
H3 - 40 to 59 inches: weathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Alo variant, calcareous

Percent of map unit: 10 percent
Hydric soil rating: No

Myford, sandy loam

Percent of map unit: 2 percent
Hydric soil rating: No

Bosanko, clay

Percent of map unit: 2 percent

Hydric soil rating: No

Yorba, gravelly sandy loam
Percent of map unit: 1 percent
Hydric soil rating: No

104—Alo variant clay, 15 to 30 percent slopes

Map Unit Setting
National map unit symbol: hclc
Elevation: 200 to 700 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 280 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition
Alo variant and similar soils: 70 percent
Alo variant, calcareous: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alo Variant

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sedimentary rock

Typical profile
H1 - 0 to 25 inches: clay
H2 - 25 to 38 inches: clay
H3 - 38 to 59 inches: weathered bedrock

Properties and qualities
Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Description of Alo Variant, Calcareous

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Properties and qualities

Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Bosanko, clay

Percent of map unit: 5 percent
Hydric soil rating: No

Myford, sandy loam

Percent of map unit: 3 percent
Hydric soil rating: No

Anaheim, clay loam

Percent of map unit: 2 percent
Hydric soil rating: No

105—Alo variant clay, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hcld
Elevation: 200 to 700 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 280 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Alo variant and similar soils: 70 percent
Alo variant, calcareous: 20 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alo Variant

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 25 inches: clay
H2 - 25 to 38 inches: clay
H3 - 38 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Description of Alo Variant, Calcareous

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Properties and qualities

Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Bosanko, clay

Percent of map unit: 5 percent
Hydric soil rating: No

Calleguas, clay loam
Percent of map unit: 5 percent
Hydric soil rating: No

107—Anaheim loam, 30 to 50 percent slopes

Map Unit Setting
National map unit symbol: hclg
Elevation: 40 to 2,060 feet
Mean annual precipitation: 11 to 19 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Anaheim and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Anaheim

Setting
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine grained residuum weathered from sandstone and shale

Typical profile
A1 - 0 to 9 inches: loam
A2 - 9 to 17 inches: loam
A3 - 17 to 26 inches: loam
Cr - 26 to 54 inches: bedrock

Properties and qualities
Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 39 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

Anaheim, clay loam
Percent of map unit: 7 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Cieneba, sandy loam
Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)
Hydric soil rating: No

Nacimiento, clay loam
Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

108—Anaheim clay loam, 15 to 30 percent slopes

Map Unit Setting
National map unit symbol: hclh
Elevation: 100 to 2,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition
Anaheim and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Anaheim

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine grained residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 26 inches: clay loam
H2 - 26 to 59 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Alo, clay

Percent of map unit: 5 percent
Hydric soil rating: No

Anaheim, clay loam

Percent of map unit: 5 percent
Hydric soil rating: No

Nacimiento, clay loam

Percent of map unit: 5 percent
Hydric soil rating: No

Balcom, clay loam

Percent of map unit: 3 percent
Hydric soil rating: No

Cieneba, sandy loam

Percent of map unit: 2 percent
Hydric soil rating: No

109—Anaheim clay loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hclj
Elevation: 20 to 2,710 feet
Mean annual precipitation: 11 to 19 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Anaheim and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Anaheim

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine grained residuum weathered from sandstone and shale

Typical profile

A1 - 0 to 9 inches: clay loam
A2 - 9 to 17 inches: clay loam
A3 - 17 to 26 inches: clay loam
Cr - 26 to 59 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 39 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Alo

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Nacimiento, clay loam

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Calleguas

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW CLAYEY (1975) (R019XD071CA)
Hydric soil rating: No

Cieneba, sandy loam

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)
Hydric soil rating: No

110—Anaheim clay loam, 50 to 75 percent slopes

Map Unit Setting

National map unit symbol: hclk
Elevation: 100 to 2,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 300 to 350 days

Farmland classification: Not prime farmland

Map Unit Composition

Anaheim and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Anaheim

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine grained residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 21 inches: clay loam
H2 - 21 to 59 inches: weathered bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 20 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Cieneba, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Calleguas, clay loam

Percent of map unit: 5 percent
Hydric soil rating: No

111—Balcom clay loam, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hcll
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 260 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Balcom and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Balcom

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 34 inches: clay loam
H2 - 34 to 59 inches: weathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 24 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Bosanko, clay
Percent of map unit: 5 percent
Hydric soil rating: No

Calleguas, clay loam
Percent of map unit: 4 percent
Hydric soil rating: No

San andreas, sandy loam
Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 2 percent
Hydric soil rating: No

112—Balcom clay loam, 15 to 30 percent slopes

Map Unit Setting
National map unit symbol: hclm
Elevation: 10 to 1,620 feet
Mean annual precipitation: 11 to 19 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Balcom and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Balcom

Setting
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous residuum weathered from sandstone and shale

Typical profile
A - 0 to 19 inches: clay loam
Bk - 19 to 34 inches: clay loam
Cr - 34 to 44 inches: bedrock

Properties and qualities
Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 39 inches to paralithic bedrock

Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Bosanko, clay

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Cieneba, sandy loam

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)
Hydric soil rating: No

Calleguas

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW CLAYEY (1975) (R019XD071CA)
Hydric soil rating: No

114—Balcom-Rock outcrop complex, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: hclp
Elevation: 650 to 4,000 feet
Mean annual precipitation: 8 to 15 inches
Mean annual air temperature: 45 to 63 degrees F
Frost-free period: 110 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Balcom and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Balcom

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 27 inches: clay loam
H2 - 27 to 59 inches: weathered bedrock

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: 24 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Rock outcrop
Percent of map unit: 10 percent
Hydric soil rating: No

Calleguas, clay loam
Percent of map unit: 10 percent
Hydric soil rating: No

Cieneba, sandy loam
Percent of map unit: 5 percent
Hydric soil rating: No

126—Bosanko clay, 9 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2xm61
Elevation: 100 to 2,040 feet
Mean annual precipitation: 9 to 16 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 321 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Bosanko and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bosanko

Setting
Landform: Hillslopes, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile
Ap - 0 to 5 inches: clay
Bss - 5 to 25 inches: clay
Bk - 25 to 37 inches: clay
Cr - 37 to 79 inches: bedrock

Properties and qualities
Slope: 9 to 15 percent
Depth to restrictive feature: 26 to 38 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Bonsall

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Falllbrook

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Vista

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Balcom

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Alo

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

127—Bosanko clay, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2xm5y
Elevation: 120 to 1,080 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 353 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Bosanko and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bosanko

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Acid residuum weathered from igneous rock

Typical profile

Ap - 0 to 5 inches: clay
Bss - 5 to 25 inches: clay
Bk - 25 to 35 inches: clay
Cr - 35 to 79 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 26 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Balcom

Percent of map unit: 6 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Alo

Percent of map unit: 6 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Bonsall

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Fallbrook

Percent of map unit: 1 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Vista

Percent of map unit: 1 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

130—Bosanko-Balcom complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hcm6
Elevation: 300 to 2,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 260 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Bosanko and similar soils: 45 percent
Balcom and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bosanko

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile

H1 - 0 to 15 inches: clay
H2 - 15 to 27 inches: clay, clay loam, silty clay
H2 - 15 to 27 inches: weathered bedrock
H2 - 15 to 27 inches:
H3 - 27 to 31 inches:

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 22 to 32 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Description of Balcom

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 30 inches: clay loam
H2 - 30 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 24 to 30 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Unnamed, steeper soils

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, less sloping soils

Percent of map unit: 5 percent
Hydric soil rating: No

Alo, clay

Percent of map unit: 2 percent
Hydric soil rating: No

Calleguas, clay loam

Percent of map unit: 2 percent
Hydric soil rating: No

Cieneba, sandy loam

Percent of map unit: 1 percent
Hydric soil rating: No

132—Botella clay loam, 2 to 9 percent slopes, warm MAAT, MLRA 19

Map Unit Setting

National map unit symbol: 2tyz8
Elevation: 80 to 1,450 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 64 to 65 degrees F
Frost-free period: 330 to 360 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Botella and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Botella

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, flat
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from sedimentary rock

Typical profile

A - 0 to 8 inches: clay loam
2Bt - 8 to 35 inches: silty clay loam
2C - 35 to 66 inches: clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Sorrento

Percent of map unit: 6 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mocho

Percent of map unit: 4 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

134—Calleguas clay loam, 50 to 75 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2xm62
Elevation: 220 to 2,110 feet
Mean annual precipitation: 13 to 18 inches
Mean annual air temperature: 64 to 65 degrees F
Frost-free period: 353 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Calleguas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calleguas

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from calcareous shale

Typical profile

A1 - 0 to 7 inches: clay loam
A2 - 7 to 11 inches: clay loam
A3 - 11 to 15 inches: very channery clay loam
Cr - 15 to 59 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: SHALLOW CLAYEY (1975) (R019XD071CA)
Hydric soil rating: No

Minor Components

Cieneba

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Balcom

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Anaheim

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

135—Capistrano sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hcmc
Elevation: 0 to 2,500 feet
Mean annual precipitation: 14 to 25 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 240 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Capistrano and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Capistrano

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, flat
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 27 inches: sandy loam
H2 - 27 to 65 inches: fine sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

Capistrano, gravelly
Percent of map unit: 5 percent
Hydric soil rating: No

Hanford
Percent of map unit: 5 percent
Hydric soil rating: No

Corralitos, loamy sand
Percent of map unit: 5 percent
Hydric soil rating: No

Myford, sandy loam
Percent of map unit: 3 percent
Hydric soil rating: No

Ramona, fine sandy loam
Percent of map unit: 2 percent
Hydric soil rating: No

141—Cieneba sandy loam, 15 to 30 percent slopes

Map Unit Setting
National map unit symbol: hcmk
Elevation: 500 to 4,000 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition
Cieneba and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile
H1 - 0 to 17 inches: sandy loam
H2 - 17 to 59 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 4 to 20 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)
Hydric soil rating: No

Minor Components

San andreas, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Anaheim, loam

Percent of map unit: 5 percent
Hydric soil rating: No

Soper, gravelly loam

Percent of map unit: 5 percent
Hydric soil rating: No

142—Cieneba sandy loam, 30 to 75 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcml
Elevation: 500 to 4,000 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Cieneba and similar soils: 65 percent
Minor components: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hills

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 4 to 20 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)
Hydric soil rating: No

Minor Components

Cieneba, uneroded

Percent of map unit: 10 percent
Hydric soil rating: No

San andreas, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Soper, cobbly loam

Percent of map unit: 5 percent
Hydric soil rating: No

Calleguas, clay loam

Percent of map unit: 5 percent
Hydric soil rating: No

Vista, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Tollhouse

Percent of map unit: 2 percent
Hydric soil rating: No

Blasingame, loam

Percent of map unit: 1 percent
Hydric soil rating: No

145—Cieneba-Rock outcrop complex, 30 to 75 percent slopes

Map Unit Setting

National map unit symbol: hcmp
Elevation: 500 to 4,000 feet
Mean annual precipitation: 8 to 35 inches
Mean annual air temperature: 45 to 64 degrees F
Frost-free period: 110 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Cieneba and similar soils: 60 percent
Rock outcrop: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 7 to 20 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D

Ecological site: SHALLOW LOAMY - ROCK OUTCROP COMPLEX (R019XD073CA)
Hydric soil rating: No

Description of Rock Outcrop

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile
H1 - 0 to 4 inches: unweathered bedrock

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Anaheim, loam
Percent of map unit: 5 percent
Hydric soil rating: No

Tollhouse, soils
Percent of map unit: 2 percent
Hydric soil rating: No

San andreas, sandy loam
Percent of map unit: 2 percent
Hydric soil rating: No

Vista, coarse sandy loam
Percent of map unit: 1 percent
Hydric soil rating: No

146—Corralitos loamy sand

Map Unit Setting
National map unit symbol: hcmq
Elevation: 30 to 1,000 feet
Mean annual precipitation: 12 to 30 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 230 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Corralitos and similar soils: 65 percent
Unnamed: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corralitos

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, flat
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 60 inches: stratified sand to loamy sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: SANDY (1975) (R019XD035CA)
Hydric soil rating: No

Description of Unnamed

Setting

Parent material: Alluvium derived from mixed

Properties and qualities

Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Riverwash

Percent of map unit: 5 percent
Landform: Fans
Hydric soil rating: Yes

Metz, loamy sand
Percent of map unit: 5 percent
Hydric soil rating: No

Soboba, gravelly loamy sand
Percent of map unit: 3 percent
Hydric soil rating: No

Capistrano, sandy loam
Percent of map unit: 2 percent
Hydric soil rating: No

154—Gabino gravelly clay loam, 15 to 50 percent slopes

Map Unit Setting
National map unit symbol: hcmz
Elevation: 200 to 2,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 290 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition
Gabino and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gabino

Setting
Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile
H1 - 0 to 10 inches: gravelly clay loam
H2 - 10 to 38 inches: gravelly clay, cobbly clay
H2 - 10 to 38 inches: stratified very cobbly sand to very gravelly sand
H3 - 38 to 50 inches:

Properties and qualities
Slope: 15 to 50 percent
Depth to restrictive feature: 26 to 40 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: CLAYEY (1975) (R019XD001CA)
Hydric soil rating: No

Minor Components

Soper, cobbly loam

Percent of map unit: 4 percent
Hydric soil rating: No

Myford, sandy loam

Percent of map unit: 4 percent
Hydric soil rating: No

Gabino, less sloping or steeper

Percent of map unit: 4 percent
Hydric soil rating: No

Yorba, cobbly sandy loam

Percent of map unit: 3 percent
Hydric soil rating: No

173—Myford sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hcnl
Elevation: 0 to 1,560 feet
Mean annual precipitation: 11 to 18 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Myford and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myford

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Alluvium derived from sandstone

Typical profile

A1 - 0 to 1 inches: sandy loam
A2 - 1 to 4 inches: sandy loam
A3 - 4 to 12 inches: sandy loam
Bt1 - 12 to 18 inches: sandy clay
Bt2 - 18 to 28 inches: sandy clay loam
Btk1 - 28 to 35 inches: sandy clay loam
Btk2 - 35 to 41 inches: sandy clay loam
B't1 - 41 to 49 inches: sandy clay loam
B't2 - 49 to 61 inches: sandy clay loam
Bt3 - 61 to 71 inches: sandy clay loam
C - 71 to 79 inches: sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 8 to 20 inches to abrupt textural change
Natural drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Minor Components

Myford, thick surface

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Capistrano

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: LOAMY (1975) (R019XD029CA)

Hydric soil rating: No

Yorba, gravelly sandy loam

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Chesterton, loamy sand

Percent of map unit: 3 percent
Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Water

Percent of map unit: 2 percent
Landform: Depressions

175—Myford sandy loam, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hcnn
Elevation: 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 270 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Myford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myford

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium derived from mixed

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 18 inches: sandy clay
H3 - 18 to 28 inches: sandy clay loam
H4 - 28 to 71 inches: sandy clay loam
H5 - 71 to 79 inches: sandy loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: About 12 inches to abrupt textural change
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Minor Components

Myford, sandy loam, eroded

Percent of map unit: 5 percent
Hydric soil rating: No

Capistrano, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Yorba, gravelly sandy loam

Percent of map unit: 3 percent
Hydric soil rating: No

San andreas, sandy loam

Percent of map unit: 2 percent
Hydric soil rating: No

176—Myford sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hcnp

Elevation: 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 270 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Myford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myford

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 18 inches: sandy clay
H3 - 18 to 28 inches: sandy clay loam
H4 - 28 to 71 inches: sandy clay loam
H5 - 71 to 79 inches: sandy loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: About 12 inches to abrupt textural change
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Minor Components

Myford, sandy loam, eroded

Percent of map unit: 5 percent
Hydric soil rating: No

Myford, less sloping or steeper

Percent of map unit: 5 percent

Hydric soil rating: No

Cieneba, sandy loam
Percent of map unit: 3 percent
Hydric soil rating: No

Yorba, gravelly sandy loam
Percent of map unit: 2 percent
Hydric soil rating: No

177—Myford sandy loam, 9 to 30 percent slopes, eroded

Map Unit Setting
National map unit symbol: hcnq
Elevation: 0 to 2,100 feet
Mean annual precipitation: 11 to 18 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Myford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myford

Setting
Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone

Typical profile
A - 0 to 7 inches: sandy loam
Bt - 7 to 11 inches: sandy clay
Btk - 11 to 21 inches: sandy clay loam
B't - 21 to 64 inches: sandy clay loam
C - 64 to 79 inches: sandy loam

Properties and qualities
Slope: 9 to 30 percent
Depth to restrictive feature: 4 to 10 inches to abrupt textural change
Natural drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 0.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Minor Components

Myford, sandy loam
Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Cieneba, sandy loam
Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)
Hydric soil rating: No

Yorba, cobbly sandy loam
Percent of map unit: 2 percent
Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

185—Pits

Map Unit Composition
Pits: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Igneous, metamorphic and sedimentary rock

Typical profile

H1 - 0 to 6 inches: extremely gravelly coarse sand
H2 - 6 to 60 inches: extremely gravelly sand, extremely gravelly coarse sand, very gravelly coarse sand
H2 - 6 to 60 inches:
H2 - 6 to 60 inches:

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

191—Riverwash

Map Unit Composition

Riverwash: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverwash

Setting

Landform: Fans
Parent material: Sandy and gravelly alluvium

Typical profile

C1 - 0 to 6 inches: gravelly sand
C2 - 6 to 60 inches: stratified gravelly coarse sand to sandy loam

Properties and qualities

Slope: 0 to 5 percent
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 24 inches
Frequency of flooding: Frequent
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8w
Hydric soil rating: Yes

192—Rock outcrop-Cieneba complex, 30 to 75 percent slopes

Map Unit Setting

National map unit symbol: hcp6
Elevation: 500 to 4,000 feet
Mean annual precipitation: 8 to 35 inches
Mean annual air temperature: 45 to 64 degrees F
Frost-free period: 110 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 50 percent
Cieneba and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Description of Cieneba

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 4 to 20 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY - ROCK OUTCROP COMPLEX (R019XD073CA)
Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 3 percent
Hydric soil rating: No

Anaheim, loam

Percent of map unit: 3 percent
Hydric soil rating: No

Soper, cobbly loam

Percent of map unit: 3 percent
Hydric soil rating: No

Tollhouse

Percent of map unit: 1 percent
Hydric soil rating: No

193—San Andreas sandy loam, 15 to 30 percent slopes, warm MAAT, MLRA 20

Map Unit Setting

National map unit symbol: 2x533
Elevation: 40 to 1,810 feet
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

San andreas and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Andreas

Setting

Landform: Hillslopes, mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 31 inches: sandy loam
H2 - 31 to 39 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Cieneba

Percent of map unit: 5 percent
Landform: Mountain slopes, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Hydric soil rating: No

Anaheim

Percent of map unit: 3 percent
Landform: Hillslopes, mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Hydric soil rating: No

Myford

Percent of map unit: 2 percent
Landform: Mountain slopes, terraces

Landform position (three-dimensional): Mountainflank, riser
Down-slope shape: Convex, concave, linear
Across-slope shape: Convex, concave, linear
Hydric soil rating: No

197—Soboba gravelly loamy sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hcpc
Elevation: 30 to 4,200 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 175 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Soboba and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soboba

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, flat
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly alluvium derived from mixed

Typical profile

H1 - 0 to 10 inches: gravelly loamy sand
H2 - 10 to 60 inches: very gravelly sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: SANDY (1975) (R019XD035CA)
Hydric soil rating: No

Minor Components

Unnamed
Percent of map unit: 10 percent
Hydric soil rating: No

Riverwash
Percent of map unit: 5 percent
Landform: Fans
Hydric soil rating: Yes

Corralitos, loamy sand
Percent of map unit: 5 percent
Hydric soil rating: No

Soboba, gravelly loamy sand
Percent of map unit: 5 percent
Hydric soil rating: No

199—Soper loam, 15 to 30 percent slopes

Map Unit Setting
National map unit symbol: hcpf
Elevation: 100 to 2,500 feet
Mean annual precipitation: 12 to 25 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition
Soper and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soper

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile
H1 - 0 to 9 inches: loam
H2 - 9 to 30 inches: clay loam
H3 - 30 to 59 inches: weathered bedrock

Properties and qualities
Slope: 15 to 30 percent

Depth to restrictive feature: 20 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

Anaheim, loam
Percent of map unit: 5 percent
Hydric soil rating: No

Alo, clay
Percent of map unit: 5 percent
Hydric soil rating: No

Cieneba, sandy loam
Percent of map unit: 3 percent
Hydric soil rating: No

Balcom, clay loam
Percent of map unit: 2 percent
Hydric soil rating: No

200—Soper loam, 30 to 50 percent slopes

Map Unit Setting
National map unit symbol: hcpg
Elevation: 100 to 2,500 feet
Mean annual precipitation: 12 to 25 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition
Soper and similar soils: 65 percent
Minor components: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soper

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 30 inches: gravelly clay loam
H3 - 30 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

Soper, low sloping or steeper loams

Percent of map unit: 10 percent
Hydric soil rating: No

Severly eroded areas

Percent of map unit: 10 percent
Hydric soil rating: No

Alo, clay

Percent of map unit: 5 percent
Hydric soil rating: No

Anaheim, loam

Percent of map unit: 5 percent
Hydric soil rating: No

Cieneba, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

202—Soper gravelly loam, 30 to 50 percent slopes, MLRA 20

Map Unit Setting

National map unit symbol: 2wv8f
Elevation: 10 to 2,010 feet
Mean annual precipitation: 13 to 18 inches
Mean annual air temperature: 63 to 65 degrees F
Frost-free period: 271 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Soper and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soper

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

A - 0 to 8 inches: gravelly loam
Bt - 8 to 29 inches: gravelly clay loam
Cr - 29 to 79 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 22 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

Cieneba

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Yorba

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Gabino

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Gaviota

Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Fontana

Percent of map unit: 1 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

203—Soper cobbly loam, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: hcpk
Elevation: 100 to 2,500 feet
Mean annual precipitation: 12 to 25 inches
Frost-free period: 250 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Soper and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soper

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 9 inches: cobbly loam
H2 - 9 to 30 inches: cobbly clay loam, cobbly sandy clay loam, cobbly loam
H2 - 9 to 30 inches: weathered bedrock
H2 - 9 to 30 inches:
H3 - 30 to 59 inches:

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: 20 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

Yorba, cobbly sandy loam
Percent of map unit: 5 percent
Hydric soil rating: No

Soper, gravelly loam
Percent of map unit: 5 percent
Hydric soil rating: No

Gabino, gravelly clay loam
Percent of map unit: 3 percent
Hydric soil rating: No

Cieneba, rock outcrop complex
Percent of map unit: 1 percent
Hydric soil rating: No

Cieneba, sandy loam
Percent of map unit: 1 percent
Hydric soil rating: No

204—Soper-Rock outcrop complex, 30 to 75 percent slopes

Map Unit Setting
National map unit symbol: hcpl
Elevation: 100 to 4,000 feet
Mean annual precipitation: 8 to 25 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 110 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition
Soper and similar soils: 60 percent
Soper, cobbly loam: 20 percent
Rock outcrop: 15 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soper

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile
H1 - 0 to 4 inches: gravelly loam

H2 - 4 to 20 inches: gravelly clay loam, gravelly sandy clay loam, gravelly loam
H2 - 4 to 20 inches: weathered bedrock
H2 - 4 to 20 inches:
H3 - 20 to 59 inches:

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 20 to 24 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: SHALLOW LOAMY - ROCK OUTCROP COMPLEX (R019XD073CA)
Hydric soil rating: No

Description of Soper, Cobbly Loam

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 4 inches: gravelly loam

Properties and qualities

Depth to restrictive feature: More than 80 inches
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 0.6 inches)

Description of Rock Outcrop

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Cieneba, sandy loam

Percent of map unit: 3 percent
Hydric soil rating: No

Anaheim, loam

Percent of map unit: 2 percent
Hydric soil rating: No

207—Sorrento loam, 2 to 9 percent slopes, warm MAAT, MLRA 19

Map Unit Setting

National map unit symbol: 2tz0c
Elevation: 0 to 1,340 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 62 to 66 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Sorrento and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sorrento

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

A - 0 to 12 inches: loam
AB - 12 to 37 inches: silty clay loam
Bk - 37 to 62 inches: silty clay loam

2C - 62 to 72 inches: sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

Mocho

Percent of map unit: 7 percent
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Anacapa

Percent of map unit: 2 percent
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Garretson

Percent of map unit: 2 percent
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Pico

Percent of map unit: 2 percent
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Botella

Percent of map unit: 2 percent
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

226—Yorba cobbly sandy loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hcq9
Elevation: 100 to 2,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Yorba and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yorba

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Sandy and gravelly alluvium derived from mixed

Typical profile

H1 - 0 to 11 inches: very cobbly sandy loam
H2 - 11 to 40 inches: very gravelly sandy clay loam
H3 - 40 to 63 inches: very gravelly sandy loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: CLAYPAN (1975) (R019XD061CA)
Hydric soil rating: No

Minor Components

Myford, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Gabino, gravelly clay loam

Percent of map unit: 5 percent
Hydric soil rating: No

Soper, cobbly loam

Percent of map unit: 3 percent
Hydric soil rating: No

Modjeska, gravelly loam

Percent of map unit: 2 percent
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the following National Soil Survey Handbook link: “National Soil Survey Handbook.”

ABC soil

A soil having an A, a B, and a C horizon.

Ablation till

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

AC soil

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low: 0 to 3
Low: 3 to 6
Moderate: 6 to 9
High: 9 to 12
Very high: More than 12

Backslope

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Bajada

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

Basal area

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology)

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology)

from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout (map symbol)

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Borrow pit (map symbol)

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

Bottom land

An informal term loosely applied to various portions of a flood plain.

Boulders

Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR)

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy

The leafy crown of trees or shrubs. (See Crown.)

Canyon

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena

A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps

See Terracettes.

Cement rock

Shaly limestone used in the manufacture of cement.

Channery soil material

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment

Control of unwanted vegetation through the use of chemicals.

Chiseling

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clay

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions

See Redoximorphic features.

Clay film

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay spot (map symbol)

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

Claypan

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil

Sand or loamy sand.

Cobble (or cobblestone)

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility)

See Linear extensibility.

Colluvium

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions

See Redoximorphic features.

Conglomerate

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat)

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology)

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations)

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system

Growing crops according to a planned system of rotation and management practices.

Cross-slope farming

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown

The upper part of a tree or shrub, including the living branches and their foliage.

Cryoturbate

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

Cuesta

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

Culmination of the mean annual increment (CMAI)

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave

The walls of excavations tend to cave in or slough.

Decreasers

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing

Postponing grazing or resting grazing land for a prescribed period.

Delta

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression, closed (map symbol)

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

Depth, soil

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diatomaceous earth

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace)

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural)

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface

Runoff, or surface flow of water, from an area.

Drainageway

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill

See Mine spoil.

Ecological site

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated)

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic)

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface

A land surface shaped by the action of erosion, especially by running water.

Escarpment

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Escarpment, bedrock (map symbol)

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, nonbedrock (map symbol)

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

Esker

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left

behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat)

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity

The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil

Sandy clay, silty clay, or clay.

Firebreak

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Forest cover

All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glaciofluvial deposits

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping

Growing crops in strips that grade toward a protected waterway.

Grassed waterway

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit (map symbol)

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

Gravelly soil material

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol)

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

Green manure crop (agronomy)

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water

Water filling all the unblocked pores of the material below the water table.

Gully (map symbol)

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology)

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat)

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon: An organic layer of fresh and decaying plant residue.

L horizon: A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon: The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon: The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon: The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon: The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon: Soft, consolidated bedrock beneath the soil.

R layer: Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

M layer: A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

W layer: A layer of water within or beneath the soil.

Humus

The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Very low: Less than 0.2
Low: 0.2 to 0.4
Moderately low: 0.4 to 0.75
Moderate: 0.75 to 1.25
Moderately high: 1.25 to 1.75
High: 1.75 to 2.5
Very high: More than 2.5

Interfluve

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology)

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions

See Redoximorphic features.

Irrigation

Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin: Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border: Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding: Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation: Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle): Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow: Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler: Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation: Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding: Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography)

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll

A small, low, rounded hill rising above adjacent landforms.

Ksat

See Saturated hydraulic conductivity.

Lacustrine deposit

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landfill (map symbol)

An area of accumulated waste products of human habitation, either above or below natural ground level.

Landslide

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lava flow (map symbol)

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

Leaching

The removal of soluble material from soil or other material by percolating water.

Levee (map symbol)

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit

The moisture content at which the soil passes from a plastic to a liquid state.

Loam

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength

The soil is not strong enough to support loads.

Low-residue crops

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Marsh or swamp (map symbol)

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

Mass movement

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses

See Redoximorphic features.

Meander belt

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment

Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil

Very fine sandy loam, loam, silt loam, or silt.

Mesa

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Metamorphic rock

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth’s crust. Nearly all such rocks are crystalline.

Mine or quarry (map symbol)

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

Mine spoil

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage

Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area

A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol)

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil

Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil

Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can

occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Muck

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat

See Hemic soil material.

Mudstone

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules

See Redoximorphic features.

Nose slope (geomorphology)

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low: Less than 0.5 percent
Low: 0.5 to 1.0 percent
Moderately low: 1.0 to 2.0 percent
Moderate: 2.0 to 4.0 percent
High: 4.0 to 8.0 percent
Very high: More than 8.0 percent

Outwash

Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material

The unconsolidated organic and mineral material in which soil forms.

Peat

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped

An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon

The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation

The movement of water through the soil.

Perennial water (map symbol)

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

Permafrost

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

pH value

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting

Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit

The moisture content at which a soil changes from semisolid to plastic.

Plasticity index

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology)

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Plinthite

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan

A compacted layer formed in the soil directly below the plowed layer.

Ponding

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings

See Redoximorphic features.

Potential native plant community

See Climax plant community.

Potential rooting depth (effective rooting depth)

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil

The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil

A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and

promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid: Less than 3.5
Extremely acid: 3.5 to 4.4
Very strongly acid: 4.5 to 5.0
Strongly acid: 5.1 to 5.5
Moderately acid: 5.6 to 6.0
Slightly acid: 6.1 to 6.5
Neutral: 6.6 to 7.3
Slightly alkaline: 7.4 to 7.8
Moderately alkaline: 7.9 to 8.4
Strongly alkaline: 8.5 to 9.0
Very strongly alkaline: 9.1 and higher

Red beds

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations

See Redoximorphic features.

Redoximorphic depletions

See Redoximorphic features.

Redoximorphic features

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix

See Redoximorphic features.

Regolith

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material)

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol)

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

Sapric soil material (muck)

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat)

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

Very high: 100 or more micrometers per second (14.17 or more inches per hour)

High: 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)

Moderately high: 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)

Moderately low: 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)

Low: 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)

Very low: Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (map symbol)

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic)

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slide or slip (map symbol)

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

Slope

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill

The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Sodic (alkali) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodic spot (map symbol)

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

Sodicity

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight: Less than 13:1
Moderate: 13-30:1
Strong: More than 30:1

Sodium adsorption ratio (SAR)

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand: 2.0 to 1.0
Coarse sand: 1.0 to 0.5
Medium sand: 0.5 to 0.25
Fine sand: 0.25 to 0.10
Very fine sand: 0.10 to 0.05
Silt: 0.05 to 0.002
Clay: Less than 0.002

Solum

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol)

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

Stone line

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot (map symbol)

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

Strath terrace

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

Platy: Flat and laminated

Prismatic: Vertically elongated and having flat tops

Columnar: Vertically elongated and having rounded tops

Angular blocky: Having faces that intersect at sharp angles (planes)

Subangular blocky: Having subrounded and planar faces (no sharp angles)

Granular: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

Single grained: Entirely noncoherent (each grain by itself), as in loose sand

Massive: Occurring as a coherent mass

Stubble mulch

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil

Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum

The part of the soil below the solum.

Subsurface layer

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation)

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field

generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology)

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer

Otherwise suitable soil material that is too thin for the specified use.

Till

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Tuff

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

Upland

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variegation

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Very stony spot (map symbol)

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

Water bars

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol)

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point)

The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow

The uprooting and tipping over of trees by the wind.

Appendix D REGULATORY BACKGROUND

Regulatory Background Information

Section 404 of the Clean Water Act (CWA)

Section 404 of the CWA regulates the discharge of dredged material, placement of fill material, or certain types of excavation within "waters of the U.S." (resulting in more than incidental fallback of material) and authorizes the Secretary of the Army, through the Chief of Engineers, to issue permits for such actions. Permits can be issued for individual projects (individual permits) or for general categories of projects (general permits). "Waters of the U.S." are defined by the CWA as "rivers, creeks, streams, and lakes extending to their headwaters and any associated wetlands." Wetlands are defined by the CWA as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." The USACE has adopted several revisions to their regulations in order to more clearly define "waters of the U.S." Until the beginning of 2001, "waters of the U.S." included, among other things, isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not part of a tributary system to interstate waters or to navigable "waters of the U.S."

The jurisdictional extent of USACE regulation changed with the 2001 SWANCC (Solid Waste Agency of Northern Cook County) ruling. The U.S. Supreme Court held that the USACE could not apply Section 404 of the CWA to extend their jurisdiction over an isolated quarry pit. The Court ruled that the CWA does not extend Federal regulatory jurisdiction over non-navigable, isolated, intra-state waters. However, the Court made it clear that non-navigable wetlands adjacent to navigable waters are still subject to USACE jurisdiction.

Section 401 of the CWA

Section 401 of the CWA requires that any applicant for a Federal permit for activities that involve a discharge to 'waters of the State,' shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act. Therefore, before the USACE will issue a Section 404 permit, applicants must apply for and receive a Section 401 Water Quality Certification from the RWQCB. Applications to the RWQCB must include a complete CEQA document (e.g., Initial Study/Mitigated Negative Declaration).

Section 1602 of the California Fish and Game Code

Section 1602 of the California Fish and Game Code requires any person, State or local governmental agency, or public utility which proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or use materials from a streambed, or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, to first notify the CDFW of the proposed project. Notification is generally required for any project that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. Based on the notification materials

submitted, the CDFW will determine if the proposed project may impact fish or wildlife resources. If the CDFW determines that a proposed project may substantially adversely affect existing fish or wildlife resources, a Lake or Streambed Alteration Agreement (SAA) will be required. A completed CEQA document must be submitted to CDFW before a SAA will be issued.

Appendix E FIELD DATA SHEETS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Irvine Ranch Open Space City/County: Orange Sampling Date: 5/15/2018

Applicant/Owner: OC parks State: CA Sampling Point: WAS01

Investigator(s): J. Seamands, R. Brown Section, Township, Range: 32 T4S R8W

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): Northwestern Wheat + Range Lat: 33.776612 Long: -117.738415 Datum: NAD83

Soil Map Unit Name: Calleguas clay loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No _____

Hydric Soil Present? Yes X No _____

Wetland Hydrology Present? Yes X No _____

Is the Sampled Area within a Wetland? Yes X No _____

Remarks: previous> road, berm created, surrounding low-lying area Palustrine Scrub-shrub (PSS) feature

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30'r)			
1. Salix gooddingii	10	✓	FACW
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Baccharis salicifolia	50	✓	FAC
2.			
3.			
4.			
5.			
	50 = Total Cover		
Herb Stratum (Plot size: 5'r)			
1. Eucrypta chrysanthemifolia	1	✓	UPL
2. Phacelia cicutaria	1		UPL
3. Bromus madritensis ssp rubens	1		UPL
4. Hirschfeldia incana	1		UPL
5.			
6.			
7.			
8.			
	4 = Total Cover		
Woody Vine Stratum (Plot size: 30'r)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 96 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: Eucrypta, Phacelia + Hirschfeldia not listed on NWPL

SOIL

Sampling Point: WA501

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5YR 3/1	90					SiCL Loam	
0-3	10YR 4/3	10					Sil Loam	
3-20	10YR 4/2	60	2.5YR 4/8	40	C	M	Sily Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): NO

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- X Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: geomorphic posisitioning

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Irvine Open Space City/County: Orange Sampling Date: 5/15/2018
Applicant/Owner: OC parks State: CA Sampling Point: WA502
Investigator(s): J. Seamands R. Brown Section, Township, Range: S32 T4S R8W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 3
Subregion (LRR): Northwestern Wheat and Range Lat: 33.776719 Long: -117.738394 Datum: NAD83
Soil Map Unit Name: Soper gravelly loam NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No ✓
Hydric Soil Present? Yes _____ No ✓
Wetland Hydrology Present? Yes _____ No ✓
Is the Sampled Area within a Wetland? Yes _____ No ✓

Remarks: Upland sagebrush scrub

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Artemisia californica	35	✓	UPL
2. Encelia californica	15	✓	UPL
3. Acmispon glaber	7		UPL
4.			
5.			
	57 = Total Cover		
Herb Stratum (Plot size: 5'r)			
1. Bromus madritensis ssp rubens	50	✓	UPL
2. Artemisia californica	2		UPL
3. Centaurea melitensis	2		UPL
4. Encelia californica	1		UPL
5. Hirschfeldia incana	2		UPL
6.			
7.			
8.			
	57 = Total Cover		
Woody Vine Stratum (Plot size: 30'r)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 43 % Cover of Biotic Crust ✓

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:
Acmispon glaber
Artemisia californica
Centaurea melitensis
Encelia californica
Not listed on NWPL or USDA Plant Database
Hirschfeldia incana

SOIL

Sampling Point: WA502

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/3	100					Sandy Loam	
3-24	7.5 YR 4/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): NO

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Upland Sagebrush scrub

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Irvine Ranch Open Space City/County: Orange Sampling Date: 5/16/2018
Applicant/Owner: OC parks State: CA Sampling Point: WAS03
Investigator(s): J. Seamands R. Brown Section, Township, Range: S32 T04S R08W
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): Northwestern Wheat and Range Lat: 33.777847 Long: -117.738507 Datum: NAD83
Soil Map Unit Name: Soper cobbly loam NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No X
Hydric Soil Present? Yes _____ No X
Wetland Hydrology Present? Yes _____ No _____
Is the Sampled Area within a Wetland? Yes _____ No X

Remarks: previous road berm surrounding low-lying area

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30'r)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Baccharis salicifolia	95.	✓	FAC
2. Artemisia californica	25		UPL
3.			
4.			
5.			
	120 = Total Cover		
Herb Stratum (Plot size: 5'r)			
1. Marrubium vulgare	2		FACU
2. Scrophularia californica	2.		FAC
3. Artemisia californica	1.		UPL
4. Sambucus nigra	1.		FACU
5. Solanum douglasii	1.	✓	FAC
6. Bromus madritensis var. rubens	30	✓	UPL
7. Hirschfeldia incana	1.		UPL
8.			
	38 = Total Cover		
Woody Vine Stratum (Plot size: 30'r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 62 % Cover of Biotic Crust ✓

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	98	x 3 =	294
FACU species	3	x 4 =	12
UPL species	57	x 5 =	285
Column Totals:	158 (A)		591 (B)

Prevalence Index = B/A = 3.74

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:
Art cal → Not in NWPL or USDA
Hirsch incana

SOIL

Sampling Point: WAS03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24"	10YR 5/3	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): No

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic positioning

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Irvine Ranch Open Space City/County: Orange County Sampling Date: 5/17/18

Applicant/Owner: OC Parks State: CA Sampling Point: WAS04

Investigator(s): J. Seamands R. Brown Section, Township, Range: S04 T5S R8W

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): Northwestern Wheat & Range Lat: 33.767642 Long: -117.72636 Datum: NAD83

Soil Map Unit Name: Anaheim clay loam NWI classification: PFO/EMICh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: located within an active stream channel, also within a backwater inlet/cove of Irvine Lake

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	100	✓	FACW
2.			
3.			
4.			
	100 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Rubus ursinus	2		FAC
2. Toxicodendron diversilobum	1		FACU
3.			
4.			
5.			
	3 = Total Cover		
Herb Stratum (Plot size: 5'r)			
1. Rubus ursinus	20	✓	FAC
2. Stipa miliacea	20	✓	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: 30'r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

PFO (palustrine forested wetland)

Stipa miliacea - not listed in NWPL, but occurs in streambanks

SOIL

Sampling Point: WA504

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	99	10YR 5/8	1-2	CS	M	sandy loam	
6-24	10YR 3/1	45	7.5YR 5/4	5	C	M	sandy clay loam	Roots present
			N 8.5	10	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): No

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 14"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Geomorphic positioning

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Irvine Ranch Open Space City/County: Orange County Sampling Date: 5/17/18

Applicant/Owner: OC Parks State: CA Sampling Point: WAS 05

Investigator(s): J. Seamands, R. Brown Section, Township, Range: S04 T5S R8W

Landform (hillslope, terrace, etc.): Roadside embankment Local relief (concave, convex, none): Convex Slope (%): 7-10

Subregion (LRR): Northwestern Wheat + Range Lat: 33.767648 Long: -117.726731 Datum: NAD83

Soil Map Unit Name: Bosanko clay NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks: Sampling point on road embankment, disturbed conditions, possible fill, Upland sampling point for Wetland 2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' r)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Hirschfeldia incana	5		UPL
2. Silybum marianum	50	✓	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: 30' r)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 45 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: WAS 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	7.5 YR 3/1	100					silty clay loam	fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): No

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Irvine Ranch Open Space City/County: Orange Sampling Date: 6/27/2018
Applicant/Owner: OC Parks State: CA Sampling Point: WAS06
Investigator(s): J. Seamands R. Brown Section, Township, Range: S32 T4S R8W
Landform (hillslope, terrace, etc.): detention basin Local relief (concave, convex, none): concave Slope (%): 1
Subregion (LRR): Northwestern Wheat + Range Lat: 33.781232 Long: -117.747234 Datum: NAD83
Soil Map Unit Name: Balcom clay loam / Myford sandy loam NWI classification: PSSAh / PEMIAh / R4SB-Ar PSSAx
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____ No ✓	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks: roadside detention basin

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' r)			
1. Salix goodingii	10	✓	FACW
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Plantago lanceolata	35	✓	FAC
2. Lupinus microcarpus	5		UPL
3. Elymus hispidus	5		UPL
4. Melilotus alba	5		UPL
5.			
6.			
7.			
8.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: 30' r)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: Lupinus, Elymus + Melilotus – not listed on NWPL

SOIL

Sampling Point: WASO6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ✓ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

geomorphic position

MP-1

Project: IOS
Project Number:
Stream: MP-1
Investigator(s): RB, JS

Date: 5/9/18
Town:
Photo begin file# 1

Time: 14:15
State: CA
Photo end file# 4

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details: See GIS data
Projection: **Datum:**
Coordinates:

Notes:

OHWM = 15'
CDFW = 30' (w. veg)

Brief site description:

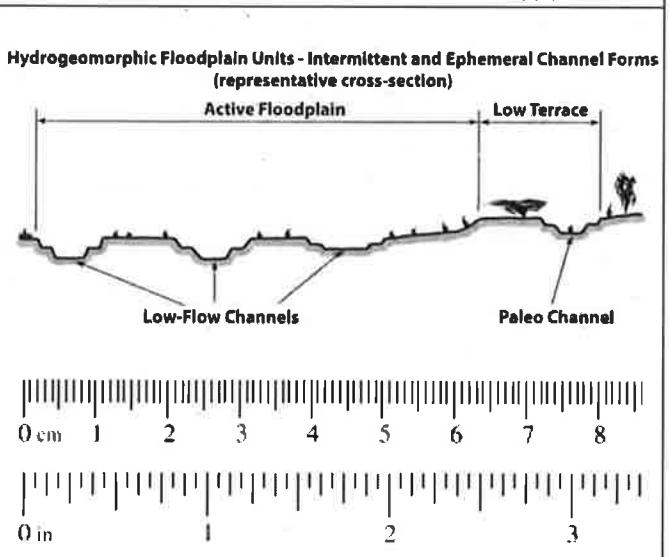
Ephemeral drainage

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [ ] Topographic maps
  Scale:
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] Clinometer / level
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: Sand/Silt

Total veg cover: 5-10 % Tree: 1 % Shrub: 2 % Herb: 3 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: baccharis salicifolia, bromus diandrus

Other:

- ☐
- ☐
- ☐
- ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☒ Other: flow patterns
  - ☐ Other:

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel:

Average sediment texture:

Total veg cover: % Tree: % Shrub: % Herb: %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present:

Other:

- ☐
- ☐
- ☐
- ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☐ Change in dominant species present
- ☐ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☐ N ☐ Change in dominant species present
- Y ☐ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sand

Total veg cover: 70 % Tree: 1 % Shrub: 5 % Herb: 65 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus, baccharis salicifolia, Quercus agrifolia

Other:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

MP-2

Project: 105 **Project Number:** **Stream:** MP-2 **Investigator(s):** RB, JS	**Date:** 5/9/18 **Town:** **Photo begin file#** 5	**Time:** 14:45 **State:** CA **Photo end file#** 8
Y [X] / N [ ] Do normal circumstances exist on the site? Y [ ] / N [X] Is the site significantly disturbed?	**Location Details:** See GPS **Projection:** **Datum:** **Coordinates:**	

Notes:

Connects w/ MP-1 ~~~~ downstream

USACE = 65'

CDFW = 75'

Brief site description:

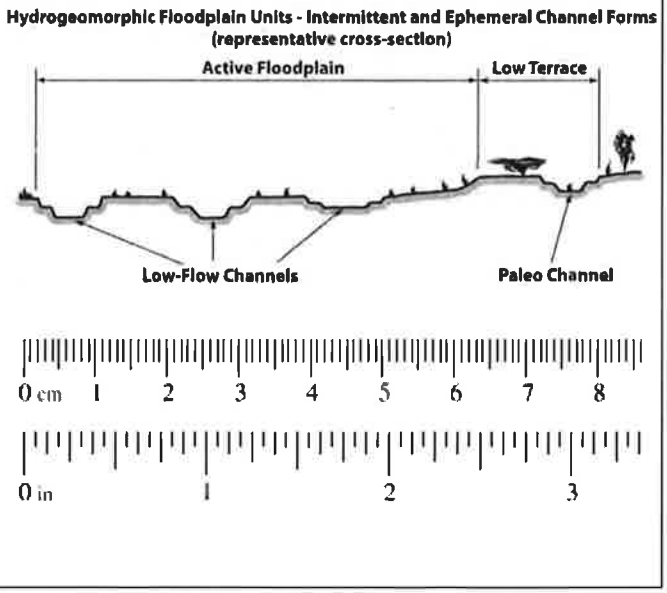
Ephemeral wash

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [ ] Topographic maps
  Scale:
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] Clinometer / level
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand - silt

Total veg cover: 40 % Tree: ____ % Shrub: 1 % Herb: 35 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus, Ambrosia psylostachya, Baccharis ~~prto~~ salicifolia

Other:
- ☒ Hirschfeldia incana
- ☒ Opuntia ficus indica
- ☐
- ☐

☐ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☐ Other
  - ☐ Tree
  - ☒ Shrub
  - ☐ Herb
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel:

Average sediment texture: sand

Total veg cover: 40 % Tree: ____ % Shrub: ____ % Herb: 40 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus

Other:
- ☒ Baccharis salicifolia
- ☐
- ☐
- ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silt / sand

Total veg cover: _____ % Tree: _____ % Shrub: ✕ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Baccharis salicifolia, Bromus diandrus

Other: ☐ ☐ ☐ ☐

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

MP-3

Project: 10S **Project Number:** **Stream:** MP-3 **Investigator(s):**	**Date:** 5/9/18 **Town:** **Photo begin file#** 9	**Time:** 15:30 **State:** CA **Photo end file#** 14, 19-20, ~~27-32~~, 35-36
Y ☒ / N ☐ Do normal circumstances exist on the site? Y ☐ / N ☒ Is the site significantly disturbed?	**Location Details:** See GIS **Projection:** **Datum:** **Coordinates:**	

Notes:

~~Ep~~ Trib to MP-1/2
OHWM = 5
CDFW = 10

Brief site description:

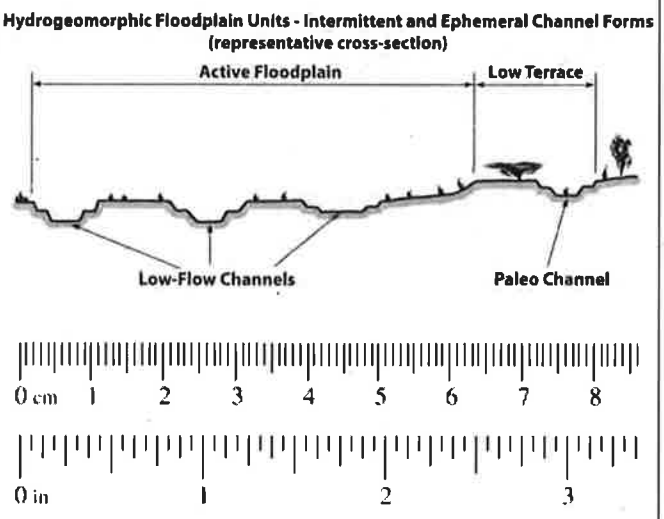
Ephemeral drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: silt

Total veg cover: 20 % Tree: ____% Shrub: ____% Herb: 20 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus, Hirschfeldia incan

Other:

- ☐
- ☐
- ☐
- ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel:

Average sediment texture: _____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other:

- ☐
- ☐
- ☐
- ☐

☐ NA **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** See low flow channel description

Characteristics used to delineate the active floodplain/ low terrace boundary:

☐ Change in average sediment texture
☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
☐ Change in overall vegetation maturity
☐ Change in dominant species present
☐ Other ☐ Presence of bed and bank
☐ Drift and/or debris
☐ Other: _____
☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

Y ☒ N ☐ Change in average sediment texture
Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
Y ☒ N ☐ Change in overall vegetation maturity
Y ☒ N ☐ Change in dominant species present
Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
Y ☐ N ☐ Drift and/or debris
Y ☐ N ☐ Other: _____
Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sand w/ cobbles

Total veg cover: 80 % Tree: ____ % Shrub: 5 % Herb: 75 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus, Eriodyctyon crassifolium

Other: ☒ Baccharis salicifolia
☒ Quercus agrifolia
☒ Platanus Racemosa
☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

☒ Mapping on aerial photograph ☒ GPS
☒ Digitized on computer ☐ Other: _____

MP-4

Project: 105 **Project Number:** **Stream:** MP-4 **Investigator(s):** RB, JS	**Date:** 5/10/14 **Town:** **Photo begin file#** 15	**Time:** 0920 **State:** CA **Photo end file#** 18
Y ☒ / N ☐ Do normal circumstances exist on the site? Y ☐ / N ☒ Is the site significantly disturbed?	**Location Details:** See GIS data **Projection:** **Datum:** **Coordinates:**	

Notes:

OHWM = 2'
CDFW = 6'

Recent fire affecting veg.

Brief site description:

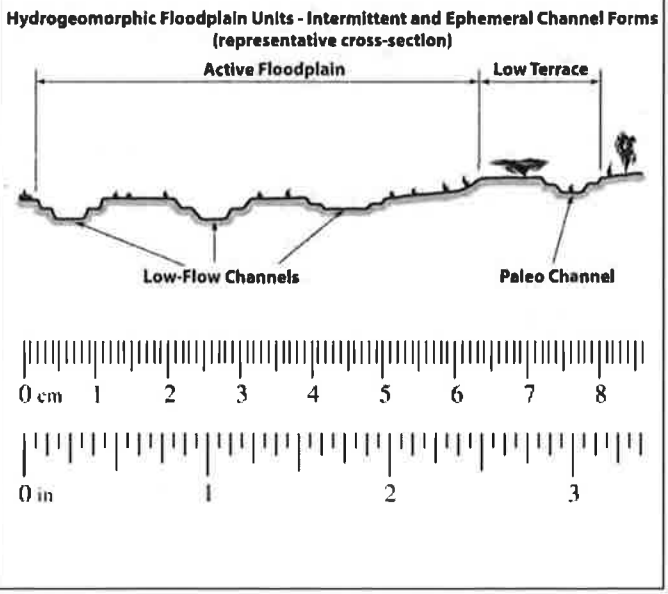
Ephemeral wash; trib to MP-3

Checklist of resources (if available):

- ☒ Aerial photography
  - Dates:
- ☐ Topographic maps
  - Scale:
- ☐ Geologic maps
- ☒ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  - Gage number:
  - Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



MP-4

☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☐ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: Sand w/ silt; interspersed w/ cobbles & boulders

Total veg cover: 30 % Tree: ____ % Shrub: ____ % Herb: 30 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus

Other:
- ☐
- ☐
- ☐
- ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover
- ☒ Change in overall vegetation maturity
- ☐ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: ____
  - ☐ Other: ____

☒ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel → see above

Average sediment texture: ____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: ____

Other:
- ☐
- ☐
- ☐
- ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sand

Total veg cover: 55 % Tree: ____ % Shrub: 10 % Herb: 45 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus; ~~Rhus~~ Malosma laurina, Opuntia littoralis

Other: ☐ _____ ☐ _____ ☐ _____ ☐ _____

☐ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☐ Mapping on aerial photograph
- ☐ Digitized on computer
- ☐ GPS
- ☐ Other: _____

MP-5

Project: 105 **Project Number:** **Stream:** MP-5 **Investigator(s):** RB, JS	**Date:** 5/10/18 **Town:** **Photo begin file#** 23	**Time:** 0956 **State:** CA **Photo end file#** 26
Y [X] / N [ ] Do normal circumstances exist on the site? Y [ ] / N [X] Is the site significantly disturbed?	**Location Details:** see GIS data **Projection:** **Datum:** **Coordinates:**	

Notes:

OHWM = 1'
CDFW = 4'
Surrounding veg affected by recent fire

Brief site description:

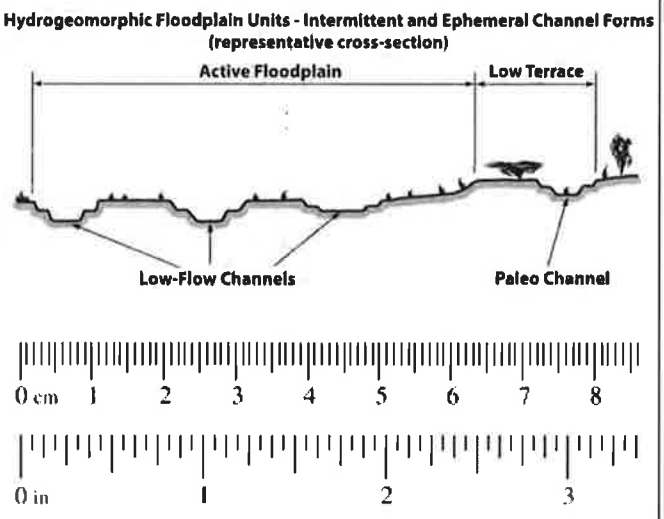
Ephemeral wash

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [ ] Topographic maps
  Scale:
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] Clinometer / level
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: Sand

Total veg cover: 20 % Tree: ____ % Shrub: ____ % Herb: 20 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus madritensis rubens, Hirschfeldia incana, Avena fatua

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb

☒ Change in overall vegetation maturity

☒ Change in dominant species present

☐ Other ☐ Presence of bed and bank

☐ Drift and/or debris

☐ Other: _____

☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low flow channel → see above

Average sediment texture: ~~Sand w/ cobbles~~

Total veg cover: ~~30~~ % Tree: ____ % Shrub: ~~10~~ % Herb: ~~20~~ %

Community successional stage:

☐ NA ☒ ~~Mid~~ (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: ~~Bromus madritensis, Hirschfeldia incana, Hesperocyparis macrocarpa, Apiastrum angustifolium~~

Other: ☐ ☐ ☐ ☐

☐ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb
- ☒ Change in overall vegetation maturity
- ☐ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☐ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sand w/ cobbles

Total veg cover: 30 % Tree: ~~10~~ % Shrub: 10 % Herb: 20 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus madritensis, Hirschfeldia incana

Other:
- ☒ ~~Yucca brevifolia~~ Hesperoyucca whipplei
- ☒ opuntia littoralis
- ☐
- ☐

☐ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☐ Mapping on aerial photograph
- ☐ Digitized on computer
- ☐ GPS
- ☐ Other: _____

MP-6

Project: 105 | **Date:** 5/10/16 | **Time:** 14:25
Project Number: | **Town:** | **State:** CA
Stream: MP-6 | **Photo begin file#** See GIS data | **Photo end file#**
Investigator(s): RB, JS

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details: See GIS data
Projection: **Datum:**
Coordinates:

Notes:

OHWM = 7'

CDFW = 20'

Originates as highway runoff from concrete v-ditch and corrugated metal culvert (36"), passes through lg. rip-rap energy diffuser before entering MP-6. Veg affected by recent fire.

Brief site description:

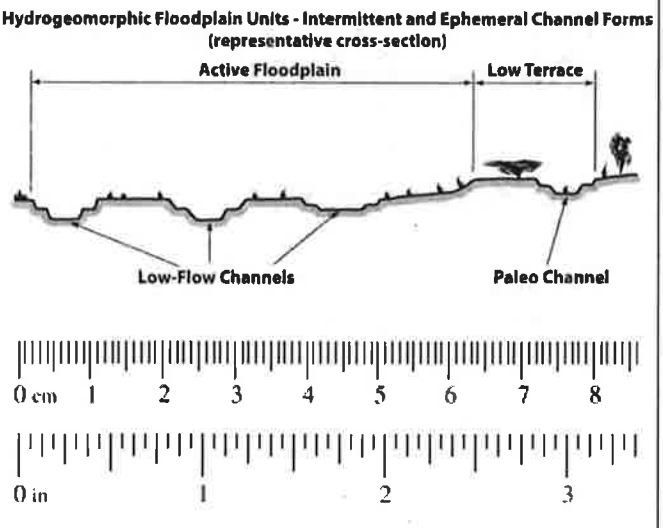
Ephemeral drainage

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [ ] Topographic maps
  Scale:
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] Clinometer / level
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
10.08		256	Boulder	
2.56		64	Cobble	Gravel
0.157		4	Pebble	
0.079		2.00	Granule	
0.039		1.00	Very coarse sand	
0.020		0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	Sand
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	
1/32	0.00061	0.0156	Medium silt	Silt
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand w/ cobbles & boulders

Total veg cover: 2 % Tree: ____% Shrub: ____% Herb: 2 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus

Other:
☒ Hirschfeldia incana
☒ Ambrosia ~~psilothaeya~~ psylostachya
☐
☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
☒ Change in overall vegetation maturity
☐ Change in dominant species present
☒ Other ☒ Presence of bed and bank
☐ Drift and/or debris
☐ Other: ____
☐ Other: ____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel → see above.

Average sediment texture: ____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: ____

Other:
☐
☐
☐
☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☐ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☐ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: Sand

Total veg cover: 65 % Tree: ____ % Shrub: 5 % Herb: 60 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus

Other:
- ☒ Ambrosia psylostachya
- ☒ Malosma laurina
- ☐
- ☐

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

Project: 105
Project Number:
Stream: MP-7
Investigator(s): RB, JS

Date: 5/10/18 **Time:** 14:41
Town: **State:** CA
Photo begin file# **Photo end file#**
See GIS data

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
See GIS data
Projection: **Datum:**
Coordinates:

Notes:
Channel created by highway runoff → channeled through cement v-ditch to large rip-rap energy diffuser → diverted into MP-7
OHWM = 4
CDFW = 8 Veg affected by recent fire.

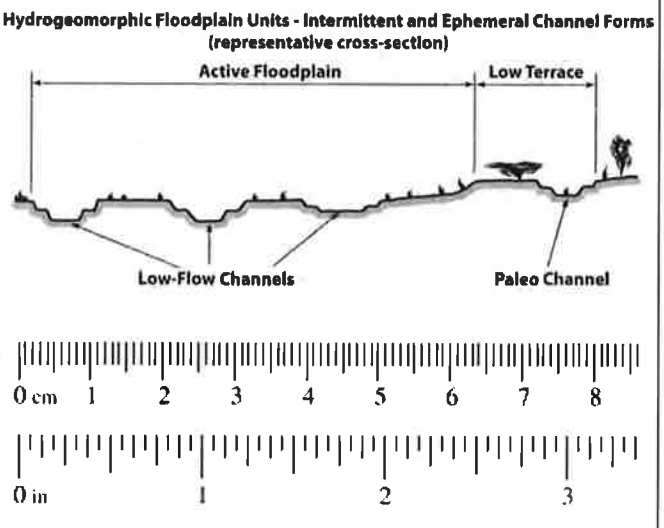
Brief site description:
Ephemeral drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
0.0098 (1/2)	0.25	Medium sand	Sand
0.005 (1/4)	0.125	Fine sand	
0.0025 (1/8)	0.0625	Very fine sand	
0.0012 (1/16)	0.031	Coarse silt	
0.00061 (1/32)	0.0156	Medium silt	Silt
0.00031 (1/64)	0.0078	Fine silt	
0.00015 (1/128)	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand w/ lg. cobbles and boulders

Total veg cover: 10 % Tree: ____% Shrub: ____% Herb: 10 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus madritensis rubens

Other:
- ☒ Marah macrocarpa
- ☒ Avena fatua
- ☐
- ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☐ Presence of bed and bank
  - ☒ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ **Continue walking the channel cross-section. Record observations below.**

NA

Characteristics of the low-flow channel: One low flow channel → see above

Average sediment texture: _____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other:
- ☐
- ☐
- ☐
- ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☒ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sand

Total veg cover: 70 % Tree: 40 % Shrub: 1 % Herb: 30 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Quercus agrifolia, Bromus madritensis, rubens, Cirsium vulgare

Other:

- ☒ Artemisia californica
- ☒ Encelia sp.
- ☒ Centaurea melitensis
- ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

MP-8

Project: 105 | **Date:** 5/11/18 | **Time:** 0931
Project Number: | **Town:** | **State:** CA
Stream: MP-8 | **Photo begin file#** See GIS data | **Photo end file#**
Investigator(s): RB, JS

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: See GIS data
Projection: **Datum:**
Coordinates:

Notes: Drainage originates as head cut next to old trail/road, likely fed by overland flows collecting at low spot. Drainage incised rather steeply shortly after originating.
OHWM = 5 ; CDFW = 15
Veg. impacted by recent fire

Brief site description:

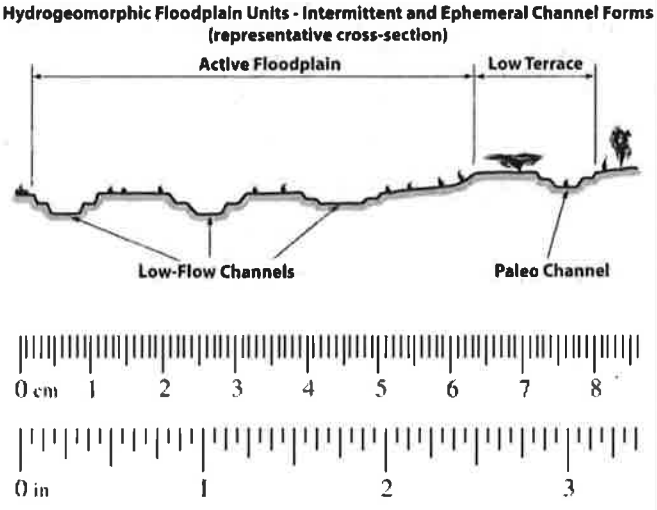
Ephemeral drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
		Cobble	Gravel
2.56	64		
0.157	4	Pebble	
		Granule	
0.079	2.00	Very coarse sand	
0.039	1.00		
		Coarse sand	
0.020	0.50		Sand
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
		Very fine sand	
1/8 0.0025	0.0625	Coarse silt	
1/16 0.0012	0.031		
		Medium silt	
1/32 0.00061	0.0156		Silt
1/64 0.00031	0.0078	Fine silt	
		Very fine silt	
1/128 0.00015	0.0039		
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand

Total veg cover: 80 % Tree: ____ % Shrub: 1 % Herb: 80 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus madritensis rubens, Hirschfeldia incana

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb

☒ Change in overall vegetation maturity

☒ Change in dominant species present

☒ Other ☒ Presence of bed and bank

☐ Drift and/or debris

☐ Other: _____

☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: single low-flow channel.

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sand w/ small cobbles

Total veg cover: 65 % Tree: ____ % Shrub: 15 % Herb: 40 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus madritensis rubens, Quercus berberidifolia tarplant

Other: ☐ _____ ☐ _____ ☐ _____ ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

MP-9

Project: IOS
Project Number:
Stream: MP-9
Investigator(s): RB, DS

Date: 5/11/14 **Time:** 0955
Town: **State:** CA
Photo begin file# **Photo end file#**
See GIS data

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
See GIS data
Projection: **Datum:**
Coordinates:

Notes: Hydrology affected by road graded upstream.
Veg affected by recent fire.
OHWM = 2'; CDFW = 6

Brief site description:
Ephemeral drainage

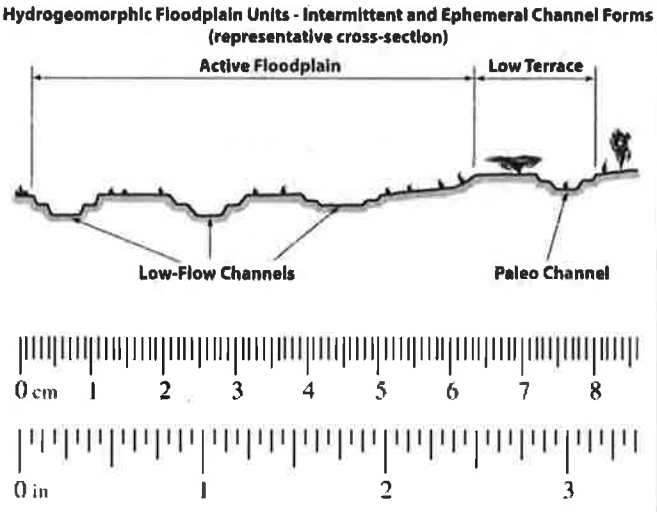
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



MP-9

☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand

Total veg cover: 45 % Tree: ____ % Shrub: 1 % Herb: 45 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus madritensis rubens, morning glory, chaparral mallow

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb

☒ Change in overall vegetation maturity

☒ Change in dominant species present

☒ Other ☒ Presence of bed and bank

☐ Drift and/or debris

☐ Other: _____

☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel. See above

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: coarse sand

Total veg cover: _____ % Tree: _____ % Shrub: 35 % Herb: 10 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Malosma laurina; Opuntia littoralis; chaparral mallow, Bromus madritensis rubens.

Other:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

MP-10

Project: 105	**Date:** 5/11/18 **Time:** 1050
Project Number:	**Town:** **State:** CA
Stream: MP-10	**Photo begin file#** **Photo end file#**
Investigator(s): RB, JS	See GIS data
Y ☐ / N ☒ Do normal circumstances exist on the site?	**Location Details:** See GIS data
Y ☐ / N ☒ Is the site significantly disturbed?	**Projection:** **Datum:**
	Coordinates:

Notes:
Short drainage originating from road runoff. Steeply incised. ~4'
Veg affected by recent fire.
OHWM = 4; CDFW = 8

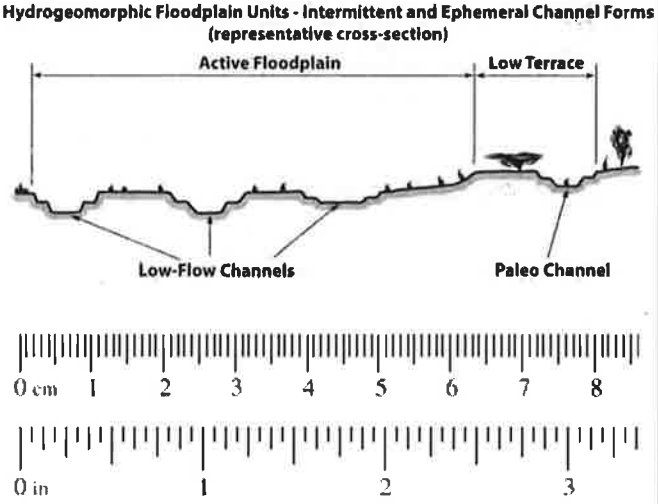
Brief site description:
Ephemeral drainage from road runoff

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand w/ up to lg. cobbles

Total veg cover: 30 % Tree: ____% Shrub: ____% Herb: 30 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus

Other:

- ☒ Hirschfeldia incana
- ☒ Phacelia
- ☐
- ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel. See above.

Average sediment texture: _____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other:

- ☐
- ☐
- ☐
- ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sand

Total veg cover: 80 % Tree: 10 % Shrub: 10 % Herb: 60 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus, Quercus agrifolia

Other:

- ☒ Malosma laurina
- ☒ Sambucus nigra
- ☒ Prunus ilicifolia
- ☒ Rhus trilobata

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

MP-11

Project: 105
Project Number:
Stream: MP-11
Investigator(s): RB, JS

Date: 5/11/18 **Time:** 1119
Town: **State:** CA
Photo begin file# **Photo end file#**
See GIS data

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
See GIS data
Projection: **Datum:**
Coordinates:

Notes: Channel bisected by road ~ 100 m upstream of confluence w/ MP-6; relatively heavy veg. growth

OHWM = 8 ; CDFW = 12

Brief site description:

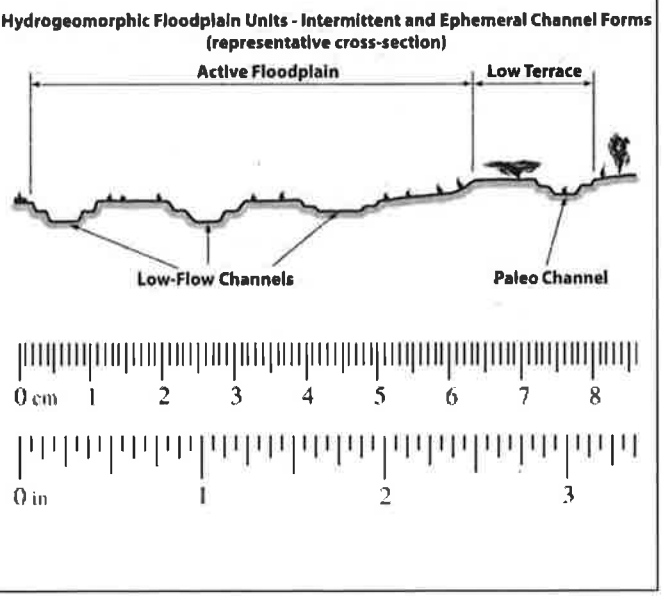
Ephemeral foothill drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
		Cobble	Gravel
2.56	64		
0.157	4	Pebble	
		Granule	
0.079	2.00		
0.039	1.00	Very coarse sand	
		Coarse sand	
0.020	0.50		
1/2 0.0098	0.25	Medium sand	Sand
		Fine sand	
1/4 0.005	0.125		
		Very fine sand	
1/8 0.0025	0.0625		
		Coarse silt	
1/16 0.0012	0.031		
		Medium silt	Silt
1/32 0.00061	0.0156		
		Fine silt	
1/64 0.00031	0.0078		
		Very fine silt	
1/128 0.00015	0.0039		
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand

Total veg cover: 50 % Tree: ____% Shrub: ____% Herb: 50 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus, Hirschfeldia incana

Other:

- ☒ Yellow pincushion
- ☒ Datura wrightii
- ☐
- ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: ____
  - ☐ Other: ____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel. See above.

Average sediment texture: ____

Total veg cover: ____ % Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: ____

Other:

- ☐
- ☐
- ☐
- ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sand w/gravel

Total veg cover: 90 % Tree: 15 % Shrub: 5 % Herb: 70 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus diandrus, Eucrypta sp., Quercus agrifolia

Other:

- ☒ Prunus ilicifolia
- ☒ Datura wrightii
- ☐
- ☐

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph ☒ GPS
- ☒ Digitized on computer ☐ Other: _____

E01-1

Project: 105	**Date:** 5/14/18 **Time:** 1115
Project Number:	**Town:** **State:** CA
Stream: E01-1	**Photo begin file#** **Photo end file#**
Investigator(s): RB, JS	See G/S Data
Y ☒ / N ☐ Do normal circumstances exist on the site?	**Location Details:** See G/S data
Y ☐ / N ☒ Is the site significantly disturbed?	**Projection:** **Datum:**
	Coordinates:

Notes:

Near headwaters

OHWM = 1' . CDFW = 5'

Brief site description:

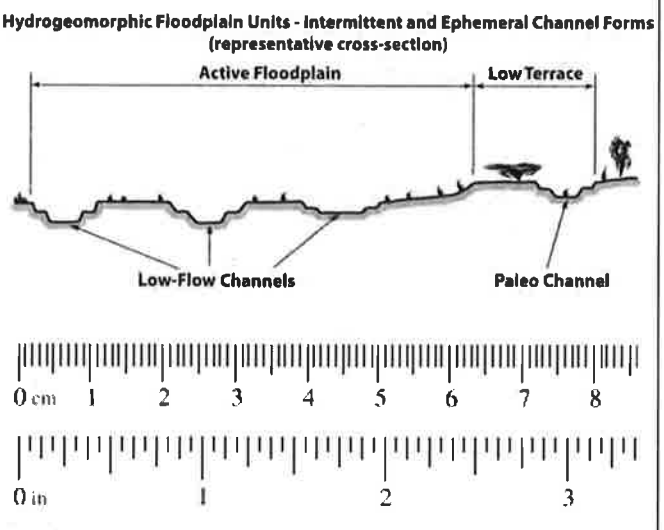
Ephemeral drainage parallel to ridge top

Checklist of resources (if available):

- ☒ Aerial photography
  - Dates:
- ☐ Topographic maps
  - Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  - Gage number:
  - Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: silty sand

Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: NA

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: single low-flow channel - see above

Average sediment texture: _____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☒ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silty sand w/ cobble

Total veg cover: 35 % Tree: ____ % Shrub: 35 % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Salvia mellifera, Artemisia californica

Other:

- ☒ Heteromeles arbutifolia
- ☒ Toxicodendron diversilobum
- ☐ _____
- ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

E01-2

Project: 105 **Project Number:** **Stream:** E01-2 **Investigator(s):** RB, JS	**Date:** 5/14/18 **Town:** **Photo begin file#**	**Time:** 12 05 **State:** CA **Photo end file#**
Y ☐ / N ☐ Do normal circumstances exist on the site? Y ☐ / N ☐ Is the site significantly disturbed?	**Location Details:** **Projection:** **Datum:** **Coordinates:**	

Notes:

Trib to E01-1

OHWM = 3' ; CDFW = 6'

Brief site description:

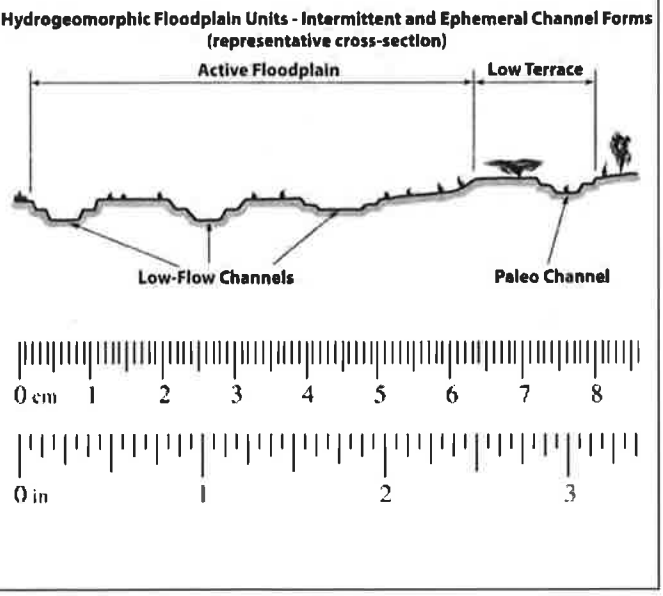
Ephemeral drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
		Cobble	Gravel
2.56	64		
0.157	4	Pebble	
		Granule	
0.079	2.00		
0.039	1.00	Very coarse sand	
		Coarse sand	
0.020	0.50		
1/2 0.0098	0.25	Medium sand	Sand
		Fine sand	
1/4 0.005	0.125		
		Very fine sand	
1/8 0.0025	0.0625		
		Coarse silt	
1/16 0.0012	0.031		
		Medium silt	Silt
1/32 0.00061	0.0156		
		Fine silt	
1/64 0.00031	0.0078		
		Very fine silt	
1/128 0.00015	0.0039		
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: Sand w/ cobbles

Total veg cover: 30 % Tree: ____ % Shrub: 15 % Herb: 15 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus sp.; Mimulus aurantiacus; Baccharis salicifolia; Artemesia californica

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb
- ☐ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ NR **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel – see above

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

EO1-2

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- ☐ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- Y ☐ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silty sand

Total veg cover: 80 % Tree: ____ % Shrub: 80 % Herb: 1 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Salvia mellifera, Artemisia californica; Rhus integrifolia

Other:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☐ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☐ Mapping on aerial photograph
- ☐ Digitized on computer
- ☐ GPS
- ☐ Other: _____

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- ☐ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb
- Y ☐ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silty sand

Total veg cover: 90 % Tree: ____ % Shrub: 70 % Herb: 50 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Artemisia cal.; Eriogonum fasc.;

Other:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph ☒ GPS
- ☒ Digitized on computer ☐ Other: _____

☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: Sand w/ gravel

Total veg cover: 85 % Tree: ____ % Shrub: 85 % Herb: 40 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus madritensis rubens, Artemisia cal., Eriogonum fasc., Baccharis salicifolia;

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb
- ☐ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: single low-flow channel

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

E01-6

Project: 105	**Date:** 5/15/18 **Time:** 0953
Project Number:	**Town:** **State:** CA
Stream: E01-6	**Photo begin file#** **Photo end file#**
Investigator(s): RB, JS	See GIS data
Y ☒ / N ☐ Do normal circumstances exist on the site?	**Location Details:** See GIS data
Y ☐ / N ☒ Is the site significantly disturbed?	**Projection:** **Datum:**
	Coordinates:

Notes:

OHWM = 4, CDFW = 10

Brief site description:

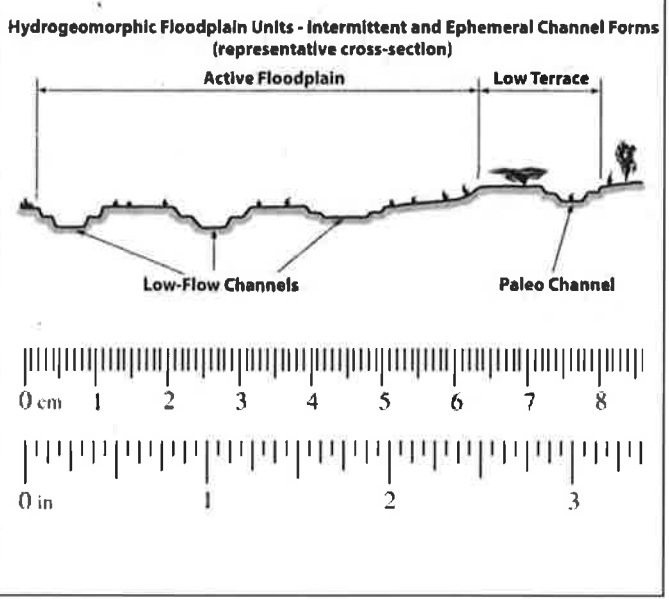
Ephemeral drainage, near headwater

Checklist of resources (if available):

- ☒ Aerial photography
  - Dates:
- ☐ Topographic maps
  - Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  - Gage number:
  - Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
0.0098 (1/2)	0.25	Medium sand	Sand
0.005 (1/4)	0.125	Fine sand	
0.0025 (1/8)	0.0625	Very fine sand	
0.0012 (1/16)	0.031	Coarse silt	
0.00061 (1/32)	0.0156	Medium silt	Silt
0.00031 (1/64)	0.0078	Fine silt	
0.00015 (1/128)	0.0039	Very fine silt	
		Clay	Mud



E011-1

Project: 105
Project Number:
Stream: E011-1
Investigator(s): RB, LB

Date: 5/21/18
Town:
Photo begin file# See GIS data

Time: 08 43
State: CA
Photo end file#

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: See GIS data
Projection: **Datum:**
Coordinates:

Notes:
Drainage bisected by road → culvert underneath.

OHWM = 3'; COFW = 8'

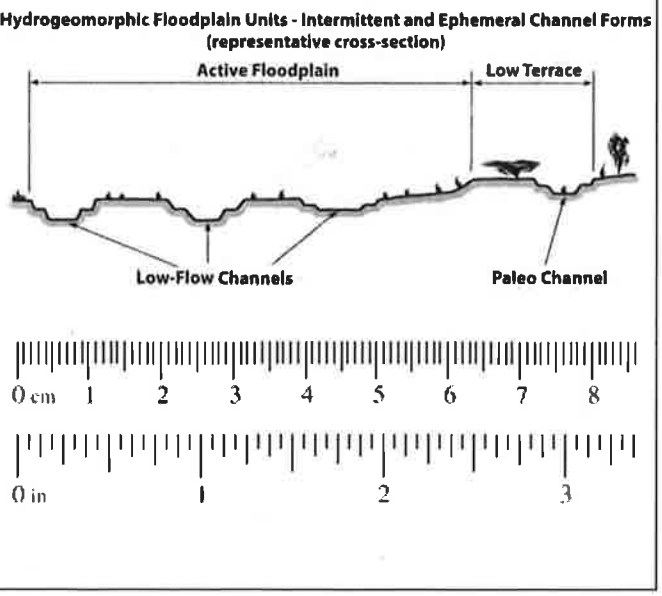
Brief site description:
Ephemeral drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
		Cobble	Gravel
2.56	64		
0.157	4	Pebble	
		Granule	
0.079	2.00		
0.039	1.00	Very coarse sand	
		Coarse sand	
0.020	0.50		
1/2 0.0098	0.25	Medium sand	Sand
		Fine sand	
1/4 0.005	0.125		
		Very fine sand	
1/8 0.0025	0.0625		
		Coarse silt	
1/16 0.0012	0.031		
		Medium silt	Silt
1/32 0.00061	0.0156		
		Fine silt	
1/64 0.00031	0.0078		
		Very fine silt	
1/128 0.00015	0.0039		
		Clay	Mud



E011-1

☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: silty sand w/ lg. cobbles

Total veg cover: 20 % Tree: 0 % Shrub: ____ % Herb: 20 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus spp.

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: ____
  - ☐ Other: ____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel — see above

Average sediment texture: ____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: ____

Other: ☐ ☐ ☐ ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silty sand w/ lg. pebbles

Total veg cover: 90 % Tree: 10 % Shrub: 75 % Herb: 5 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Artemisia californica, Eriogonum fasciculatum, Baccharis salicifolia

Other: ☐ _____ ☐ _____ ☐ _____ ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

Project: 105
Project Number:
Stream: E011-2
Investigator(s): RB, LB

Date: 5/21/18 **Time:** 0858
Town:
State: CA
Photo begin file# See GIS data **Photo end file#**

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: See GIS data
Projection: **Datum:**
Coordinates:

Notes:
Drainage bisected by road – culverted

OHWM = 2 ; CDFW = 6

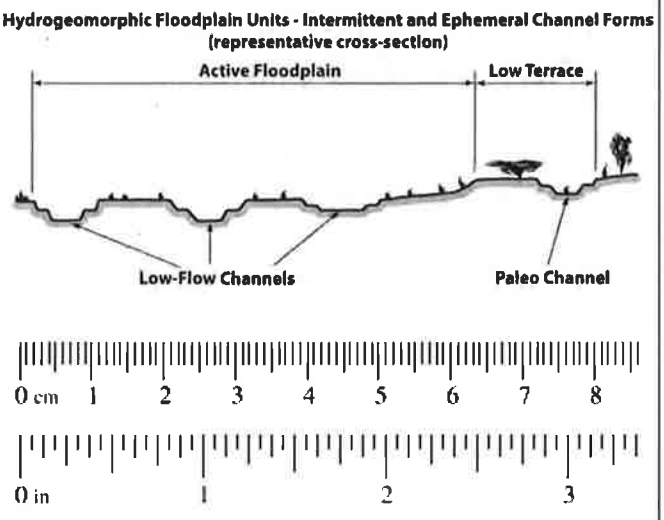
Brief site description:
Ephemeral drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
		Cobble	Gravel
2.56	64	Pebble	
0.157	4	Granule	
0.079	2.00	Very coarse sand	
0.039	1.00	Coarse sand	
0.020	0.50	Medium sand	Sand
1/2 0.0098	0.25	Fine sand	
1/4 0.005	0.125	Very fine sand	
1/8 0.0025	0.0625	Coarse silt	
1/16 0.0012	0.031	Medium silt	
1/32 0.00061	0.0156	Fine silt	Silt
1/64 0.00031	0.0078	Very fine silt	
1/128 0.00015	0.0039	Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand/silt

Total veg cover: 90 % Tree: ____% Shrub: ____% Herb: 90 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus spp.

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb

☒ Change in overall vegetation maturity

☒ Change in dominant species present

☒ Other ☒ Presence of bed and bank

☐ Drift and/or debris

☐ Other: _____

☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: single low-flow channel → see above

Average sediment texture: _____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: loamy sand

Total veg cover: 90 % Tree: 10 % Shrub: 55 % Herb: 35 %

Community successional stage:

- ☐ NA
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Artemisia californica, Eriogonum fasciculatum, Quercus agrifolia, Malosma laurina

Other: ☐ _____ ☐ _____ ☐ _____ ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

E011-3

Project: 105
Project Number:
Stream: E011-3
Investigator(s):

Date: 5/21/18 **Time:** 0938
Town: **State:** CA
Photo begin file# **Photo end file#**
see GIS data

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
see GIS data
Projection: **Datum:**
Coordinates:

Notes:
Drainage bisected by foot trail

OHWM = 6'; CDFW = 18

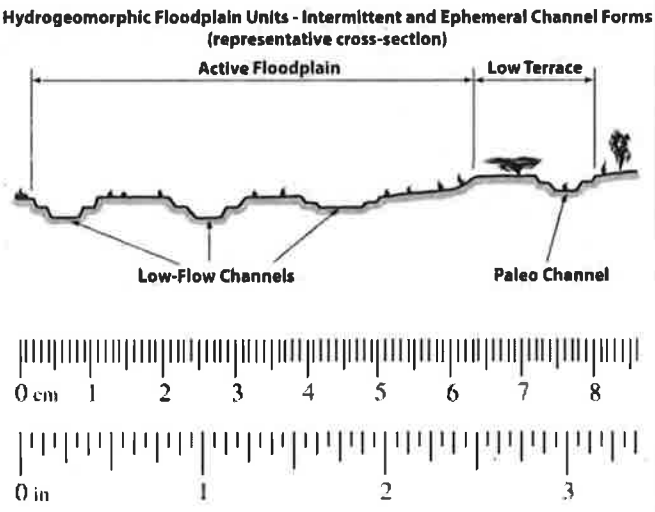
Brief site description:
Ephemeral drainage – coast live oak woodland

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sandy loam

Total veg cover: 20 % Tree: 0 % Shrub: ____ % Herb: 20 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus spp.; Toxicodendron diversilobum

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

☒ Change in total veg cover ☒ Tree ☒ Shrub ☐ Herb

☒ Change in overall vegetation maturity

☒ Change in dominant species present

☒ Other ☒ Presence of bed and bank

☐ Drift and/or debris

☐ Other: _____

☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel → see above.

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☐ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☐ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silty loam

Total veg cover: 100 % Tree: 100 % Shrub: 30 % Herb: 85 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Quercus agrifolia, Heteromeles arbutifolia, Bromus spp.

Other:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph ☒ GPS
- ☒ Digitized on computer ☐ Other: _____

E011-4

Project: 105
Project Number:
Stream: E011-4
Investigator(s): PB, LB

Date: 5/21/18
Time: 0950
Town:
State: CA
Photo begin file#
Photo end file# see GIS data

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: see GIS data
Projection: **Datum:**
Coordinates:

Notes:
Drainage bisected by foot trail

OHWM = 2'; CDFW = 5'

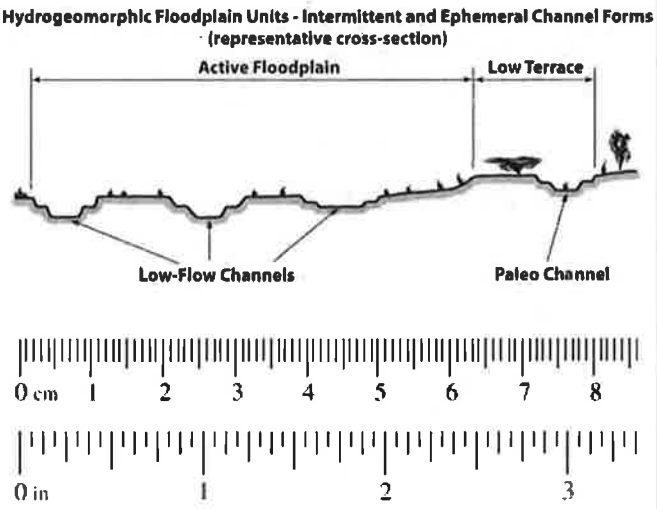
Brief site description:
Ephemeral drainage - coast live oak woodland

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☐ Global positioning system (GPS)
- ☒ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: silty loam

Total veg cover: 20 % Tree: ____ % Shrub: ____ % Herb: 20 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus spp.

Other:
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: Single low-flow channel → see above.

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other:
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☐ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☐ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silty loam

Total veg cover: 100 % Tree: 10 % Shrub: 20 % Herb: 90 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Quercus agrifolia, Bromus spp., Malacothamnus sp., Salvia mellifera, Artemisia californica.

Other: ☐ _____ ☐ _____ ☐ _____ ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

E011-5

Project: 105
Project Number:
Stream: E011-5
Investigator(s): RB, LB

Date: 5/21/18 **Time:** 10:16
Town: **State:** CA
Photo begin file# **Photo end file#**
See GIS data

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:
See GIS data
Projection: **Datum:**
Coordinates:

Notes:
Drainage bisected by foot trail → coast live oak woodland

OHWM = 5' ; CDFW = 9

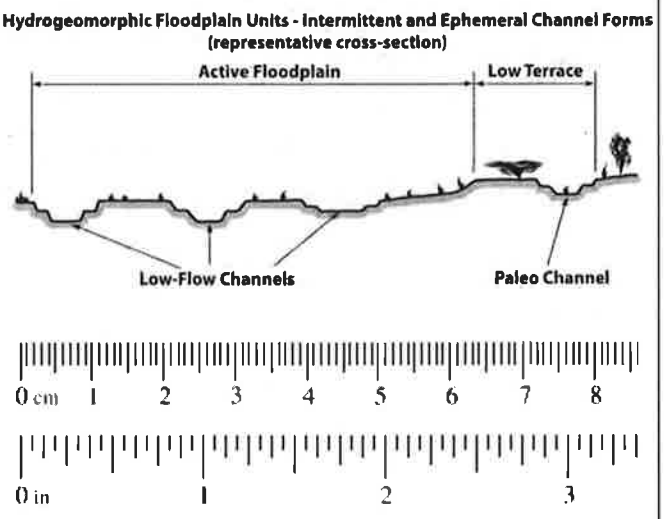
Brief site description:
Ephemeral drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)		Wentworth size class	
	10.08		256	Boulder	
	2.56		64	Cobble	Gravel
	0.157		4	Pebble	
				Granule	
	0.079		2.00		
	0.039		1.00	Very coarse sand	
	0.020		0.50	Coarse sand	
1/2	0.0098		0.25	Medium sand	Sand
1/4	0.005		0.125	Fine sand	
1/8	0.0025		0.0625	Very fine sand	
1/16	0.0012		0.031	Coarse silt	
1/32	0.00061		0.0156	Medium silt	Silt
1/64	0.00031		0.0078	Fine silt	
1/128	0.00015		0.0039	Very fine silt	
				Clay	Mud



E011-5

☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand

Total veg cover: 60 % Tree: ____% Shrub: ____% Herb: 60 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus spp.

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb

☒ Change in overall vegetation maturity

☒ Change in dominant species present

☒ Other ☒ Presence of bed and bank

☐ Drift and/or debris

☐ Other: _____

☐ Other: _____

☒ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: single low-flow channel - see above

Average sediment texture: _____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☒ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☒ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silty loam

Total veg cover: 100 % Tree: 75 % Shrub: 30 % Herb: 100%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Quercus agrifolia; Bromus spp.; Eriogonum fasciculatum, Artemisia californica

Other:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☒ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

Project: 105
Project Number:
Stream: EOIL-6
Investigator(s): RB, LB

Date: 5/21/18 **Time:** 10:39
Town: **State:** CA
Photo begin file# See GIS info **Photo end file#**

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: See GIS data
Projection: **Datum:**
Coordinates:

Notes:
Drainage bisected by foot trail → coast live oak woodland

OHWM = 4' CDFW = 12'

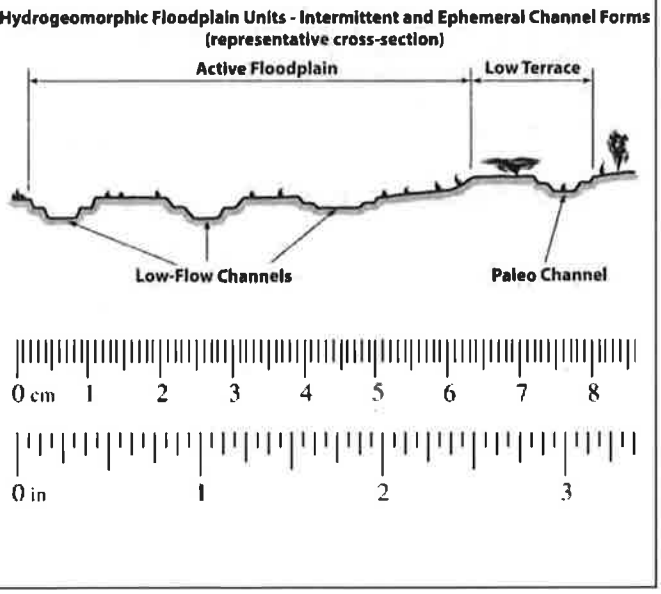
Brief site description:
Ephemeral drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
		Cobble	Gravel
2.56	64		
0.157	4	Pebble	
		Granule	
0.079	2.00	Very coarse sand	
0.039	1.00		
		Coarse sand	
0.020	0.50		
		Medium sand	Sand
1/2 0.0098	0.25		
		Fine sand	
1/4 0.005	0.125		
		Very fine sand	
1/8 0.0025	0.0625	Coarse silt	
1/16 0.0012	0.031		
		Medium silt	
1/32 0.00061	0.0156		Silt
		Fine silt	
1/64 0.00031	0.0078		
		Very fine silt	
1/128 0.00015	0.0039		
		Clay	Mud



EO11-6

☒ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☒ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: sand

Total veg cover: 100 % Tree: ____% Shrub: ____% Herb: 100 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Bromus spp.

Other: ☐ ☐ ☐ ☐

☒ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☐ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other
  - ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ NA **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel: single low-flow channel – see above

Average sediment texture: _____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: _____

Other: ☐ ☐ ☐ ☐

☒ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☒ Change in average sediment texture
- ☒ Change in total veg cover ☒ Tree ☒ Shrub ☐ Herb
- ☒ Change in overall vegetation maturity
- ☒ Change in dominant species present
- ☒ Other ☒ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: _____
  - ☐ Other: _____

☐ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☒ N ☐ Change in average sediment texture
- Y ☒ N ☐ Change in total veg cover ☒ Tree ☒ Shrub ☐ Herb
- Y ☒ N ☐ Change in overall vegetation maturity
- Y ☒ N ☐ Change in dominant species present
- Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: _____
  - Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☒ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: sandy loam

Total veg cover: 100 % Tree: 60 % Shrub: 30 % Herb: 100 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Dominant species present: Quercus agrifolia; Bromus spp.; Eriogonum fasciculatum, Opuntia littoralis; Artemisia californica; Salvia mellifera

Other:
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

☐ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: _____

Appendix F ARID WEST INDICATOR TABLES



Table 1. Potential Geomorphic Indicators of Ordinary High Water Marks for the Arid West

(A) Below OHW	(B) At OHW	(C) Above OHW
1. In-stream dunes 2. Crested ripples 3. Flaser bedding 4. Harrow marks 5. Gravel sheets to rippled sands 6. Meander bars 7. Sand tongues 8. Muddy point bars 9. Long gravel bars 10. Cobble bars behind obstructions 11. Scour holes downstream of obstructions 12. Obstacle marks 13. Stepped-bed morphology in gravel 14. Narrow berms and levees 15. Streaming lineations 16. Desiccation/mud cracks 17. Armored mud balls 18. Knick Points	1. Valley flat 2. Active floodplain 3. Benches: low, mid, most prominent 4. Highest surface of channel bars 5. Top of point bars 6. Break in bank slope 7. Upper limit of sand-sized particles 8. Change in particle size distribution 9. Staining of rocks 10. Exposed root hairs below intact soil layer 11. Silt deposits 12. Litter (organic debris, small twigs and leaves) 13. Drift (organic debris, larger than twigs)	1. Desert pavement 2. Rock varnish 3. Clast weathering 4. Salt splitting 5. Carbonate etching 6. Depositional topography 7. Caliche rubble 8. Soil development 9. Surface color/tone 10. Drainage development 11. Surface relief 12. Surface rounding

Table 2. Potential Vegetation Indicators of Ordinary High Water Marks for the Arid West

	(D) Below OHW	(E) At OHW	(F) Above OHW
Hydroriparian indicators	1. Herbaceous marsh species 2. Pioneer tree seedlings 3. Sparse, low vegetation 4. Annual herbs, hydromesic ruderals 5. Perennial herbs, hydromesic clonals	1. Annual herbs, hydromesic ruderals 2. Perennial herbs, hydromesic clonals 3. Pioneer tree seedlings 4. Pioneer tree saplings	1. Annual herbs, xeric ruderals 2. Perennial herbs, non-clonal 3. Perennial herbs, clonal and non-clonal co-dominant 4. Mature pioneer trees, no young trees 5. Mature pioneer trees w/upland species 6. Late-successional species
Mesoriparian Indicators	6. Pioneer tree seedlings 7. Sparse, low vegetation 8. Pioneer tree saplings 9. Xeroriparian species	5. Sparse, low vegetation annual herbs, hydromesic 6. ruderals 7. Perennial herbs, hydromesic clonals 8. Pioneer tree seedlings 9. Pioneer tree saplings 10. Xeroriparian species 11. Annual herbs, xeric ruderals	7. Xeroriparian species 8. Annual herbs, xeric ruderals 9. Perennial herbs, non-clonal 10. Perennial herbs, clonal and non-clonal codominent 11. Mature pioneer trees, no young trees 12. Mature pioneer trees, xeric understory 13. Mature pioneer trees w/upland species 14. Late-successional species 15. Upland species
Xeroriparian indicators	10. Sparse, low vegetation 11. Xeroriparian species 12. Annual herbs, xeric ruderals	12. Sparse, low vegetation 13. Xeroriparian species 14. Annual herbs, xeric ruderals	16. Annual herbs, xeric ruderals 17. Mature pioneer trees w/upland species 18. Upland species

Table 3. Summary of Wetland Indicator Status

Category		Probability
Obligate Wetland	OBL	Almost always occur in wetlands (estimated probability >99%)
Facultative Wetland	FACW	Usually occur in wetlands (estimated probability of 67–99%)
Facultative	FAC	Equally likely to occur in wetlands/non-wetlands (estimated probability of 34–66%)
Facultative Upland	FACU	Usually occur in non-wetlands (estimated probability 67–99%)
Obligate Upland	UPL	Almost always occur in non-wetlands (estimated probability >99%)
Non-Indicator	NI	No indicator status has been assigned

Source: Reed, 1988; USFWS, 1997; USACE, 2012.

Table 4. Wetland Hydrology Indicators*

Primary Indicators	Secondary Indicators
Watermarks	Oxidized Rhizospheres Associated with Living Roots
Water-Borne Sediment Deposits	FAC-Neutral Test
Drift Lines	Water-Stained Leaves
Drainage Patterns Within Wetlands	Local Soil Survey Data

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 5. Wetland Hydrology Indicators for the Arid West*

	Primary Indicator (any one indicator is sufficient to make a determination that wetland hydrology is present)	Secondary Indicator (two or more indicators are required to make a determination that wetland hydrology is present)
Group A – Observation of Surface Water or Saturated Soils		
A1 – Surface Water	X	
A2 – High Water Table	X	
A3 – Saturation	X	
Group B – Evidence of Recent Inundation		
B1 – Water Marks	**X** (Non-riverine)	**X** (Riverine)
B2 – Sediment Deposits	**X** (Non-riverine)	**X** (Riverine)
B3 – Drift Deposits	**X** (Non-riverine)	**X** (Riverine)
B6 – Surface Soil Cracks	X	
B7 – Inundation Visible on Aerial Imagery	X	
B9 –Water-Stained Leaves	X	
B10 – Drainage	X	X
B11 – Salt Crust	X	
B12 – Biotic Crust	X	
B13 – Aquatic Invertebrates	X	

Table 5. Wetland Hydrology Indicators for the Arid West*		
	Primary Indicator (any one indicator is sufficient to make a determination that wetland hydrology is present)	**Secondary Indicator (two or more indicators are required to make a determination that wetland hydrology is present)**
Group C – Evidence of Current or Recent Soil Saturation		
C1 – Hydrogen Sulfide Odor	X	
C2 – Dry-Season Water Table		X
C3 – Oxidized Rhizospheres along Living Roots	X	

*Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0.

Table 6. Field Indicators of Hydric Soil Conditions*	
1. Indicators of Historical Hydric Soil Conditions	**2. Indicators of Current Hydric Soil Conditions**
a. Histosols b. Histic epipedons; c. Soil colors (e.g., gleyed or low-chroma colors, soils with bright mottles (Redoximorphic features) and/or depleted soil matrix d. High organic content in surface of sandy soils e. Organic streaking in sandy soils f. Iron and manganese concretions g. Soil listed on county hydric soils list	a. Aquic or peraquic moisture regime (inundation and/or soil saturation for *7 continuous days) b. Reducing soil conditions (inundation and/or soil saturation for *7 continuous days) c. Sulfidic material (rotten egg smell)

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 7. Hydric Soil Indicators for the Arid West*			
Hydric Soil Indicators	**Hydric Soil Indicators**	**Hydric Soil Indicators**	**Hydric Soil Indicators**
A1 – Histosol	S1 – Sandy Mucky Mineral	F1 – Loamy Mucky Mineral	A9 – 1 cm Muck
A2 – Histic Epipedon	S4 – Sandy Gleyed Matrix	F2 – Loamy Gleyed Matrix	A10 – 2 cm Muck
A3 – Black Histic	S5 – Sandy Redox	F3 – Depleted Matrix	F18 – Reduced Verti
A4 – Hydrogen Sulfide	S6 – Stripped Matrix	F6 – Redox Dark Surface	TF2 – Red Parent Material
A5 – Stratified Layers	—	F7 – Depleted Dark Surface	Other (See Section 5 of Regional Supplement, Version 2.0)
A9 – 1 cm Muck	—	F8 – Redox Depressions	—
A11 – Depleted Below Dark Surface	—	F9 – Vernal Pools	—
A12 – Thick Dark Surface	—	—	—

* Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0. ** Indicators of hydrophytic vegetation and wetland hydrology must be present

Appendix G PLANT COMPENDIUM WITH WETLAND INDICATOR STATUS

BSAs Plant Compendium with Wetland Indicator Status

Species Name	Common Name	Wetland Indicator Status*	BSA			
			OC	MP	EOI	EOII
Acmispon americanus	American deerweed	UPL	X	X	X	X
Acmispon glaber	deerweed	UPL	X	X	X	X
Acmispon grandiflorus	large leaved lotus			X		
Acmispon micranthus	small flowered lotus		X			
Acmispon wrangelianus	Chilean trefoil			X		
Acourtia microcephala	sacapellote		X	X	X	X
Adenostoma fasciculatum	chamise	UPL	X	X		X
Ailanthus altissima	tree of heaven	FACU		X		
Agrostis stolonifera	spreading bent	FACW	X			
Amaranthus blitoides	mat amaranth			X	X	X
Ambrosia acanthicarpa	annual bursage	UPL	X	X		
Ambrosia confertiflora	weak leaved burweed	UPL		X		
Ambrosia psilostachya	perennial ragweed	FACU		X	X	X
Amsinckia intermedia	common fiddleneck		X	X		
Amsinckia menziesii	small flowered fiddleneck	UPL			X	X
Antirrhinum kelloggii	Kellogg's snapdragon			X		
Antirrhinum nuttallianum	Nuttall's snapdragon			X		
Artemisia californica	California sagebrush	UPL	X	X	X	X
Artemisia douglasiana	mugwort	FAC		X	X	X
Artemisia dracunculus	wild tarragon	UPL			X	
Arundo donax	giant reed	FACW		X		
Asclepias californica	California milkweed				X	
Asclepias eriocarpa	Indian milkweed			X	X	X
Asclepias fascicularis	narrow-leaf milkweed	FAC		X		
Atriplex canescens	fourwing saltbush	FACU		X		
Atriplex semibaccata	Australian saltbush	FAC	X		X	X
Avena barbata	slim oat	UPL	X	X	X	X
Avena fatua	wild oat	UPL	X	X	X	X
Baccharis pilularis	coyote brush	UPL	X		X	X
Baccharis salicifolia	mulefat	FAC	X	X	X	X
Baccharis sarothroides	broom baccharis	FACU				X
Bebbia juncea	sweetbush		X	X	X	
Bloomeria crocea	golden stars		X	X	X	X
Bothriochloa laguroides	silver beardgrass					X
Brickellia californica	California brickellbush	FACU	X	X	X	
Bromus diandrus	ripgut brome	UPL	X	X	X	X
Bromus hordeaceus	soft chess	FACU		X	X	X
Bromus madritensis var. *rubens*	red brome	UPL	X	X	X	X
Calandrinia menziesii	red maids					X
Calochortus splendens	splendid mariposa lily		X	X	X	X
Calystegia macrostegia	island morning glory		X			
Calystegia peirsonii	Peirson’s morning glory		X	X	X	X
Camissoniopsis robusta	robust sun cup			X		
Capsella bursa-pastoris	sheperd's purse	FACU				X
Carduus pycnocephalus	Italian thistle					X
Castilleja foliolosa	Texas paintbrush			X	X	
Ceanothus crassifolius	hoary leaved ceanothus	UPL		X		X
Ceiba insignis	white floss silk tree				X	
Centaurea melitensis	tocalote	UPL	X	X	X	X
Cercocarpus betuloides	birch leaf mountain mahogany			X	X	
Chaenactis artemisiifolia	white pincushion		X	X		X
Chaenactis glabriuscula	common yellow chaenactis			X		X

Species Name	Common Name	Wetland Indicator Status*	BSA			
			OC	MP	EOI	EOII
Chenopodium album	lamb's quarters	FACU	X	X		
Chenopodium murale	nettle leaf goosefoot	FACU		X	X	
Chlorogalum pomeridianum	soap plant		X	X		
Chorizanthe staticoides	Turkish rugging		X			
Cirsium occidentale	western thistle	UPL			X	X
Claytonia perfoliata	miner's lettuce	FAC	X			
Clematis ligusticifolia	creek clematis	FAC				X
Collinsia heterophylla	Chinese houses			X		
Corethrogyne filaginifolia	common sandaster		X	X	X	X
Cotula coronopifolia	brass buttons	OBL	X	X		
Croton californicus	California croton	UPL		X		X
Croton setiger	turkey-mullein			X	X	X
Cryptantha intermedia	common cryptantha	UPL	X	X	X	X
Cucurbita foetidissima	calabazilla			X	X	X
Cuscuta californica	California dodder			X	X	X
Cylindropuntia californica	California cholla					X
Cynara cardunculus	artichoke thistle	UPL			X	X
Cynodon dactylon	Bermuda grass	FACU	X		X	X
Cyperus difformis	variable flatsedge	OBL				X
Datura wrightii	jimsonweed			X	X	X
Deinandra fasciculata	clustered tarweed	FACU	X	X	X	X
Dendromecon rigida	bush poppy					X
Descurainia pinnata	yellow tansy mustard	UPL		X		
Dichelostemma capitatum	blue dicks	FACU	X	X	X	X
Distichlis spicata	salt grass			X		
Dudleya cymosa	canyon dudleya	UPL			X	
Dudleya lanceolata	southern California dudleya		X	X		X
Dudleya multicaulis	many stemmed dudleya		X	X		
Dudleya pulverulenta	chalk dudleya				X	X
Ehrendorferia ochroleuca	yellow bleeding heart			X		
Elymus condensatus	giant wild rye	FACU	X	X	X	X
Elymus glaucus	blue wild rye	FACU	X	X		
Elymus hispidus	intermediate wheatgrass		X	X	X	X
Elymus triticoides	beardless wild rye	FAC+	X	X	X	X
Emmenanthe penduliflora	whispering bells		X	X		
Encelia actoni	Acton encelia			X		
Encelia californica	bush sunflower			X	X	X
Encelia farinosa	brittlebush	UPL		X	X	
Epilobium canum	California fuchsia	UPL		X		X
Eriastrum sapphirinum	sapphire eriastrum		X	X	X	X
Ericameria palmeri	Palmer's goldenbush				X	X
Erigeron canadensis	Canada horseweed	FACU	X	X	X	X
Erigeron foliosus	leafy daisy		X	X	X	X
Eriodictyon crassifolium	thick leaved yerba santa	UPL		X	X	X
Eriogonum elongatum	longstem buckwheat		X		X	
Eriogonum fasciculatum	California buckwheat	UPL	X	X	X	
Eriophyllum confertiflorum	yellow yarrow	UPL	X	X	X	X
Erodium brachycarpum	white stemmed filaree		X			X
Erodium cicutarium	red stemmed filaree	UPL	X	X	X	X
Eschscholzia caespitosa	foothill poppy		X	X	X	X
Eschscholzia californica	California poppy			X		
Eucalyptus citriodora	lemon scented gum	FACU			X	
Eucalyptus polyanthemos	silver dollar gum				X	
Eucrypta chrysanthemifolia	spotted eucrypta		X	X	X	X
Euphorbia albomarginata	rattlesnake sandmat				X	X

Species Name	Common Name	Wetland Indicator Status*	BSA			
			OC	MP	EOI	EOII
Foeniculum vulgare	fennel	FACU	X		X	X
Fraxinus dipetala	California ash				X	
Funastrum cynanchoides	fringed twinevine	FACU		X	X	X
Galium andrewsii	phlox leaved bedstraw			X		X
Galium angustifolium	narrow leaved bedstraw	UPL	X	X	X	X
Gazania linearis	treasure flower		X	X	X	
Gilia angelensis	chaparral gilia			X	X	
Grindelia camporum	gumweed	FACW			X	
Gutierrezia californica	matchweed				X	X
Hazardia squarrosa	saw toothed goldenbush		X	X	X	X
Helianthus annuus	common sunflower	FACU		X		
Helianthus californicus	California sunflower	OBL			X	X
Heliotropium curassavicum	seaside heliotrope	FACU		X	X	X
Hesperoyucca whipplei	chaparral yucca		X	X	X	X
Heteromeles arbutifolia	toyon	UPL	X	X	X	X
Heterotheca grandiflora	telegraph weed	UPL	X		X	X
Hirschfeldia incana	mustard		X	X	X	X
Hordeum murinum	foxtail barley	FACU		X	X	X
Isocoma menziesii	white flowered goldenbush	FAC	X			
Juglans californica	southern California black walnut	FACU				X
Juncus balticus	wire rush	FACW		X		
Juniperus californica	California juniper			X		
Keckiella antirrhinoides	Chaparral beard tongue			X	X	X
Keckiella cordifolia	heart leaved keckiella			X	X	X
Kochia scoparia	summer cypress	UPL		X		
Lactuca serriola	prickly lettuce	FACU	X	X	X	X
Lathyrus vestitus	common Pacific pea					X
Lepidium densiflorum	common pepperweed	UPL	X	X		X
Lepidospartum squamatum	California scalebroom	FACU	X	X	X	X
Limonium sinuatum	statice	FACW			X	
Lonicera interrupta	chaparral honeysuckle			X		
Lotus corniculatus	bird's foot trefoil	FAC	X			X
Lupinus bicolor	bicolored lupine	UPL	X	X		X
Lupinus hirsutissimus	stinging lupine			X		
Lupinus latifolius	broad leaf lupine	FACW			X	
Lupinus longifolius	long leaf bush lupine				X	X
Lupinus microcarpus	chick lupine				X	
Lysimachia arvensis	scarlet pimpernel	FAC	X	X		X
Malacothamnus fasciculatus	chaparral bush mallow		X	X	X	X
Malacothrix saxatilis	cliff aster		X	X	X	X
Malosma laurina	laurel sumac		X	X	X	X
Marah macrocarpa	chilicothe	UPL	X	X	X	X
Marrubium vulgare	white horehound	FACU		X	X	X
Medicago polymorpha	California burclover	FACU		X		X
Melaleuca quinquenervia	broad-leaved paperbark				X	
Melica imperfecta	Coast Range melic				X	
Melilotus albus	white sweetclover	FACU+	X	X	X	X
Melilotus indicus	annual yellow sweetclover	FACU		X		
Mimulus aurantiacus	sticky monkeyflower	UPL	X	X	X	X
Mirabilis laevis	desert wishbone bush			X	X	X
Nicotiana glauca	tree tobacco	FAC	X	X	X	X
Oenothera speciosa	Mexican evening primrose		X			
Oenothera suffrutescens	wild honeysuckle				X	
Opuntia ficus-indica	tuna cactus				X	

Species Name	Common Name	Wetland Indicator Status*	BSA			
			OC	MP	EOI	EOII
Opuntia littoralis	prickly pear	UPL	X	X	X	X
Paeonia californica	California peony			X		
Pennisetum purpureum	elephant grass			X	X	
Persicaria lapathifolia	common knotweed	FACW		X		
Phacelia cicutaria	caterpillar phacelia		X	X	X	X
Phacelia minor	California bluebell			X		
Phacelia parryi	Parry's phacelia			X		X
Phoradendron leucarpum	American mistletoe			X		X
Pinus halepensis	Aleppo pine		X		X	
Plantago lanceolata	English plantain	FAC			X	
Platanus racemosa	California sycamore	FAC		X	X	X
Plecostachys serpyllifolia	petite-licorice	FACU		X		
Poa secunda	pine bluegrass	FACU	X	X		X
Polygonum aviculare	yard knotweed	FAC		X		
Polypodium californicum	California polypody			X		
Polypogon monspeliensis	rabbit's-foot grass	FACW	X			
Populus fremontii	Fremont cottonwood	FACW	X	X	X	
Prunus ilicifolia	holly leaf cherry		X	X	X	X
Prunus persica	peach				X	
Pseudognaphalium californicum	ladies' tobacco	UPL		X	X	X
Pseudognaphalium canescens	Wright's cudweed	FACU			X	X
Pseudognaphalium microcephalum	Wright's cudweed			X	X	
Quercus agrifolia	coast live oak	UPL	X	X	X	X
Quercus agrifolia var. *oxyadenia*	southern coast live oak					X
Quercus berberidifolia	inland scrub oak			X		X
Rhus aromatica	fragrant sumac	FACU		X		X
Rhus glabra	smooth sumac				X	X
Rhus integrifolia	lemonade berry	UPL	X	X	X	X
Rhus ovata	sugar bush	UPL		X	X	X
Ribes californicum	California gooseberry					X
Ricinus communis	castor bean	FACU		X		
Robinia var.	locust				X	
Romneya coulteri	Coulter's matilija poppy			X		
Rosa californica	California rose	FAC		X		X
Rubus ursinus	California blackberry	FAC			X	
Rumex crispus	curly dock	FAC	X			X
Salix gooddingii	black willow	FACW	X	X	X	X
Salix lasiolepis	arroyo willow	FACW			X	X
Salsola tragus	Russian thistle	FACU	X	X	X	X
Salvia apiana	white sage	UPL	X	X	X	X
Salvia columbariae	chia sage	UPL	X	X		X
Salvia leucophylla	purple sage					X
Salvia mellifera	black sage	UPL	X	X	X	X
Sambucus nigra	black elderberry	FACU	X	X	X	X
Schinus molle	Peruvian pepper tree	FACU			X	
Schinus terebinthifolia	Brazilian pepper tree	FAC			X	
Schismus barbatus	old han schismus	UPL	X	X	X	X
Scrophularia californica	California figwort	FAC	X	X	X	X
Searsia lancea	African sumac					X
Selaginella bigelovii	Bigelow's moss fern				X	X
Senecio vulgaris	common groundsel	FACU		X		
Setaria viridis	green foxtail	UPL	X			
Silene laciniata	cardinal catchfly		X	X		
Silybum marianum	milk thistle		X	X	X	X
Sisymbrium orientale	Indian hedge mustard	UPL		X		

Species Name	Common Name	Wetland Indicator Status*	BSA			
			OC	MP	EOI	EOII
Sisyrinchium bellum	blue eyed grass	FACW				X
Solanum douglasii	Douglas' nightshade	FAC		X	X	X
Solanum xanti	purple nightshade		X	X		X
Sonchus arvensis	perennial sow thistle	FACU				X
Sonchus asper	spiny sowthistle	FAC	X	X	X	
Sonchus oleraceus	common sowthistle	UPL	X	X	X	X
Stephanomeria exigua	small wirelettuce	UPL	X			
Stephanomeria virgata	twiggy wreath plant			X		
Stipa lepida	foothill needle grass		X	X	X	X
Stipa miliacea	smilo grass				X	X
Symphoricarpos albus	common snowberry	FACU				X
Tamarix ramosissima	tamarisk	FAC	X	X	X	X
Tetradymia comosa	hairy horsebrush			X		
Toxicodendron diversilobum	poison oak	FACU	X	X	X	X
Tragopogon dubius	yellow salsify			X		
Trichostema lanceolatum	vinegarweed	FACU		X		
Trifolium pratense	red clover	FACU	X			
Trifolium repens	white clover	FACU		X		
Trifolium wormskioldii	cow clover	FACW		X		
Typha latifolia	broadleaf cattail	OBL	X			
Uropappus lindleyi	silver puffs		X			
Urtica dioica	stinging nettle	FAC		X		X
Veronica persica	bird's eye speedwel			X		
Vicia villosa	hairy vetch					X
Washingtonia robusta	California fan palm	FAC	X		X	X
Xanthium spinosum	spiny cocklebur	FACU		X		
Xanthium strumarium	cocklebur	FAC		X	X	X

* Some species have not been assigned a Wetland Indicator Status by the resource agencies; therefore, one is not listed for those species.

Wetland Indicator Status Definitions

OBL – Obligate Wetland: Occurs almost always in wetlands under natural conditions

FACW – Facultative Wetland: Usually occurs in wetlands, but often found in non-wetlands

FAC – Facultative: Equally likely to occur in wetlands or non-wetlands

FACU – Facultative Upland: Usually occurs in non-wetlands, but often found in wetlands

UPL – Obligate Upland: Occurs almost always in non-wetlands under natural conditions

(+) or (-) with Facultative categories: positive (+) or negative (-) sign is used to more specifically define the regional frequency of occurrence in wetlands. The positive sign indicates a frequency toward the higher end of the category (more frequently found in wetlands). A negative sign indicates a frequency toward the lower end of the category (less frequently found in wetlands).

Appendix D CULTURAL RESOURCES TECHNICAL REPORT

CULTURAL RESOURCES SURVEY REPORT ON BEHALF OF ORANGE COUNTY PARKS OF PORTIONS OF EAST ORANGE I, EAST ORANGE II, AND MOUNTAIN PARK CONSERVATION EASEMENTS, STAGING AREA AND TRAIL IMPROVEMENT PROJECTS, NEAR IRVINE LAKE, ORANGE COUNTY, CALIFORNIA



- Cultural Resources Survey for OC Parks of portions of East Orange I, II, and Mountain Park Conservation Easements
- Phase I archaeological survey of approximately 585 acres of land in an unsectioned portion of Lomas De Santiago and Santiago De Santa Ana Mexican Land Grants, as depicted on the Black Star Canyon, CA (1988) USGS 7.5-minute series topographic quadrangle
- Saddleback Park Motocross Racetrack (P30-001771)

Submitted to:
OC Parks Planning & Design Division
13042 Old Myford Road
Irvine, CA 92602

Submitted by:
Hubert Switalski and Victoria Harvey
Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627

August 2018

This document may contain sensitive archaeological information. Not for public distribution.

This document entitled *CULTURAL RESOURCES SURVEY REPORT ON BEHALF OF ORANGE COUNTY PARKS OF PORTIONS OF EAST ORANGE I, EAST ORANGE II, AND MOUNTAIN PARK CONSERVATION EASEMENTS STAGING AREA AND TRAIL IMPROVEMENT PROJECTS, NEAR IRVINE LAKE, ORANGE COUNTY, CALIFORNIA,* was prepared by Stantec Consulting Services Inc. for the account of *Orange County Parks*. The material in it reflects Stantec Consulting Services Inc. best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Prepared by _____
(signature)

Hubert Switalski, Senior Archaeologist

Prepared by _____
(signature)

Victoria Harvey, RPA Principal Investigator

Cover page: Overview of the Project Area with Suicide Hill, part of Saddleback Park (P30-001771) in background, view north. Photo taken from the Santiago Canyon Sanitary Landfill on January 25, 2018 (Stantec IMG_0499).

TABLE OF CONTENTS

Page

1.0 **MANAGEMENT SUMMARY** 1
2.0 **REGULATORY FRAMEWORK** 2
3.0 **PROJECT DESCRIPTION** 3
3.1 East Orange I 4
3.2 East Orange II 4
3.3 Mountain Park 4
4.0 **PROJECT LOCATION** 5
5.0 **ENVIRONMENTAL BACKGROUND** 5
6.0 **CULTURAL BACKGROUND** 11
6.1 Archaeological Background 11
6.1.1 Greven Knoll Phases 11
6.1.2 Angeles Phase 12
6.2 Ethnography 12
6.3 Historical Background 13
6.3.1 Early History 13
6.3.2 Early Oil Exploration 13
6.3.3 Water Resources 14
6.4 Current and Past Land Use 14
7.0 **METHODOLOGY** 15
7.1 Records Search 15
7.1.1 East Orange I 15
7.1.2 East Orange II 18
7.1.3 Mountain Park 20
7.2 Native American Notification/Sacred Lands File Search 23
7.3 Field Methods 23
8.0 **SURVEY RESULTS** 24
8.1 East Orange I 24
8.2 East Orange II 28
8.3 Mountain Park 29
9.0 **CULTURAL RESOURCES** 31
9.1 Saddleback Park Motocross Raceway (CA-ORA-1771H, P30-001771) 31
10.0 **MANAGEMENT RECOMMENDATIONS** 33
11.0 **REFERENCES** 36

LIST OF FIGURES

Figure 1. Project location and vicinity map. 6

Figure 2. East Orange I, East Orange II, and Mountain Park Project Area shown with nearby topographical features discussed in the text. 7

Figure 3. East Orange I Project Area with the Study Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minute series topographic quadrangle. 8

Figure 4. East Orange Project Area with the Study Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minute series topographic quadrangle. 9

Figure 5. Mountain ParkProject Area with the Study Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minute series topographic quadrangle. 10

Figure 6. Overview of the Project Area showing portion of Suicide Hill, associated with Saddleback Park (P30-001771), with terraced hillside in background, view west. 25

Figure 7. Overview of the Project Area with remnants of an abandoned motocross racetrack (Saddleback Park) visible in hillside in foreground, view southwest. Note the typical vegetation and topography within the Project Area. 25

Figure 8. East Orange I Project Area showing steep terrain with slope more than 50°, depicted on the Black Star Canyon, CA (1988) 7.5-minute series USGS topographic quadrangle. 26

Figure 9. Overview of the Project Area depicting steep hillside and dense, impassible vegetation, view north. 27

Figure 10. Overview of the Project Area (East Orange II) showing the partially overgrown access road, view south towards Santiago Canyon Road. 28

Figure 11. Overview of the Project Area (East Orange II) showing outline of the access road, view north. Note the typical vegetation and topography within this portion of the Project Area. 29

Figure 12. Overview of the Project Area (Mountain Park) taken within Gypsum Canyon, view south. Note the typical vegetation comprised of oak trees along Gypsum Creek. 30

Figure 13. Overview of the Project Area (Mountain Park) taken from the N-S trending ridge with Santa Ana River in the background, view north. 30

Figure 14. Photograph of Saddleback Park circa 1984 with Suicide Hill in background. 32

Figure 15. Photograph of Saddleback Park circa 1970s showing entrance to the park (center) and Santiago Canyon Road on the right. 32

Figure 16. Portion of concrete foundation (Feature 1) identified near the original entrance to Saddleback Park, view southeast. 33

Figure 17. Overview of Saddleback Park (East Orange I) with portion of Webco and Banzai Hills on the right, view northwest. 34

LIST OF TABLES

Table 1. Summary of Cultural Resource Studies Previously Conducted Within the East Orange I Study Area 16

Table 2. Summary Known Cultural Resources Previously Documented Within the East Orange I Study Area 17

Table 3. Summary of Cultural Resource Studies Previously Conducted Within the East Orange II Study Area 19

Table 4. Summary of Known Cultural Resources Previously Documented Within the East Orange II Study Area 20
Table 5. Summary of Cultural Resource Studies Previously Conducted Within the Mountain Park Study Area 21
Table 6. Summary of Known Cultural Resources Previously Documented Within the Mountain Park Study Area 22
Table 7. Survey Methodology Implemented within East Orange I Project Area 27
Table 8. Summary of Resources Documented During the Current Study 31

APPENDICES

East Orange I, East Orange II, and Mountain Park Study Areas with Archaeological Survey Coverage ..... Appendix A
Native American Notification/Sacred Lands File Search Correspondence ..... Appendix B
Site Records (DPR-523 Forms) ..... Appendix C

1.0 MANAGEMENT SUMMARY

In January and June, 2018, Stantec Consulting Services Inc. (Stantec) conducted an archaeological study on behalf of the Orange County Parks (OC Parks) of portions of East Orange I, East Orange II, and Mountain Park Conservation Easements (the Project), near the City of Irvine, Orange County, California. OC Parks is in the process of preparing an Interim Operations Plan (IOP) for the 2014 Irvine Ranch Open Space Donation, which encompasses approximately 2,300 acres of land donated by the Irvine Company. Of these 2,300 acres, OC Parks proposes to conduct future improvements, which are only limited to portions of conservation easements referred to as East Orange I, East Orange II, and Mountain Park.

As the proposed project is located on lands owned and managed by OC Parks and may require state and local permits, the proposed project is subject to compliance with the California Environmental Quality Act (CEQA) requirements regarding the project's impacts on cultural resources. CEQA (Public Resources Code Sections 21000 etc.) requires that, before approving most discretionary projects, the Lead Agency must identify and examine any significant adverse environmental effects that may result from activities associated with such projects (Public Resources Code Sections 21083.2 and 21084.1). CEQA explicitly requires that the initial study examine whether the project may result in a significant adverse change to "historical resources" and "unique archaeological resources." Under these requirements, a cultural resources inventory was conducted to determine impacts of the proposed project on any cultural resources potentially eligible for nomination to California Register of Historical Resources (CRHR) and/or the National Register of Historic Places (NRHP).

The archaeological study consisted of an archival records search of the Project Area and the surrounding Study Area conducted at the South Central Coastal Information Center (SCCIC) of the California Historic Resources Information System (CHRIS), located at California State University, Fullerton, a Sacred Lands File search conducted with the Native American Heritage Commission (NAHC) in Sacramento, and an archaeological survey of approximately 584.9 acres within portions of East Orange I, East Orange II, and Mountain Park conservation easements. The remaining 68.9 acres were not surveyed due to steep terrain, dense vegetation or combination of both.

The survey resulted in the identification and documentation of a single, historic period motocross racetrack (Saddleback Park), which opened in 1967 and operated until its closure in 1984. Based on the field data and archival research, the resource does appear to be associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage, in this case the development of motocross racing on state and national levels as allegedly it was the first off-road park of its kind built in the United States. However, since its closure, any features/structures associated with the park have been removed and the off-road course once associated with this facility exhibits very little in terms of integrity, and as such does not appear to be eligible for nomination to the California Register of Historic Resources (CRHR) and/or the National Register of Historic Places (NRHP).

Prehistoric resources (CA-ORA-1240 and CA-ORA-1294) previously documented within the Project Area were tested for significance in 2004 by M. Dice and C. Taniguchi and were found ineligible to the CRHR and/or the NRHP. Previously recorded historic period rocket fuel test facility (P30-176701) was previously determined as ineligible to the CRHR with its structures completely removed in 2005. As such, these resources do not require any further studies. Previously documented isolated finds (P30-100304 and P30-100460) do not meet the minimum requirements for inclusion and evaluation to the CRHR and generally require no additional investigation or evaluation. Therefore, based on the results of this study, no significant and/or archaeological resources were identified within the Project Area, and no substantial adverse impacts to such resources as defined in Section 15064.5 are expected.

2.0 REGULATORY FRAMEWORK

This archaeological study was conducted to meet the CEQA requirements regarding cultural resources on lands proposed for potential future development. CEQA (Public Resources Code Sections 21000 etc.) requires that before approving most discretionary projects, the Lead Agency must identify and examine any significant adverse environmental effects that may result from activities associated with such projects (Public Resources Code Sections 21083.2 and 21084.1). CEQA explicitly requires that the initial study examine whether the project may have a significant effect on "historical resources" and "unique archaeological resources." Under these requirements, a cultural resources inventory was conducted in order to determine impacts of the proposed project on cultural resources potentially eligible for nomination to the CRHR.

CEQA (California Public Resources Code Section 21000 et seq.) (1970) established that historical and archaeological resources are afforded consideration and protection by the California Environmental Quality Act (CEQA) (14 CCR Section 21083.2, 14 CCR Section 15064). CEQA Guidelines define significant cultural resources under three regulatory designations: historical resources, tribal cultural resources, and unique archaeological resources. These designations permit for a fair amount of overlap.

A historical resource is a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR"; or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code"; or "any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" (14 CCR Section 15064.5[a][3]). Historical resources automatically listed in the CRHR include California cultural resources listed in or formally determined eligible for the NRHP and California Registered Historical Landmarks from No. 770 onward (PRC 5024.1[d]). Locally listed resources are entitled to a presumption of significance unless a preponderance of evidence in the record indicates otherwise.

Tribal cultural resources (TCRs) are similar to the traditional cultural property designation within the National Historic Preservation Act (NHPA) guidance. These can be sites, features, places, cultural landscapes, and sacred places or objects that have cultural value or significance to a Tribe. To qualify as a TCR, it must either be 1) listed on or eligible for listing on the California Register or a local historic register or, 2) or is a resource that the lead agency, at its discretion and supported by substantial evidence, determines should be treated as a TCR (PRC Section 21074). TCRs can include "non-unique archaeological resources" (see "unique archaeological resource" below) that, rather than being important for "scientific" value as a resource, can also be significant because of the sacred and/or cultural tribal value of the resource. Tribal representatives are considered experts appropriate for providing substantial evidence regarding the locations, types, and significance of tribal cultural resources within their traditionally and cultural affiliated geographic area (PRC Section 21080.3.1(a)).

Under CEQA, a resource is generally considered historically significant if it meets the criteria for listing in the CRHR. A resource must meet at least one of the following criteria (PRC 5024.1; 14 CCR Section 15064.5[a][3]):

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage. Title 14, CCR Section 4852(b)(1) adds, "is

associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States."
2. Is associated with the lives of persons important in our past. Title 14, CCR Section 4852(b)(2) adds, "is associated with the lives of persons important to local, California, or national history."
3. Embodies the distinctive characteristics of a type, period, region, or method of construction; or represents the work of an important creative individual; or possesses high artistic values. Title 14, CCR 4852(b)(3) allows a resource to be CRHR eligible if it represents the work of a master.
4. Has yielded, or may be likely to yield, information important in prehistory or history. Title 14, CCR 4852(b)(4) specifies that importance in prehistory or history can be defined at the scale of "the local area, California, or the nation."

Historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (14 CCR 4852[c]).

An archaeological artifact, object, or site can meet CEQA's definition of a unique archaeological resource even if it does not qualify as a historical resource (PRC 21083.2[g]; 14 CCR 15064.5[c][3]). An archaeological artifact, object, or site is considered a unique archaeological resource if "it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria (PRC 21083.2[g]):

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person."

Public Resources Code 5097.98. This section discusses the procedures that need to be followed upon the discovery of Native American human remains. The NAHC, upon notification of the discovery of human remains is required to contact the County Coroner pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code and shall immediately notify those persons it believes to be most likely descended from the deceased Native American.

Health and Safety Code 7050.5. This code establishes that any person, who knowingly mutilates, disinters, wantonly disturbs, or willfully removes any human remains in or from any location without authority of law is guilty of a misdemeanor. It further defines procedures for the discovery and treatment of Native American human remains.

The *Project Area* is confined to the 403.9-acre portion of land within the East Orange I conservation easement, and a 30-meter (100 feet) wide buffer along an existing road (approximately 147.0 acres) proposed for maintenance/improvement within East Orange II conservation easement, and approximately 102.9 acres within Mountain Park conservation easement, for a total of 653.8 acres. It is expected that any potential adverse impacts, including ground disturbance, arising from any future maintenance and improvement projects will be contained within the acreage. The *Study Area* for this project consists of the Project Area and a ½-mile radius surrounding the Project Area.

3.0 PROJECT DESCRIPTION

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are

enjoyed by millions of local residents and visitors each year. In 2014, through a generous gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres of land previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres.

The Property has been conveyed to the County with restrictions that are intended to protect its "Conservation Values," specifically its natural, ecological, scenic, open space, recreational and educational values. These values are equal in importance and are the basis for OC Parks' management of the Property. They are also fully consistent with the vision of OC Parks as identified in the OC Parks Strategic Plan: "Preserve Orange County's parks in perpetuity for the recreation, education and inspiration of all visitors."

OC Parks is currently preparing an IOP for the Irvine Ranch Open Space and the IOP is intended to provide: 1) management consideration and to guide the management of the Irvine Ranch Open Space until an Adaptive Management Plan for the Property is developed; 2) to document and delineate the relationship between OC Parks and the Irvine Ranch Conservancy (IRC) regarding the management of the property; and 3) to ensure that the Property is managed in a way that protects its conservation and resource values, while providing opportunities for public access for recreational and educational purposes.

OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park conservation easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

3.1 East Orange I

Proposed improvements within East Orange I include the development of a staging area and trail, which will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack and was known to local motorcycle enthusiasts as Saddleback Park.

3.2 East Orange II

Proposed improvements within portions of East Orange II will include the development of a staging area and trail which will be contained within disturbed areas from past uses. Improvements will include the addition of a concrete pad within the existing decomposed granite parking lot, to support ADA accessible parking, portable restrooms, and signage. The trail will follow existing jeep trail routes. Activities planned for the Augustine staging area will be limited to parking lot and picnic area improvements. This staging area will serve as the access point to an existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access.

3.3 Mountain Park

OC Parks anticipates that the proposed improvements within Mountain Park will include the development of a staging area and trail, which will be contained within disturbed areas from previous land use. It is anticipated that improvements will include a decomposed granite parking lot, addition of portable restrooms, picnic benches, and signage. The staging area will be used as

the access point to an existing fire road/trail system that will be used as a trail, with use of this trail system would not require additional maintenance above and beyond that required to maintain current access.

This document is prepared to support OC Parks' Initial Study/Mitigated Negative Declaration (IS/MND) of the IOP covering portions of East Orange I, East Orange II, and Mountain Park properties. This archaeological study addresses proposed improvements specifically within portions of East Orange I, East Orange II, and Mountain Park conservation easements, that could have an adverse impact on cultural resources as a result of the aforementioned improvements. This study addresses approximately 403.8 acres of land within East Orange I, approximately 147.0 acres of land (approximately 3.2 linear miles) of the existing fire road/trail system situated within portions of East Orange II, and approximately 102.9 acres of land (approximately 4.45 linear miles) of the existing fire road/trail system within Mountain Park conservation easement.

4.0 PROJECT LOCATION

The Study Area is located approximately four miles east of the City of Orange and five miles north of the City of Irvine, in the north-central portion of Orange County, California (Figure 1). The Study Area is situated within the northern portion of Loma Ridge within the Santa Ana Mountains, overlooking Santiago Creek to the north and Santiago Reservoir (Irvine Lake) to the east (Figure 2). Specifically, the Study Area is in an un-sectioned portion of Rancho Lomas De Santiago and Santiago De Santa Ana Mexican land grants, as depicted on the Black Star Canyon, CA (1988) USGS 7.5-minute series topographic quadrangles (Figures 3 through 5).

5.0 ENVIRONMENTAL BACKGROUND

The Study Area is located in the north-central portion of Orange County in the foothills of Santa Ana Mountains, bounded by Santiago Creek to the north, Limestone Canyon to the southeast and Peters Canyon to the southwest. The Study Area is located within the northern portion of the Loma Ridge, which is part of the Santa Ana Mountains.

This part of Orange County is part of the Peninsular Range Natural Province of southern California, a system of northwesterly trending ridges that extend from the Transverse Ranges south into Baja California. The topography of this province is characterized by irregular coastal plain in the west, as well as prominent ridges, peaks, valleys and subdued upland areas as one moves south and east (Jahns 1954:29). The general topography within the Study Area is comprised of rolling foothills intersected by ephemeral and perennial drainages, with slope between 10 and 30°. The elevation ranges from 740 to 965 feet within the East Orange I Project Area, from 840 to 1,240 feet within the East Orange II Project Area, and between 400 and 950 feet within the Mountain Park Project Area.

The climate of the Study Area is classified as Mediterranean and characterized by long, dry summer, and wet, relatively short winters. The vegetation within the Study Area and immediate surroundings is classified as Coastal Sage Scrub and Valley Grassland plant community, which is generally dominated by a lush growth of California buckwheat (Munz 1974).

Prior to development first as an agricultural community and now as suburban this area had flora of chaparral and southern oak woodland, characterized by grassland with shrubs and oak stands in the foothills (Rundel and Gustafson 2005). Common plants within these biotic communities would have included chamise (*Adenostoma fasciculatum*), scrub oak (*Quercus dumosa*), coast live oak (*Quercus agrifolia*), manzanita (*Arctostaphylos* sp.), toyon (*Hetermoles arbutifolia*), sugarbush (*Rhus ovata*), and lemonade-berry (*Rhus integrifolia*) (Rundel and Gustafson 2005).

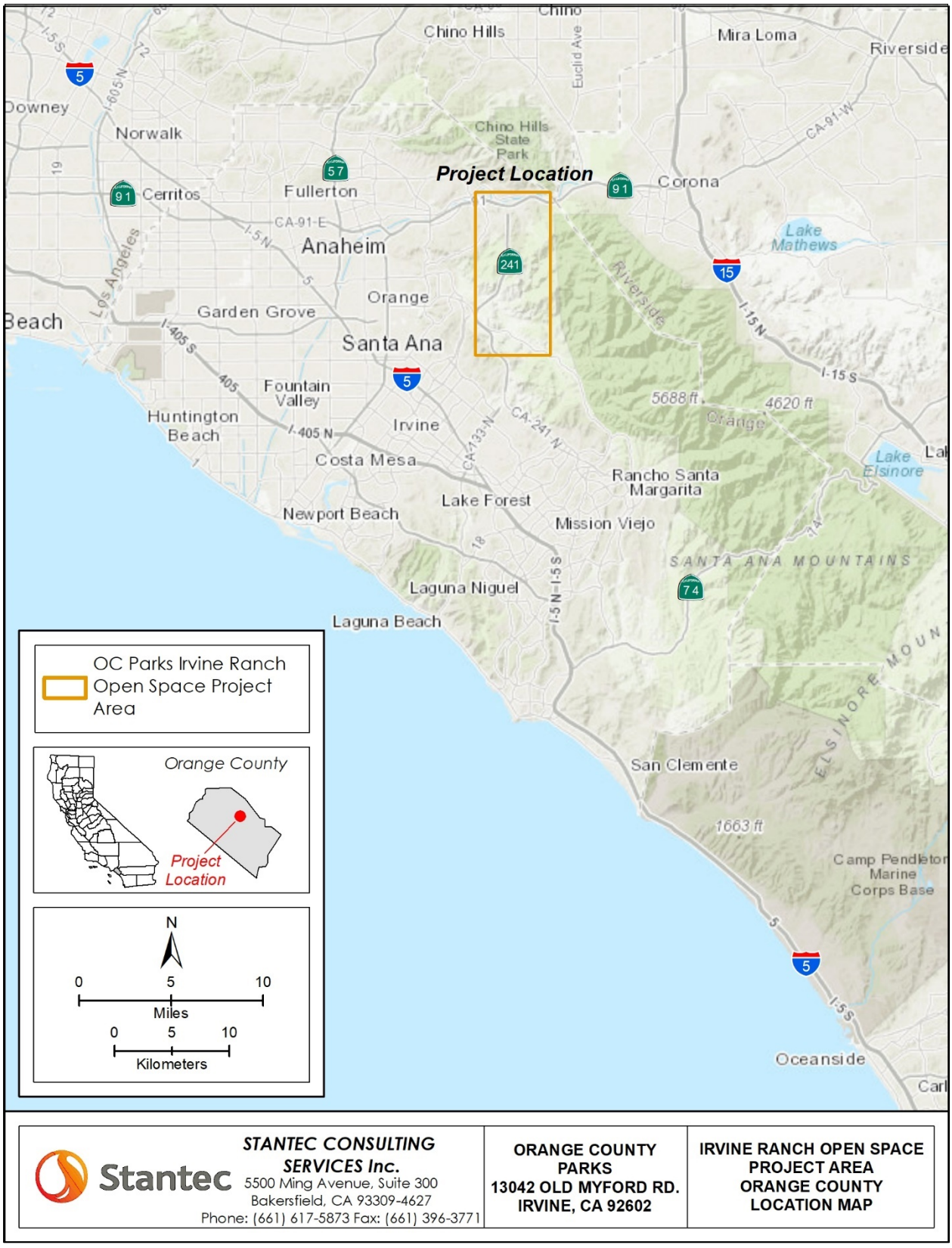


Figure 1. Project location and vicinity map.

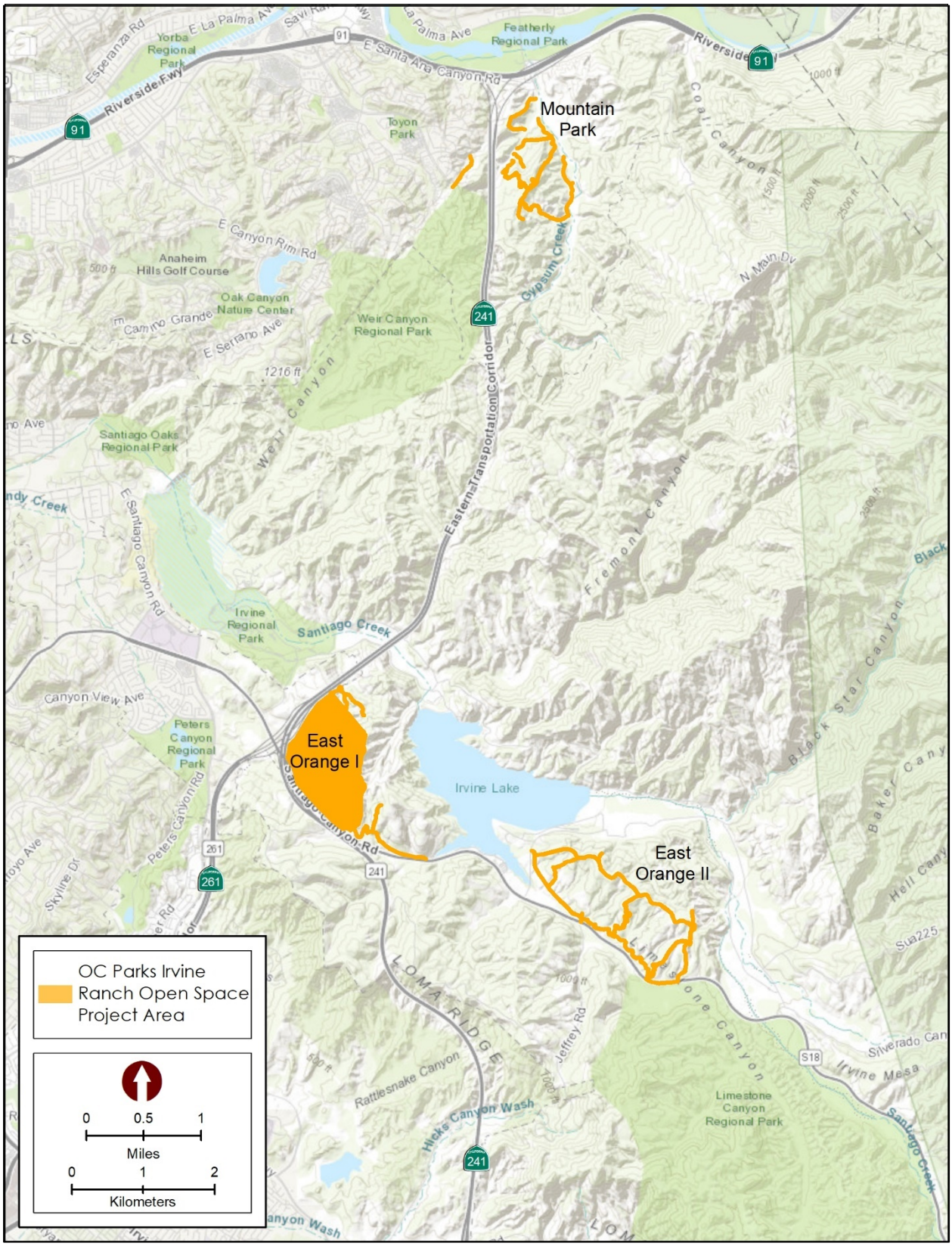


Figure 2. East Orange I, East Orange II, and Mountain Park Project Area shown with nearby topographical features discussed in the text.

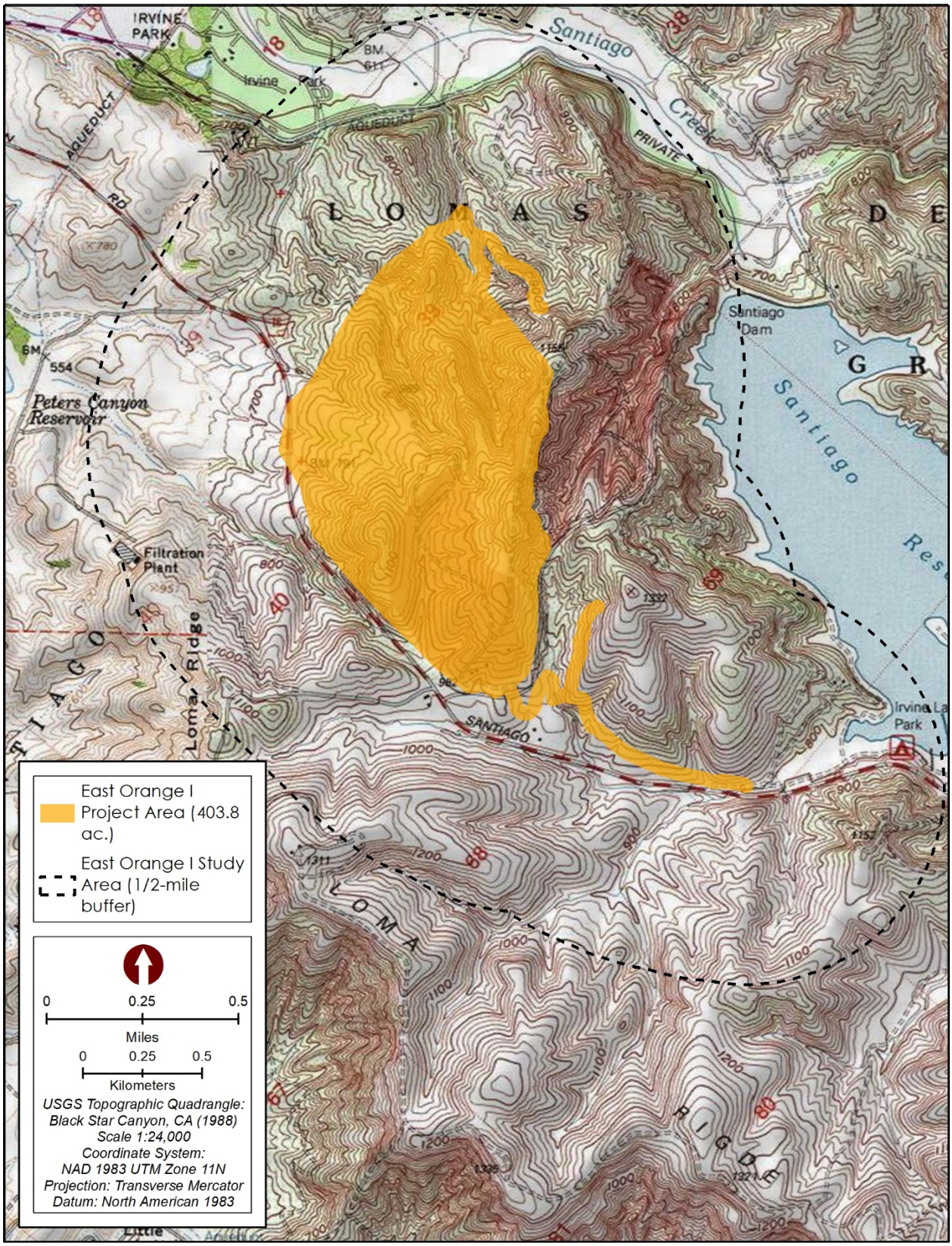


Figure 3. East Orange I Project Area with the Study Area depicted on the Black Star Canyon, CA (1988), USGS 7.5-minute series topographic quadrangle.

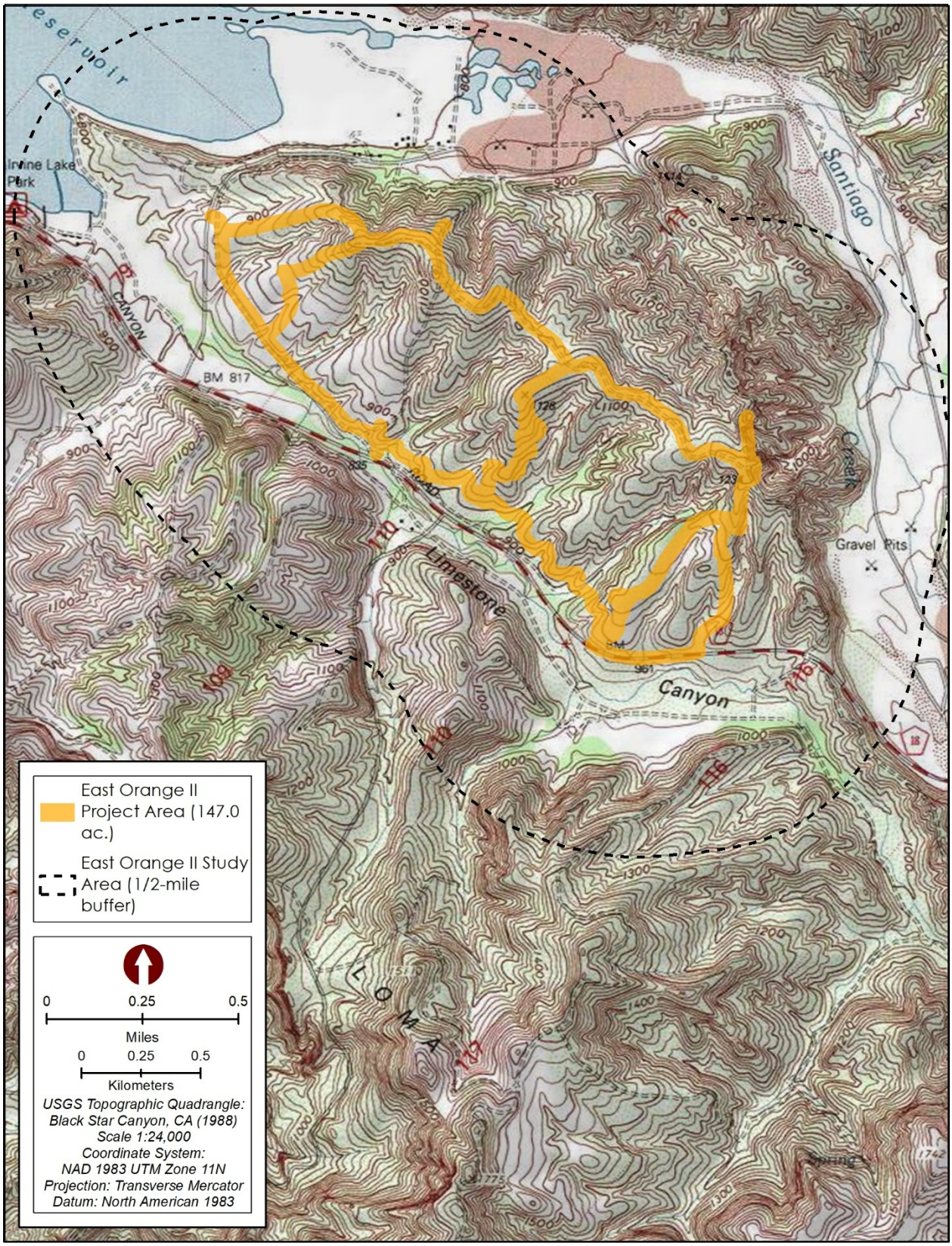


Figure 4. East Orange II Project Area with the Study Area depicted on the Black Star Canyon, CA (1988), USGS 7.5-minute series topographic quadrangle.

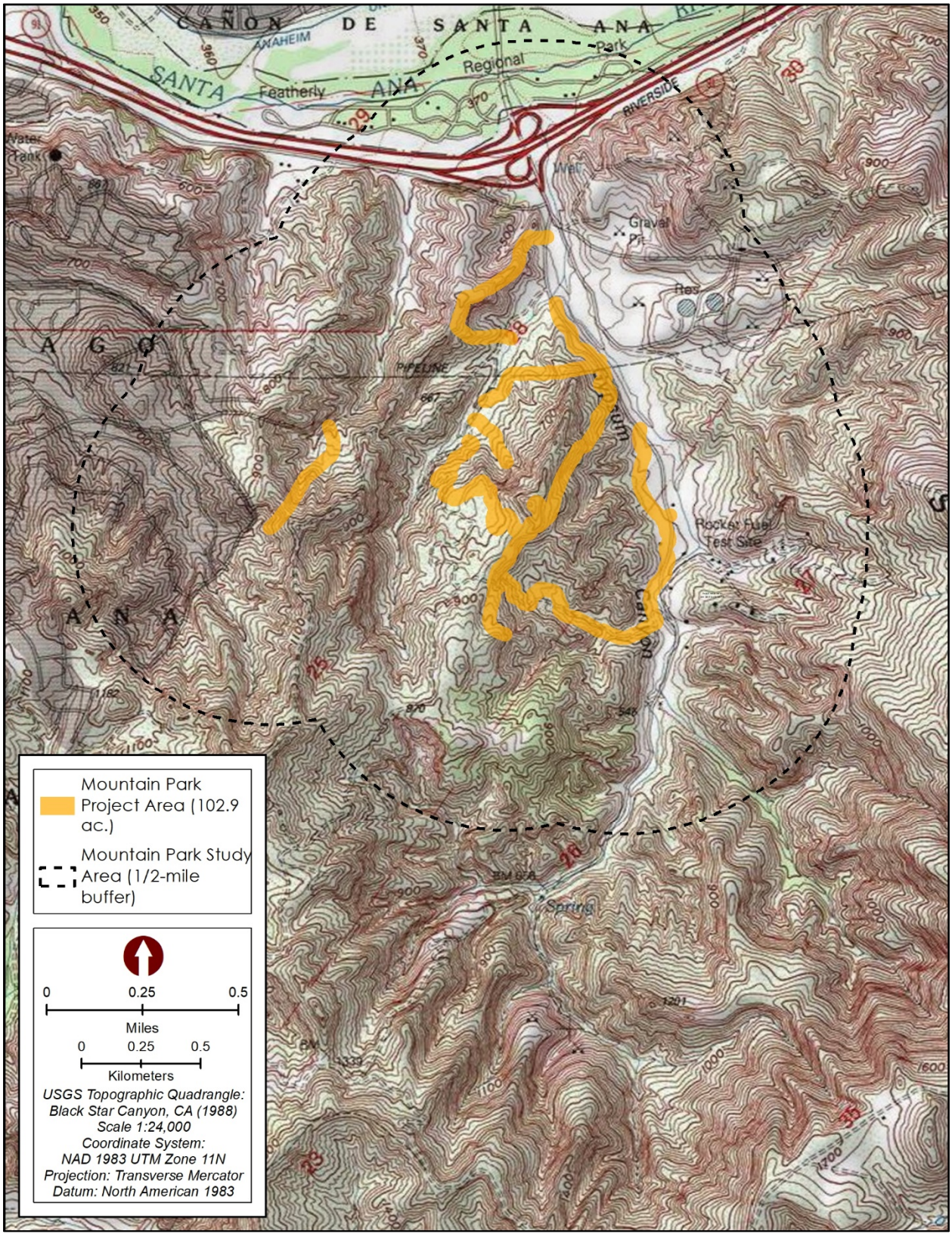


Figure 5. Mountain Park Project Area with the Study Area depicted on the Black Star Canyon, CA (1988), USGS 7.5-minute series topographic quadrangle.

6.0 CULTURAL BACKGROUND

Regional human occupation chronologies for parts of southern California and the Southwest have been employed for this locality (Elsasser 1978; Warren and Crabtree 1986). Such sequences are generally based on the presence of temporally diagnostic artifacts, such as projectile points, pottery, or beads. The most recent chronological clarification of the prehistory of the southern California area has been presented by Sutton (2010) and Sutton and Gardner (2010). The more recent chronology is presented below.

6.1 Archaeological Background

The earliest period of human occupation in southern California is referred to by various terms, including Clovis, Paleoindian, and Early Systems Period. This is a time believed to have commenced about 12,000 years ago Before Present (BP), lasting until about 10,000 years BP. While some scholars have championed the idea of a Pre-Projectile Point Tradition predating this time, it is not considered here, as there are no documented sites of this age near the current Study Area. The following cultural periods reflect human adaptations that occurred among prehistoric societies in inland California. While these are broad generalizations, there appear to be similarities among various populations in southern California, particularly in the inland areas.

Prehistoric chronological sequences for the area can be represented by the Encinitas Tradition and the Del Rey Tradition. The Encinitas Tradition is characterized by an abundance of grinding implements (manos and metates), rough core and flaked stone and bone tools, and shell ornaments but few projectile points and hunting implements (Sutton and Gardner 2010). Subsistence focused on collecting rather than hunting with faunal remains, varying by site, including marine mammals, fish, shell fish, and land animals (Sutton and Gardner 2010:7). The Encinitas Tradition has four regional expressions: The Topanga in coastal Los Angeles and Orange county areas, the La Jolla in the coastal San Diego area, Pauma in inland San Diego areas, and the Greven Knoll in inland Los Angeles, Orange, San Bernardino, and Riverside County areas (Sutton and Gardner 2010:8-25).

6.1.1 Greven Knoll Phases

Greven Knoll Phase I (9,400 to 4,000 BP) is characterized by manos and metates (though no mortars and pestles), large projectile points, hammerstones, flexed inhumations and few cremations (Sutton and Gardner 2010:25). Greven Knoll I groups seem to have been influenced by Mojave Desert groups based on similarities in material culture (Sutton and Gardner 2010). The "Cogstone Point" Site, located in the Prado Basin near the Study Area, contained manos, metates, discoidals, cogstones, Pinto-style points but no scrapers, as is common in Greven Knoll I sites. Shell artifacts are also rare at sites dating to this phase of Greven Knoll.

Greven Knoll Phase II (4,000 to 3,000 BP) shared many similarities with Greven Knoll I but is differentiated by an increase in percentages of manos and a decrease in percentages of flaked stone points and bone tools (Sutton and Gardner 2010:8). Pinto-style points are still found but Elko-style points become more common. Many Greven Knoll II sites also contain Greven Knoll I components, indicating little change in settlement patterns (Sutton and Gardner 2010:30). There are at least seven Greven Knoll II sites located in the Prado Basin (Sutton and Gardner 2010:30).

Greven Knoll III (3,000 to 1,000 BP), formerly known as Sayles Complex, is characterized by abundant manos and metates, Elko-style points, scraper planes and choppers, hammerstones, late discoidals, few mortars and pestles and an absence of shell artifacts (Sutton and Gardner

2010:8). Flexed inhumations under rock cairns and yucca and other seeds are also noted during this phase (Sutton and Gardener 2010:8).

The Greven Knoll Phases were replaced in the Study Area at about 1,000 BP by new cultural traditions with Takic influences moving east from the coastal areas (Sutton and Gardner 2010:34). Known as the Del Rey Tradition this period represents the development of the Gabrielino culture in southern California (Sutton 2010). The Del Rey Tradition is divided into three phases for this area and referred to as the Angeles Phases.

6.1.2 Angeles Phase

Angeles Phase IV (1,000 to 800 BP) is characterized by Cottonwood-style arrow points, *Olivella* cupped beads and *Mytillus* shell disk beads, imported pottery and possibly ceramic pipes. Population increases lead to fewer but larger permanent settlements as well (Sutton 2010).

Angeles Phase V (800 to 450 BP) is characterized by an increase in both size and number of steatite ornaments and vessels, and more elaborate effigies (Sutton 2010). This phase also saw the development of the mainland Gabrielino dialect and a decline in exploitation of marine resources with an increase in use of small seeds (Sutton 2010). Settlement shifted from woodlands to open grasslands (Sutton 2010).

Angeles Phase VI (450 to 150 BP) reflects cultural patterns into the post-contact period (roughly AD 1542). One of the most noticeable changes would likely have been the extreme population loss due to disease and missionization of the native populations. *Olivella* shell beads drilled with metal needles, glass beads, and metal tools as well as locally made ceramics and the use of domesticated animals were noted in Angles VI (Sutton 2010).

6.2 Ethnography

Early Native American peoples of this area are poorly understood though the cultural traditions represented in archaeological data are presented above. The presence of occupation in this area by the ethnohistoric Gabrielino (*Tongva*) people began to be demonstrated about 1,000 years ago. The northern portion of the Santa Ana Mountains with the present-day communities of Irvine and Orange lie within the south-central portion of territory accepted as being home to the *Tongva* with the neighboring Juaneno and Cahuilla further south and east, respectively. Ethnohistorically the *Tongva* were semi-sedentary hunters and gatherers whose language is one of the Cupan languages in the Takic family, part of the Uto-Aztecan linguistic stock (Bean and Smith 1978).

The *Tongva* territory encompassed a vast area that stretched from Topanga Canyon in the northwest, to the base of Mount Wilson in the north, to San Bernardino in the east, Aliso Creek in the southeast and the Southern Channel Islands, in all an area of more than 2,500 square miles (Bean and Smith 1978; McCawley 1996). At European contact, the tribe consisted of more than 5,000 people living in various settlements throughout the area (McCawley 1996). Some of the villages could be quite large, housing up to 150 people. The *Tongva* are considered to have been one of the wealthiest tribes and they appear to have greatly influenced tribes they traded with (Kroeber 1976:621).

The *Tongva* practiced hunting and gathering economy and subsistence zones exploited were marine, woodland and grassland (Bean and Smith 1978). At the time of contact plant foods were the more significant part of the *Tongva* diet with acorns being the most important food source exploited. Therefore, it was necessary that villages be located near water sources to allow for the

leaching or removal of tannic acids from the acorns. Grass seeds and chia were also heavily utilized. Seeds were parched then ground and cooked as mush in various combinations according to taste and availability. Other fruit and plant foods would be eaten raw or cooked and they could be dried for storage. Bulbs, roots, and tubers were dug in the spring and summer and usually eaten fresh. Mushrooms and tree fungus were prized as delicacies. Various teas were made from flowers, fruits, stems, and roots for medicinal cures as well as beverages (Bean and Smith 1978:538-540).

The principal game animals were deer, rabbit, jackrabbit, woodrat, mice, ground squirrels, antelope, quail, dove, ducks, and other birds (Bean and Smith 1978). Predators were largely avoided as food, as were tree squirrels and most reptiles (Bean and Smith 1978). Fresh water fish were caught in the streams and rivers, while salmon were available when they ran in the larger creeks (Bean and Smith 1978). Sea mammals, fish, and crustaceans were hunted and gathered from both the shoreline and the open ocean, using reed and dugout canoes by coastal *Tongva* groups. Shellfish were the most common resource, including abalone, turbans, mussels, clams, scallops, bubble shells, and others (Bean and Smith 1978:538-540). Houses were domed, circular structures thatched with tule or similar materials (Bean and Smith 1978:542). The *Tongva* are renowned for their workmanship of steatite and these artifacts were highly prized (Bean and Smith 1978). Common everyday items were often decorated with inlaid shell or carvings reflecting the intricately developed skill (Bean and Smith 1978:542).

6.3 Historical Background

The earliest historical account of travel through the Study Area is commonly credited to the 1774 Spanish expedition of Juan Bautista de Anza, who was en-route from Sonora, Mexico to Monterey, California, for the purpose of supplying the mission and military communities. During this journey the group passed through the San Bernardino Valley on its way to Mission San Gabriel.

6.3.1 Early History

The Spanish and later, Mexican governments encouraged settlement of California by the establishment of large land grants called *ranchos.* These land titles (concessions) were government issued, permanent, unencumbered property-ownership rights, which were devoted to raising cattle and sheep. Of the 800 grants, Spain made about 30 between 1784 and 1821, the remainder, were granted by the Mexican government between 1833 and 1846. Lands encompassing the current Study Area were initially granted to Juan P. Ontiveros in 1837, as part of the 35,971-acre Rancho San Juan y Cajon de Santa Ana (Cowan 1956:82). With the annexation of California by the United States, this part of California was overrun with settlers, and native lands passed into Euro American hands. Subsequently, the surrounding land use gradually changed from ranching to farming and industry.

In the mid-1880s, George and Edward Malden, bought approximately 430 acres of land, surrounding the present-day Fullerton. As the Pacific Land and Improvement Company, a subsidiary of the Santa Fe Railway, was looking to acquire additional land, the Malden brothers offered free right of way and half interest in the land to the railroad. On July 5, 1887, Edward Malden formally staked his claim at what is now the intersection of Harbor Boulevard and Commonwealth Avenue.

6.3.2 Early Oil Exploration

While citrus seems to dominate this portion of California with Orange County boasting more orange groves than any other municipality in the Unites States, cultivation of walnuts and

avocados flourished as well. And in 1880 with the discovery of Brea-Olinda Oil Field, the region experienced its first real boom that lasted well into the 1920s. Brea-Olinda Oil Field was the first commercial oil field in the Los Angeles area and by 1905 became the state's most productive oil site (Bushman 2012:4). Consequently, oil exploration in Orange County continued with Yorba Linda, Kraemer, Richfield near present day Irvine, and Signal Hill, Telegraph Hill, and Santa Fe Springs near Long Beach, resulted in major oil discoveries. While the oil contributed to the growth of Southern California, it also brought attention to one of Southern California/s biggest problems – the scarcity of water.

6.3.3 Water Resources

The flood of 1916 and the agricultural growth of Orange County in the early 1920s gave rise to the need for improved flood protection of the county's coastal plain, and development of a system to replenish the ground water that was used at constantly increasing rate. In 1927 the Orange County Flood Control Act created the Orange County Flood Control District to both control and conserve flood and storm waters including overflow from the Santa Ana River (OC Public Works n.d.). Subsequently, numerous public works projects to control and maintain the flow of the Santa Ana River, were constructed including the Santiago Dam, which was completed in 1931 by a joint venture by the Irvine Company and Serrano Irrigation District. Currently, the dam marks the usual ending point of surface flow in Santiago Creek, as all the discharge is retained in the reservoir (Irvine Lake).

6.4 Current and Past Land Use

The Study Area, including East Orange I, II, and Mountain Park conservation easements, is located east, west, and north of Irvine Lake (Santiago Reservoir). East Orange I is situated immediately west of Santiago Sanitary Landfill, which was closed in 1996. Between 1967 and 1984, this parcel was colloquially known as Saddleback Park and was one of the first off-road motocross tracks in the United States, with the first California Moto-Cross Association (CMA) race taking place on March 24, 1968. In the fall of 1968 came one of the first international races with over 22,000 fans present to watch East German, Swedish, British, Czech, and American riders compete in a milestone race. The track had the biggest obstacles in motocross, including the infamous tri-level massive uphill stair steps called Suicide Mountain, which was added to the park in the early 1980s. However, a series of liability lawsuits against the Irvine Company and the cost associated with those lawsuits and liability insurance forced the Saddleback Park to close its doors in 1984 (Lawrence 2016). Currently, this portion of the conservation easement is heavily overgrown with native grasses and vegetation, with remnants of the Saddleback Park's terraces, racetracks, and ramps barely distinguished amid the dense vegetation.

Portions of the East Orange II conservation easement are currently undeveloped. A single partially paved roadway runs through the southern portion of the property, with another unpaved and partially overgrown roadway that may have been once used as a fire road, located further north and following a natural ridgeline in a northwest-southeast direction. This portion of the property overlooks Santiago Creek, which is located approximately ½-mile further north and east from the Project Area. Access to the property is controlled via a series of locked gates and it is surrounded by a chain link fence.

Currently, the Mountain Park conservation easement appears to be relatively undeveloped with an abandoned, gravel filled parking lot situated near its entrance. Several unpaved roads intersect the property, which may have been used by off-road enthusiasts, with several abandoned roads which may have served as fire roads/firebreaks during the Canyon 2 Fire, which

burned approximately 9,217 acres (California Department of Forestry and Fire Protection 2018), results of which were still visible during the survey. Portion of the property located further south in the confines of Gypsum Canyon was once utilized by a rocket fuel test site, remnants of which, included displaced water pipes, broken concrete footings and concrete pipes used for water crossings, were observed in the landscape. However, it appears that the two structures associated with this facility may have been removed sometime in 2005. This portion of the property overlooks Santa Ana River, which is located approximately ½-mile to the north. Access to the property is controlled via a series of locked gates and the property is surrounded by a chain link fence.

7.0 METHODOLOGY

Archaeological investigations reported herein consisted of a records search conducted at the SCCIC on January 4, February 12, and June 11, 2018, a Sacred Lands File Search with the Native American Heritage Commission (NAHC) in Sacramento, as well as an intensive pedestrian survey of the entire 653.7-acre Project Area. Provided below is the methodology used during the current study.

7.1 Records Search

A records search of the Study Area was conducted by a Stantec archaeologist at the SCCIC on January 4 and February 12, 2018, for East Orange I and East Orange II conservation easements, respectively, and on June 11, 2018 for Mountain Park conservation easement. The search included a review of all previously recorded prehistoric and historic archaeological sites, as well as a review of all known cultural resources survey reports, excavation reports, and regional overviews. Additionally, the following maps were consulted for presence of historic period features and built environment resources: Corona, CA (1902) 30-minute topographic quadrangle, Black Star Canyon, CA (1949, 1967, 1974) 15-minute topographic quadrangle, and Santa Ana, CA (1949, 1965) 30-minute topographic quadrangle. As part of the archival research at the SCCIC, the following sources were consulted: the California Archaeological Inventory Records, NRHP, California Historic Landmark Registry, California Points of Historical Interest, Inventory of Historic Structures, and Historical Landmarks for Orange County.

7.1.1 East Orange I

Results of the records search indicated that one negative (Breece and Padon 1982), four positive cultural resources inventories (Bissell 1981; Cottrell and Bickford 1978; Greenwood and Associates 1991; Mason 1984) and one Phase II test excavation (Dice and Taniguchi 2004) were conducted directly within the Project Area or within portions of the Project Area. Additionally, three negative (Benner 1992; Bissell and Becker 1991; Cameron 1991) and five positive (Archaeological Associates 1978; Cooley and Schroth 1979; Douglas et al. 1981; Mason 1990; Schmidt 2000) cultural resource inventories, three Phase II test excavations (Davy and McKeehan 1997; Foster Wheeler 1996; Webb 1991), one literature review (Rosenthal 1991), and one construction monitoring project (Sundberg and Whitney-Desautels 1991) were previously conducted within a ½-mile radius of the East Orange I Project Area (Table 1). A summary of previous studies is provided below.

Cottrell and Bickford (1978) conducted an archaeological inventory of approximately 1550 acres of land on either side of the Laguna Canyon Road and the end of Laguna Freeway (Highway 133 and 241). The survey was conducted within portions of the current Project Area and resulted in the identification of three prehistoric resources. However, all of the resources identified by Cottrell and Bickford (1978) are more than a ½-mile from the current Project Area and will not be affected by the proposed project.

TABLE 1
SUMMARY OF CULTURAL RESOURCE STUDIES PREVIOUSLY CONDUCTED WITHIN THE EAST ORANGE I STUDY AREA.

Author(s)	Year	Level of Investigation	Results	Report Reference No.
Archaeological Associates	1978	Survey	Positive	OR-00302
Benner, M.	1992	Survey	Negative	OR-03347
Brece, B., and B. Padon	1982	Survey	Negative	OR-00648*
Bissell, R.	1989	Survey	Positive	OR-00983*
Bissell, R., and K. Becker	1991	Survey	Negative	OR-01089
Cameron, C.	1991	Survey	Negative	OR-01175
Cooley, T., and A. Schroth	1979	Survey	Positive	OR-01099
Cottrell, M., and V. Bickford	1978	Survey	Positive	OR-00274*
Davy, D., and J. McKeehan	1997	Test Excavation	-	OR-04560
Dice, M., and C. Taniguchi	2004	Test Excavation	-	OR-02882*
Douglas, R., J. Cooper, D. Burkenroad, E. Gardner, and T. Mabry	1981	Survey	Positive	OR-00622
Foster Wheeler	1996	Test Excavation	-	OR-01484
Greenwood and Associates	1991	Survey	Positive	OR-02108*
Mason, R.	1984	Survey	Positive	OR-00752*
Mason, R.	1990	Survey	Positive	OR-01026
Rosenthal, J.	1991	Literature Review	-	OR-01127
Schmidt, J.	2000	Survey	Positive	OR-02183
Sundberg, F., and N. Whitney-Desautels	1991	Monitoring	-	OR-01105
Webb, L.	1991	Test Excavation	-	OR-01844

**previously conducted within or within portions of East Orange I Project Area*

Mason (1984) conducted an archaeological inventory along the Eastern Corridor Alignment (Highway 241) and documented over 100 archaeological resources. However, the survey was conducted along the 20-mile long proposed alignment for Highway 241 and all resources documented by Mason (1984) are more than ½-mile away from the current Project Area and will not be affected by the proposed project.

Bissell (1989) conducted an archaeological inventory of 1,800 acres of portion of Orange Planning Area 1, which encompasses the current East Orange I Project Area in its entirety. Bissell (1981) reported that three previously known sites were located within the Project Area and three additional prehistoric sites were identified during the survey. Five of the prehistoric resources were lithic scatters comprised of stone tools and debitage, while the last site, included flaked stone debitage and bedrock mortars.

Greenwood and Associates (1991) conducted an archeological inventory of approximately 25 linear miles along the Eastern Transportation Corridor (present-day Highway 241). The survey resulted in the discovery of 25 isolated finds, three historic period resources, and seven prehistoric sites. One of the prehistoric sites (CA-ORA-1240, P30-001240), a small lithic scatter, documented by Greenwood and Associates (1991) is located within the current Project Area and is summarized in the text below.

The results of the record search also indicated that one prehistoric resource (CA-ORA-1240, P30-001240)) was previously documented within the current Project Area, and 12 prehistoric resources, three historic resources, and one multi-component resource were previously documented within a ½-mile radius of the current Project Area (Table 2). Provided below is a summary of resources previously documented within the Project Area.

TABLE 2
SUMMARY OF KNOWN CULTURAL RESOURCES PREVIOUSLY DOCUMENTED WITHIN THE EAST ORANGE I STUDY AREA.

Quad. (7.5")	Trinomial	Primary Number	Component	Description
Black Star Canyon	CA-ORA-304	30-000304	Prehistoric	Bedrock milling station
Black Star Canyon	CA-ORA-625	30-000625	Prehistoric	Bedrock milling station (removed from original location for park decorations)
Black Star Canyon	CA-ORA-626	30-000626	Prehistoric	Lithic and ground stone scatter
Black Star Canyon	CA-ORA-770	30-000770	Prehistoric	Lithic and ground stone scatter
Black Star Canyon	CA-ORA-1068	30-001068	Prehistoric	Ground stone scatter
Black Star Canyon	CA-ORA-1220	30-001220	Prehistoric	Lithic and ground stone scatter
Black Star Canyon	CA-ORA-1224	30-001224	Prehistoric	Lithic and ground stone scatter
Black Star Canyon	CA-ORA-1224	30-001224	Prehistoric	Lithic and ground stone scatter
Black Star Canyon	CA-ORA-1234	30-001234	Prehistoric	Lithic and ground stone scatter
Black Star Canyon	CA-ORA-1240	30-001240	Prehistoric[2]	Lithic and ground stone scatter*
Black Star Canyon	CA-ORA-1241	30-001241	Prehistoric	Cave with associated
Black Star Canyon	CA-ORA-1260/H	30-001260	Multi-component	Lithic scatter, fire-affected rocks, ground stone. Location where the Juan Flores gang members were hanged
Black Star Canyon	CA-ORA-1471	30-001471	Prehistoric	Lithic scatter

TABLE 2
SUMMARY OF KNOWN CULTURAL RESOURCES PREVIOUSLY DOCUMENTED WITHIN THE EAST ORANGE I STUDY AREA (cont.).

Quad. (7.5")	Trinomial	Primary Number	Component	Description
Black Star Canyon	CA-ORA-1474H	30-001474	Historic[2]	Old Jack Wilmott Camp, ca. 1910*
Black Star Canyon	CA-ORA-1548H	30-001548	Historic[2]	Canal, reservoir, refuse deposit, ca. early part of the 20th century
Black Star Canyon	CA-ORA-1549	30-001549	Prehistoric[2]	Lithic scatter
Black Star Canyon	-	30-100332	Prehistoric	Isolated metate fragment
Black Star Canyon	-	30-162283[1]	Historic	Irvine Regional Park

**within East Orange I; [1]listed on the NRHP; [2]found ineligible to the CR/NRHP through Phase II testing*

CA-ORA-1240 (P30-001240) was documented by Sorensen et al. (1990) as a small light lithic and ground store scatter comprised of three large chert flakes, a possible hammerstone, and a bifacial mano in an area measuring 70 meters by 55 meters. The resource was documented on a flat plateau overlooking Santiago Canyon Road to the north and west. Sorensen et al. (1990) noted that the site appeared to have been mechanically bulldozed causing extensive sheet erosion and the development of gullies across the entire site. However, it is possible that the bulldozing noted by Sorensen et al. (1990) may have been the result of road grading and road maintenance conducted between 1968 and 1984 when the area was used as a motocross raceway as part of the Saddleback Park.

The site was updated and tested in 2004 by Dice and Taniguchi, who relocated the resource, but noted that the site appeared to be located approximately 100 meters northeast from the spot initially recorded by Sorensen et al. (1990). Dice and Taniguchi (2004:34) observed additional artifacts on the surface including one primary flake, one secondary flake, four tertiary flakes, five core fragments, two fragments of fire affected rock, a discoidal scraper, and a projectile point, both of which were collected. Overall, seven test units were excavated within the site boundary and two flakes and one core fragment were recovered from the top 5 centimeters of topsoil. No other artifacts, features, or deposits were observed during test excavation. Based on the results of testing, Dice and Taniguchi (2004:35) concluded that site CA-ORA-1240 (P30-001240) did not meet the significance criteria and should not be considered a unique resource under CEQA, nor did the resource fulfill Criterion D of the NHPA for listing in the NRHP.

7.1.2 East Orange II

Results of the records search for the East Orange II Study Area revealed that two positive cultural resource surveys (Mason 1990; Leonard III 1976); one test excavation (Dice and Taniguchi 2004), and one document management/overview (Strozier 1978) were previously conducted within or within portions of the East Orange II Project Area. Additionally, two positive cultural resource surveys (Mason 1984; McKenna 1991), and three monitoring projects (Garcia and Rockman 2007; Padon 1995; Sturm n.d.) were conducted within ½-mile radius of the East II Project Area (Table 3). A brief summary of projects conducted within the East Orange II Study Area is provided below.

Mason (1984) conducted an archaeological inventory along the Eastern Corridor Alignment (Highway 241) and documented over 100 archaeological resources. However, the survey was conducted along the 20-mile long proposed alignment for Highway 241 and all resources

documented by Mason (1984) are more than ½-mile away from the current East Orange II Project Area and will not be affected by the proposed project.

Leonard III (1976) conducted an archaeological sample survey of nearly 32,000 acres comprising the Silverado-Modjeska Planning Area. The survey resulted in the discovery of nine cultural resources; however, none of the resources documented by Leonard III (1976) were documented within the ½-mile radius of the East Orange II conservation easement.

Dice and Taniguchi (2004) conducted a Phase II test excavation to determine significance of six prehistoric archaeological sites and two historic period archaeological sites, on behalf of the Irvine Company. One of the tested prehistoric archaeological sites (CA-ORA-1294, P30-001294) was documented within the planning boundary of East Orange II and it is summarized further in the text below.

TABLE 3
SUMMARY OF CULTURAL RESOURCE STUDIES PREVIOUSLY CONDUCTED WITHIN THE EAST ORANGE II STUDY AREA.

Author(s)	Year	Level of Investigation	Results	Report Reference No.
Dice, M., and C. Taniguchi	2004	Test Excavation	-	ORA-02882*
Garcia, K., and M. Rockman	2007	Survey and Monitoring	Negative	OR-03600
Leonard III, N.	1976	Survey	Positive	OR-01141*
Mason, R.	1984	Survey	Positive	OR-00752
Mason, R.	1990	Survey	Positive	OR-01026*
McKenna, J.	1991	Survey	Positive	OR-01136
Padon, B.	1995	Monitoring	Positive	OR-01887
Solis, L.	2009	Survey	Positive	OR-03833
Strozier, H.	1978	Management Document	-	OR-02225*
Sturm, B.	n.d.	Survey and Monitoring	Positive	OR-01039

**previously conducted within or within portions of East Orange II Project Area*

The results of the records search also indicated that in addition to a prehistoric site CA-ORA-1294 (P30-001294), two isolated finds comprised of a single mano, and two groundstone fragments were previously documented within the East Orange II Project Area, and five archaeological sites (all prehistoric) were previously documented within a ½-mile radius of the East Orange II Project Area (Table 4).

Prehistoric site CA-ORA-1294 (P30-001294) was documented by McKenna (1991) as a single rock-ring resembling a prehistoric feature and a single, granitic mano located approximately 30 meters from the rock ring. In 2004, Dice and Taniguchi revisited the site and excavated ten shovel test pits (STP) to test for potential subsurface deposits. All STPs were "excavated to a depth of at least 30

centimeters below the modern ground surface, while several were dug to 80 centimeters" (Dice and Taniguchi 2004:36). Subsurface excavations yielded four flakes and one possible fire-cracked cobble fragment, with none of the STPs exhibiting and subsurface features or midden-type soils indicative of intensive use of the area. Based on the lack of any subsurface data, it was determined that the prehistoric site CA-ORA-1294 (P30-001294) did not meet the eligibility criteria for nomination to the California Register and is not considered a unique archaeological resource for the purposes of CEQA (Dice and Taniguchi 2004:37).

TABLE 4
SUMMARY OF KNOWN CULTURAL RESOURCES PREVIOUSLY DOCUMENTED WITHIN THE EAST ORANGE II STUDY AREA.

Quad. (7.5")	Trinomial	Primary Number	Component	Description
Black Star Canyon	CA-ORA-479	30-000479	Prehistoric	Lithic scatter with fire-affected rocks
Black Star Canyon	CA-ORA-1012	30-001012	Prehistoric[2]	Lithic scatter, groundstone fragment
Black Star Canyon	CA-ORA-1225	30-001225	Prehistoric	Lithic and groundstone scatter
Black Star Canyon	CA-ORA-1226	30-001226	Prehistoric	Lithic scatter
Black Star Canyon	CA-ORA-1294	30-001294	Prehistoric[2]	Possible fire hearth with a single mano*
Black Star Canyon	-	30-100304	Prehistoric	One mano and one metate fragment*
Black Star Canyon	-	30-100460	Prehistoric[1]	Mano*

**within East Orange II Project Area; [1]collected during recordation (McKenna 1991); [2] found ineligible to the CR/NRHP through Phase II testing*

Isolated find P30-100304 consists of one mano fragment and one metate fragment approximately 30 meters apart. Both groundstone fragments were documented on top of a saddle located east of Santiago Canyon. According to Padon (1995), 16 surface scrapes north and south of the isolated find were performed; however, no other surface deposits or soil discolorations were observed.

Isolated find P30-100460 was documented as a single, unifacial mano, located along an existing roadway (McKenna 1991). The isolated find was identified to the north of a borrow pit and near an active construction and most likely it was redeposited from elsewhere. The isolate was collected by McKenna during recordation in 1991.

7.1.3 Mountain Park

Results of the records for the Mountain Park Study Area revealed that five positive cultural resource surveys (Bissell and Becker 1991; Greenwood 1980; Padon; Pletka et al. 2003, 2005) have been previously conducted within portions of the Mountain Park Conservation easement, and nine negative (Benner 1992; Chasteen 2013a, 2013b, 2013c; Drover 1983; Kyle 2002; Padon 1988; Rosenthal 1987; Strudwick 2008) and thee positive cultural resource surveys (Bupp 2013; Desautels and Whitney 1977; Greenwood and Associates 1991) have been conducted within a ½-mile radius of the Mountain Park Project Area (Table 5). A summary of cultural resource studies conducted within portions of the Mountain Park Area are provided below.

TABLE 5
SUMMARY OF CULTURAL RESOURCE STUDIES PREVIOUSLY CONDUCTED WITHIN THE EAST ORANGE II STUDY AREA.

Author(s)	Year	Level of Investigation	Results	Report Reference No.
Benner, M.	1992	Survey	Negative	OR-03347
Bissel, R., and K. Becker	1991	Survey	Positive	OR-01089*
Bupp, S.	2013	Survey	Positive	OR-02383a
Chasteen, C.	2013a	Survey	Negative	OR-02383
Chasteen, C	2013b	Survey	Negative	OR-02383b
Chasteen, C.	2013c	Survey	Negative	OR-03037
Desautels, R., and N. Whitney	1977	Survey	Positive	OR-01066
Drover, C.	1983	Survey	Negative	OR-03029
Greenwood, R.	1980	Survey	Positive	OR-00594*
Greenwood and Associates	1991	Survey	Positive	OR-02108
Kyle, C.	2002	Survey	Negative	OR-02855
Padon, B.	1988	Survey	Negative	OR-00885*
Pletka, S., S. Younger, and J. Marvin	2004	Survey	Positive	OR-02883*
Pletka, S., S. Younger, and J. Marvin	2005	Survey	Positive	OR-03344*
Rosenthal, J.	1987	Survey	Negative	OR-00860
Strudwick, I.	2008	Survey	Negative	OR-003752
Uberbrink, S.	2006	Survey	Negative	OR-03028
Webb, L.	1991	Survey	Positive	OR-01844

**previously conducted within or within portions of Mountain Park Project Area*

Bissell and Becker (1991) conducted a cultural resources reconnaissance of approximately 2,700 acres of land for the proposed North Orange County Landfill Alternative Technologies Study Project. The survey resulted in the discovery and documentation of three archaeological resources, all of which were identified outside of the current Mountain Park Project Area.

Greenwood (1980) conducted a linear survey for the proposed high-voltage transmission line between the Serrano and Mira Loma substations, portions of which run through the Mountain Park

Conservation Easement. The survey resulted in the discovery of three archaeological resources; however, all resources identified by Greenwood (1980) were reported outside of the current Mountain Park Project Area and will not be affected by the proposed project.

Pletka et al. (2004, 2005) conducted an archaeological inventory of approximately 853-acres within the 3,000-acre Mountain Park, for a proposed residential housing development. The survey resulted in the discovery of a historic period rocket fuel test facility, which was owned and managed by the McDonnell Douglas Corporation and operated under the name Astropower between 1966 and 1979. No other resources were identified during the survey. As this resource is located within the current Project Area it is briefly discussed below.

The results of the records search also indicated that one historic period resource was previously documented within the current Project Area and one prehistoric resource and one historic resource were previously documented adjacent to the current Project Area (Table 6).

TABLE 6
SUMMARY OF KNOWN CULTURAL RESOURCES PREVIOUSLY DOCUMENTED WITHIN THE MOUNTAIN PARK STUDY AREA.

Quad. (7.5")	Trinomial	Primary Number	Component	Description
Blackstar Canyon	CA-ORA-231	P30-176701	Historic	Ranch, homestead
Blackstar Canyon	CA-ORA-303	P30-000303	Prehistoric	Rockshelter, lithics, milling implements
Blackstar Canyon	-	P30-161876	Historic	Rocket fuel test site* (destroyed in 2005)

**within Mountain Park Project Area*

As stated previously, Pletka et al. (2004, 2005) documented a historic period rocket test fuel facility (P30-176701) within Gypsum Canyon. Marvin and Pletka (2003) noted that during its recordation the primary components of this facility consisted of two maintenance/office buildings, a water tank and supporting pipeline, a test pad, and an asphalt access road. Additionally, several associated refuse deposits associated with this facility were observed as well. The main structure consisted of a large steel-frame maintenance/office building with a concrete foundation with roof covered in corrugated metal. The secondary structure consisted of a small laboratory/shed constructed of corrugated metal.

Pletka et al. (2004, 2005) concluded that the facility originally contained additional buildings and test pads and was used to test hydrazine, pentaborane, and fluorine. While the facility may have been used and contributed to the development of the Cold War arms race it did not appear to be directly associated with events that have made a contribution to the nation's history, or any persons nationally significant in the Cold War history of the United States. Neither was the design of the Astropower facility a unique example of any type, method, or style of construction. Pletka et al. (2004, 2005) concluded that the facility did not meet the requirements for listing to the NRHP. Moreover, based on aerial imagery available from Google the structures associated with 30-161876 were removed in the early part of 2005.

The remaining two resources documented adjacent to the Mountain Park Project area included a prehistoric rockshelter (CA-ORA-303) and a historic period homestead (CA-ORA-231). However, it appears that both resources may have been destroyed by the construction of the Eastern Transportation Corridor (Highway 241).

7.2 Native American Notification/Sacred Lands File Search

The 1992 Amendments to the NHPA require all Federal agencies to consult with Native American Tribes or Native Hawaiian organizations for undertakings which may affect properties of traditional religious and cultural significance on or off Tribal lands. The Section 106 regulations (36 CFR 800) implementing the NHPA were revised on January 11, 2001 to reflect this change. Section 36 CFR 800.2(c)(2)(ii)(A) states that "the agency official shall ensure that consultation in the Section 106 process provides the Indian Tribe or Native Hawaiian organization a reasonable opportunity to identify its concerns about historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects." Additionally, California Public Resources Code Sections 5097.94(a) and 5097.96 authorize the NAHC in Sacramento to hold records of Native American sacred sites and burial sites. The NAHC also holds records of individuals that have particular expertise and knowledge in Native American resources.

On February 6, 2018, Stantec on behalf of OC Park, has contacted the NAHC and requested a Sacred Lands File search for the entire Study Area, including both the East Orange I and East Orange II conservation easements. The NAHC's records search of the Sacred Land File was completed on February 7, 2018, with negative results. On April 3, 2018 an updated Sacred Lands File search was requested to include the Mountain Park Study Area, and the search was completed on April 6, 2018 with culturally sensitive areas located within the Mountain Park Study Area. Additionally, the NAHC provided a list of 24 Native American individuals/organizations to contact that may have information or knowledge regarding Native American and/or Tribal resources in the Study Area. Stantec sent letters to all recommended contacts on April 6, 2018 with secondary requests submitted to the Juaneno Band of Mission Indians – Acjachemen Nation via email on August 1, 2018. Copies of correspondence related to Native American consultation are contained in Appendix C.

7.3 Field Methods

An intensive pedestrian survey of the Project Area was conducted between January 23 and 26, 2018, by Stantec archaeologists Hubert Switalski and Kendall R. Way, and between June 11 and June 14, 2018 by Hubert Switalski and Victoria Harvey. The initial survey methodology of each Project Area called for an intensive 100% pedestrian survey with parallel transects spaced approximately 10-15 meters apart. While this methodology was successfully implemented within the East Orange II and Mountain Park Project Areas, the steep, dense vegetation, and difficulties in traversing the East Orange I Project Area, a much different approach was utilized. In areas where the topography and vegetation permitted, parallel transects spaced 10-15 meters apart were utilized with other areas examined by judgmental survey focusing on ridgetops, plateaus, and areas that appeared to favor previous human occupation (both prehistoric and historic) received limited archaeological coverage. The remaining areas comprised of densely overgrown perennial drainages (with impassable vegetation) and areas comprised of heavily overgrown steep terrain were not examined and received no archaeological coverage. A detailed summary of survey results is provided further in the text in Section 8.0.

Additionally, per the California Office of Historic Preservation (OHP 1995) guidelines, Stantec examined surface and subsurface exposures such as rodent burrows and cut banks for physical manifestations of human activity greater than 50 years in age. Documentation included field notes and photographs. The extent of the survey coverage was recorded with a Trimble Juno 5, hand-held GPS unit, with between 2 to 4-meter horizontal accuracy, with the Universal Transverse Mercator (UTM), North American Datum of 1983 (NAD 83), Zone 11, meters, as the spatial reference. Photographs were taken with a Canon PowerShot A530 digital camera to document the built environment within the Project Area. Additional photos were taken with an iPhone 7 and LG Nexus 5X to document the topography and vegetation coverage within the Project Area. The

extent of the survey coverage was drawn on the Black Star Canyon, CA (1988) USGS 7.5-minute series topographic quadrangle (see Figures 3 through 5 Appendix A).

8.0 SURVEY RESULTS

Stantec conducted the archaeological survey of portions of East Orange II on January 23, 2018, with the remaining portions of East Orange I were inventoried for cultural resources between January 24 and 26, 2018, with the Mountain Park survey conducted between June 11 and 14, 2018. Provided below are the survey results for each conservation easement.

8.1 East Orange I

This portion of the Project Area is located between Eastern Transportation Corridor (Highway 241) to the north, west, and south, and the Santiago Canyon Sanitary Landfill to the east. Access to the Project Area is through a gate to the Santiago Sanitary Landfill, which has been closed to the public and decommissioned in 1996. An existing landfill (paved) road runs north south, with several maintenance (dirt) roads continuing west towards the fenced off East Orange I conservation easement. Upon arrival, it became apparent that the typical survey methodology utilizing evenly spaced, parallel transects, had to be changed to adopt to the steep terrain with virtually impassable vegetation growing along intermittent drainages and along the slopes with western exposure and aspect.

The survey commenced at a flat, exposed plateau, located immediately northwest of the entrance to the Santiago Canyon Sanitary Landfill, with parallel transects spaced approximately 10 meters apart. This portion of the Project Area was situated on top of a flat knoll/plateau that may have been mechanically graded and leveled over the last 20-30 years. Vegetation within this portion of the Project Area included mostly annual shrubs and grasses with ground visibility between 60 and 90%. Once this portion of the Project Area was inventoried, the survey continued further south towards Santiago Canyon Road, and west towards a terraced-hill located further west (Figure 6). As the survey continued, numerous terraces, mechanically created gullies, and what looked like abandoned and overgrow dirt roads, remnants of the Saddleback Park Motocross Park, were observed in the southern and western portions of East Orange I Project Area (Figure 7). Additionally, several concrete foundations as well as concrete lined storm water drains and culverts were observed along the eastern and southern portion of the Project Area, suggesting recent ground disturbance most likely associated with the construction of a storm drain system associated with the nearby Santiago Canyon Sanitary Landfill.

Special care was given to areas with exposed washes, erosional banks, and/or animal burrows that could potential expose buried cultural deposits. Additionally, the flat plateau in the western portion of the Project Area, where prehistoric resource CA-ORA-1240 (P30-001240) was previously documented, was examined for manifestation of additional surface deposits and/or additional features that could have been associated with CA-ORA-1240 (P30-001240); however, none were encountered.

While an attempt was made to maintain parallel transects spaced approximately 10-15 meters apart, this methodology was abandoned in favor of a more judgmental approach. To achieve this, transects were abandoned, and areas located along ridgetops, and drainages devoid of any vegetation were examined for cultural resources (Figure 8). As a result, most of the Project Area received limited coverage where the terrain and vegetation allowed. The remaining areas which included terrain with slope exceeding 50°, perennial drainages with impassable vegetation, and/or steep terrain (with more than 45° slope) and impassable vegetation were not surveyed for cultural resources (Figure 9).



Figure 6. Overview of the Project Area showing portion of Suicide Hill, associated with Saddleback Park (P30-001771), with terraced hillside in background, view west (Stantec IMG_0501).



Figure 7. Overview of the Project Area with remnants of an abandoned motocross racetrack (Saddleback Park) visible in hillside in foreground, view southwest. Note the typical vegetation and topography within the Project Area (Stantec IMG_0514).

As stated above, while an attempt to conduct a 100% pedestrian survey was made, due to varying degree of steep terrain, impassable vegetation, and a combination of both, the survey conducted within this portion of the East Orange I Project Area, received either full 100% archaeological coverage, judgmental coverage, or no coverage at all. Provided below is the summary of areas surveyed within this portion of the Project Area (Table 5). It should be noted that the entire East Orange I Project Area was surveyed previously in its entirety by Bissell (1981); however, none of the resources identified by Bissell (1981) were identified within the current East Orange I Project Area. Additional survey coverage maps are provided in Appendix A.

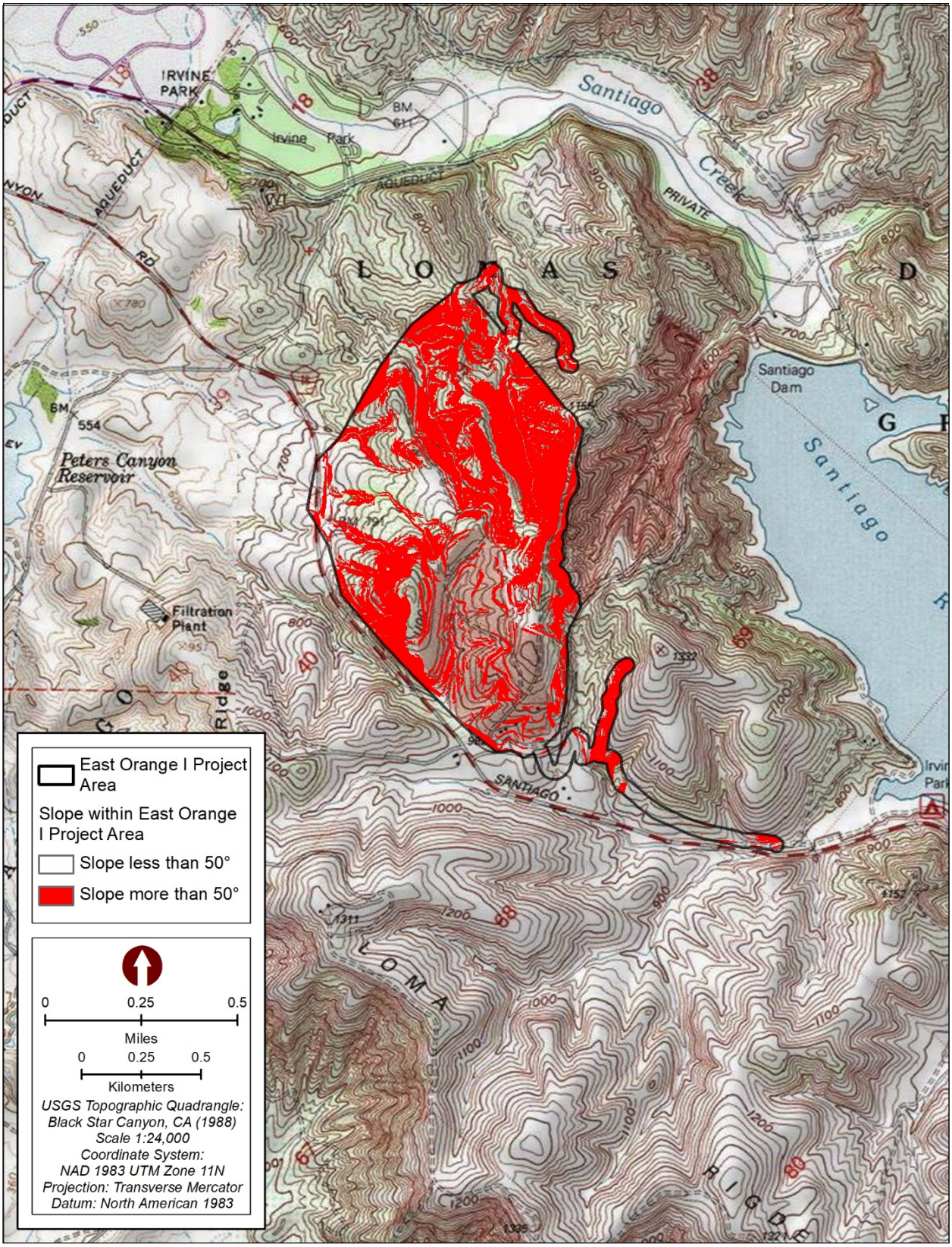


Figure 8. East Orange I Project Area showing the steep terrain with slope more than 50°, depicted on the Black Star Canyon, CA (1988) 7.5-minute series USGS topographic quadrangle.



Figure 9. Overview of the Project Area depicting steep hillside and dense, impassable vegetation, view north (Stantec IMG_0519).

The survey within this portion of the Project Area resulted in the identification and recordation of Saddleback Park, which served the Orange County and nearby communities as a motocross racetrack from its initial opening in 1967 to its closure in 1984. Additional information regarding the newly documented resource is provided below in Section 9.0.

TABLE 7
SURVEY METHODOLOGY IMPLEMENTED WITHIN EAST ORANGE I PROJECT AREA.

Survey Type	Description	Survey Methodology	Total Area (ac.)
100% Survey Coverage	Complete Coverage	Typical archaeological survey with parallel transects spaced between 10 and 15 meters apart.	49.7
Judgmental Survey	Limited Coverage	Judgmental transects walked along ridgelines, existing roadways, and areas that could potentially yield exposed archaeological resources	292.3
Overgrown Drainages	No Coverage	Areas identified along existing perennial drainages with impassable vegetation	18.1
Steep Terrain and Dense Vegetation	No Coverage	Areas with slope more than 50° and containing impassable vegetation	43.6
Total			***403.7***

8.2 East Orange II

The survey of East Orange II commenced near the intersection of an existing paved roadway and an existing, but poorly maintained, fire access road. The survey was conducted on a sunny day, with great visibility, and an average temperature of 65°F. The survey began by walking parallel transects, spaced approximately 10 meters, on the south side of the road in the southeast direction (Figure 10). Once this portion of the road was surveyed, the transects followed the road on the west and subsequently on the east side, just immediately north of Santiago Canyon Road. Once this portion of the road was examined for cultural resources, the survey continued on the north side of the road in the westerly direction. Generally, ground visibility within this portion of the Project Area was very poor with occasional patches of bare ground exposing the ground's surface. Vegetation included annual shrubs and grasses, which obscured most of ground visibility especially along portion of the road located immediately north of Santiago Canyon Road (Figure 11). Most of this portion of the Project Area was devoid of any recent development or impacts, with the poorly maintained fire road the only observable recent impact in the area.



Figure 10. Overview of the Project Area (East Orange II) showing the partially overgrown access road, view south towards Santiago Canyon Road (Stantec IMG_0525).

Additional portions of East Orange II were inventoried between June 11 and 14, 2018, as new trail alignments were added after the initial survey took place in January 2018. The new areas included approximately 3 miles of trails that were previously not inventoried. The survey for this portion of the project commenced immediately north of Santiago Canyon Road and Jeffrey Road and proceeded in the southeast direction. Generally, vegetation within this portion of the Project Area was dense, and obscuring ground visibility. In areas where the ground was exposed and devoid of any vegetation, soils and animal burrows were examined for presence of cultural resources.

Special care was given to areas where previously documented isolated finds (P30-100304 and P30-100460) and the prehistoric resource CA-ORA-1294 (P30-001294) were previously documented for additional manifestation of surface deposits or for additional features that could be associated with these resources. However, no new cultural resources or deposits associated with previously documented cultural resources were identified during the survey.



Figure 11. Overview of the Project Area (East Orange II) showing outline of the access road, view north. Note the typical vegetation and topography within this portion of the Project Area (Stantec IMG_0529).

8.3 Mountain Park

Mountain Park Conservation Easement is located immediately south of Highway 91 and east of Highway 241, with a small portion of the easement on the west side of Highway 241. The survey was conducted on a warm and sunny day, with an average temperature of 95°F. The survey of this portion of the Project Area commenced near the locked gate in Gypsum Canyon and proceeded south along the proposed trail alignment for approximately one mile, and once this portion of the survey was completed the survey continued west and north, on top of the north-south trending ridgeline. Generally, survey transects, with two individuals spaced approximately 10-15 meters apart followed each side of the trail/road alignment. In cases where steep slope and/or topography prohibited such approach, at least a single transect was attempted on each side of the proposed trail to ensure proper survey coverage.

Generally, the topography was somewhat rugged with slope between 10-15° (Figure 12). This portion of the Project Area was generally devoid of any vegetation, most likely due to the aftermath of the Canyon 2 Fire, which burned over 9,200 acres of land in 2017 (Figure 13). As this portion of the Project Area is situated along Gypsum Creek, an intermittent water source, with numerous oak trees present along its alignment, special care was given rock crops and boulders as they could potentially contain features associated with aboriginal food processing. Furthermore, several large sandstone outcrops were observed in the northern portion of the Project Area near the previously documented location of CA-ORA-303 , a prehistoric rockshelter. While several small to medium sized cavities in sandstone outcrops were observed, they appeared too shallow and represented natural rock overhangs unsuitable for human occupation.

Additionally, an effort was made to locate and identify remnants of the historic rocket fuel test facility (P30-176701) operated between 1966 and 1979. However, none of the structures documented by Pletka et al. (2004, 2005) were observed during the current survey, and only displaced fragments of broken concrete water pipes, most likely used as water crossing, were observed on the east side of Gypsum Creek. While it was assumed that the 2017 Canyon 2 Fire may have destroyed both structures, no charred remains or remains of burned features were identified during the survey. Further research and examination of aerial imagery for the Gypsum

Canyon area revealed that both structures may have been removed in the early part of 2005. The survey of this portion of the Project Area was negative and no new and/or additional cultural resources were identified during the study.



Figure 12. Overview of the Project Area (Mountain Park) taken within Gypsum Canyon, view south. Note the typical vegetation comprised of oak trees along Gypsum Creek (Stantec IMG_0666).



Figure 13. Overview of the Project Area (Mountain Park) taken from the N-S trending ridge with Santa Ana River in the background, view north (Stantec IMG_0669).

9.0 CULTURAL RESOURCES

The survey resulted in the identification and documentation of a single, historic period resource within the East Orange I Project Area (Table 8). The new resource was recorded on the California Department of Parks and Recreation Historical Resource Record forms (series DPR 523 1/95), including Primary and/or Archaeological Site Record forms appropriate for all such resources. Recordation adhered to the *Instructions for Recording Historical Resources* (OHP 1995).

TABLE 8
SUMMARY OF RESOURCES DOCUMENTED DURING THE CURRENT STUDY.

Quad (7.5")	Trinomial	Primary	Component	Description/Comments
Black Star Canyon	CA-ORA-1771H	30-001771	Historic	Saddleback Park Motocross Raceway

9.1 Saddleback Park Motocross Raceway (CA-ORA-1771H, P30-001771)

Saddleback Park represents remnants of a historic motocross raceway, which was first opened in 1967. The park is alleged to have been the first-off road park in the United States dedicated strictly to motocross racing (Short Course Racer n.d.). The land for the park carved along a ridgeline that connects two of the tallest peaks in Santa Ana Mountains, was leased from the Irvine Company by Joe Parkhurst and Bruce Meyers as a testing track for Meyers Manx buggies, which were built in Orange County. The pair quickly convinced the Irvine Company that since the land bordered an active landfill (Santiago Canyon Sanitary Landfill) it was basically useless for development. The prototype for open riding parks, at first Saddleback was to be primarily for dune buggies, but business was slow Parkhurst convinced the Irvine Company to allow motorcycles, reasoning that it would help eliminate the riding on vacant lots near large tracts of housing developments (Lawrence 2016).

Parkhurst, with the help of the visiting motocross champions from Europe, including Roger DeCoster and Joel Robert, who were inducted into the AMA (American Motocross Association) Motorcycle Hall of Fame in 1999 and 2000, respectively, designed what would become one of the most famous motocross tracks in America. The first manager of the off-road park was Vic Wilson, winner of Chuchua's First National Four-wheel Drive Grand Prix. Although originally planned to accommodate several types of off-road vehicles the park eventually decided, for safety purposes, to focus mainly on appealing to off-road motorcycles enthusiasts.

The first race was held on March 24, 1968, with two more international events held in the summer and fall of 1968, which were attended by more than 22,000 motocross enthusiasts who watched riders from England, Sweden, East Germany, and the Czech Republic compete for the top spot. With names like the Matterhorn, the Magoo Double Jump, Banzai Hill, the Wedge, and Widow Maker, the park tested many of the best riders in the world at the events but also allowed riders to test their skills all day for a $2 fee (Figures 14 and 15). The track boasted the biggest obstacles in motocross racing, including a tri-level uphill stair steps called Suicide Mountain that was built in the early 1980s (Lawrence 2016; Short Course Racer n.d.).

Saddleback Park was the prototype for open riding parks across the country, and it is possibly the most famous and most often photographed track in the sport. Often called the mecca of motocross, more national stars emerged from Saddleback than any other track in the country (Vintage MX n.d.). Also, according to some sources, the original motocross track that was

designed in 1967 by Joel Robert and Rodger DeCoster, was further south and closer to the City of Irvine. However, noise complaints from the town forced the park operator (Joe Parkhurst) to move the track to its current and more known location (Vintage MX n.d.).



Figure 14. Photograph of Saddleback Park ca. 1984 with Suicide Hill in background.



Figure 15. Photograph of Saddleback Park ca. 1970s showing entrance to the park (center) and Santiago Canyon Road on the right (Andrews 2018).

As the Irvine Company was still the landowner they were responsible for the cost and liability of the lawsuits and legal claims inevitable in a rough sport such as motocross. In 1984, the decision to close the park as an off-road vehicle mecca was made and although there have been efforts to reopen some of the tracks for races, these efforts have not been realized. Although the 17-years of off-road rivalry has left its mark in memories and photographs, the tracks are gone, overgrown with 34-years of vegetation.

The survey revealed that Saddleback Park appeared to have been established within most of the East Orange I Project Area. During the survey, two concrete foundations were identified near the original entrance gate, which may have been used for motorcycle rentals and/or daily operations of the park (Figure 16), and one concrete ramp which most likely was part of the obstacle known as Magoo Double. While heavily overgrown by 34 years of vegetation, the tracks, especially the terraced hillside of Suicide Mountain, Magoo Double, and Webco and Banzai Hill are still visible in the landscape (Figure 17).



Figure 16. Portion of concrete foundation (Feature 1) identified near the original entrance to Saddleback Park, view southeast (Stantec IMG_0532).

The survey did not reveal any structures, features, and/or artifacts that may have been associated with the early operation of the park from the late 1960s. It appears that as the park became more renowned within the motocross community, the track itself was expanded and additional course obstacles were added throughout the 70s and 80s. Furthermore, no refuse deposits or remnants associated with the daily use of the park or maintenance of motorcycles and/or equipment, as shown on Figure 14, were observed within the park. Given the 34-year old vegetation and to some extent maintenance activities associated with storm water diversion from the nearby landfill, it is very likely that any surface deposits were simply obscured by vegetation or may have been removed during construction of concrete culverts, drains, and catchment basins along the eastern and southern periphery of the park.

10.0 MANAGEMENT RECOMMENDATIONS

As part of the current archaeological study 292.5 acres received a 100% complete archaeological coverage, 292.3 acres received limited judgmental coverage, while the remaining 68.9 acres did not receive any coverage due to steep terrain (more than 50° slope), dense and impassible vegetation, and/or combination of both. The study resulted in the identification of a historic period resource (Saddleback Park) which was used between 1967 and 1984. Based on the field data and archival research the resource does appear to be associated with events that have made a significant contribution to the broad patters of California's history and cultural heritage, in this case the development of motocross racing on state and national levels as allegedly it was the first off-road park of its kind built in the United States. However, since its closure, any features/structures associated with the park have been removed and the off-road course once associated with this

facility exhibits very little in terms of integrity, and therefore does not appear to be eligible for nomination to the California Register of Historic Resources (CRHR) and/or the National Register of Historic Places (NRHP) and does not appear to represent a unique historical resource.



Figure 17. Overview of Saddleback Park (East Orange I) with portion of Webco and Banzai Hill on the right, view northwest (Stantec IMG_0539).

The NAHC's response dated April 6, 2018, indicated that the Mountain Park Study Area appears to be culturally sensitive, at least for the Mountain Park portion of the project. However, aside from the known rockshelter (CA-ORA-303), which most likely was destroyed by the construction of Highway 241, no other sites have been identified during the current or any previous surveys conducted in the area. Furthermore, no additional responses from Native American contact for Orange County have been received regarding the Study Area. Coincidentally, the Study Area is located on the Black Star Canyon quadrangle, with a known ethnographic village site (Black Star Canyon Indian Village, *California Historical Landmark No. 217)* located within the Black Star Canyon, approximately four miles from the current Study Area. It is very likely that the culturally sensitive area as indicated by the NAHC may in fact refer to Black Star Canyon proper and the Black Star Indian Village located within its confines, rather than the overall Study Area located on the Black Star Canyon topographic quadrangle.

Background research for the current study revealed that resources previously documented within portions of the current Project Area, CA-ORA-1240 (P30-001240) and CA-ORA-1294 (P30-001294) were evaluated in 2004 and were determined as not significant archaeological or historical resource under CEQA (Dice and Taniguchi 2004), thus, they were not addressed in this report; however, updated DPR-523 site records for these resources have been included in Appendix C to reflect their current status and condition. Similarly, previously documented historic rocket fuel test facility (P30-176701) was found ineligible for listing to the NRHP, and available aerial imagery suggests that both structures associated with the research facility were likely removed sometime in 2005. Furthermore, previously documented isolated finds P30-100304 and P30-100460 do not meet the minimum requirements for inclusion and evaluation of the NRHP and CRHR and generally require no additional investigation or evaluation.

The methods and techniques used by Stantec are considered sufficient for the identification and evaluation of cultural resources visible at the ground surface. However, there is always a possibility that buried archaeological deposits could be found during construction and/or earth disturbing activities. In the event that cultural resources are encountered during construction activities, all work must stop and a qualified archaeologist shall be contacted immediately. Further, in the event that any human remains are encountered or in the event that unassociated funerary objects or grave goods are discovered, State Health and Safety Code Section 7050.5 requires that no further work shall continue at the location of the find until the County Coroner has made all the necessary findings as to the origin and distribution of such remains pursuant to Public Code Resources Code Section 5097.98.

11.0 REFERENCES

Andrews, R.
2018 *Saddleback Park and the Magoo Double*. http://www.robandrewsmx.com/ article. php? id=139, accessed on February 20, 2018.

Archaeological Associates
1978 *A Preliminary Archaeological Overview: The Santiago County Water District Sewage Master Plan.* Report on file at the South Central Coastal Information Center, Fullerton.

Bean, L. J., and C. R. Smith
1978 Gabrielino. In *California*, edited by Robert F. Heizer, pp. 538-549. Handbook of North American Indians, Vol. 8, William Sturtevant, general editor, Smithsonian Institution, Washington, DC.

Benner, M.
1992 *Supplemental Environmental Impact Statement for the Eastern Transportation Corridor TCA EIS 2-1, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Bissell, R.
1989 *Cultural Resources Reconnaissance of East Orange Planning Area 1, 1,800 Acres in Eastern Orange County*. Report on file at the South Central Coastal Information Center, Fullerton.

Bissell, R., and K. Becker
1991 *Cultural Resources Reconnaissance of the Proposed North Orange County Landfill Alternative Technologies Study (NOCLATS) Landfill Property, Approximately 2,700 acres, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Breece, B., and B. Padon
1982 *Cultural Resource Survey Archaeological Resources Foothill Transportation corridor, Phase II.* Report on file at the South Central Coastal Information Center, Fullerton.

Bushman, J.
2012 Oil in Brea-Olinda. *County Courier, April, Vol. 42, No. 4.* Orange County Historical Society.

Bupp, S.
2013 *Supplemental Archaeological Survey Report for SR-91 Corridor Improvement Project, City of Corona, Riverside County, California Department of Transportation, District 8.* Report on file at the South Central Coastal Information Center, Fullerton.

California Department of Forestry and Fire Protection
2018 *California Statewide Fire Map: 2017 Fire Map Archive*. http://www.fire.ca.gov/general/ firemaps, site accessed on June 22, 2018.

Cameron, C.
1991 *An Archaeological Assessment for the Santiago Reservoir Water Filtration Plant, Near Irvine, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Chasteen, C.
2013a *Supplemental Historic Property Survey Report: Propose Capacity, Operational and Safety Improvement Along State Route 91 and Interstate 15.* Report on file at the South Central Coastal Information Center, Fullerton.

2013b *Supplemental Finding of No Adverse Effect Report for SR-91Corridor Improvement Project, City of Corona, Riverside County, California, California Department of Transportation, District 8.* Report on file at the South Central Coastal Information Center, Fullerton.

2013c *Supplemental Historic Property Survey Report: Propose Capacity, Operational and Safety Improvements Along State Route 91 and Interstate 15.* Report on file at the South Central Coastal Information Center, Fullerton.

Cooley, T., and A. Schroth
1979 *Archaeological Resources Assessment Conducted for Proposed Irvine Ranch Water District Pipeline Right of Ways.* Report on file at the South Central Coastal Information Center, Fullerton.

Cowan, R.
1956 *Ranchos of California: a list of Spanish Concessions 1775-1822 and Mexican Grants 1822-1846.* Academy Library Guild, Fresno, California.

Cottrell, M, and V. Bickford
1978 *Report of Archaeological Resources Survey Conducted for Laguna and Peter's Canyons.* Report on file at the South Central Coastal Information Center, Fullerton.

Davy, D., and J. McKeehan
1997 *Archaeological Test Excavation at ORA-1460/H: Supplemental Report for the Eastern Transportation Corridor.* Report on file at the South Central Coastal Information Center, Fullerton.

Desautels, R., and N. Whitney
1977 *Scientific Resources Report on the Archaeological and Paleontological Assessment of the Bryant Ranch Property Located in the Northwest Portion of Orange County.* Report on file at the South Central Coastal Information Center, Fullerton.

Dice, M., and C. Taniguchi
2004 *Phase 2 Archaeological Testing Evaluation of Irvine Ranch Cultural Resources*. Report on file at the South Central Coastal Information Center, Fullerton.

Douglas, R., J. Cooper, D. Burkenroad, E. Gardner, and T. Mabry
1981 *Archaeological, Historical/Ethnohistorical, and Paleontological Assessment, Weir Canyon Park-Road Study, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Drover, C.
1983 *Environmental Impact Evaluation: An Archaeological Assessment of the Oak Hills Ranch and Wallace Ranch General Plan.* Report on file at the South Central Coastal Information Center, Fullerton.

Elsasser, A. B.
1978 Development of Regional Prehistoric Cultures. In *California*, edited by Robert F. Heizer, pp. 538-549. Handbook of North American Indians, Vol. 8, William Sturtevant, general editor, Smithsonian Institution, Washington, DC.

Foster Wheeler
1996 *Archaeological Test Excavations at ORA-304 Supplemental Report for the Eastern Transportation Corridor, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Garcia, K., and M. Rockman
2007 *Results of Archaeological Survey and Monitoring for SCE Pole Replacement After Santiago Fire Along Santiago Canyon Road, Modjeska Canyon Road and Hicks Canyon Road, Orange County, California*. Report on file at the South Central Coastal Information Center, Fullerton.

Greenwood, R.
1980 *Cultural Resource Overview for the Serrano Substation to Mira Loma Substation Transmission Route Alternative Corridor Right-of-Way*. Report on file at the South Central Coastal Information Center, Fullerton.

Greenwood and Associates
1991 *Historic Property Survey Report for the Proposed Eastern Transportation Corridor, Orange County, California (12-ORA-231, 12830-111000)*. Report on file at the South Central Coastal Information Center, Fullerton.

Jahns, R.
1954 *Southern California Geology*. California Division of Mines Bulletin 170, San Francisco.

Kroeber, A. L.
1976 [1925] *Handbook of the Indians of California*. Dover Publications, Inc., New York.

Kyle, C.
2002 *Cultural Resource Assessment for Cingular Wireless Facility Sc040-03, City of Anaheim, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Lawrence, L.
2016 *Archives: The Mecca of Motocross.* http://www.cyclenews.com/2016/08 /*article/archives-mecca-motocross,* accessed on February 21, 2018.

Leonard, N., III
1976 *Archaeological Report on the Silverado-Modjeska Planning Area, Orange County, California*. Report on file at the South Central Coastal Information Center, Fullerton.

Marvin, J., and N. Pletka
2003 *Site Record for P30-176701*. Record on file at the South Central Coastal Information Center, Fullerton.

Mason, R.
1984 *Eastern Corridor Alignment Study, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

1990 *Cultural Resources Survey Report Santiago Canyon Road Alignment Study, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

McCawley, W.
1996 *First Angelinos: the Gabrielino Indians of Los Angeles*. Malki Museum Press/Ballena Press, Banning, California.

McKenna, J.
1991 *A Phase I Cultural Resource Investigation of the Proposed Calmat, Inc. Realignment of Haul Roads in the Santiago Canyon Area Near Irvine Lake, Orange County, California*. Report on file at the South Central Coastal Information Center, Fullerton.

Munz, P.
1974 *A Flora of Southern California*. University of California Press, Berkley, California.

Office of Historic Preservation (OHP)
1995 *Instructions for Recording Historical Resources*. California Department of Parks and Recreation, Office of Historic Preservation, Sacramento.

Orange County Public Works
n.d. *www.occom.OCParksublicworks.com/sections/flood*, accessed January 10, 2018.

Padon, B.
1995 *Archaeological Monitoring Report for Santiago Road Overcrossing, Orange County*. Report on file at the South Central Coastal Information Center, Fullerton.

1988 *Cultural/Scientific Resource Assessment, Gypsum Canyon Facility*. Report on file at the South Central Coastal Information Center, Fullerton.

Pletka, S., S. Younger, and J. Marvin
2004 *Cultural Resource Survey and Assessment, Mountain Park, Anaheim, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

2005 *Cultural Resource Survey and Assessment, Mountain Park, Anaheim, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Rosenthal, J.
1987 *Cultural/Scientific Resources Report for the Proposed Long-Term Jail Sites, Orange County*. Report on file at the South Central Coastal Information Center, Fullerton.

1991 *Past to Present: Cultural and Scientific Resources, an Archival Inventory Irvine Ranch Open Space Reserve, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Rundel, P., and R. Gustafson
2005 *Introduction to the Plant Life of Southern California: Coast to Foothills.* University of California Press, Oakland, California.

Schmidt, J.
2000 *Phase I Archaeological Investigation Santiago Hills Development, Phase II, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Short Course Racer
n.d. *Saddleback Raceway*. http://www.shortcourseracer.com/ saddleback-raceway, accessed on February 19, 2018.

Solis, L.
2009 *Santiago Canyon Road Culvert Replacement Project-Phase I Archaeological Survey*. Report on file at the South Central Coastal Information Center, Fullerton.

Sorensen, J., B. Texier, P. Fulton, and G. Brown
1990 *Site Record for CA-ORA-1240*. Record on file at the South Central Coastal Information Center, Fullerton.

Strozier, H.
1978 *The Irvine Company Planning Process and California Archaeology-A Review and Critique*. Report on file at the South Central Coastal Information Center, Fullerton.

Strudwick, I.
2008 *Negative Cultural Resource Assessment Letter Report for the Approximately 15-acre Robertson Ranch Parcel South of SR-91 and East of Gypsum Canyon Road, Anaheim, Orange County*. Report on file at the South Central Coastal Information Center, Fullerton.

Sturm, B.
n.d. *An Archaeological Assessment of the Irvine Lake Desilting Project*. Report on file at the South Central Coastal Information Center, Fullerton.

Sundberg, F., and N. Whitney-Desautels
1991 *Grading Monitoring Report, Archaeology, History, and Paleontology, Capistrano Collection, San Juan Capistrano, Orange County, California*. Report on file at the South Central Coastal Information Center, Fullerton.

Sutton, M.
2010 The Del Rey Tradition and its Place in the Prehistory of Southern California. *Pacific Coast Archaeological Society Quarterly* 44(2):1-54.

Sutton, M., and J. Gardner
2010 Reconceptualizing the Encinitas Tradition of Southern California. *Pacific Coast Archaeological Society Quarterly* Vol 42(4):1-64.

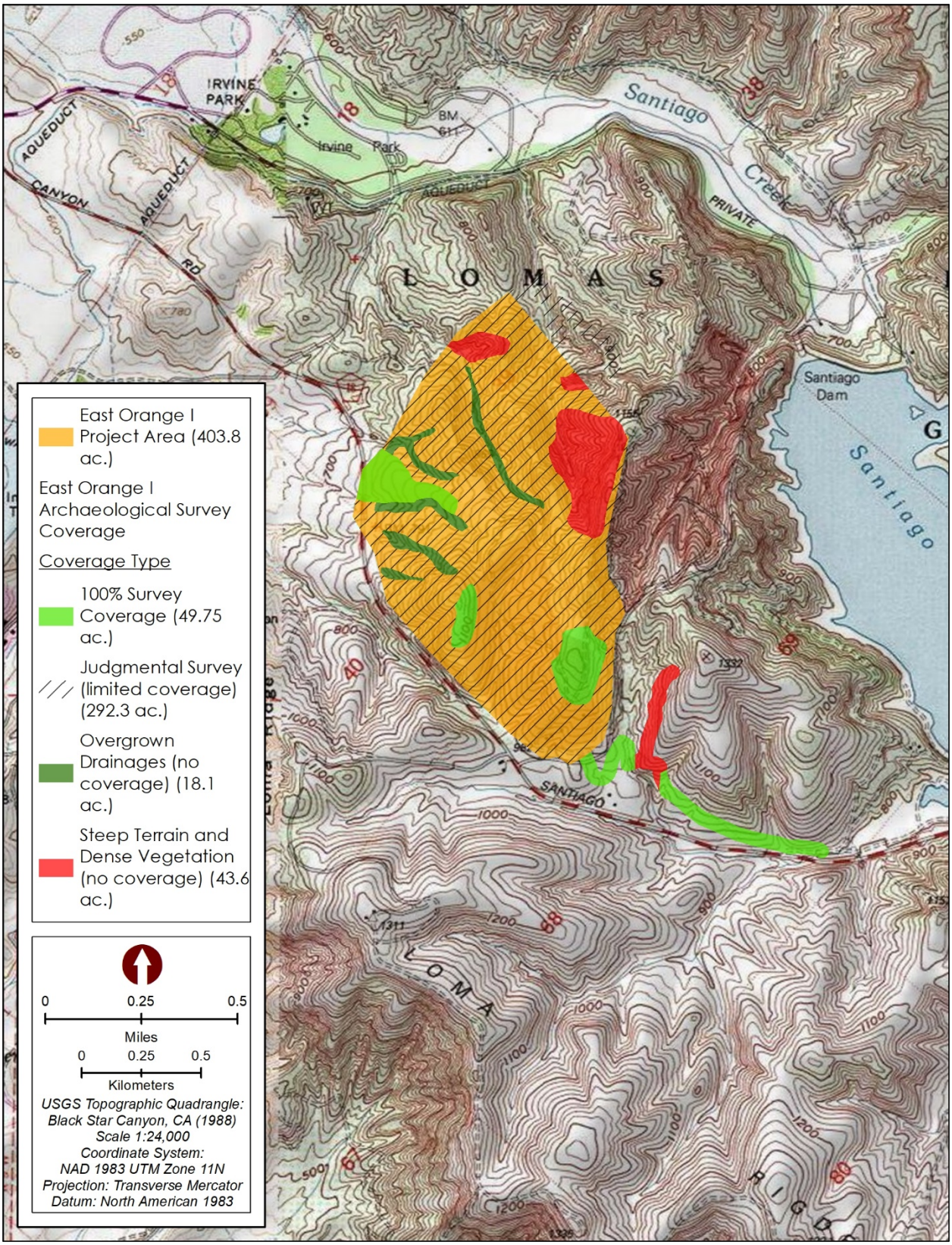
Uberbrink, S.
2006 *Archaeological Survey Report for the Eastbound SR-91 Lane Addition Project From SR-241 to SR-71, County of Orange and County of Riverside, California*. Report on file at the South Central Coastal Information Center, Fullerton.

Vintage MX
n.d. *Forgotten Tracks: Preserving Motocross History*. http://www.vintagemx.us/ forgottentracks.htm, accessed on February 26, 2018.

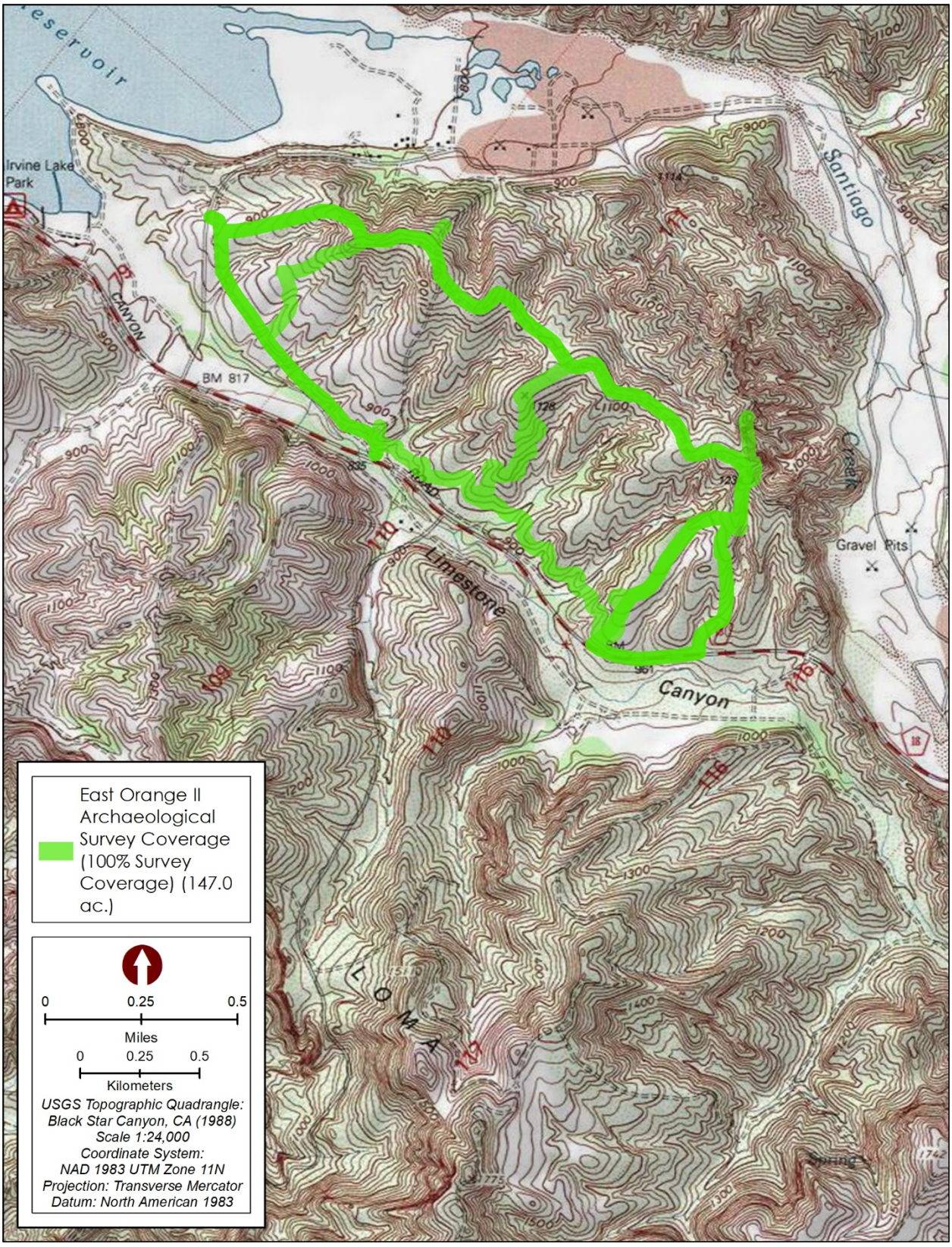
Warren, C. N., and R. H. Crabtree
1986 Prehistory of the Southwestern Area. In *Handbook of North American Indians*, Vol. 8, California, edited by R. F. Heizer, pp. 183-193. Washington: Smithsonian Institution.

Webb, L.
1991 *Request for Finding of No Effect for the Proposed Eastern Transportation Corridor, Orange County, California. Report on file at the South Central Coastal Information Center, Fullerton.*

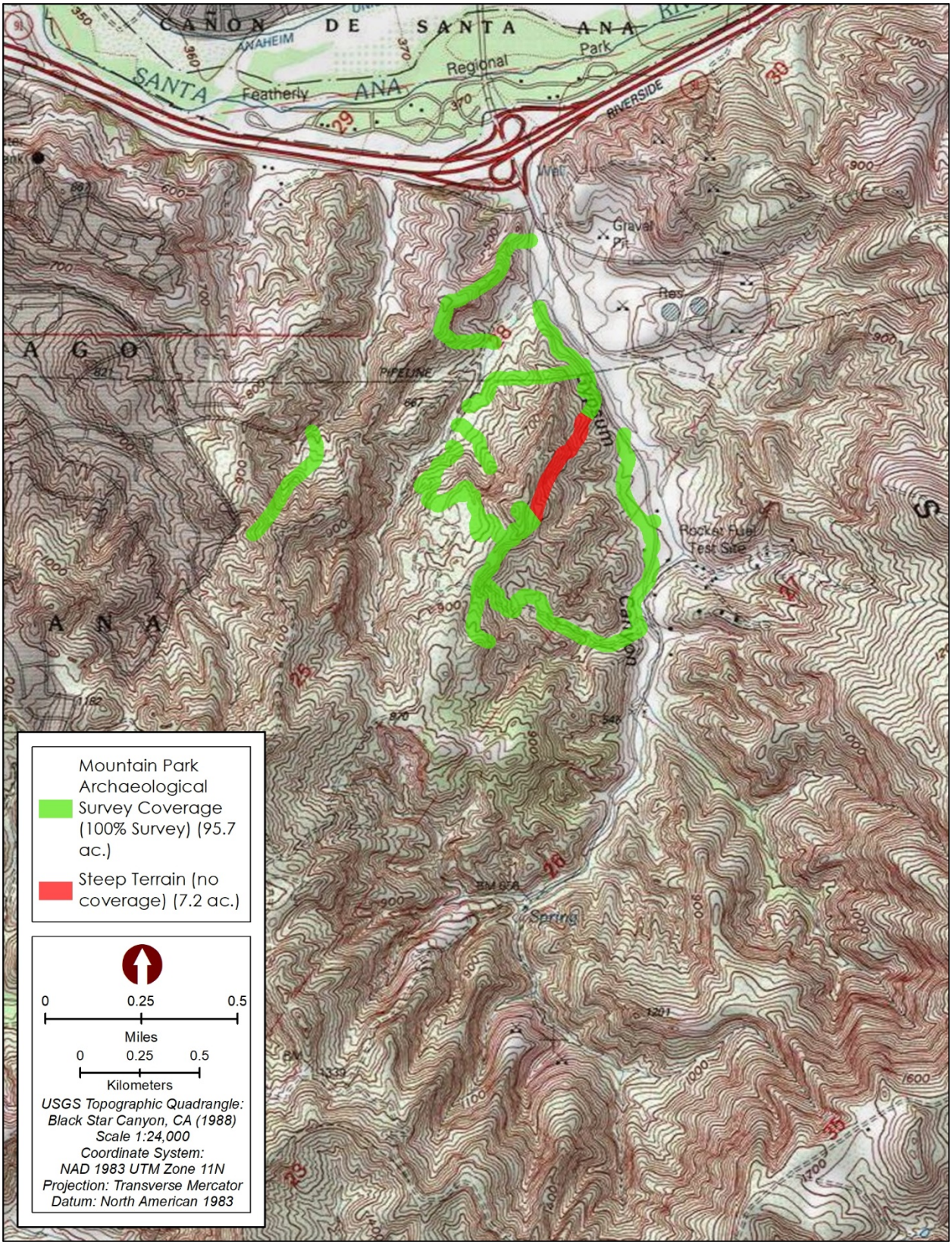
APPENDIX A – EAST ORANGE I, EAST ORANGE II, AND MOUNTAIN PARK STUDY AREAS WITH ARCHAEOLOGICAL SURVEY COVERAGE



Appendix A1 – East Orange I Study Area with Archaeological Survey Coverage



Appendix A2 – East Orange II Study Area with Archaeological Survey Coverage



Appendix A3 – Mountain Park Study Area with Archaeological Survey Coverage

APPENDIX B – NATIVE AMERICAN NOTIFICATION/SACRED LANDS FILE SEARCH CORRESPONDENCE



Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

February 6, 2018

Native American Heritage Commission
915 Capitol Mall, RM 364
Sacramento, CA 95814
Office: 916.653.4082
Fax: 916.657.5390

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1 Conservation Easement and East Orange II Conservation Easement Access Road Improvement Projects, near Irvine, Orange County, California*

Dear Sir or Madam,

One behalf of Orange County Parks, Stantec would like to request a Sacred Lands File Search and a list of appropriate Native American Contacts for the above referenced project located east of the City of Orange, Orange County, California. The proposed project is located on lands owned by Orange County Parks (OC Parks).

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a generous gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I and East Orange II Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail and will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack and was known to local motorcycle enthusiasts as Saddleback Park.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a staging area and trail which will be contained within disturbed areas from past uses. Improvements will include the addition of a concrete pad within the existing decomposed granite parking lot, to support ADA accessible parking, portable restrooms, and signage. The trail will follow existing jeep trail routes. Activities planned for the Augustine staging area will be limited to parking lot and picnic area improvements. This staging area will serve as the access point to an existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access.

Enclosed for ease of reference are the completed Native American Heritage Commission Request Form containing additional project locational information, and a map of the proposed project area depicted on the Stevens USGS 7.5-minute series topographic quadrangles. Please contact me if you have any

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

questions or concerns regarding this proposed project. Thank you for your time and assistance.

Sincerely,



Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Office: 661.885.3016
Fax: 661.396.3771
Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

NATIVE AMERICAN HERITAGE COMMISSION
915 Capitol Mall, RM 364
Sacramento, CA 95814
(916) 653-4082
(916) 657-5390 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: East Orange I and East Orange II Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Company/Firm/Agency: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

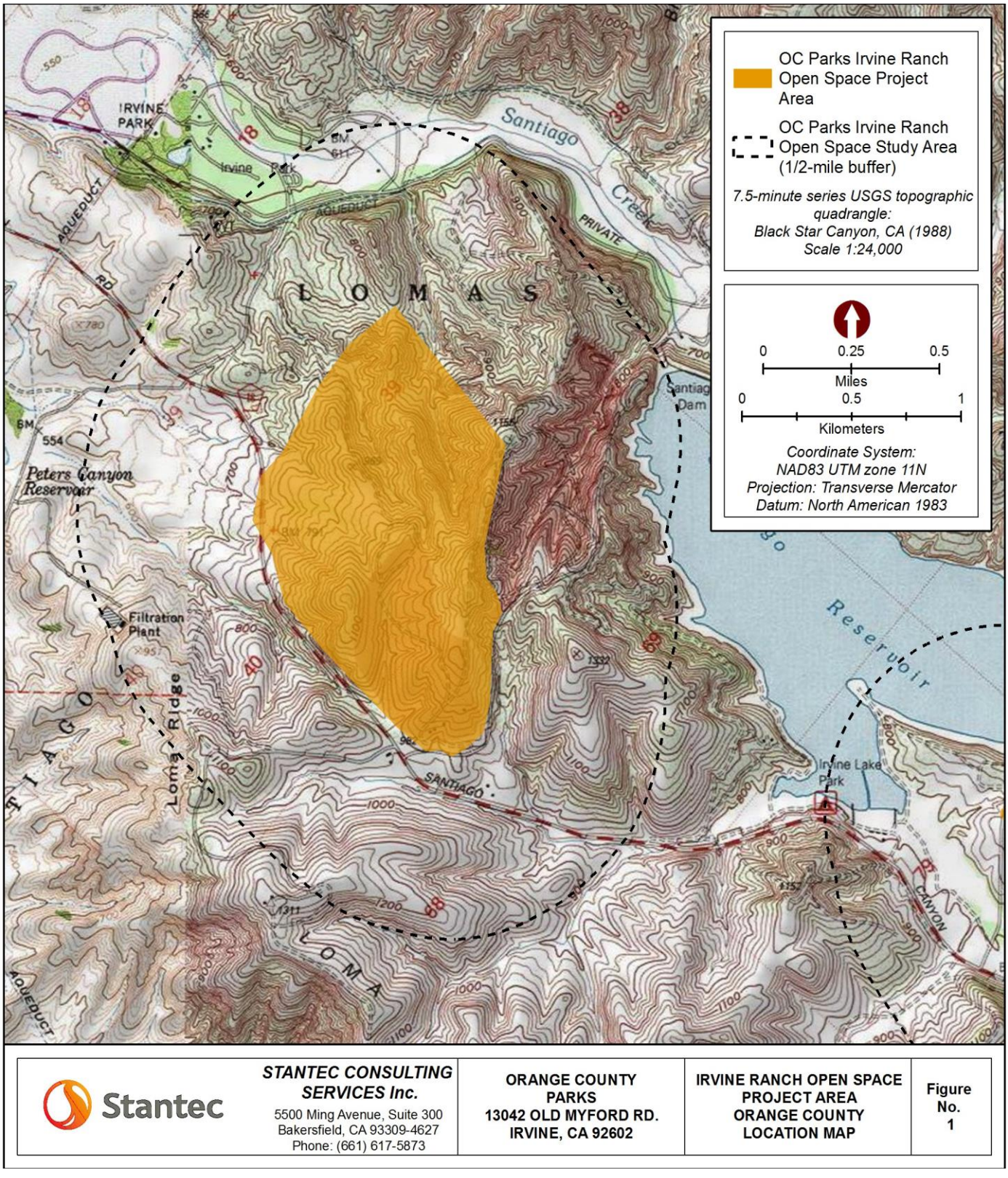


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

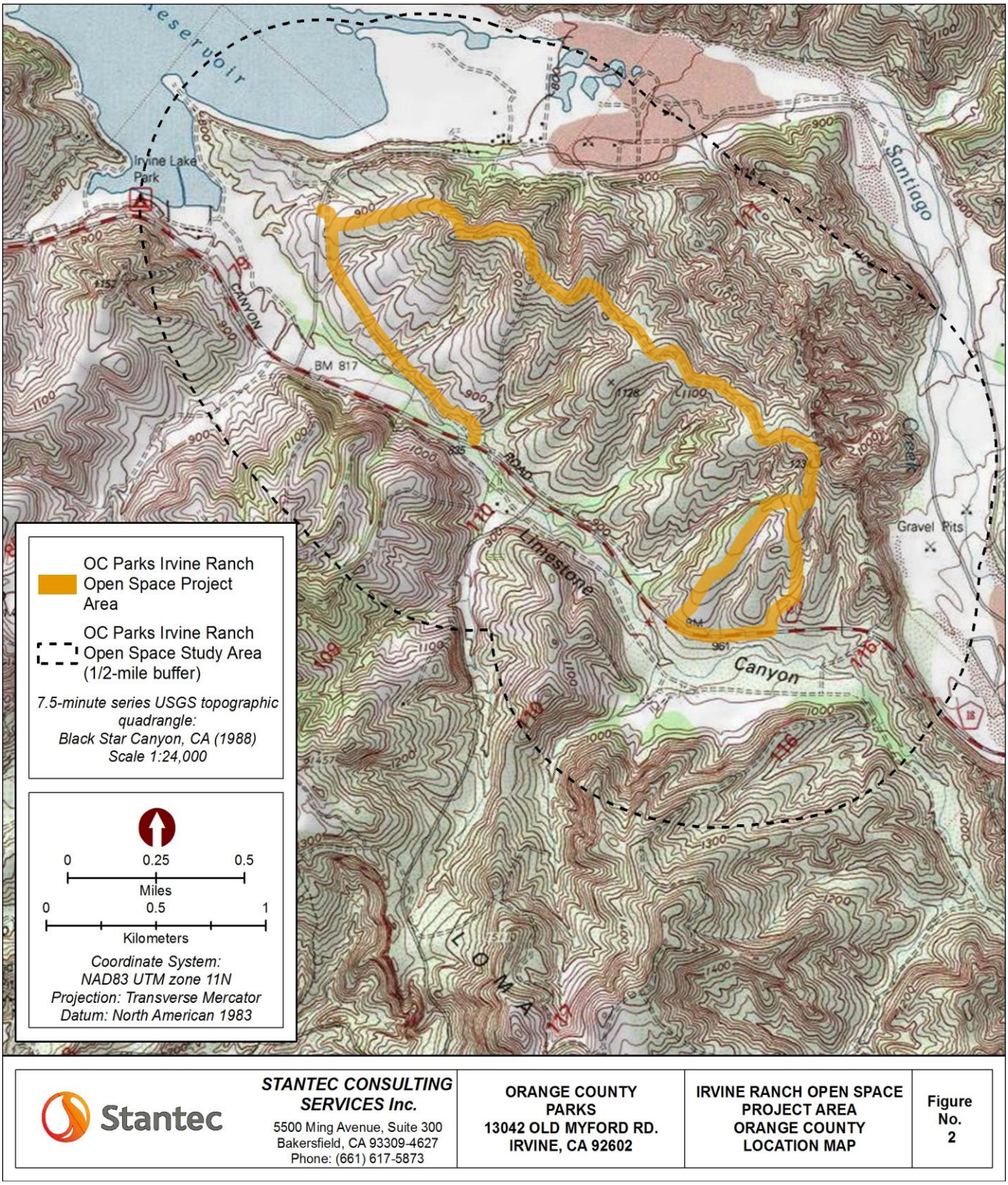


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

February 7, 2018

Victoria Harvey
Stantec Consulting Services, Inc.

Sent by E-mail: Victoria.harvey@stantec.com

RE: Proposed East Orange I and East Orange II Conservation Easement, Orange County Parks Project, near the Community of Santiago Canyon; Black Star Canyon USGS Quadrangle, Orange County, California

Dear Ms. Harvey:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results however the area is sensitive for cultural resources. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

Attached is a list of tribes culturally affiliated to the project area. I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst
(916) 373-3714

CONFIDENTIALITY NOTICE: This communication with its contents may contain confidential and/or legally privileged information. It is solely for the use of the intended recipient(s). Unauthorized interception, review, use or disclosure is prohibited and may violate applicable laws including the Electronic Communications Privacy Act. If you are not the intended recipient, please contact the sender and destroy all copies of the communication.

Native American Heritage Commission
Native American Contact List
Orange County
2/7/2018

Campo Band of Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Kumeyaay
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Tribal Office
Robert Pinto, Chairperson
4054 Willows Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126

Ewiiaapaayp Tribal Office
Michael Garcia, Vice Chairperson
4054 Willows Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chariperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
chairman@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., — Gabrielino
#231
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 — Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street — Gabrielino
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Kumeyaay
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817

Juaneno Band of Mission Indians
Sonia Johnston, Chairperson
P.O. Box 25628 — Juaneno
Santa Ana, CA, 92799
sonia.johnston@sbcglobal.net

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Joyce Perry, Tribal Manager
4955 Paseo Segovia — Juaneno
Irvine, CA, 92603
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos — Juaneno
San Juan Capisttrano, CA, 92675
Phone: (949) 293 - 8522

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed East Orange I and East Orange II Conservation Easement, Orange County Parks Project, Orange County.

Native American Heritage Commission
Native American Contact List
Orange County
2/7/2018

Juaneno Band of Mission Indians Acjachemen Nation - Romero
Teresa Romero, Chairperson
31411-A La Matanza Street — Juaneno
San Juan Capistrano, CA, 92675
Phone: (949) 488 - 3484
Fax: (949) 488-3294
tromero@juaneno.com

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

La Posta Band of Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

Pauma Band of Luiseno Indians - Pauma & Yuima Reservation
Temet Aguilar, Chairperson
P.O. Box 369 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 1289
Fax: (760) 742-3422

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838 — Kitanemuk
Newhall, CA, 91322 — Serrano
Phone: (760) 885 - 0955 — Tataviam
tsen2u@hotmail.com

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
P.O. Box 365 — Kumeyaay
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

San Pasqual Band of Mission Indians
John Flores, Environmental Coordinator
P. O. Box 365 — Kumeyaay
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
johnf@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Lisa Haws, Cultural Resources Manager
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 312 - 1935
lhaws@sycuan-nsn.gov

Sycuan Band of the Kumeyaay Nation
Cody J. Martinez, Chairperson
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed East Orange I and East Orange II Conservation Easement, Orange County Parks Project, Orange County.

Viejas Band of Kumeyaay Indians
Julie Hagen,
1 Viejas Grade Road
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

Kumeyaay

Viejas Band of Kumeyaay Indians
Robert Welch, Chairperson
1 Viejas Grade Road
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

Kumeyaay

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed East Orange I and East Orange II Conservation Easement, Orange County Parks Project, Orange County.

From: Harvey, Victoria
To: "nahc@nahc.ca.gov"
Subject: Orange County Parks Projects
Date: Tuesday, April 03, 2018 1:24:00 PM
Attachments: NAHC Letter_04032018.docx
image004.png
image005.png

Dear Sir or Madam,

One behalf of Orange County Parks, Stantec would like to request a Sacred Lands File Search and a list of appropriate Native American Contacts for the above referenced project located east of the City of Orange, Orange County, California. This letter is to provide an update to a letter sent on February 6, 2018 regarding work for the Proposed East Orange 1 and East Orange II Conservation Easements, Orange County Parks Project (Figures 1 and 2 of the attached document) that you responded to on February 7, 2018.

The update is regarding an additional area on land managed by Orange County Parks called Mountain Park (see Figures 3 and 4 in the attached document). This upgrade proposes no new ground disturbing activities but we wish to include it in the consultation letters to Tribal representatives that were included on the letter we received from NAHC on February 7, 2018.

Attached is a letter request, the project location information, and a map of the project and associated work area.

Thank you for your assistance,

Victoria Harvey, M.A.,
R.P.A.
Senior Archaeologist
Stantec Consulting Services
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Victoria.Harvet@stantec.com
(661) 549-8702 (Cell)
(661) 885-3016 (Desk)

Stantec

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 3, 2018

Native American Heritage Commission
915 Capitol Mall, RM 364
Sacramento, CA 95814
Office: 916.653.4082
Fax: 916.657.5390

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange I, East Orange I, and Mountain Park Conservation Easement Staging Area and Trail Improvement Project, near Irvine, Orange County, California*

Dear Sir or Madam,

One behalf of Orange County Parks, Stantec would like to request a Sacred Lands File Search and a list of appropriate Native American Contacts for the above referenced project located east of the City of Orange, Orange County, California. The proposed project is located on lands owned by Orange County Parks (OC Parks).

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a generous gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I and East Orange II Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land (Fig. 1). Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement (Fig. 2). Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land (Figs. 3 and 4). Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the completed Native American Heritage Commission Request Form containing additional project locational information, and a map of the proposed project area depicted on the Stevens USGS 7.5-minute series topographic quadrangles. Please contact me if you have any questions or concerns regarding this proposed project. Thank you for your time and assistance.

Sincerely,



Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Office: 661.885.3016
Fax: 661.396.3771
Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

NATIVE AMERICAN HERITAGE COMMISSION
915 Capitol Mall, RM 364
Sacramento, CA 95814
(916) 653-4082
(916) 657-5390 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located north of Santiago Reservoir (Irvine Lake) and south of Santa

Ana Canyon

Company/Firm/Agency: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

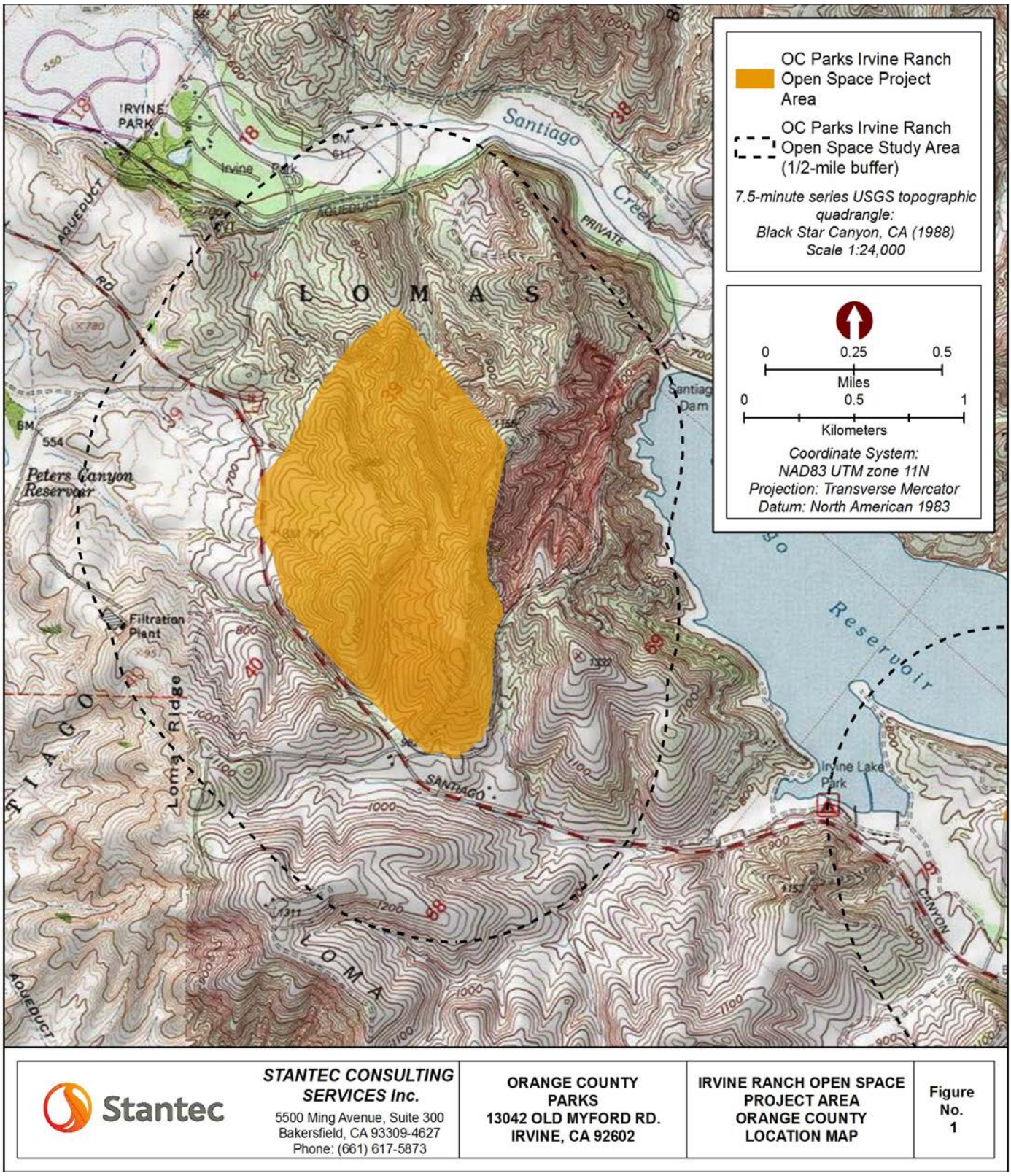


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

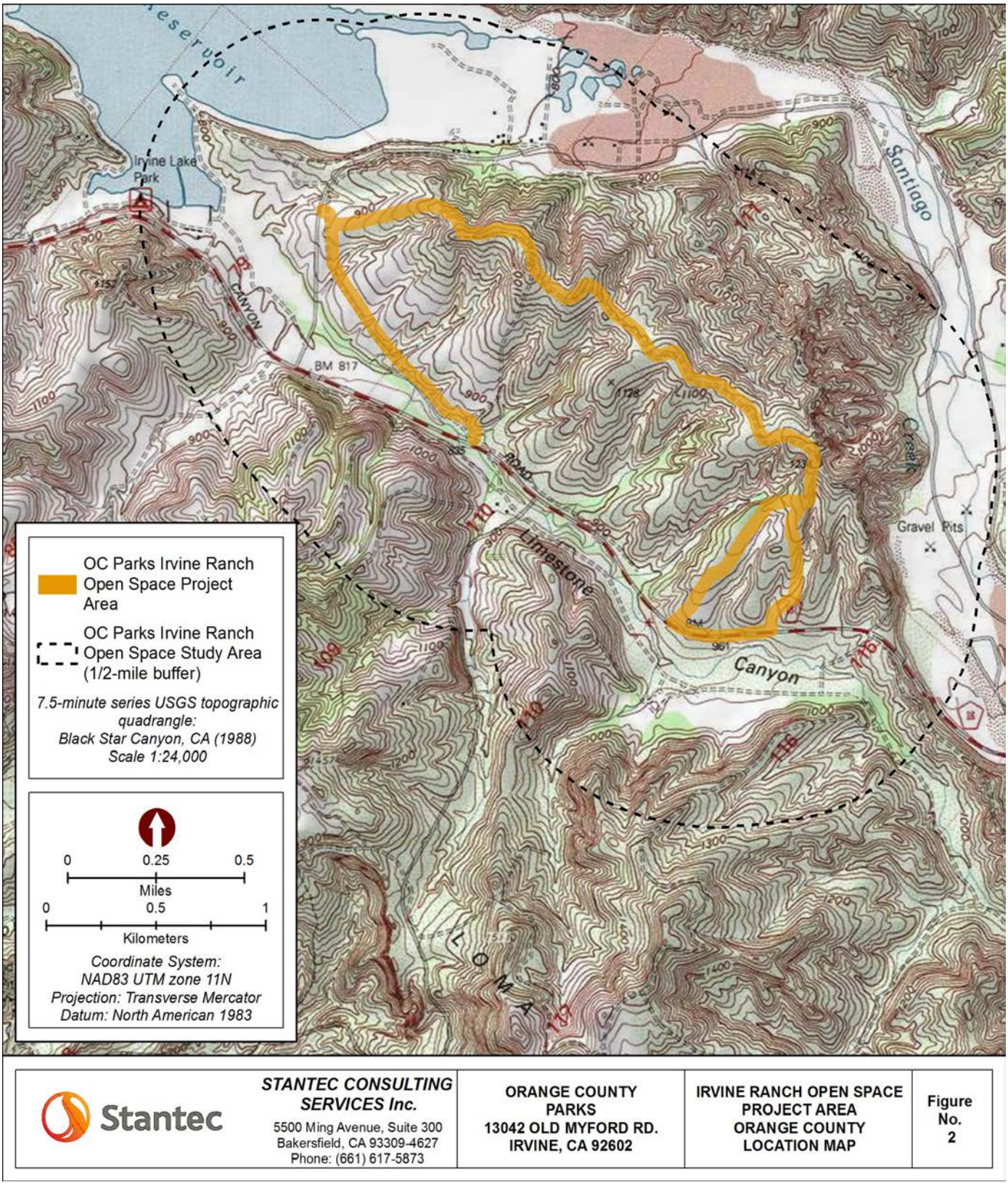


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

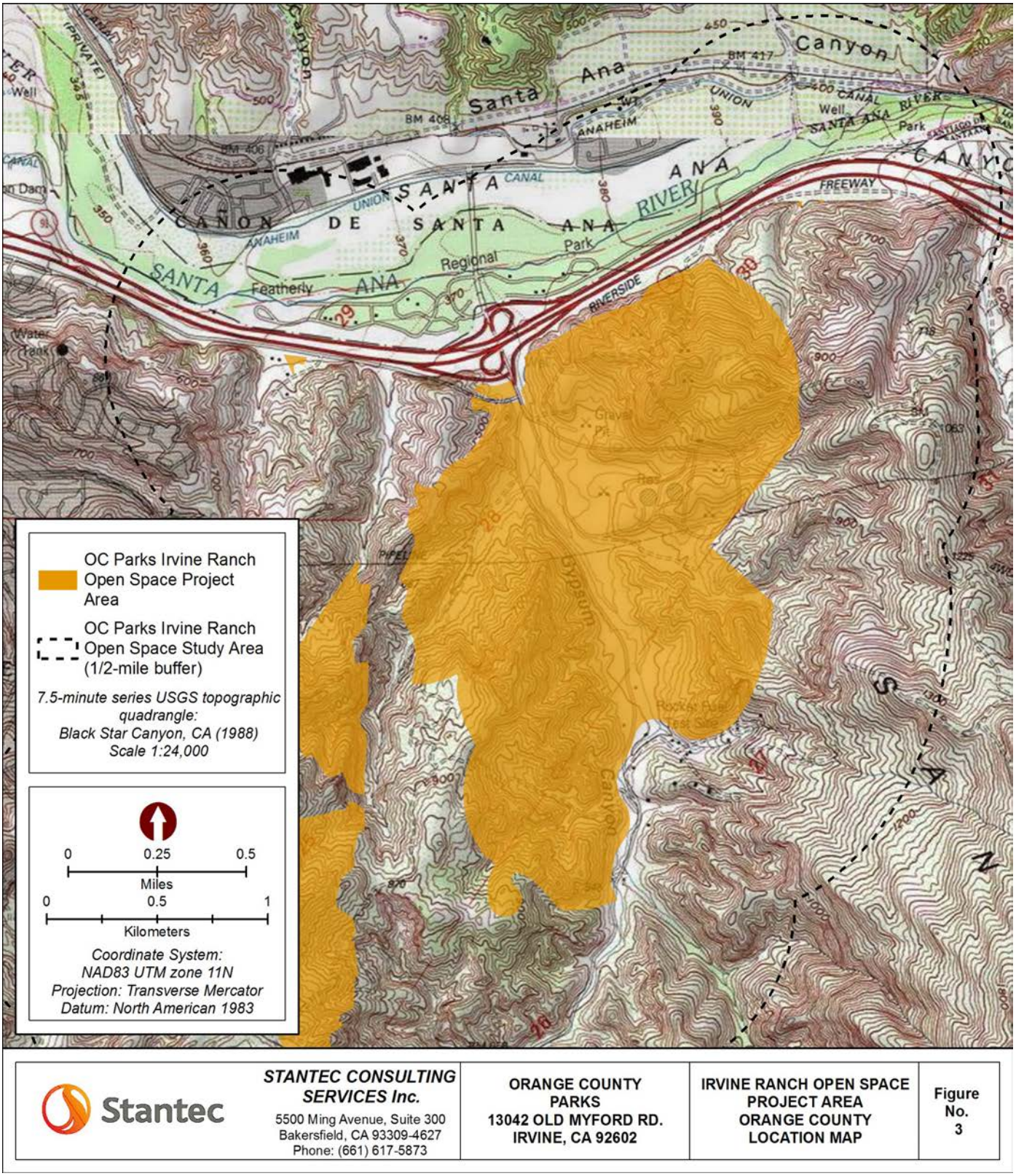


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

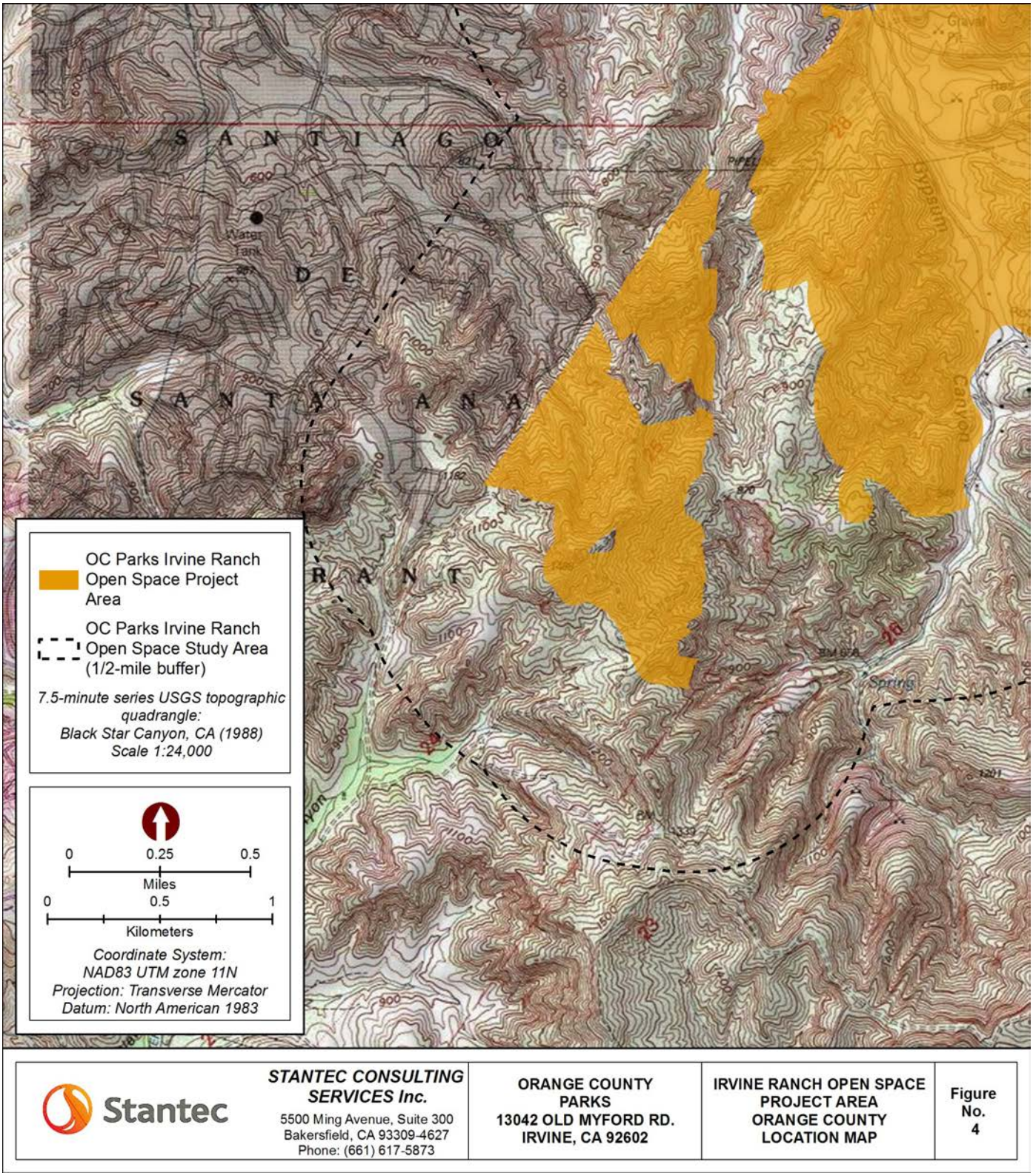


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710

April 6, 2018

Victoria Harvey
Stantec Consulting Services, Inc.

Sent by E-mail: Victoria.harvey@stantec.com

RE: Proposed East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks Project, near Irvine Lake; Black Star Canyon USGS Quadrangle, Orange County, California

Dear Ms. Harvey:

Attached is a list of tribes that have cultural and traditional affiliation to the areas of potential project effect (APE) referenced above. I suggest you contact all of those listed, if they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult, as may be required under particular state statutes. If a response has not been received within two weeks of notification, the Native American Heritage Commission (NAHC) requests that you follow-up with a telephone call to ensure that the project information has been received.

THIS INFORMATION IS CONFIDENTIAL! PLEASE DO NOT INCLUDE IN PUBLIC DOCUMENTS.
A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* (SLF) was completed for the area of potential project effect (APE) for the above referenced project. Sites have been located within the APE you provided that may be impacted by the project. Please immediately contact the Juaneno Band of Mission Indians – Acjachemen Nation at (949) 293-8522 for more information about these sites.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance, we are able to assure that our lists contain current information. If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst
(916) 373-3714

CONFIDENTIALITY NOTICE: This communication with its contents may contain confidential and/or legally privileged information. It is solely for the use of the intended recipient(s). Unauthorized interception, review, use or disclosure is prohibited and may violate applicable laws including the Electronic Communications Privacy Act. If you are not the intended recipient, please contact the sender and destroy all copies of the communication.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302
Boulevard, CA 91905

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Angela Elliott Santos,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

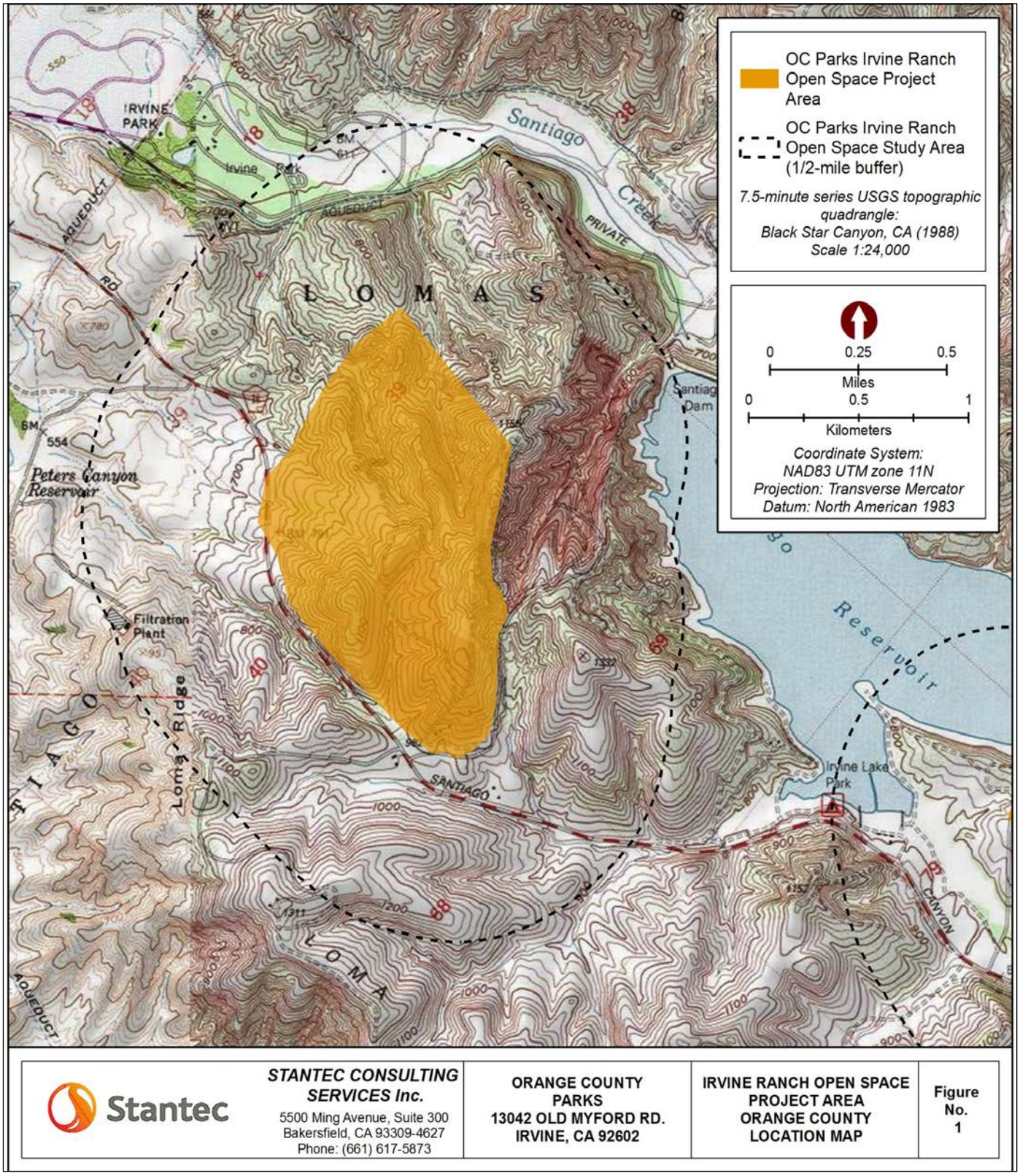


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

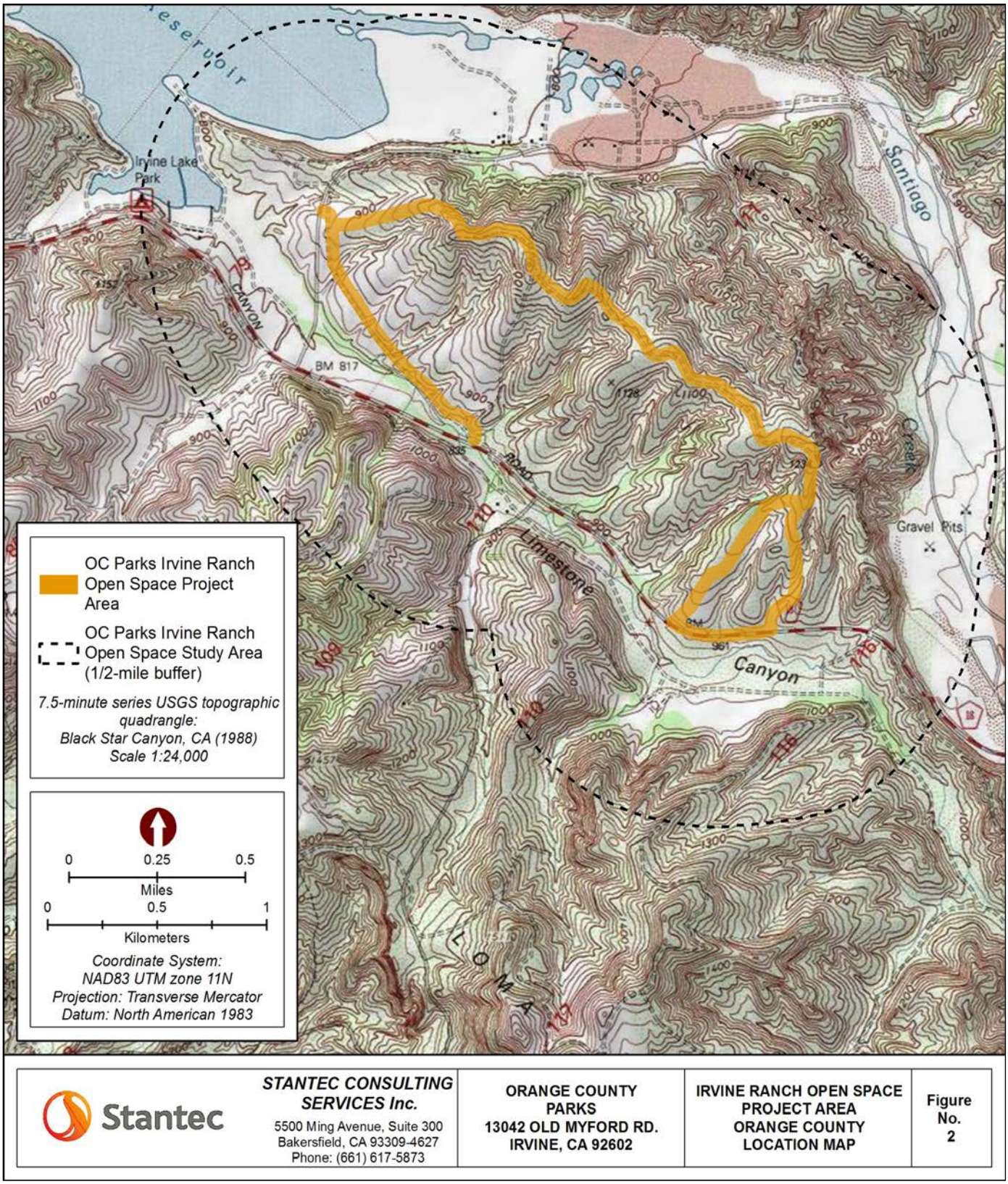


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

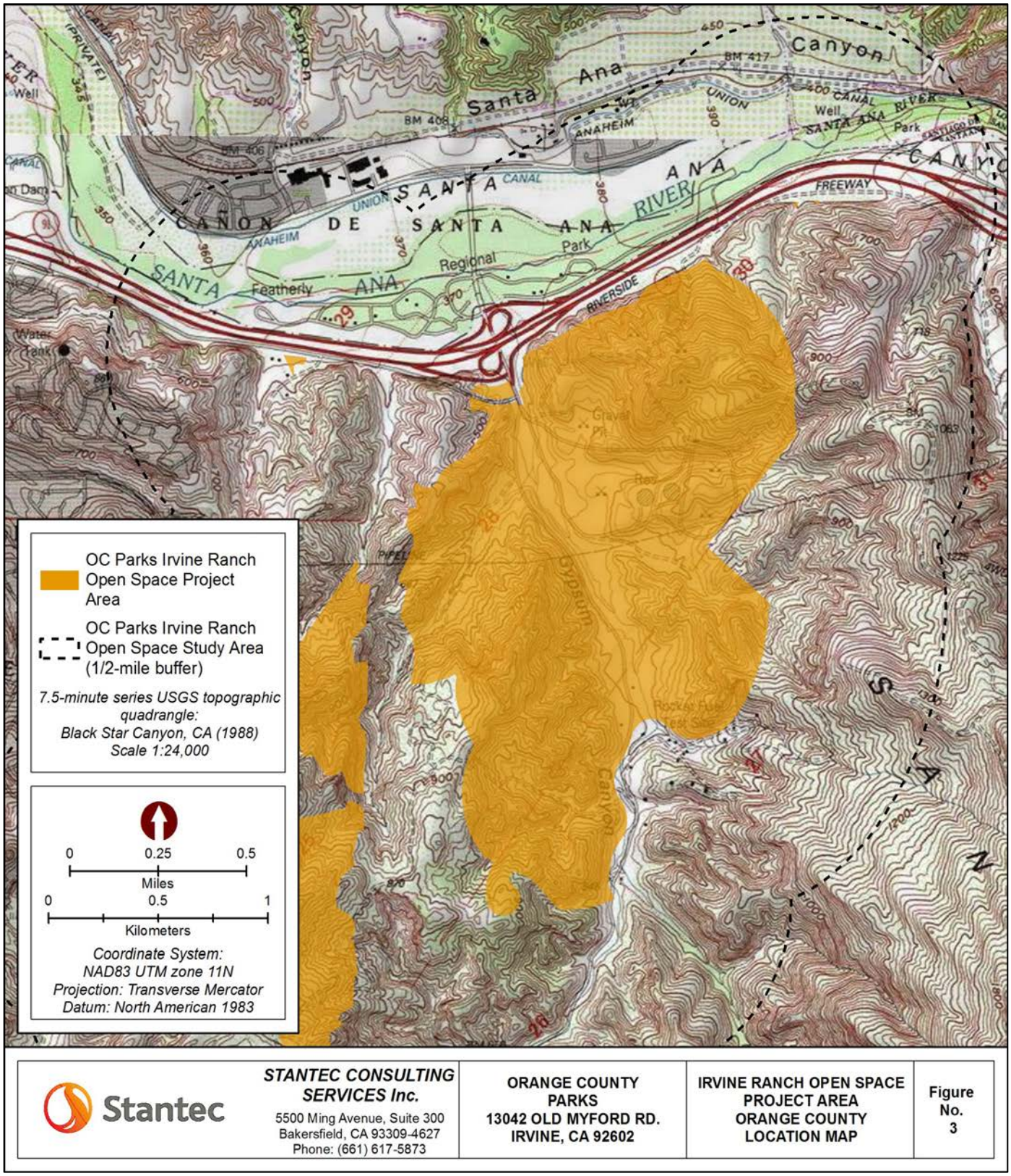


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

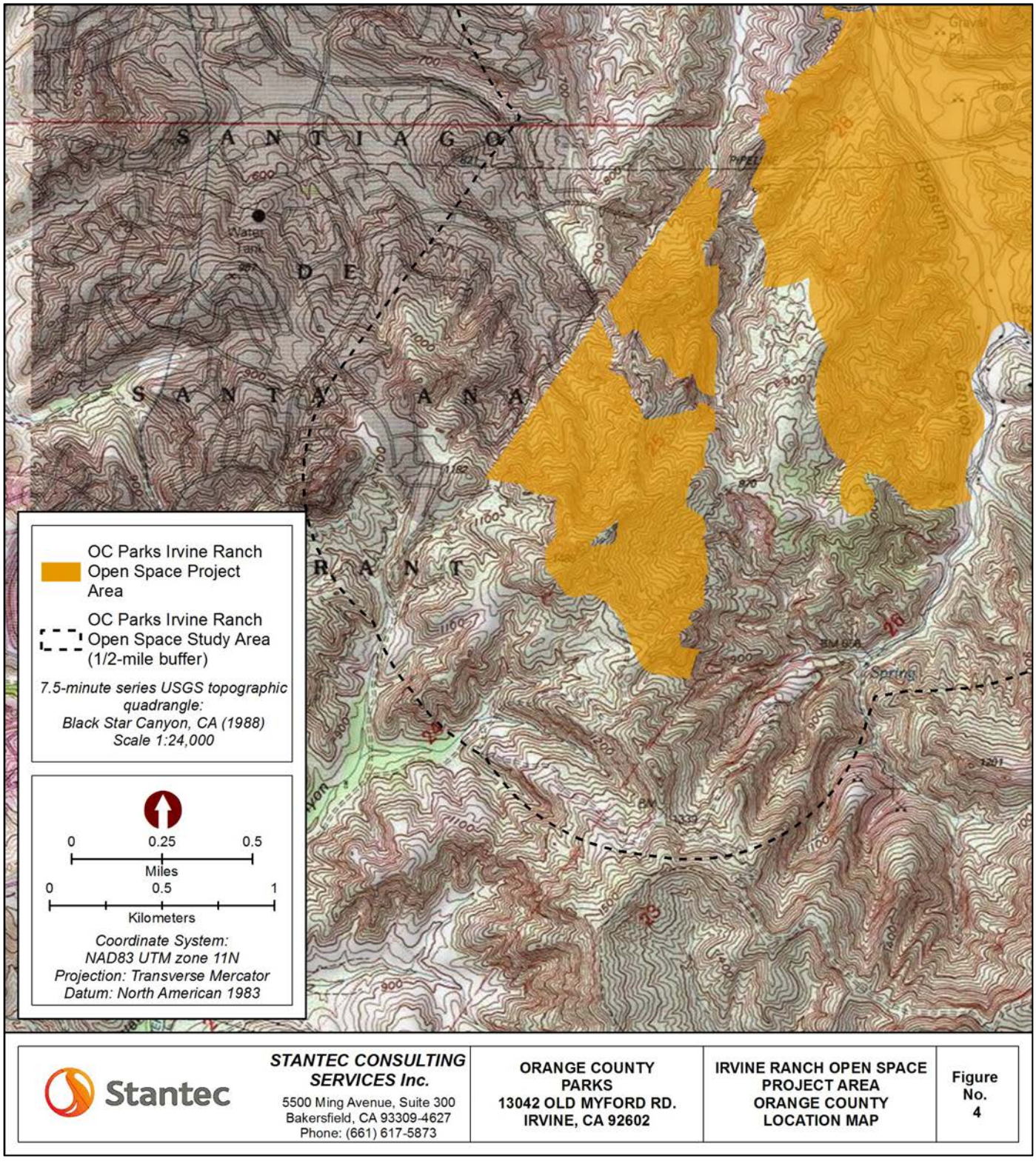


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

San Pasqual Band of Mission Indians
Allen Lawson, Chairperson
P.O. Box 365
Valley Center, CA 92082

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Allen Lawson,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

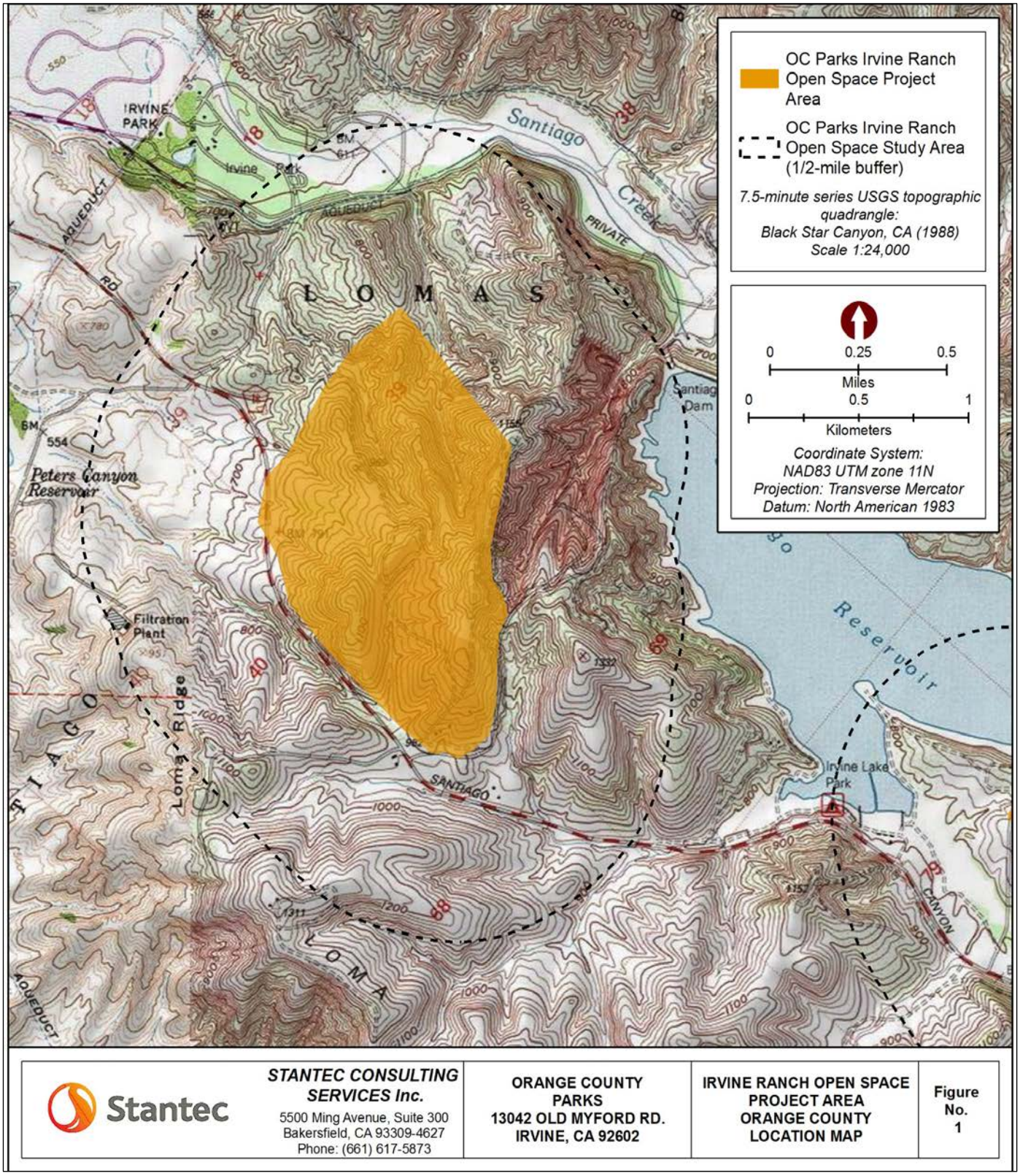


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

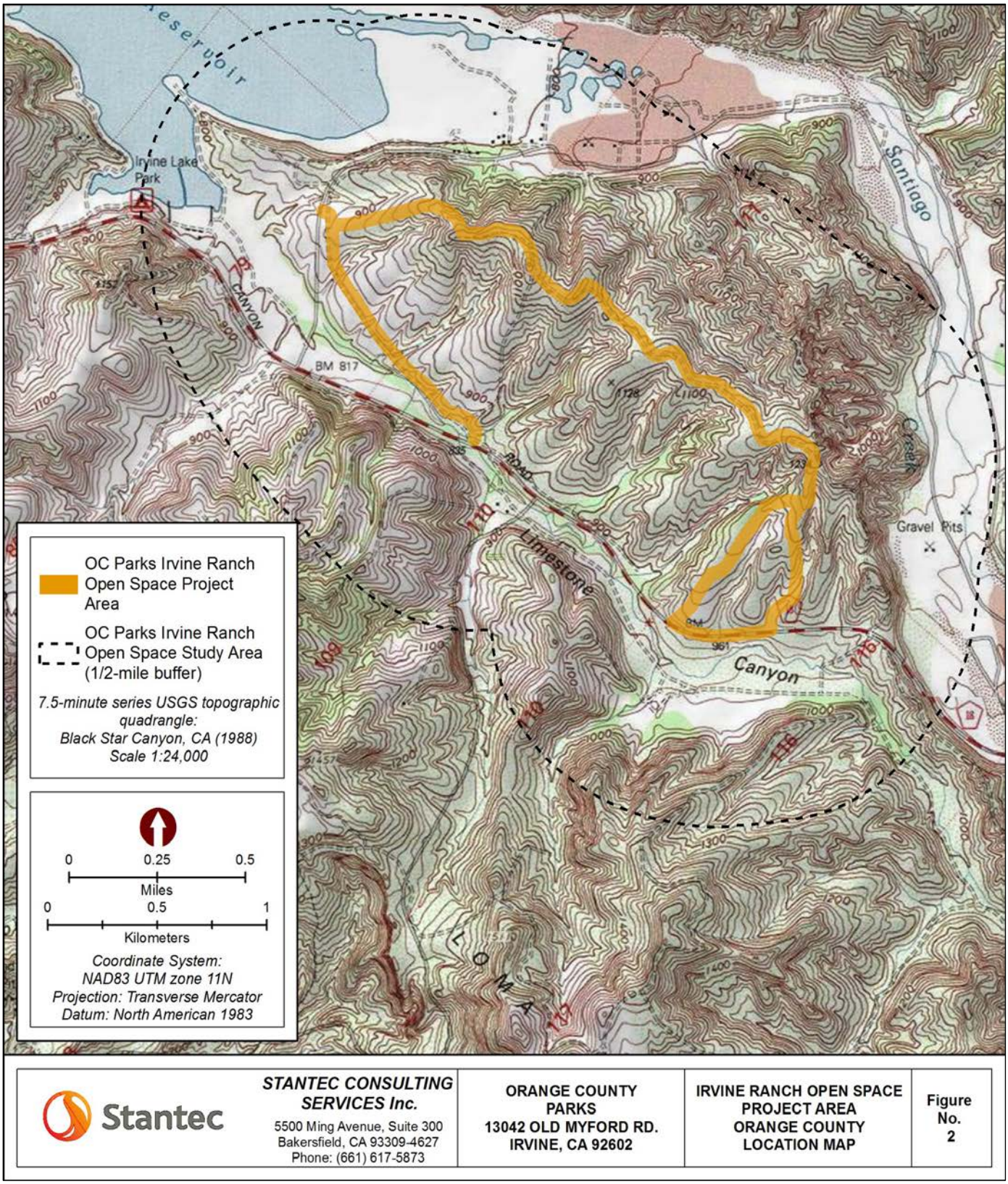


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

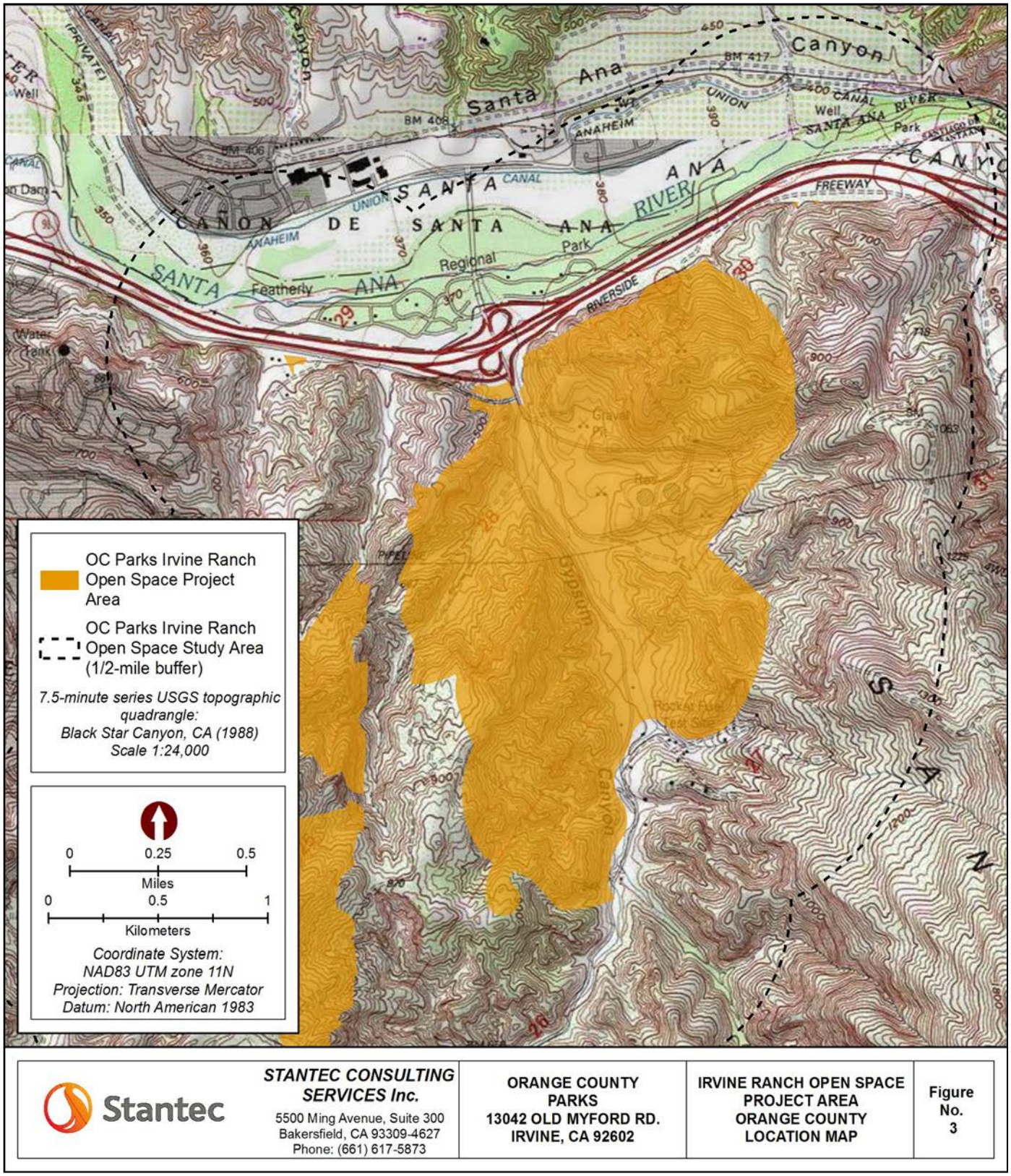


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

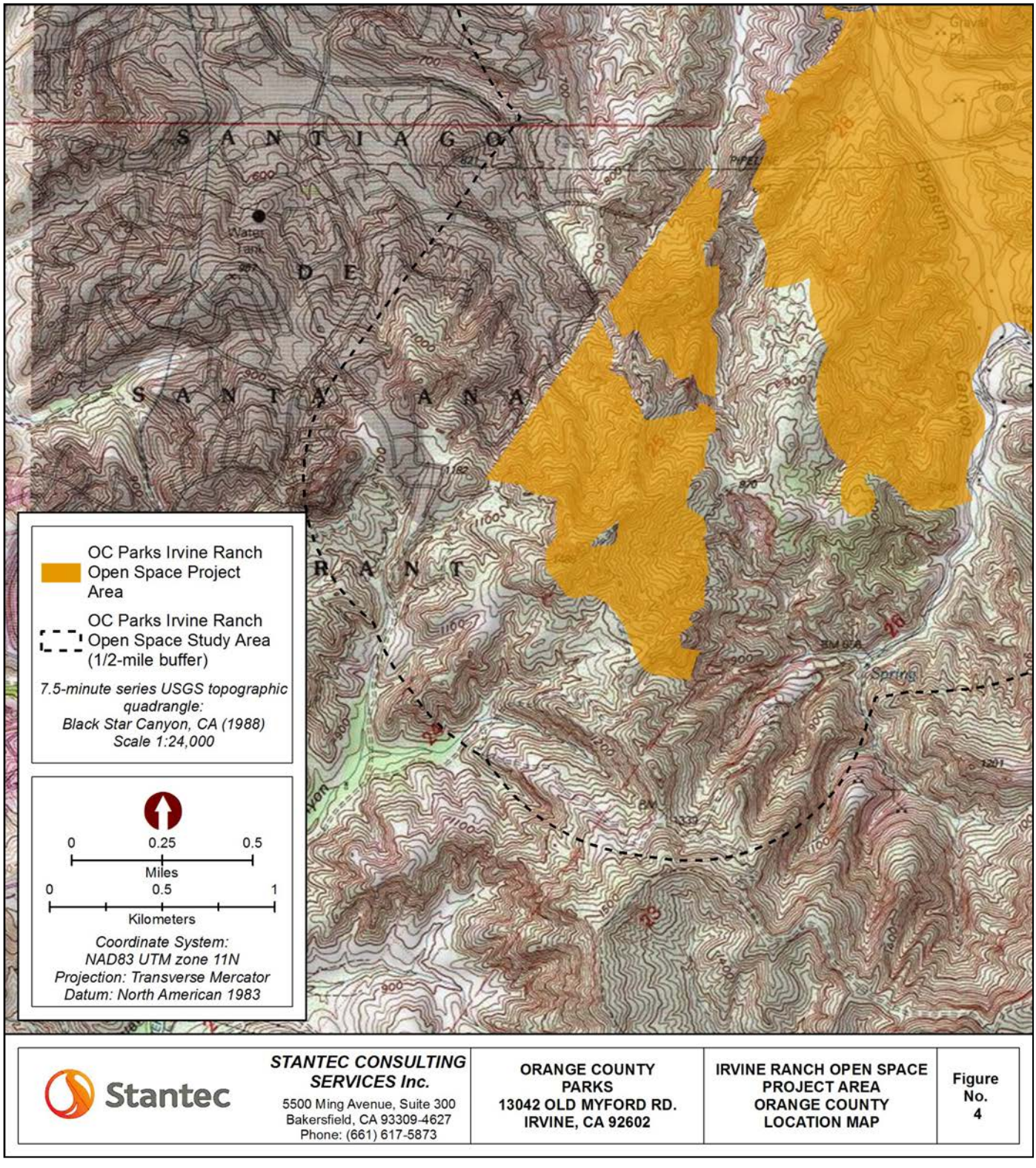


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, CA 91778

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Anthony Morales,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

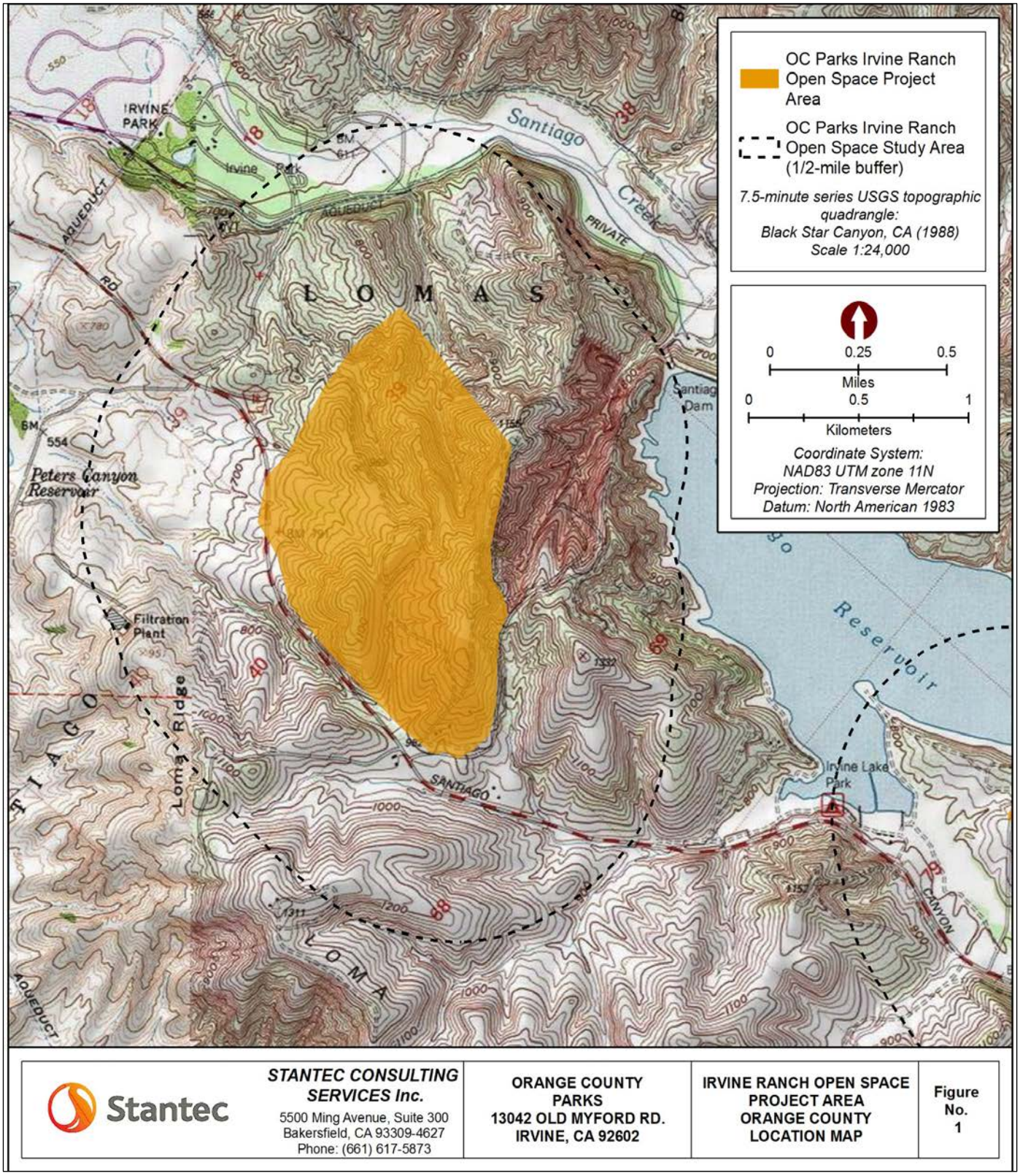


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

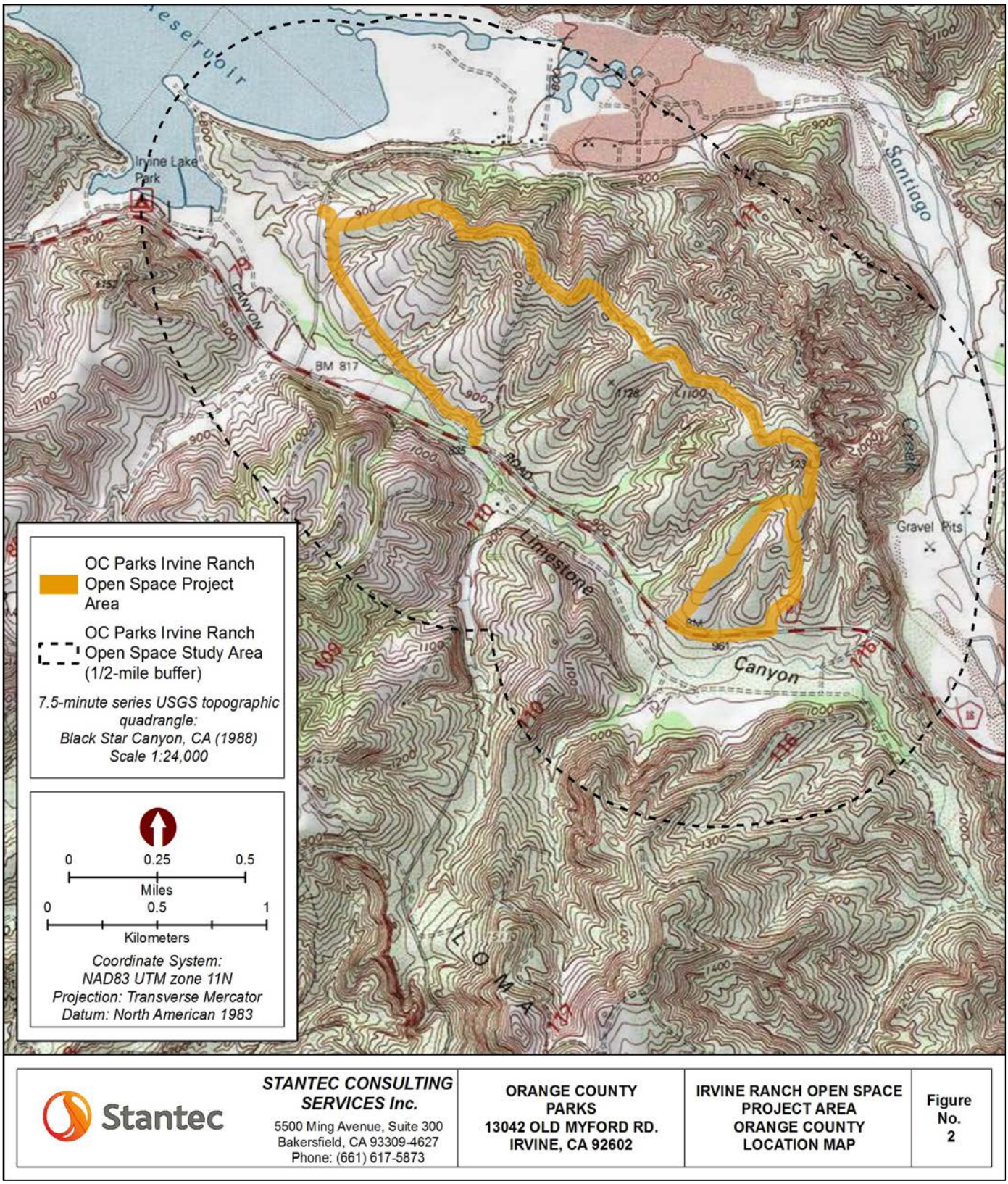


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

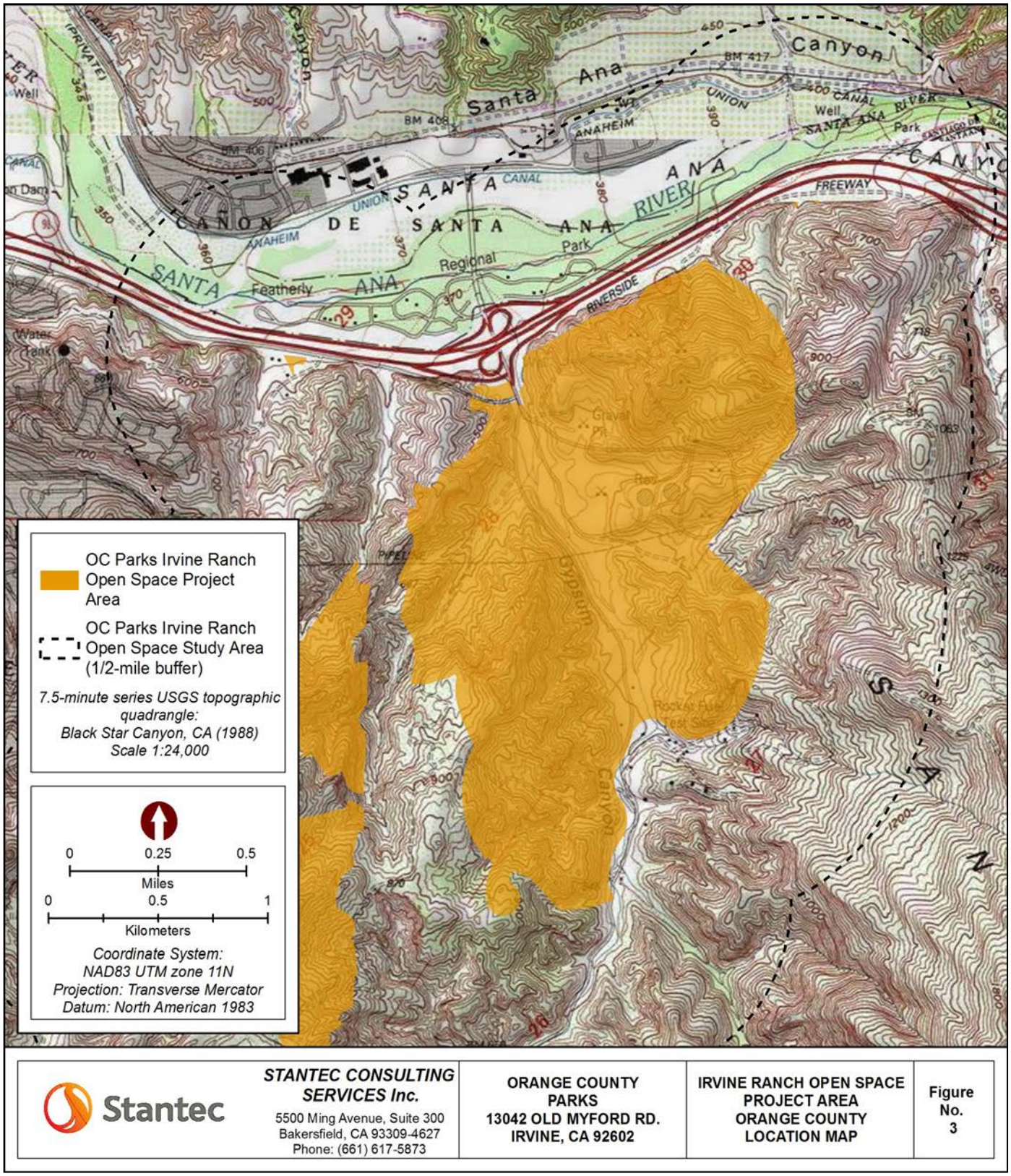


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

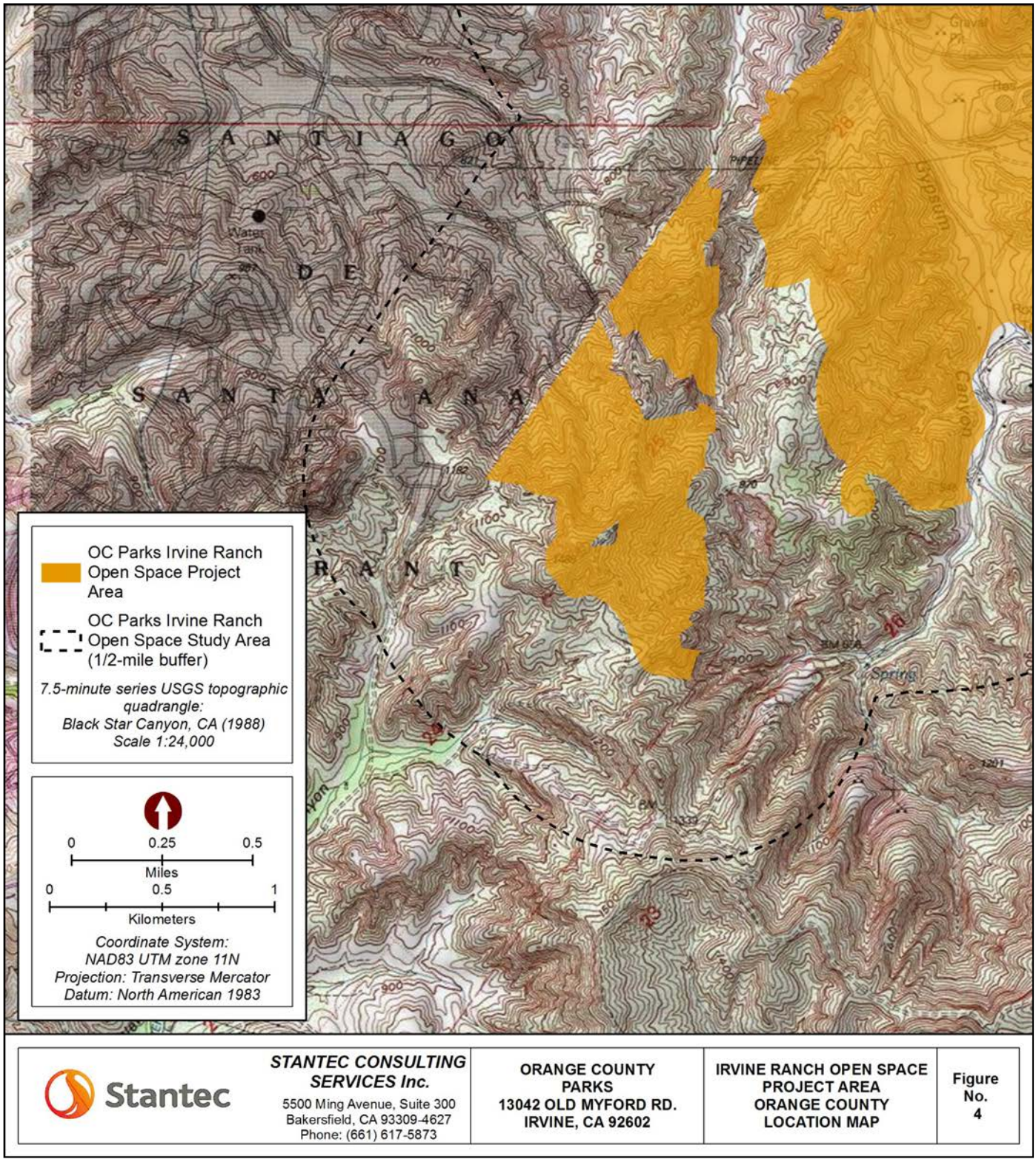


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Gabrieleno Band of Mission Indians – Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393
Covina, CA 91723

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Andrew Salas,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

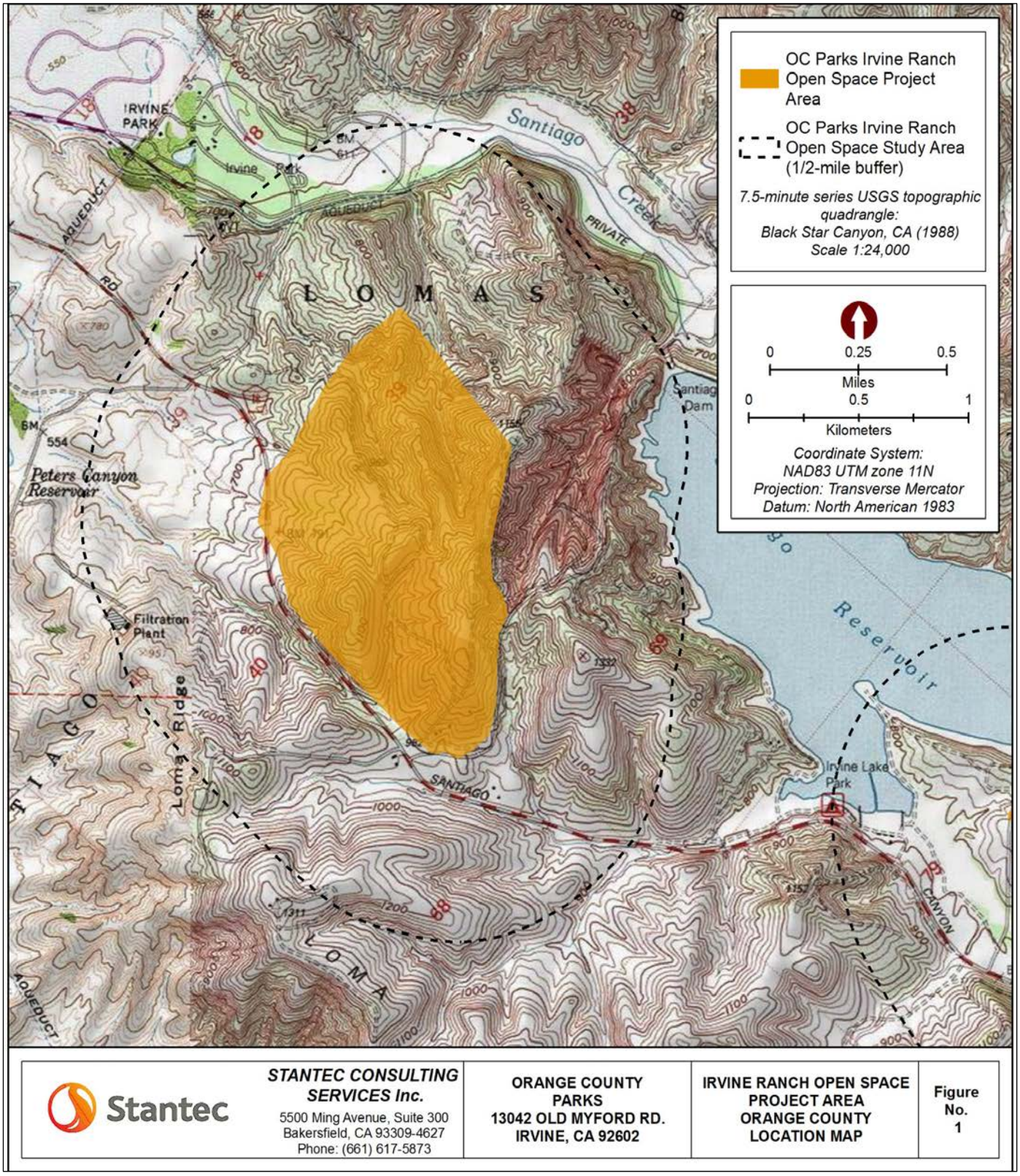


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

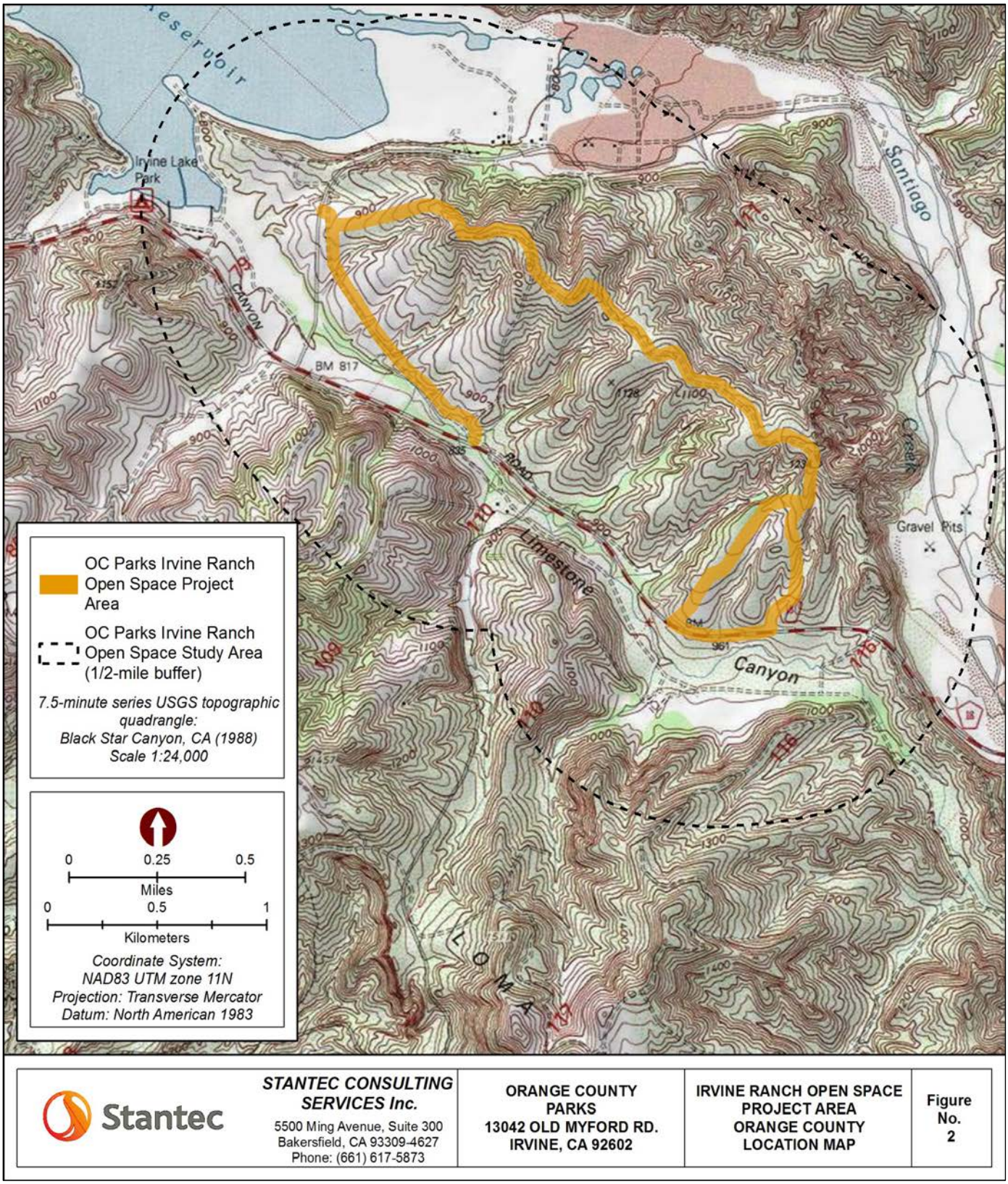


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

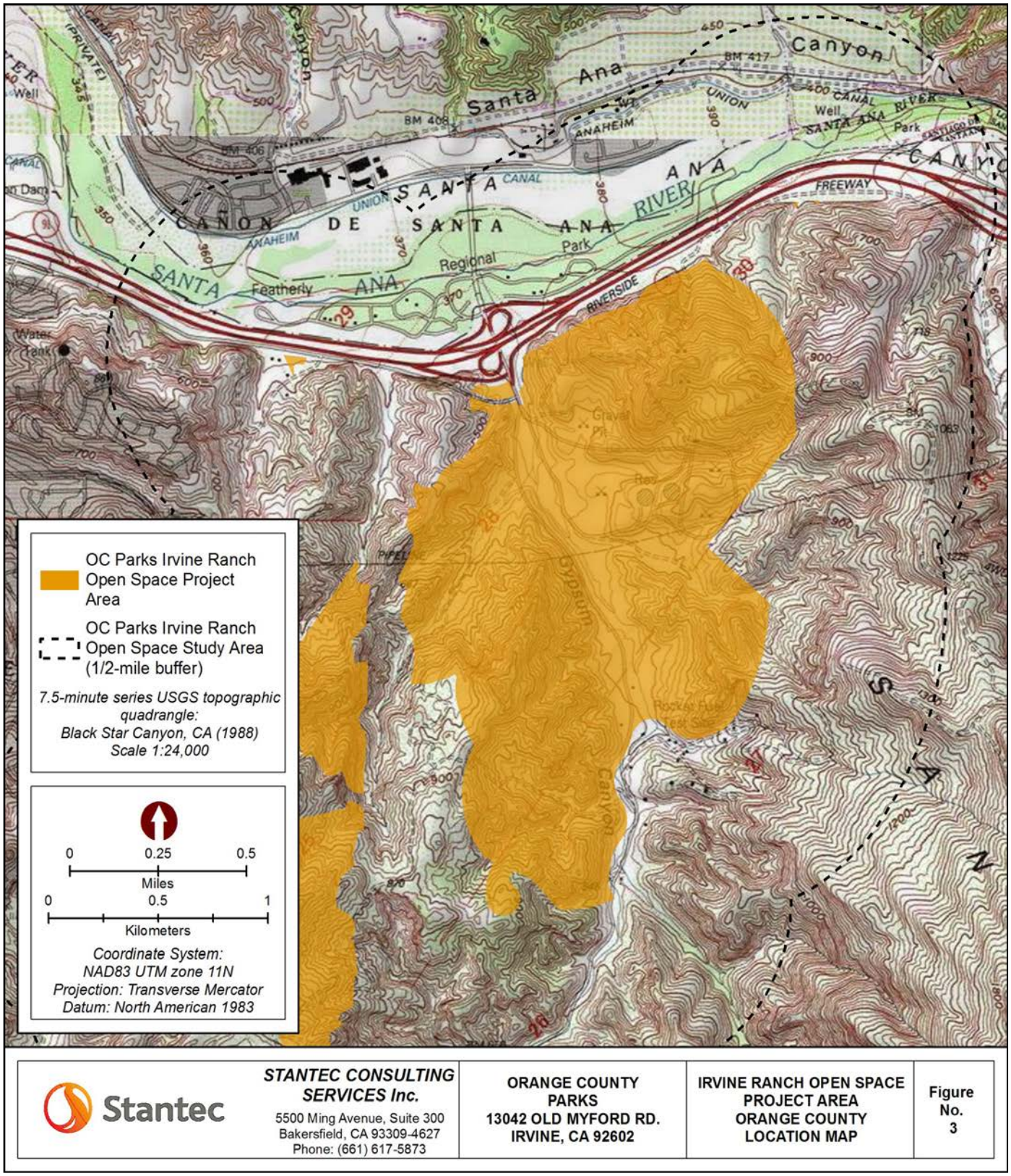


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

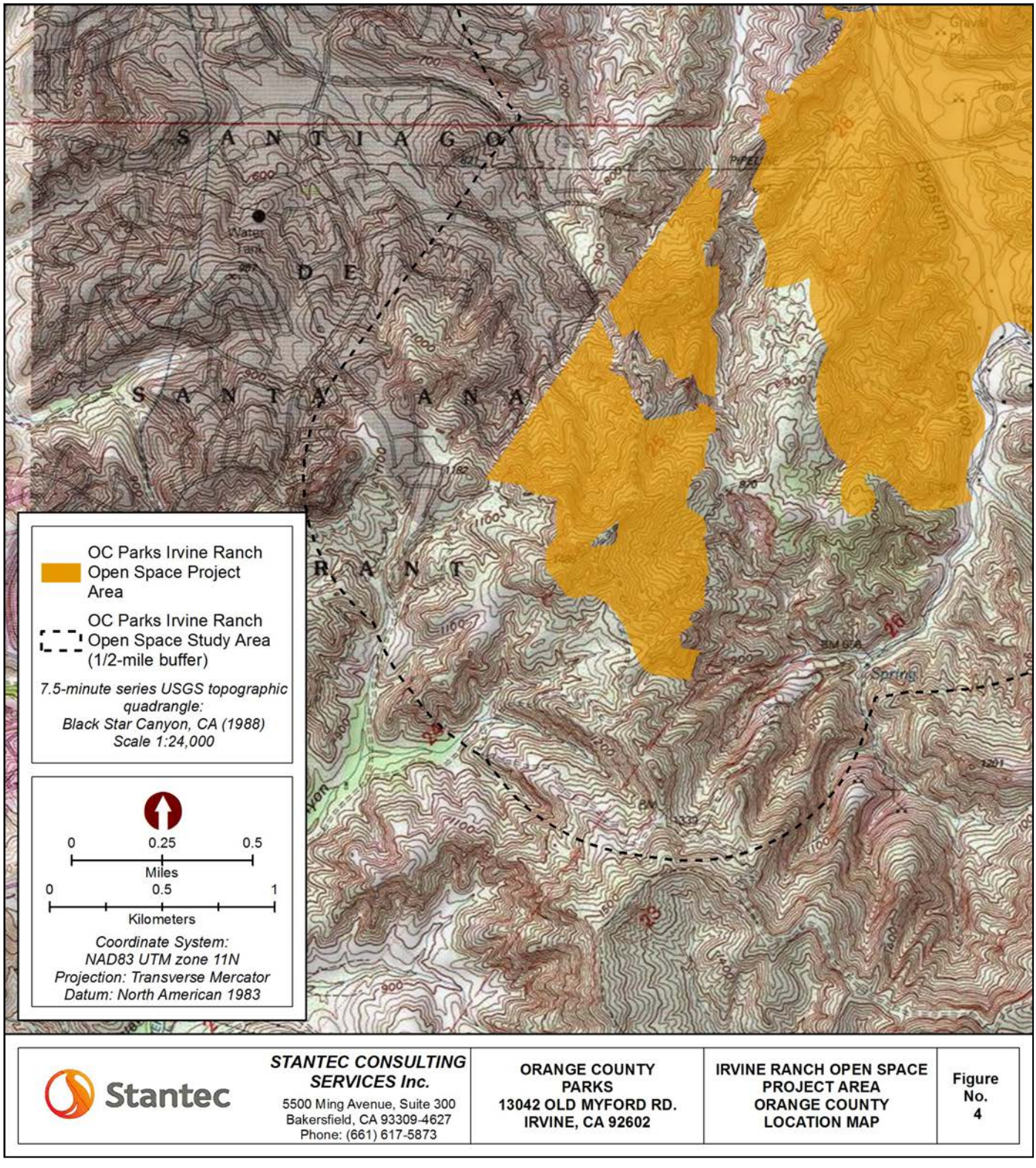


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Gabrielino Tongva Tribe
Charles Alvarez
23454 Vanowen Street
West Hills, CA 91307

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Mr. Alvarez,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

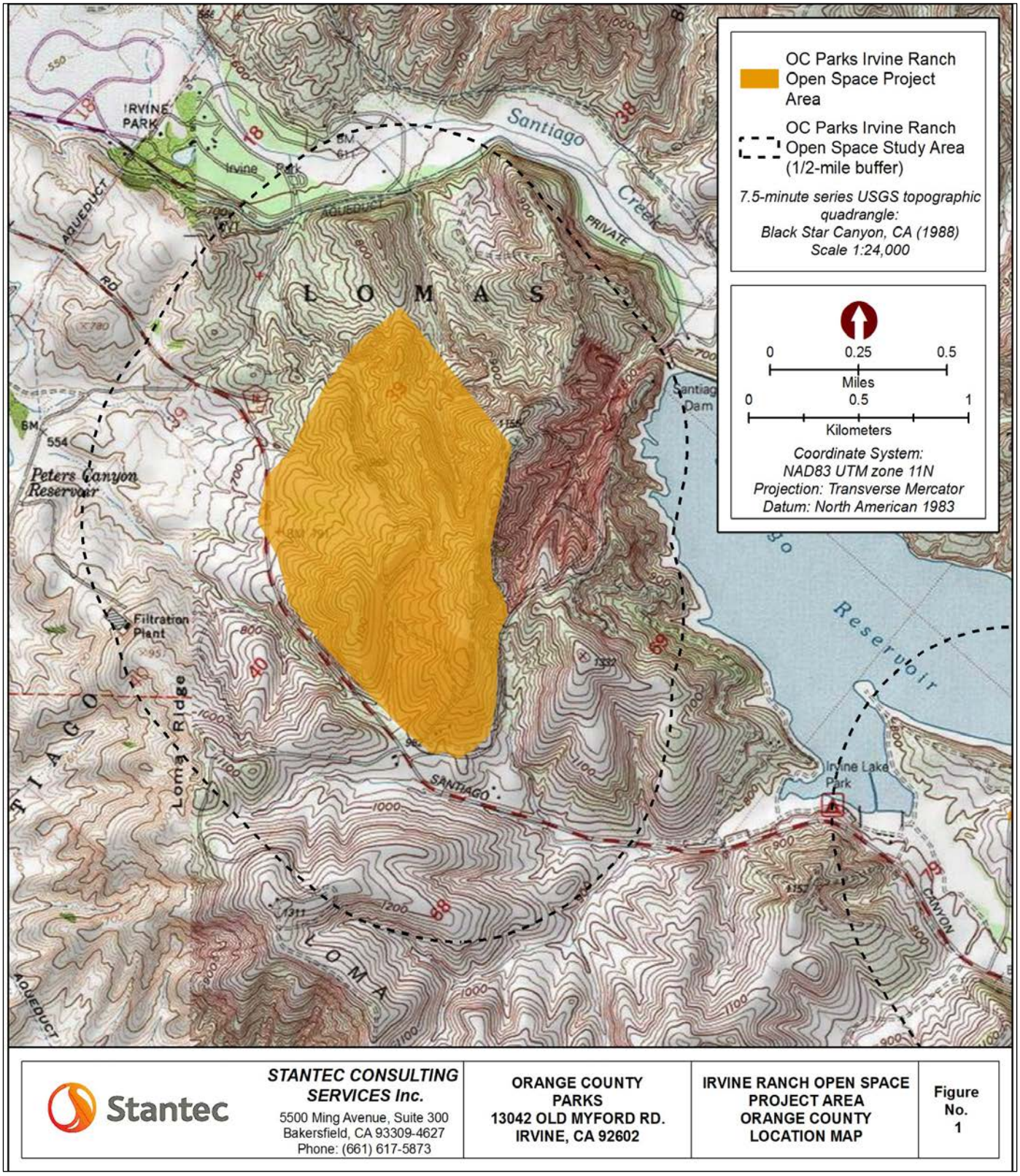


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

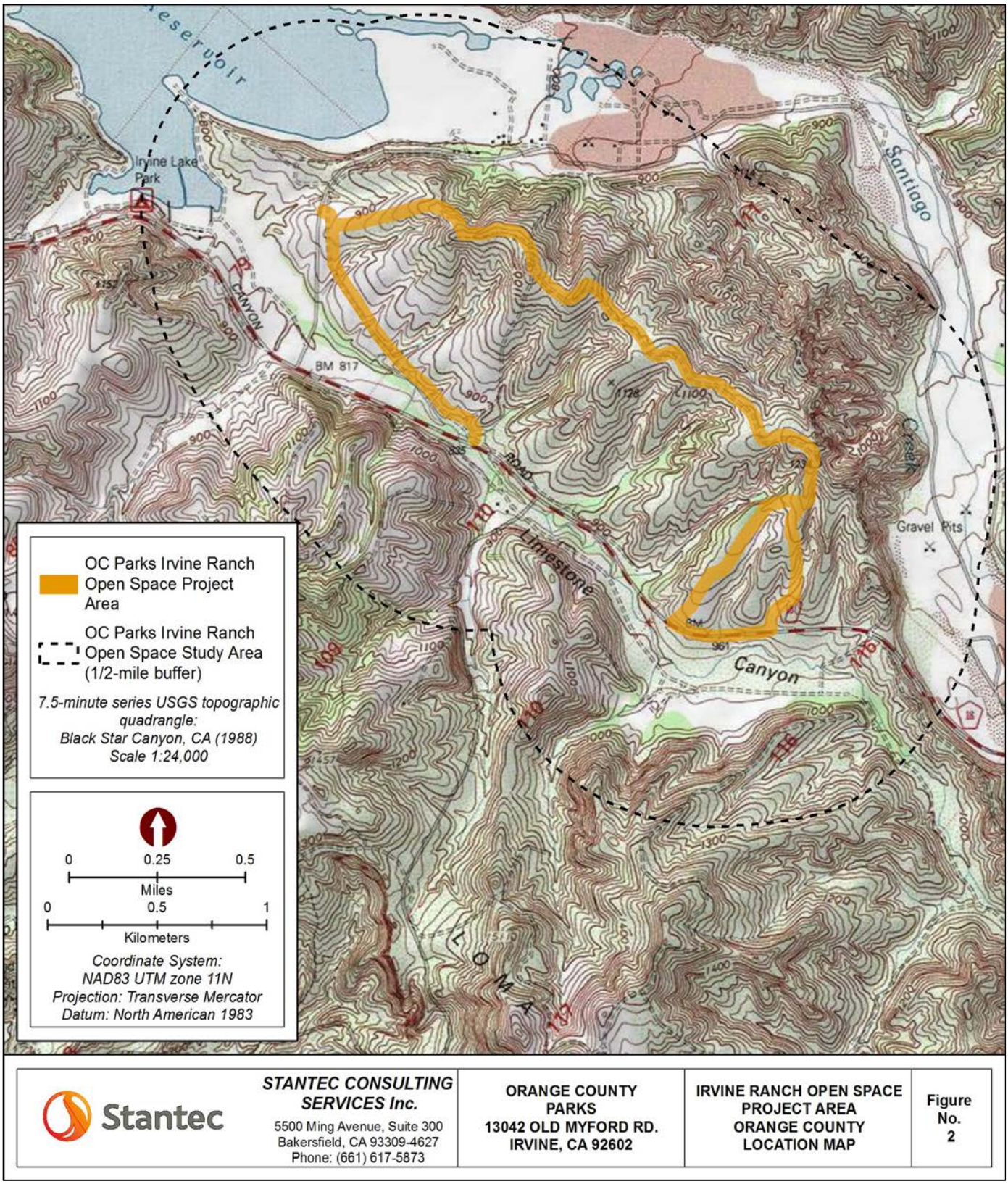


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

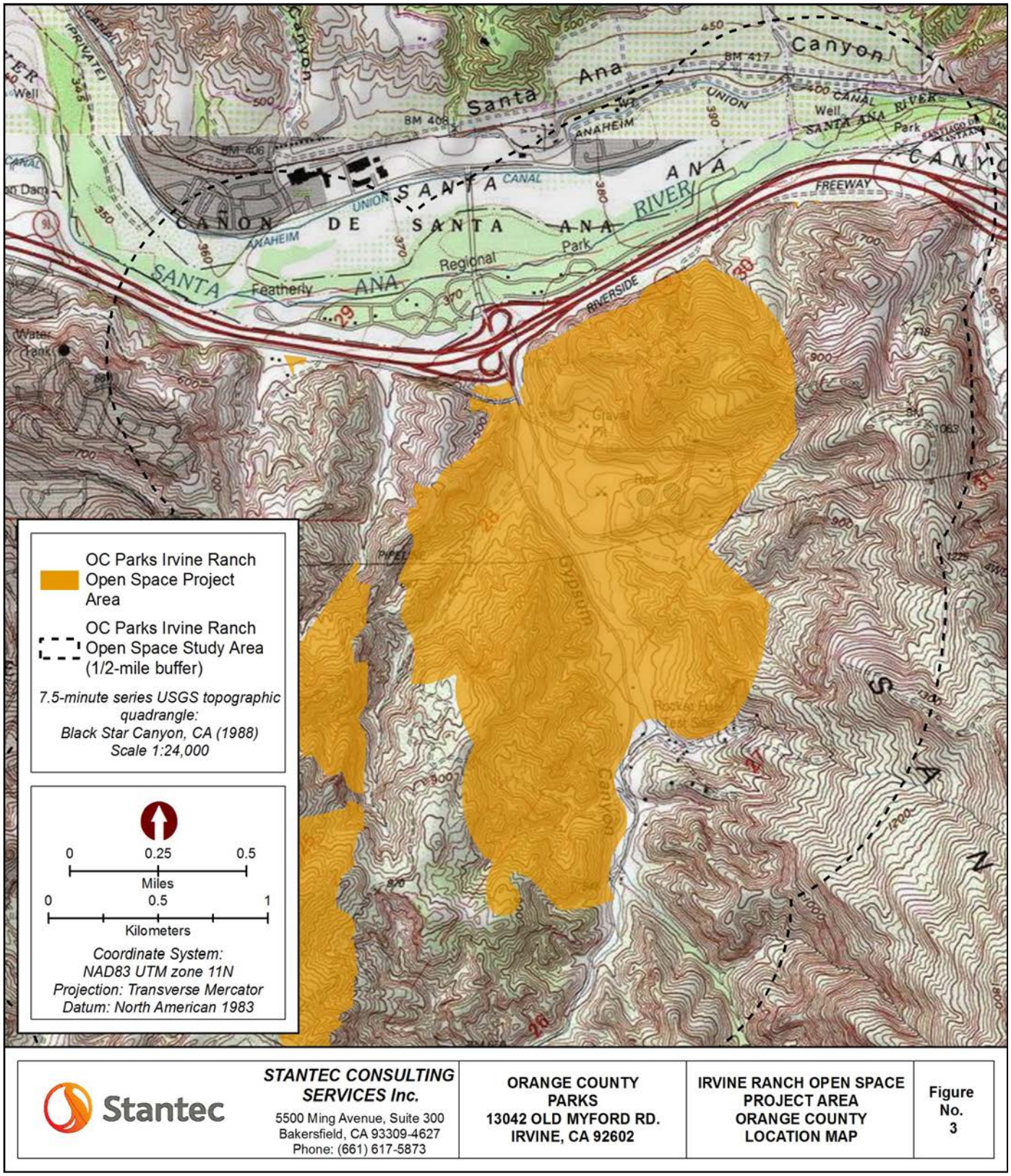


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

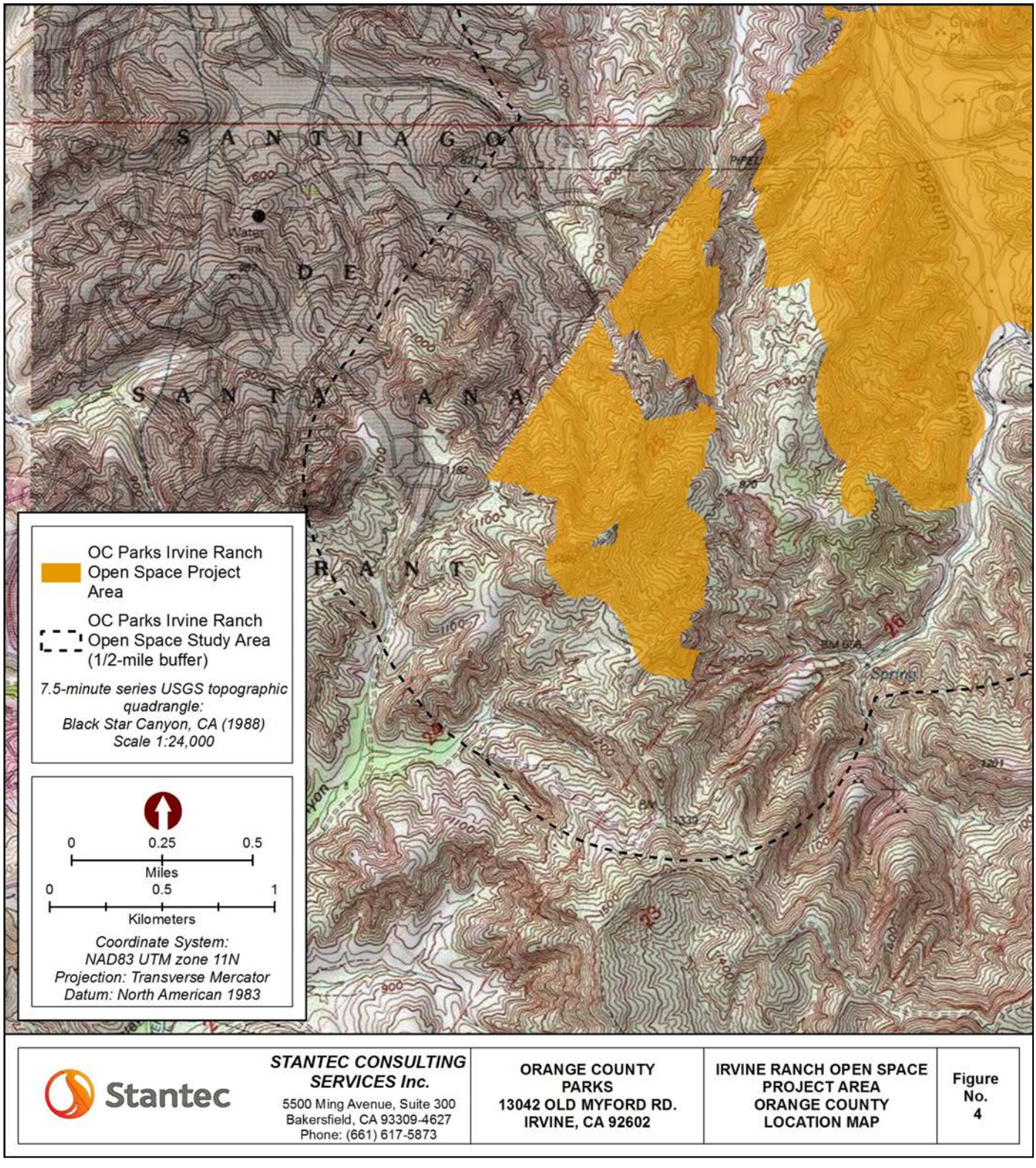


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Sycuan Band of the Kumeyaay Nations
Cody Martinez, Chairperson
1 Kwaaypaay Court
El Cajon, CA 92019

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Cody Martinez,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

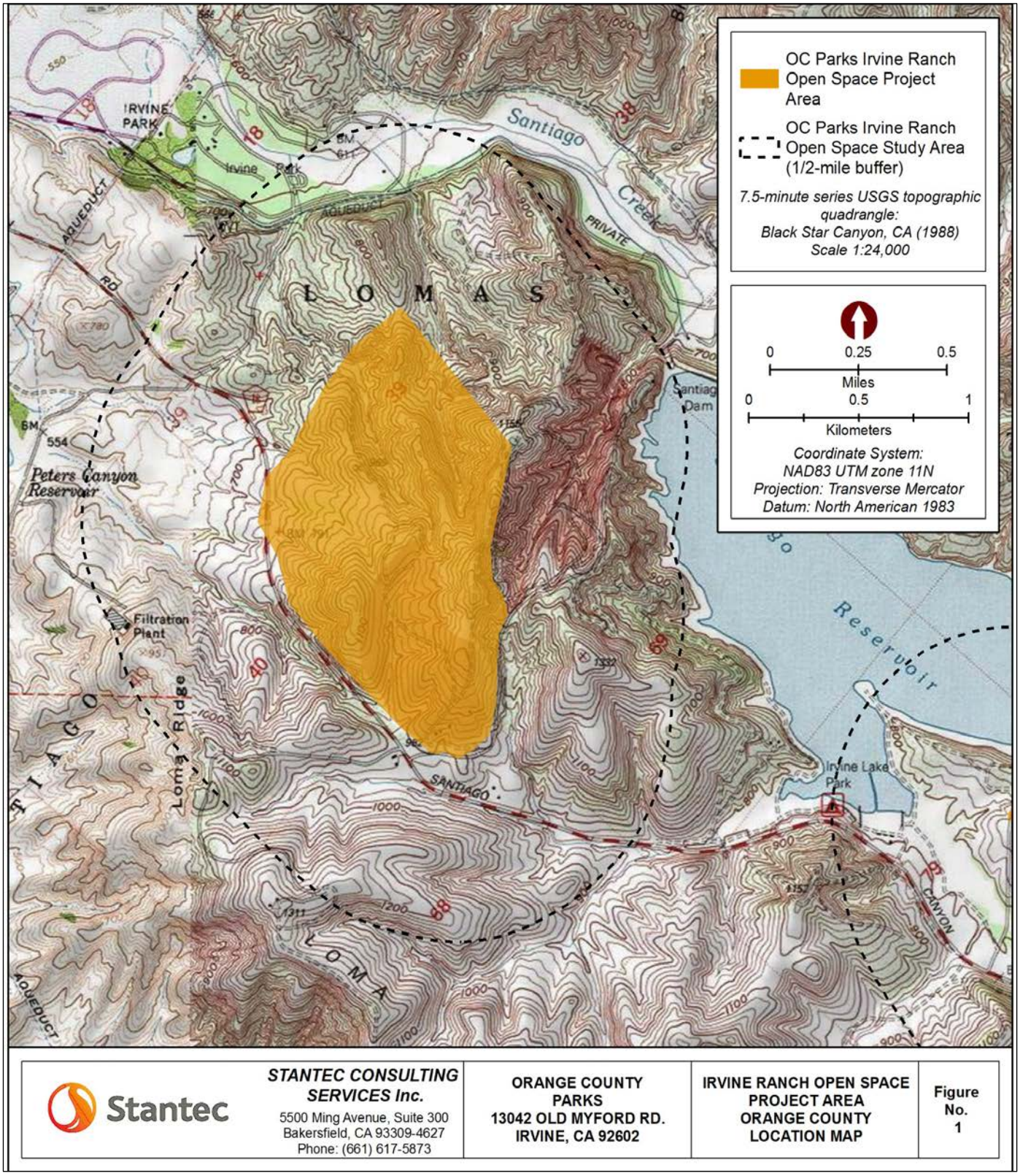


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

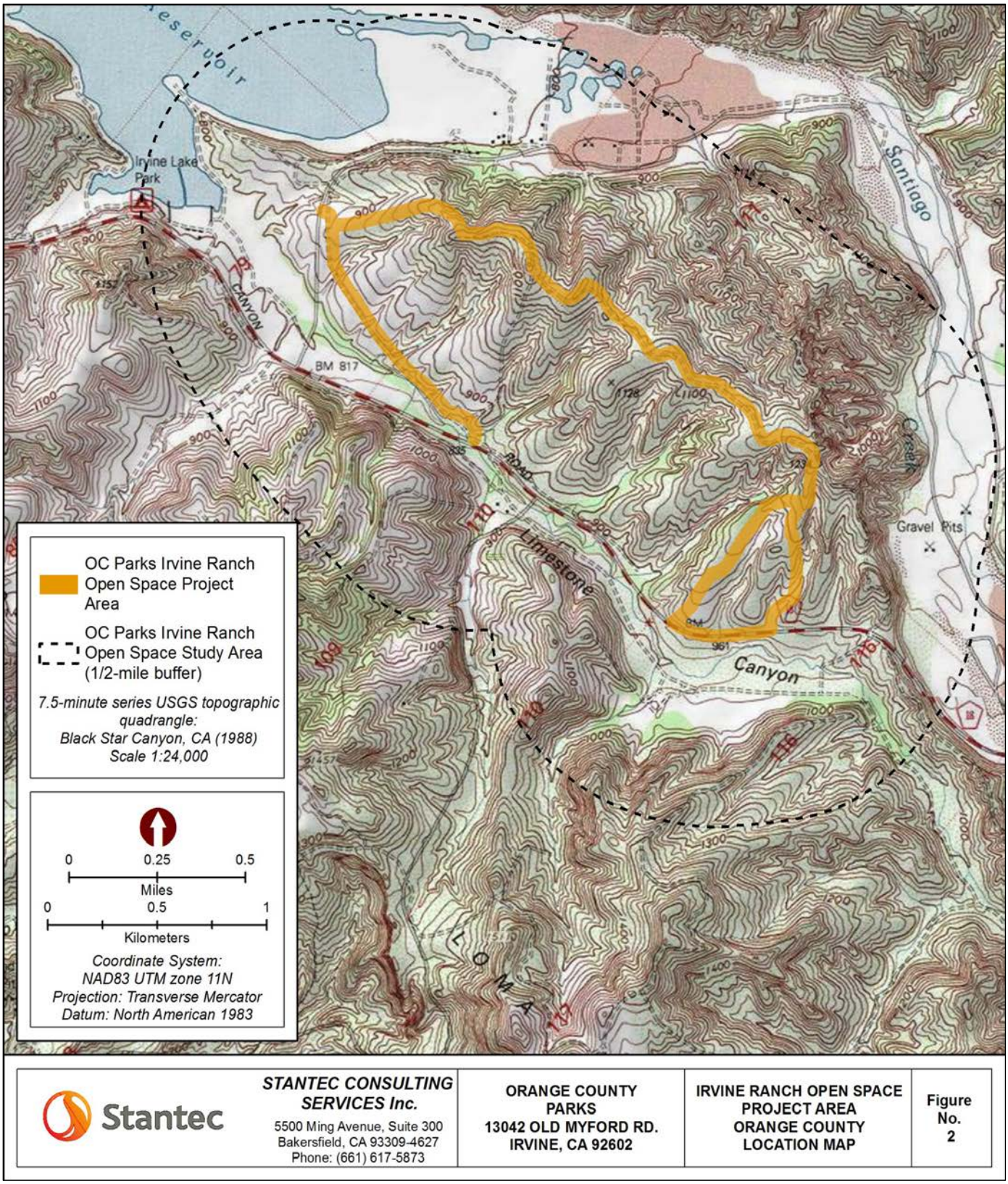


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

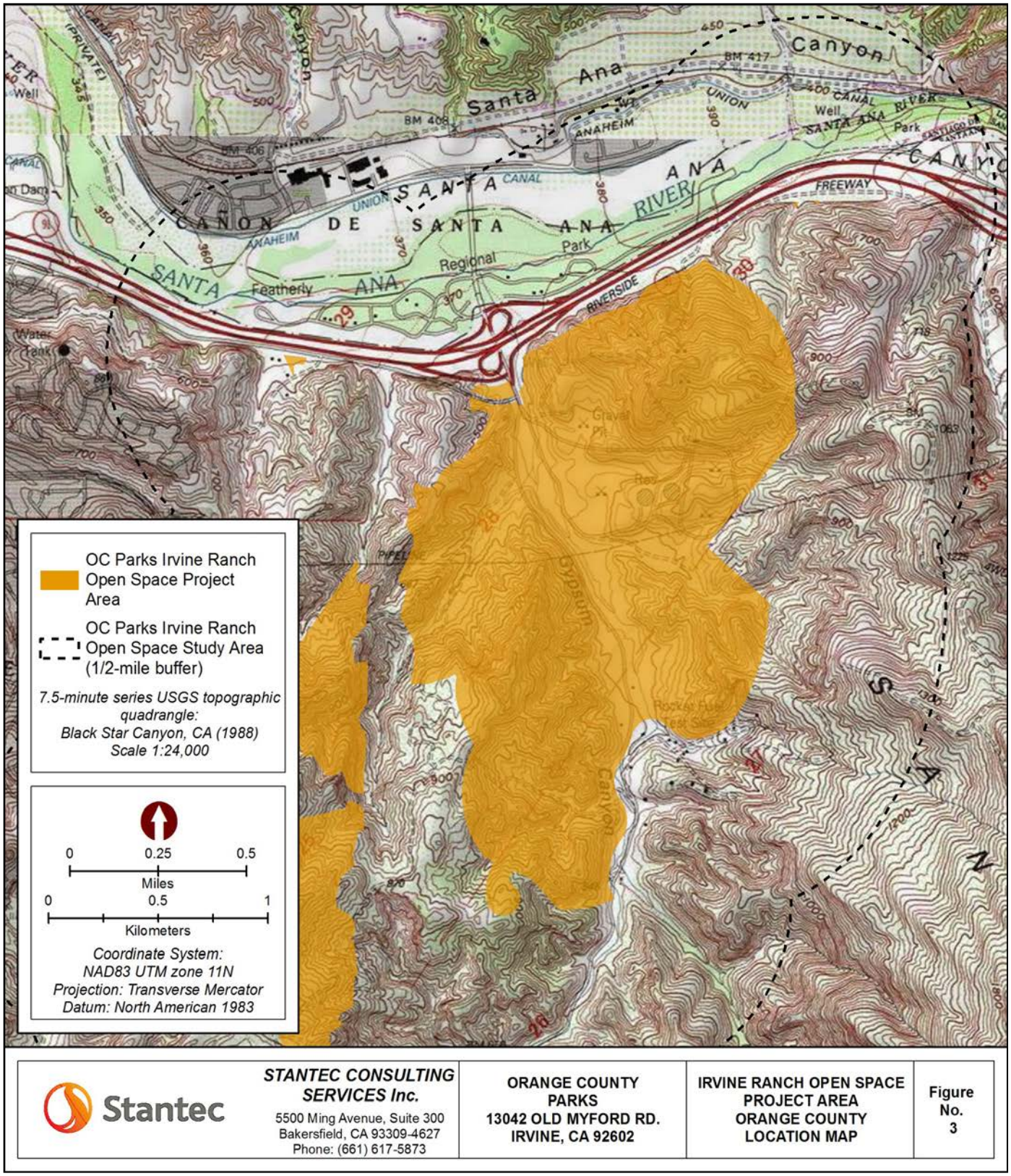


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

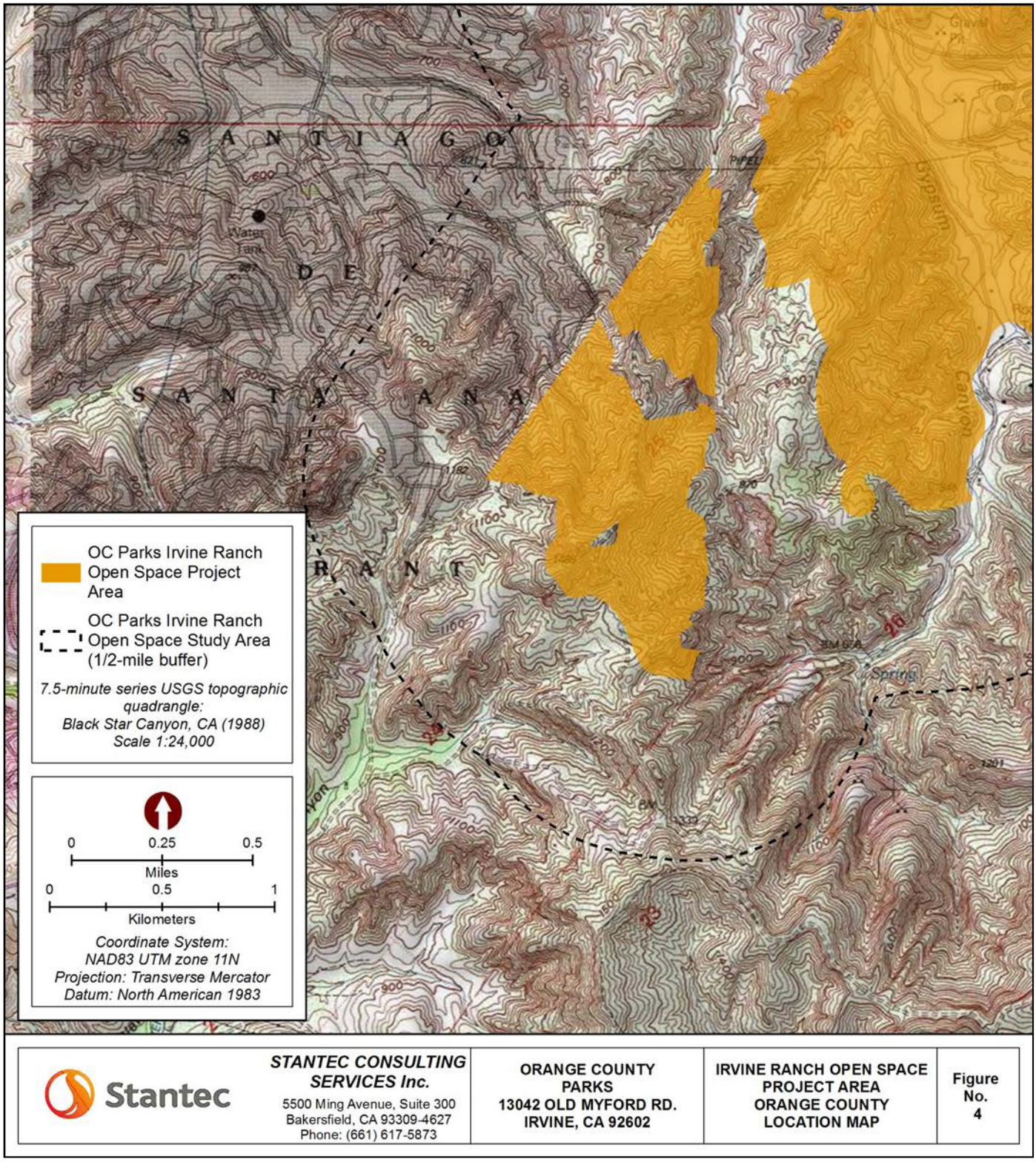


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612
Jamul, CA 91935

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Erica Pinto,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

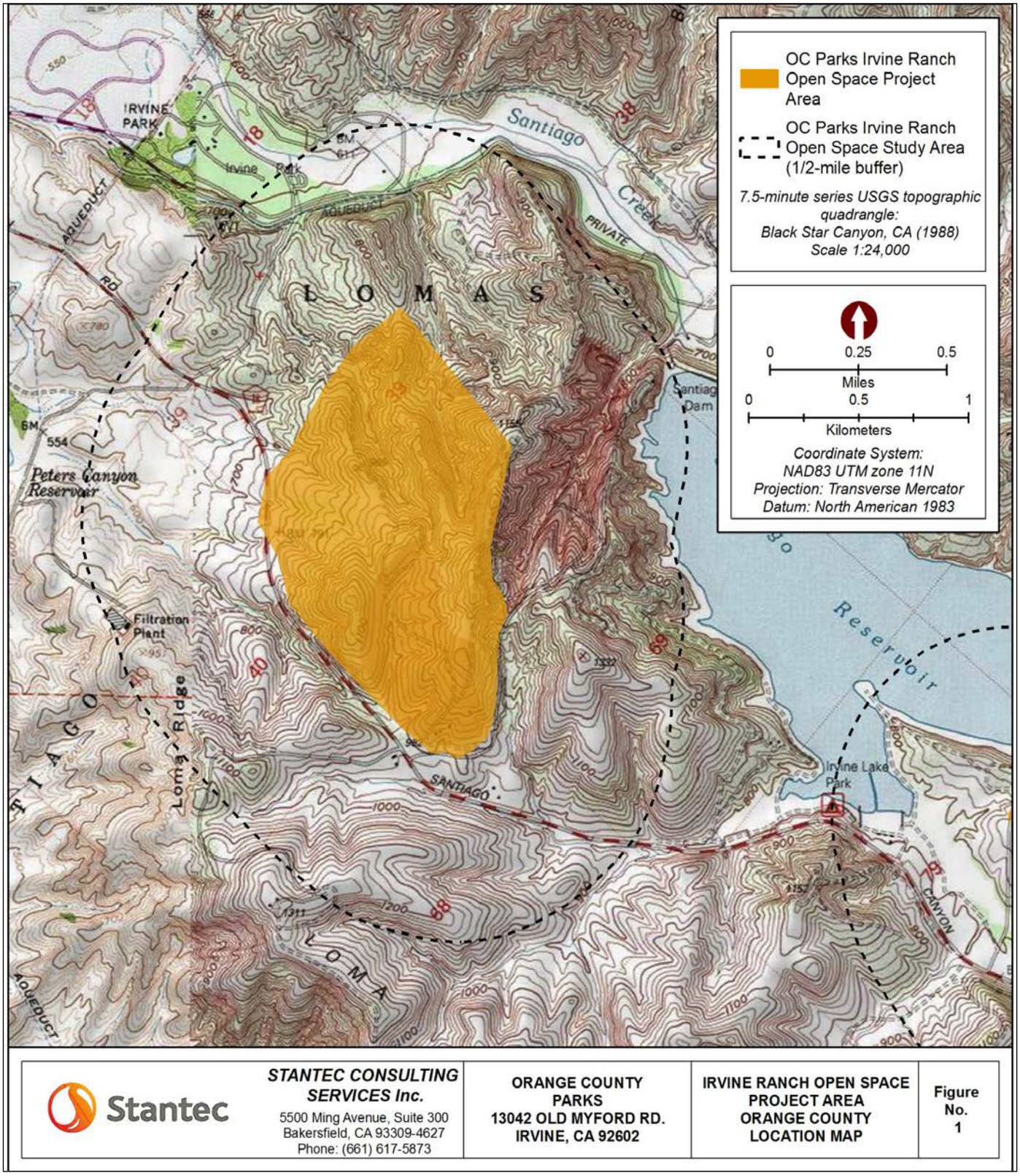


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

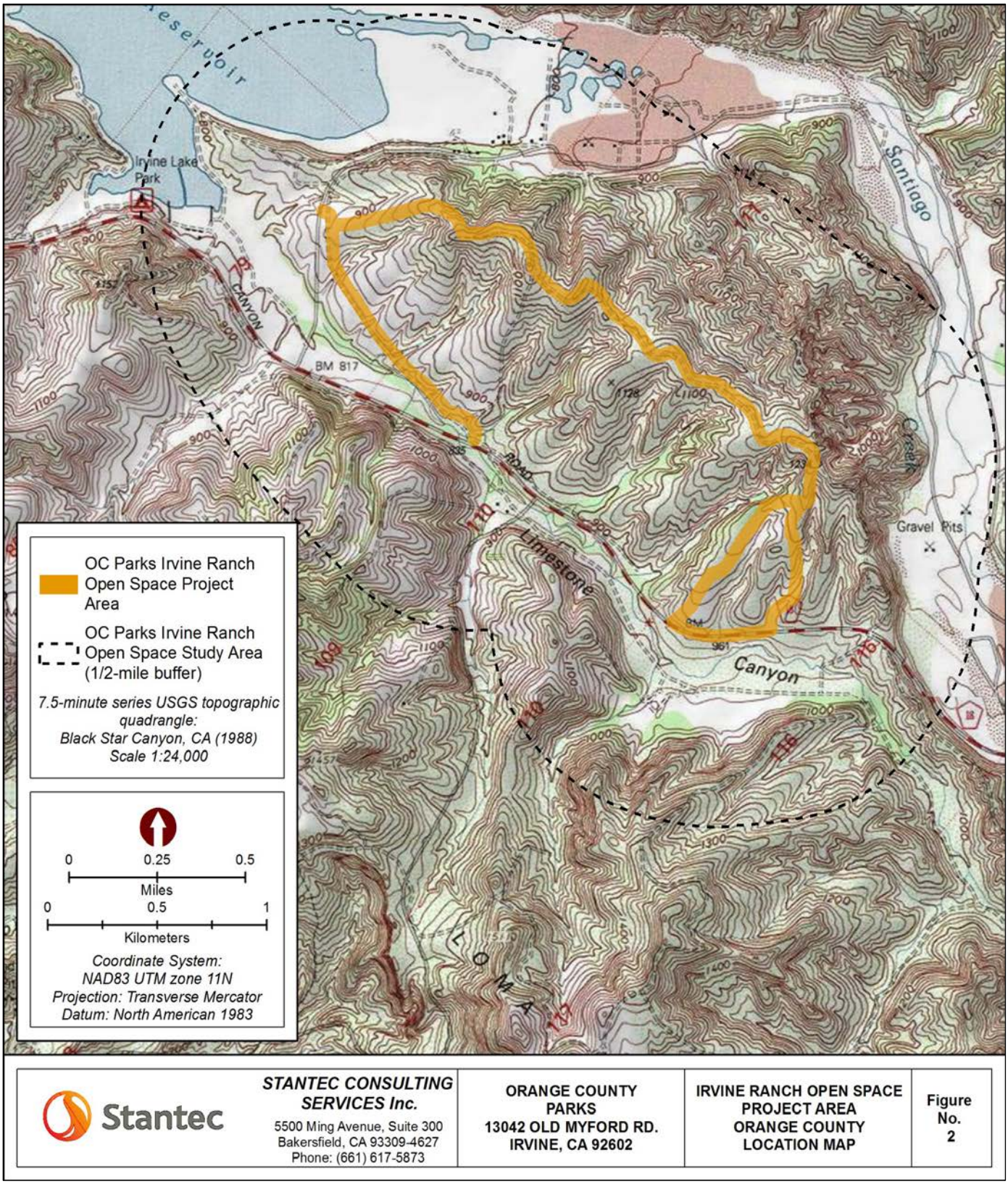


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

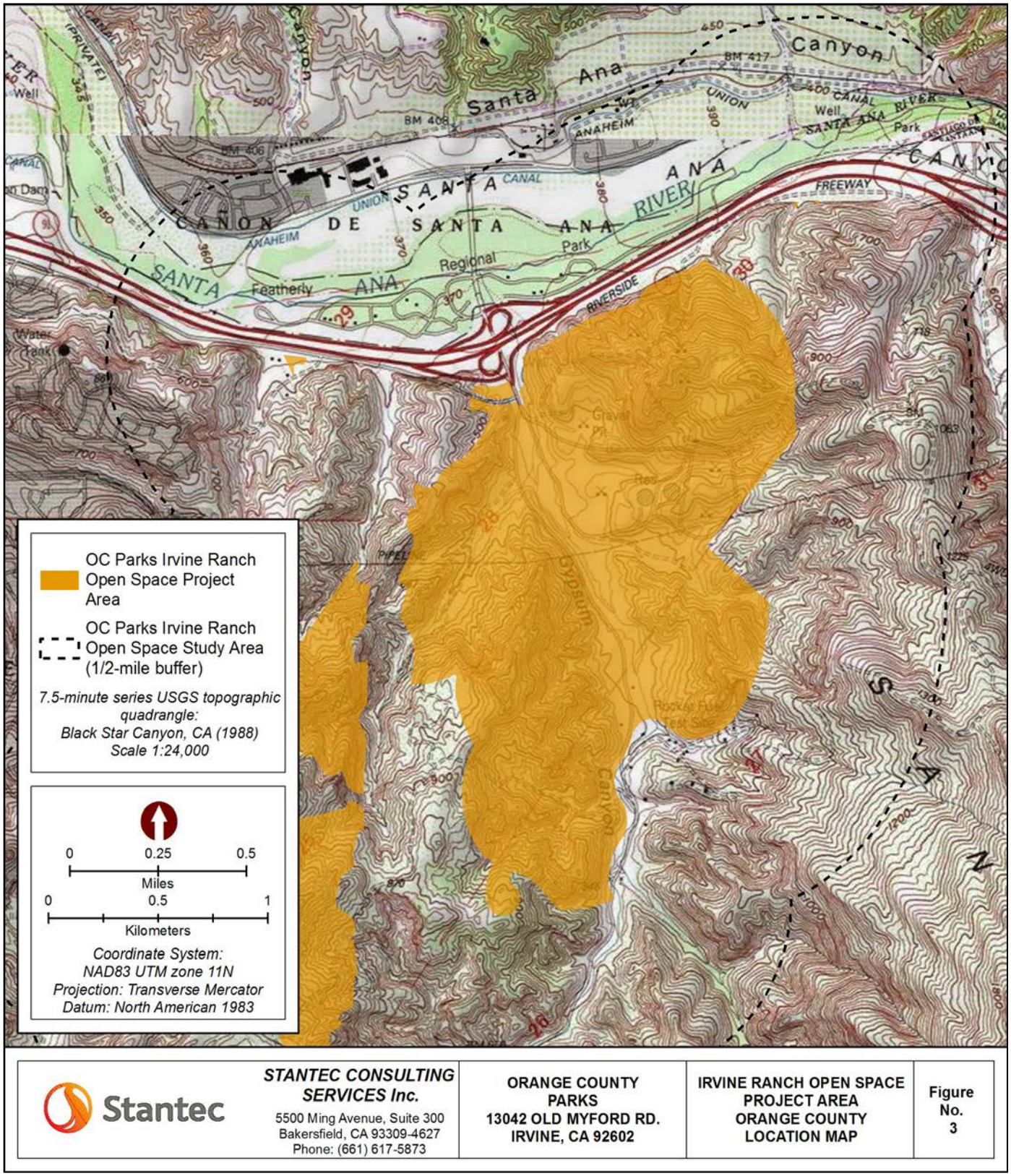


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

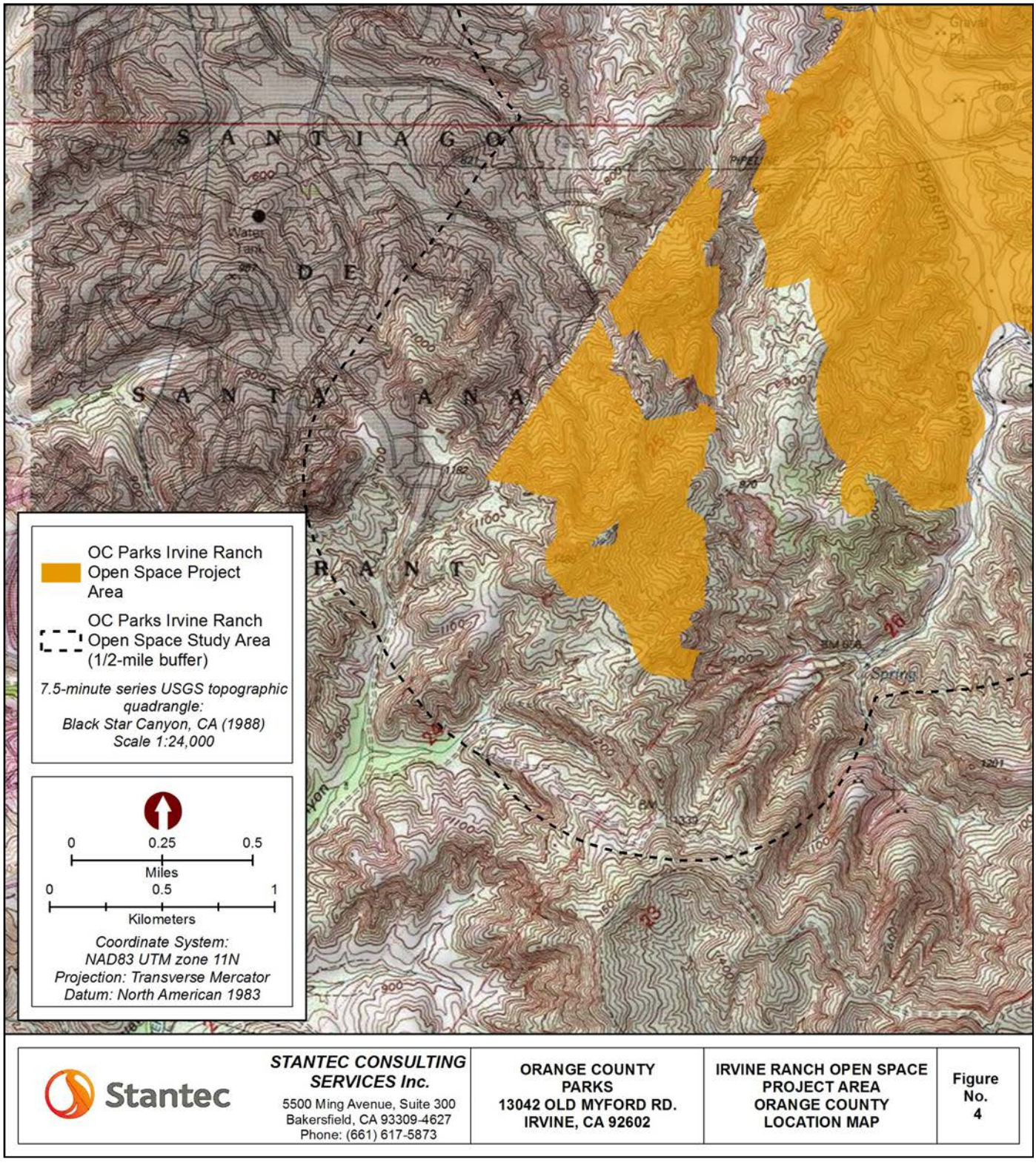


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road
Boulevard, CA 91905

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Gwendolyn Parada,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

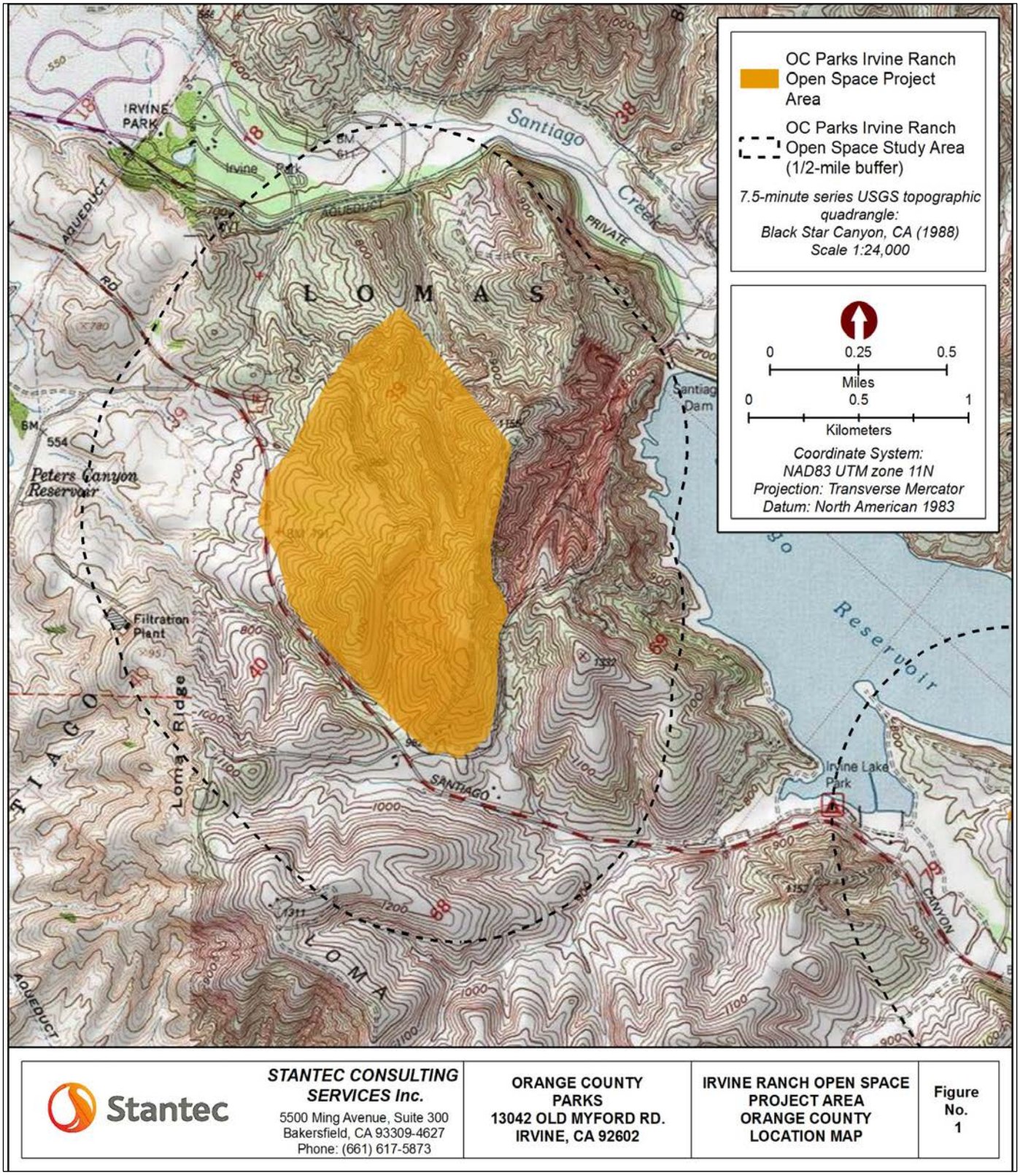


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

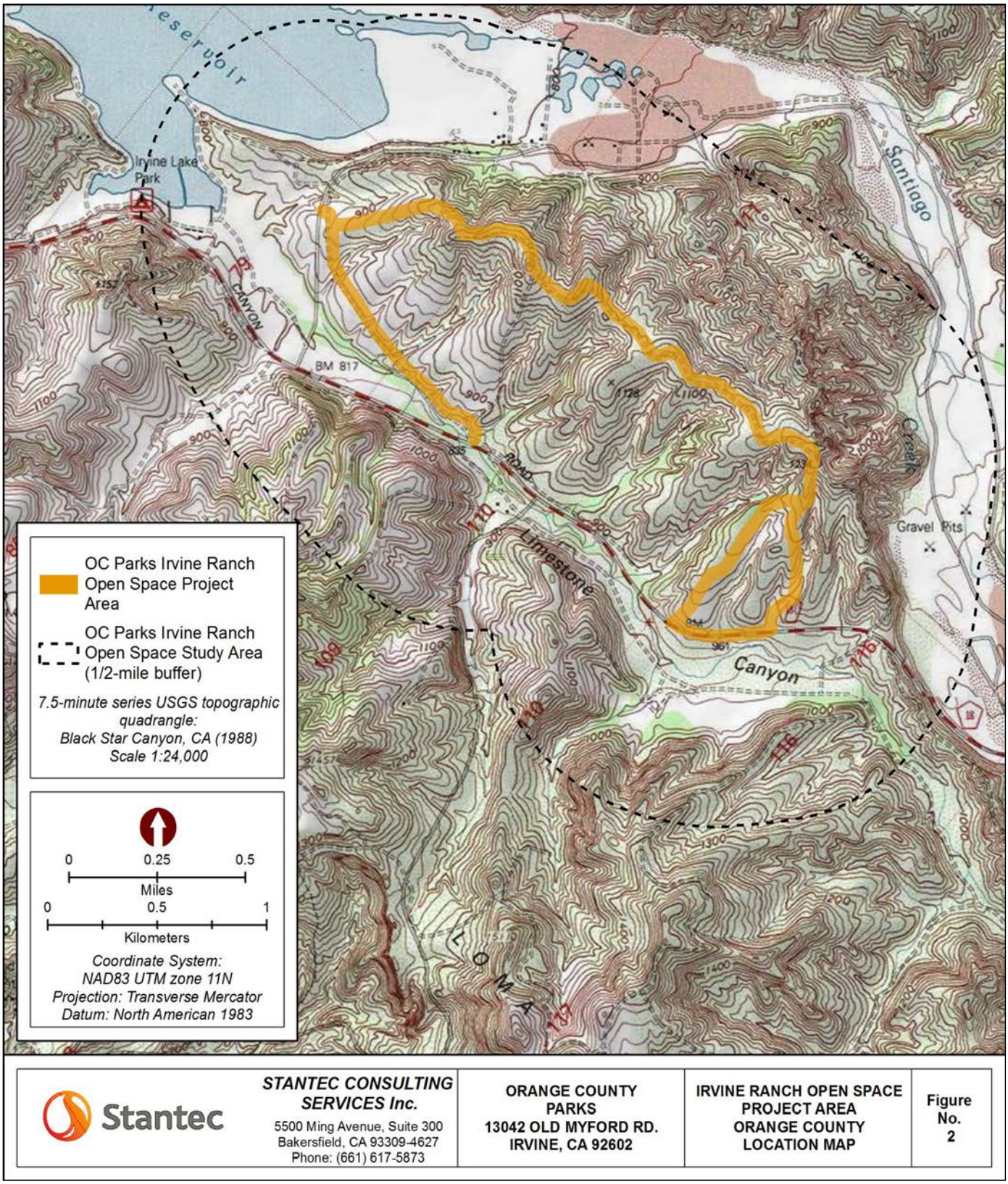


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

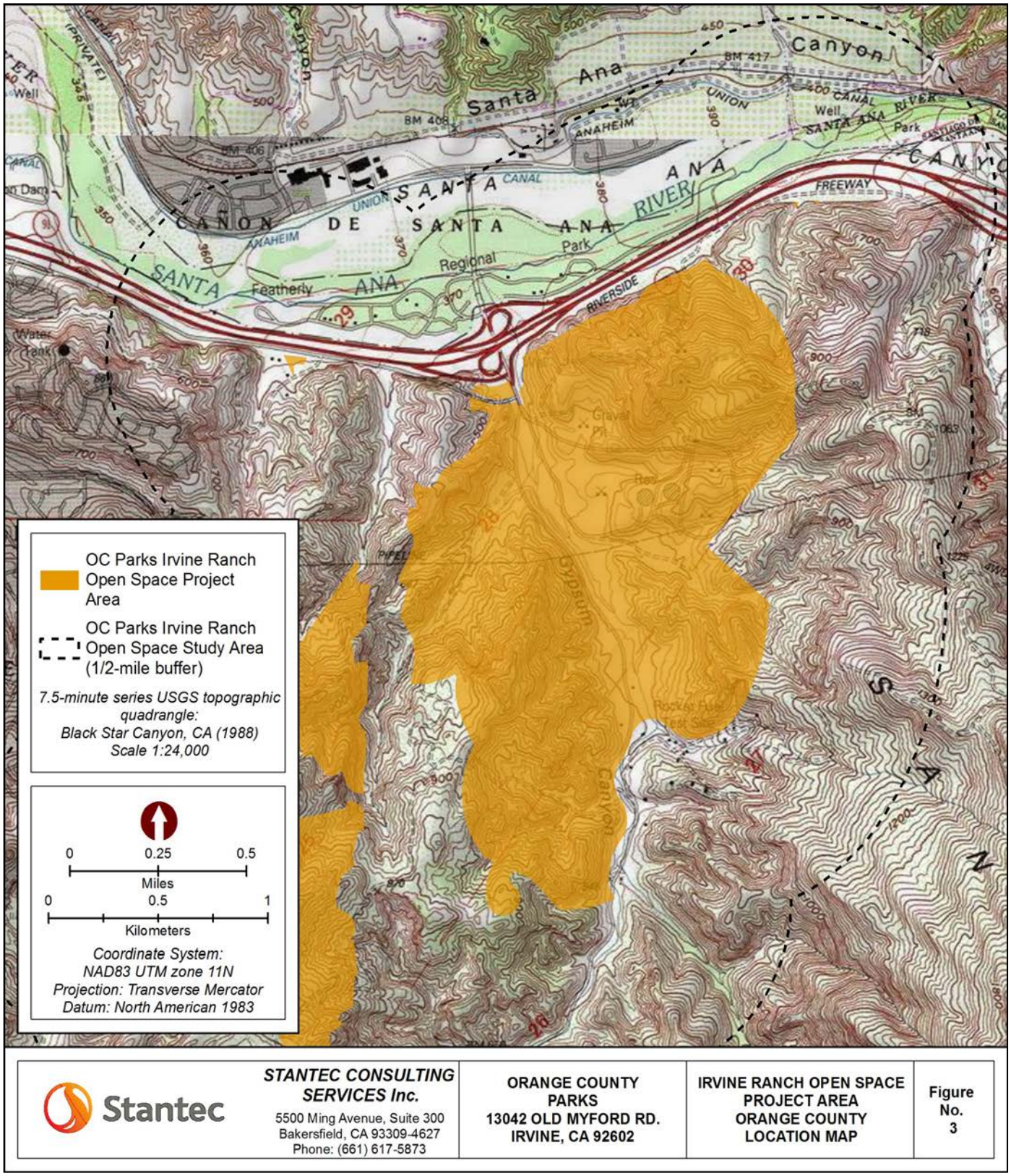


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

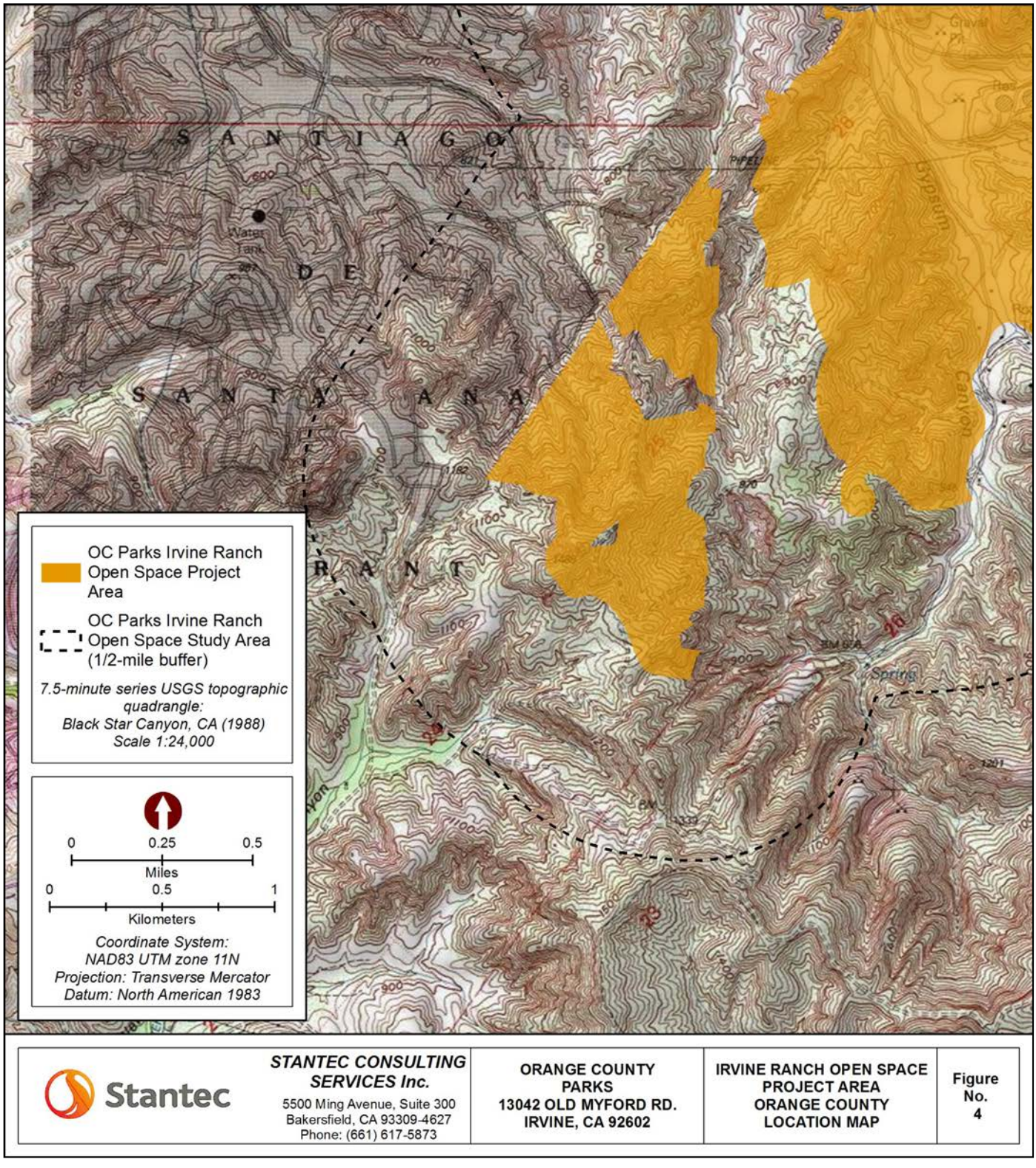


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

San Pasqual Band of Mission Indians
John Flores, Environmental Coordinator
P.O. Box 365
Valley Center, CA 92082

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Mr. Flores,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

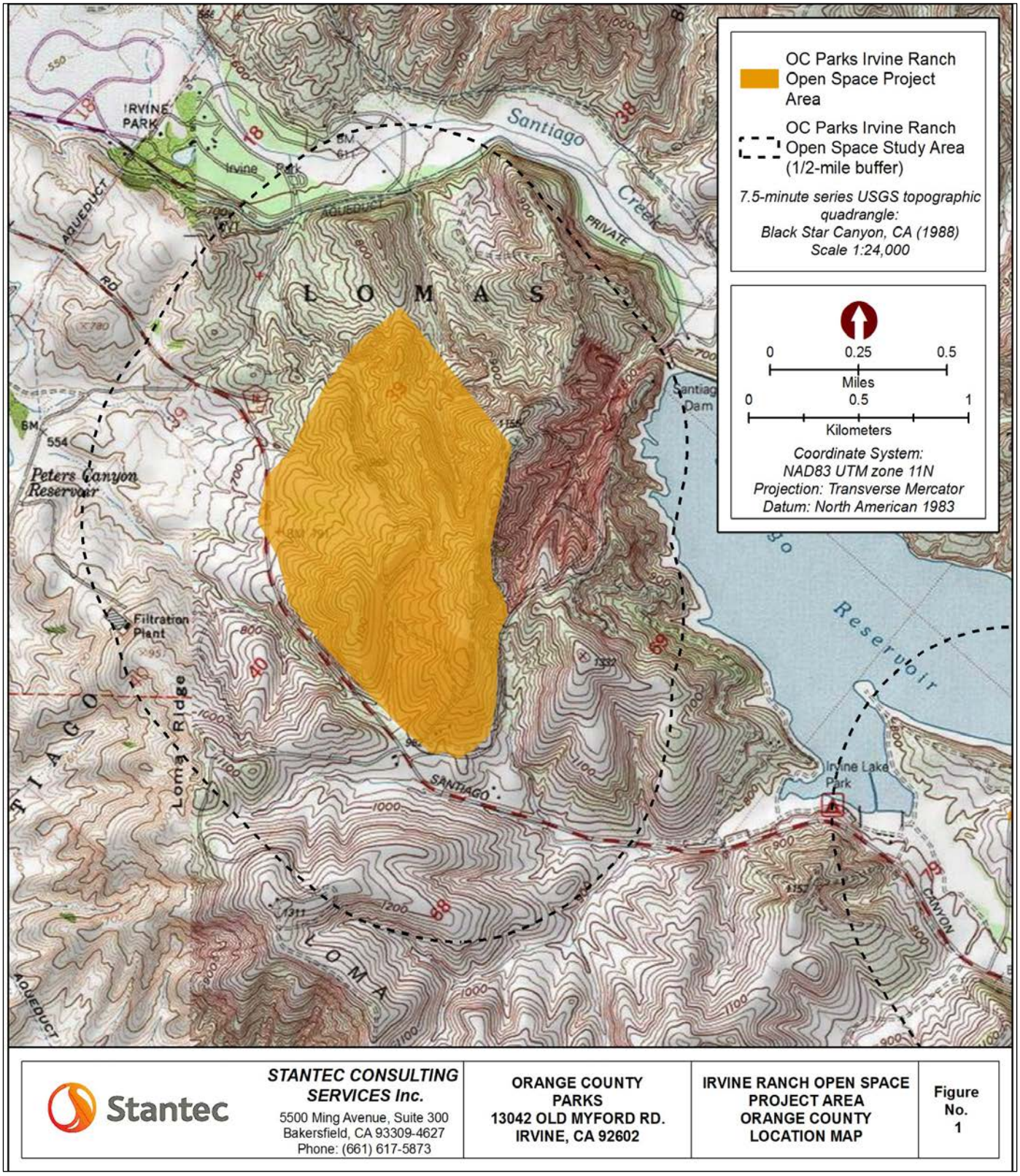


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

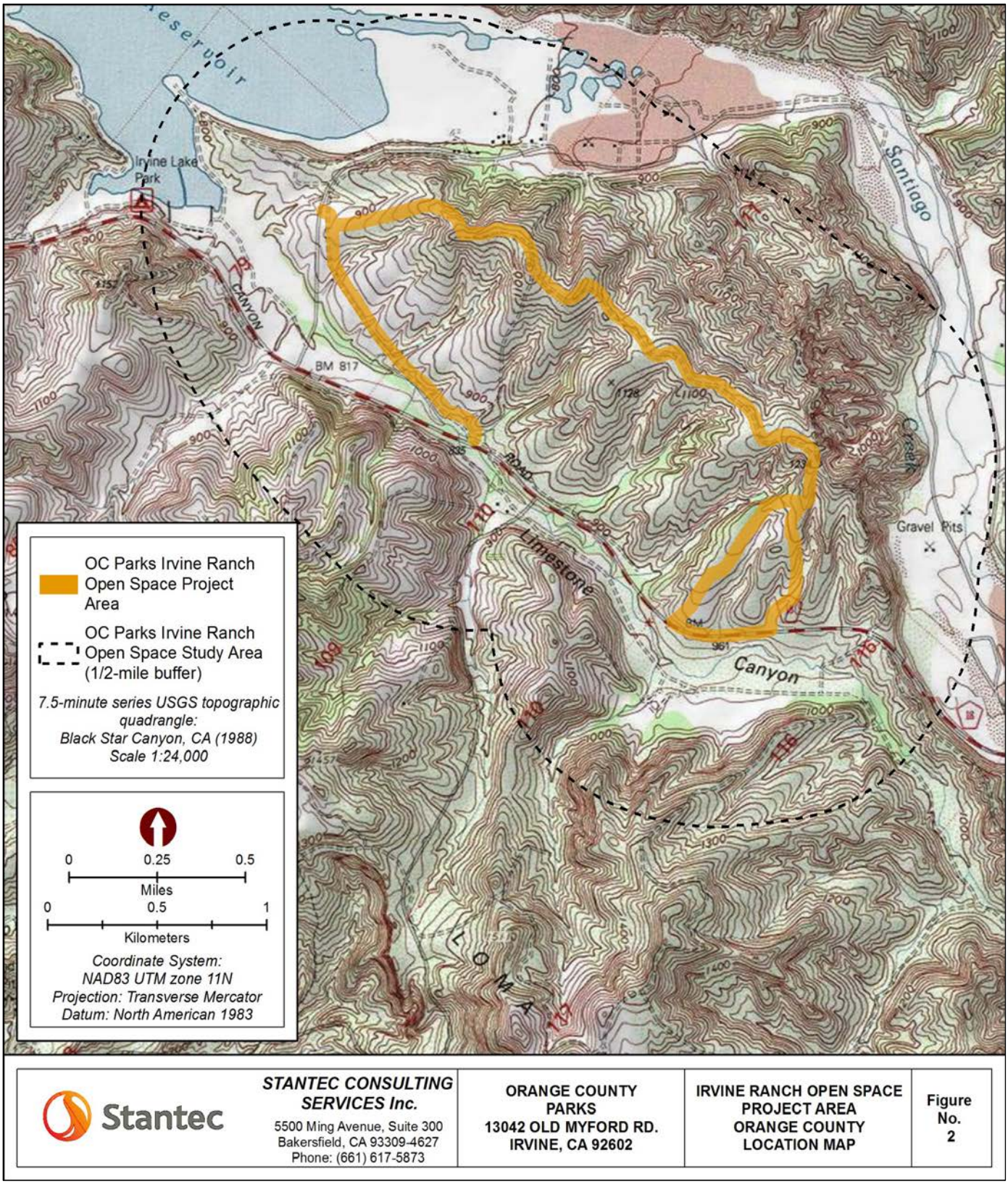


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

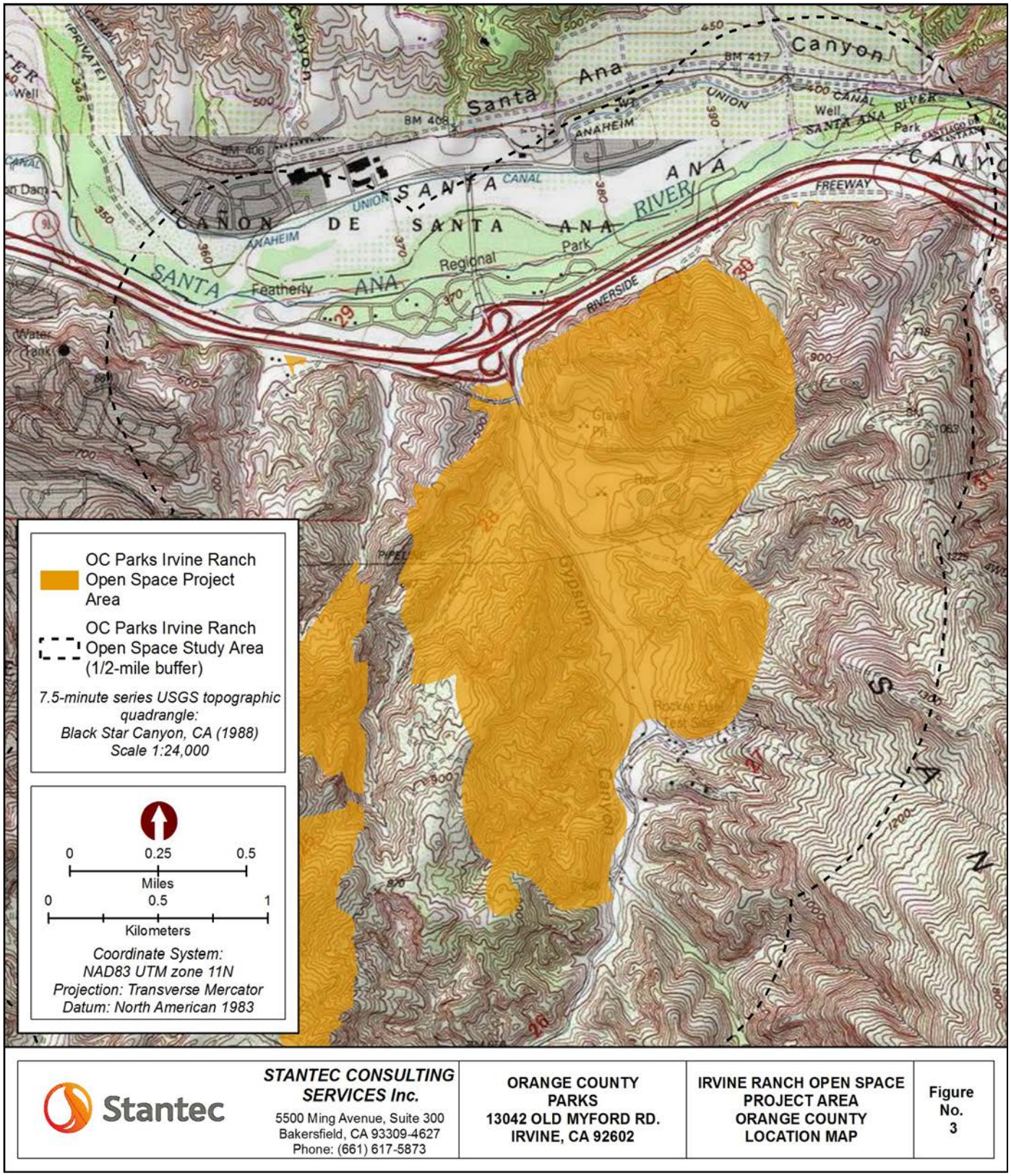


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

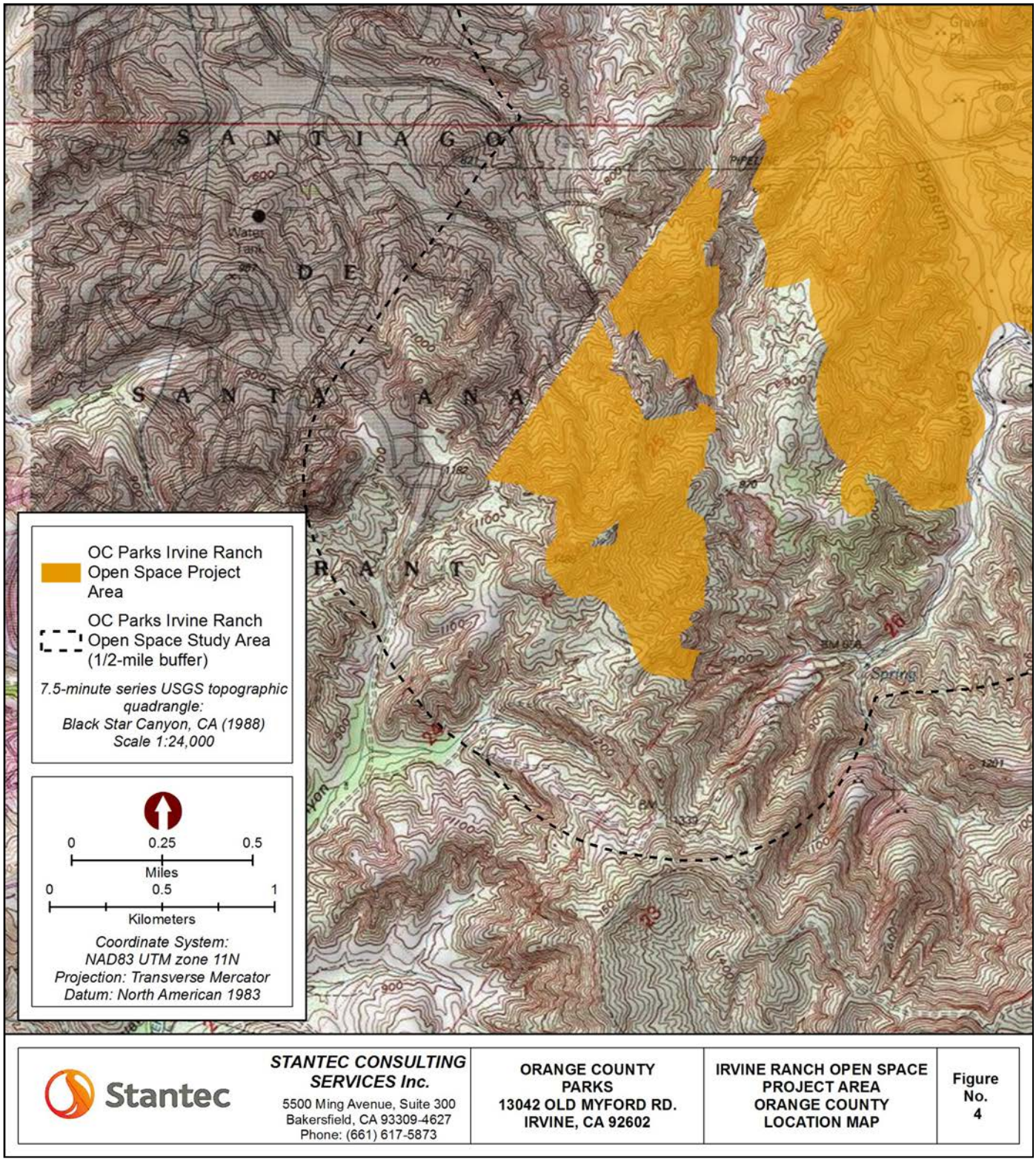


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Viejas Band of Kumeyaay Indians
Julie Hagen
1 Viejas Grade Road
Alpine, CA 91901

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Ms. Hagen,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

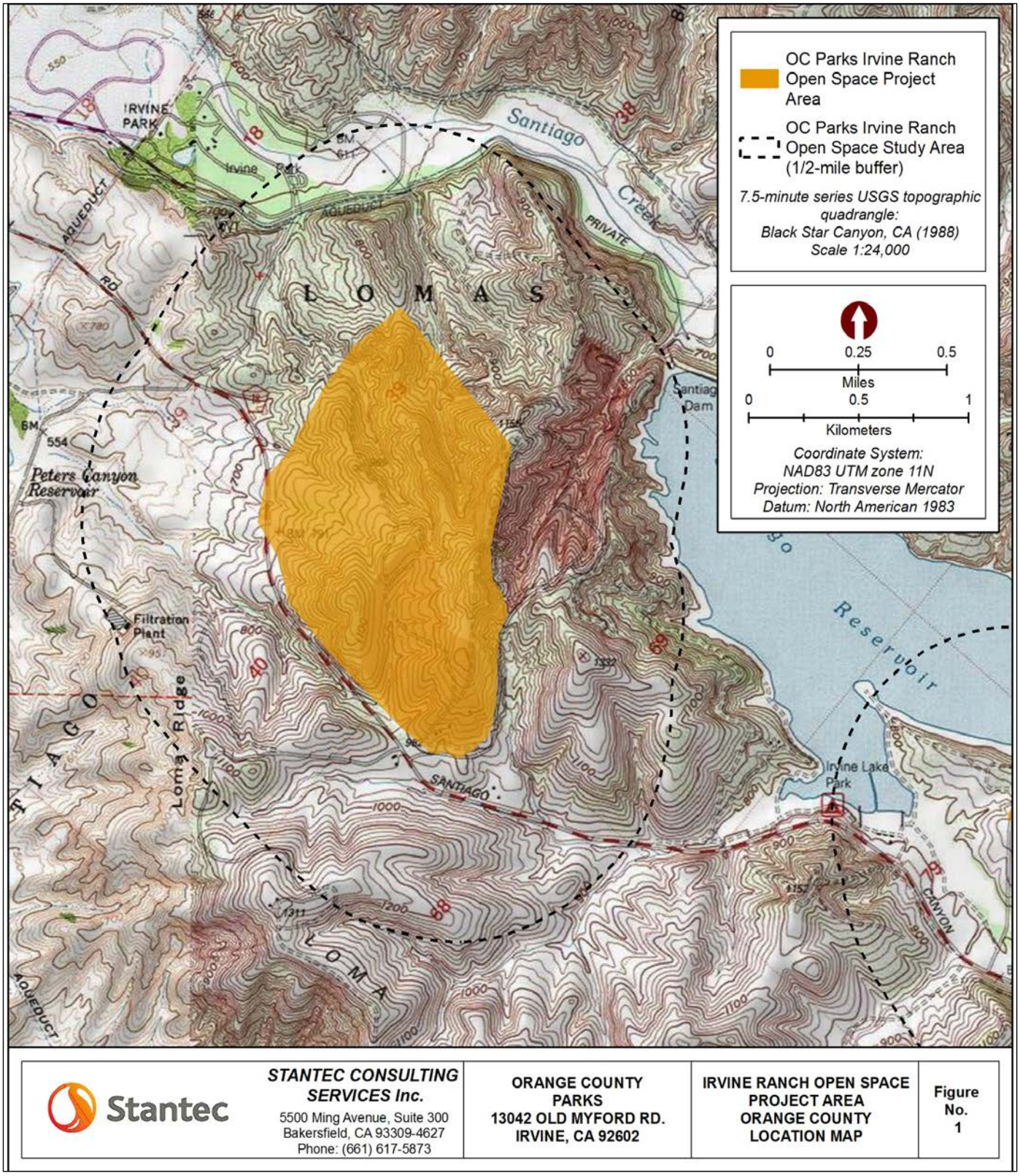


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

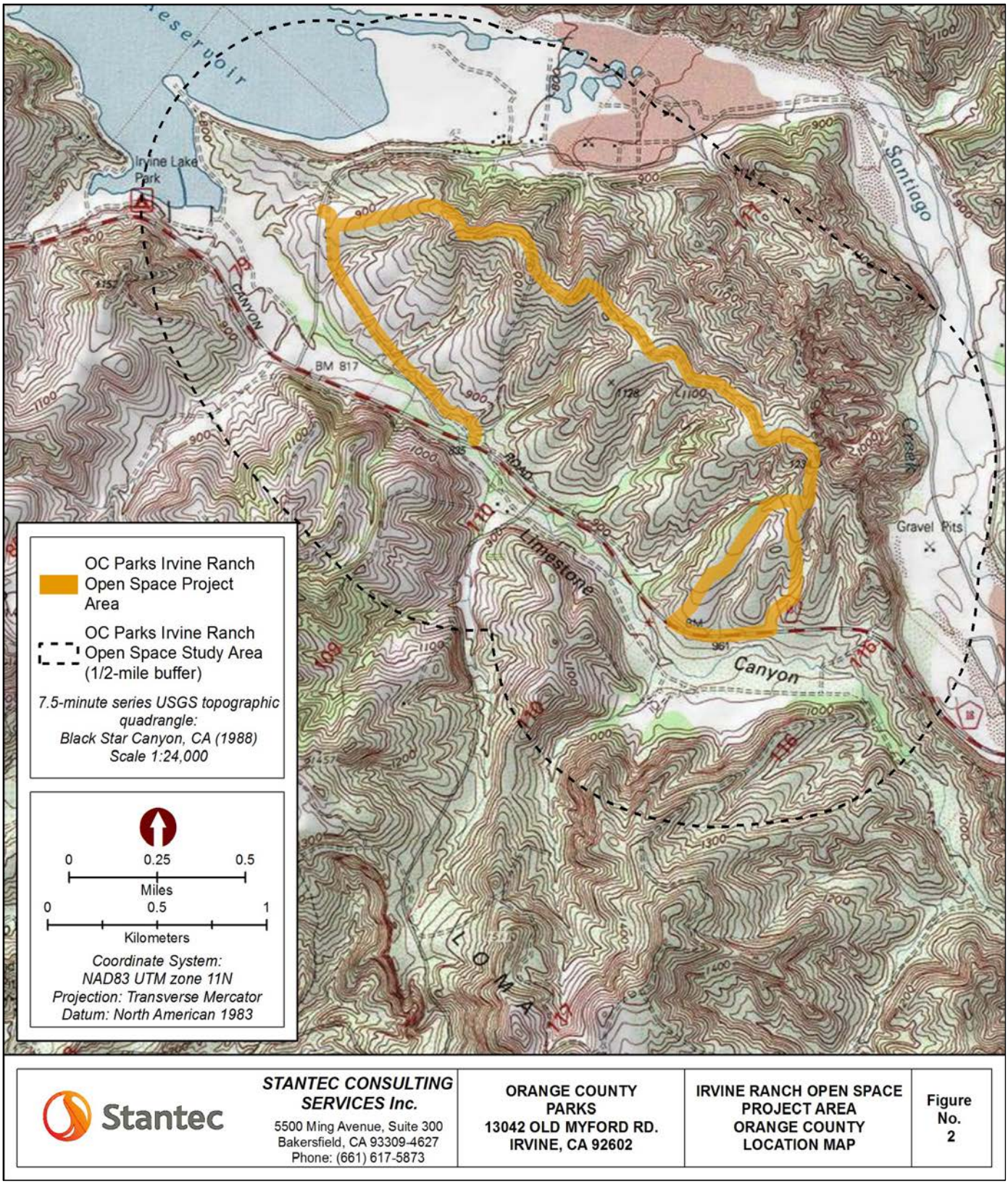


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

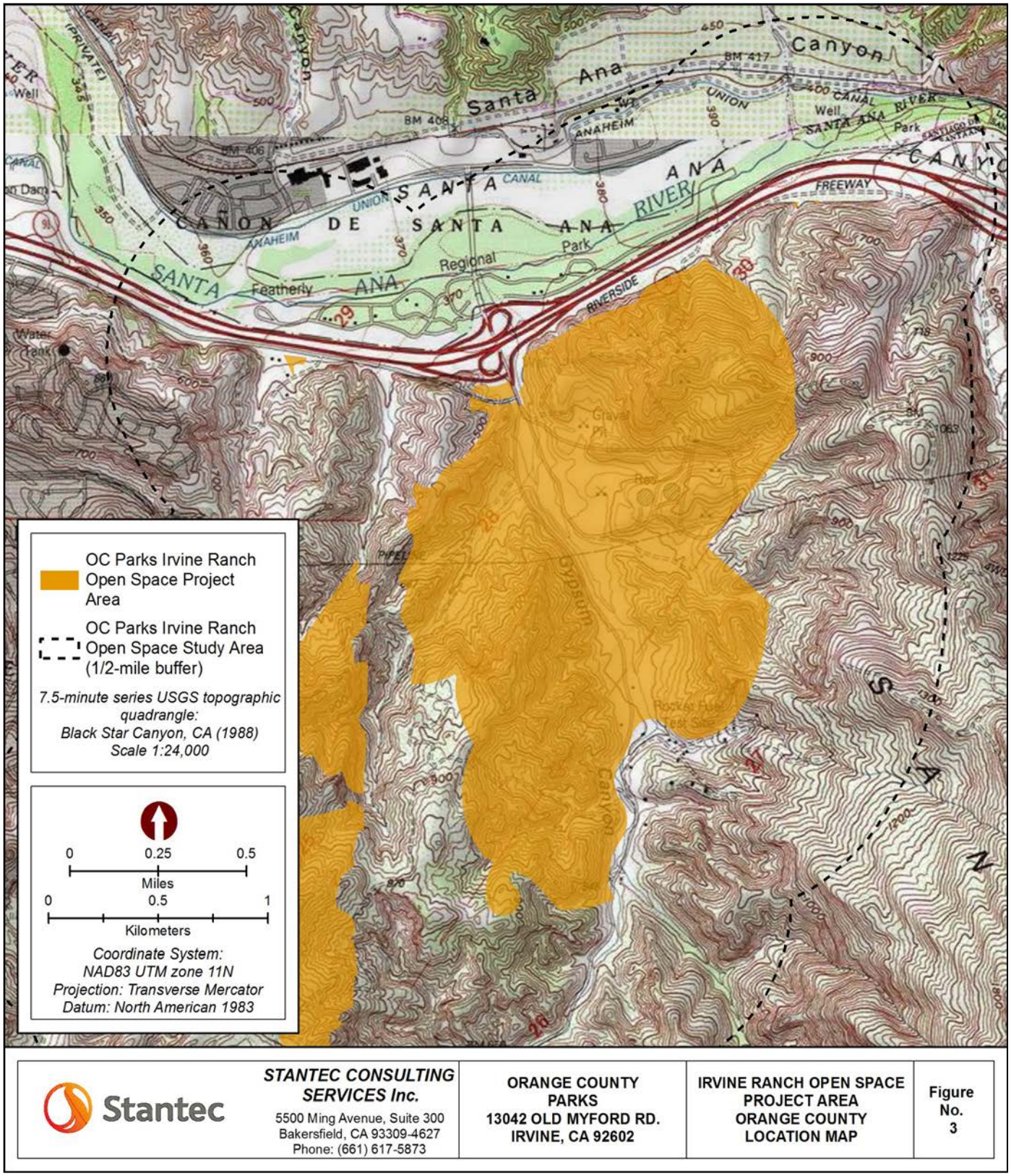


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

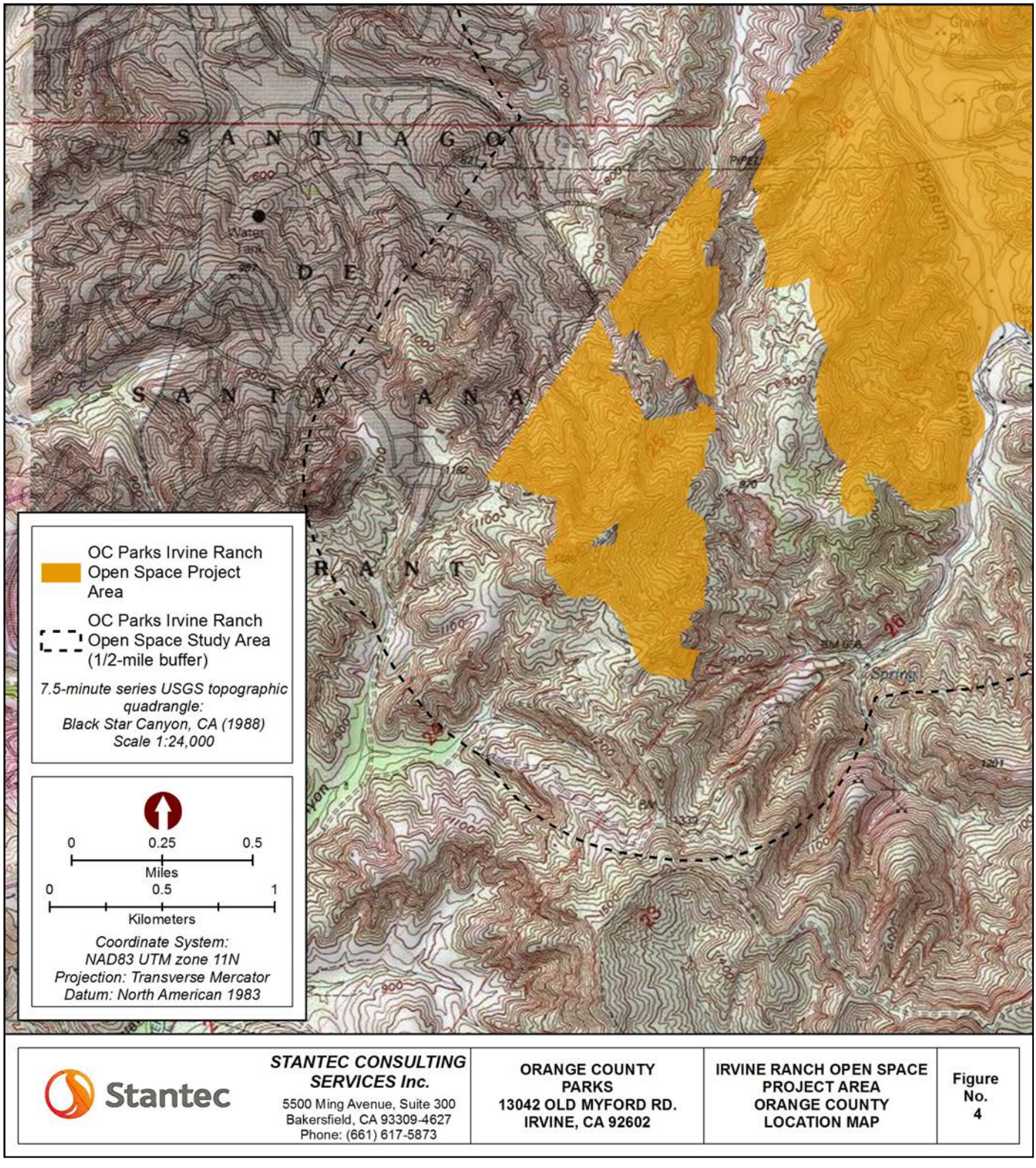


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

La Posta Band of Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road
Boulevard, CA 91905

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Ms. Miller,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

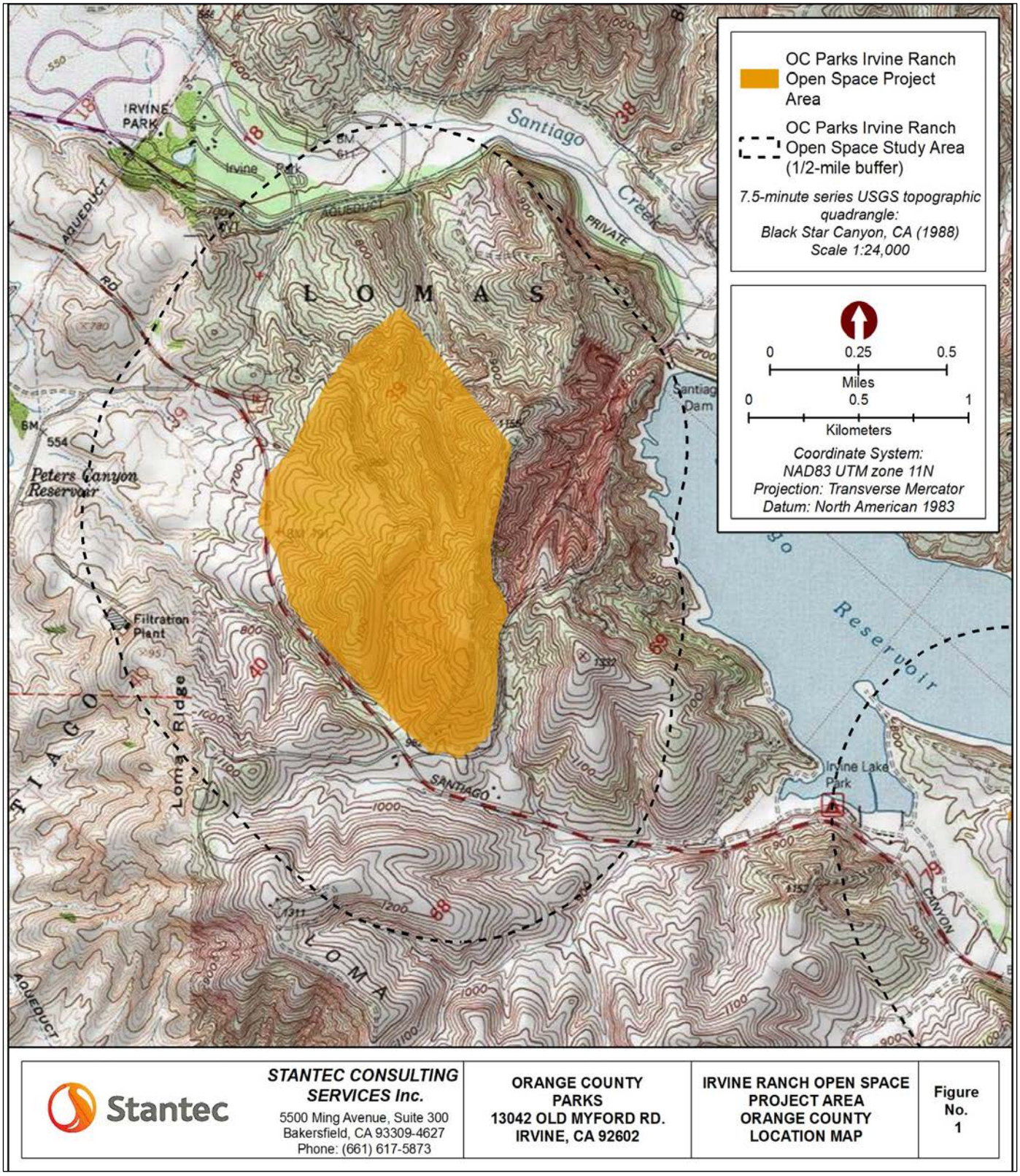


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

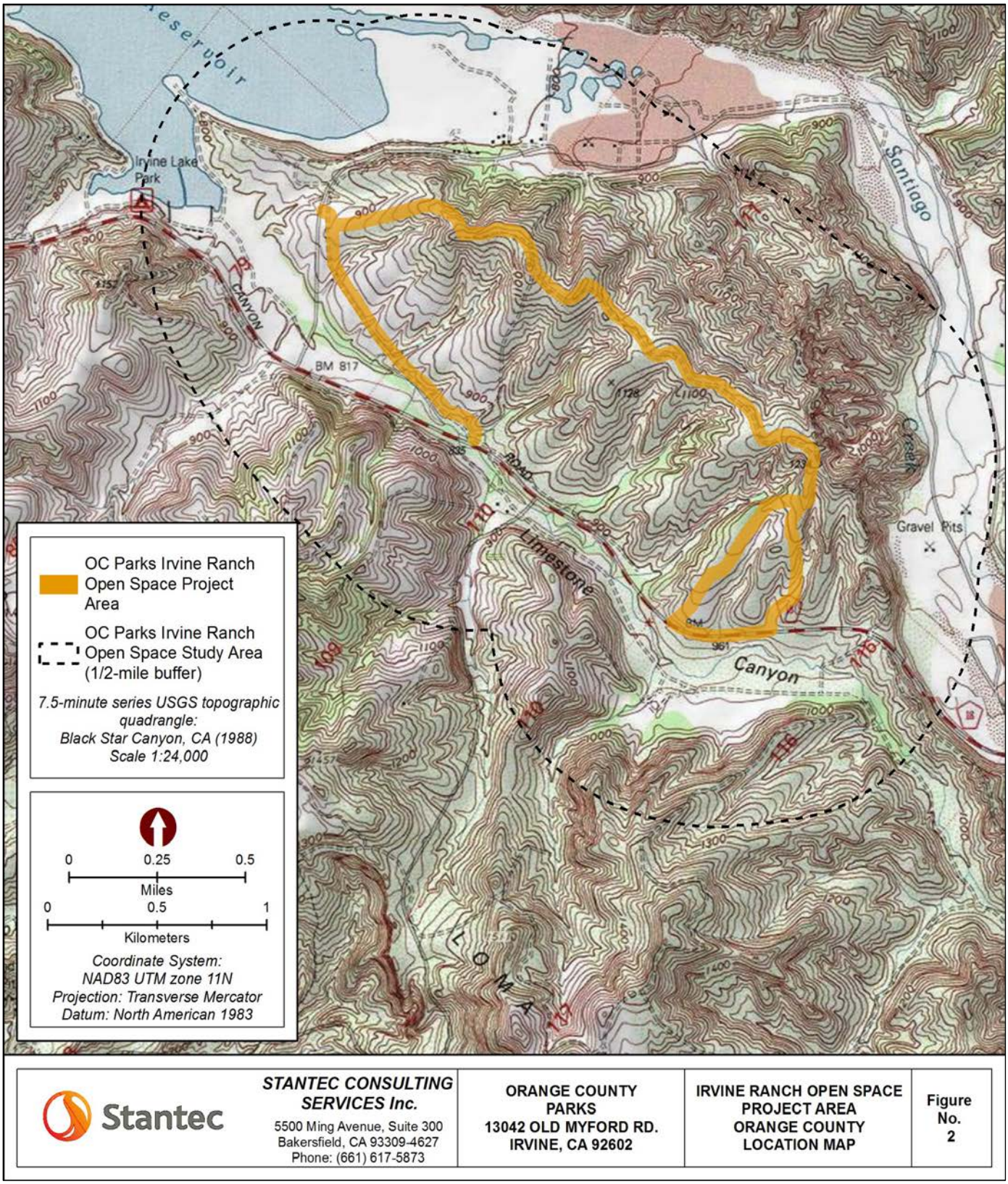


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

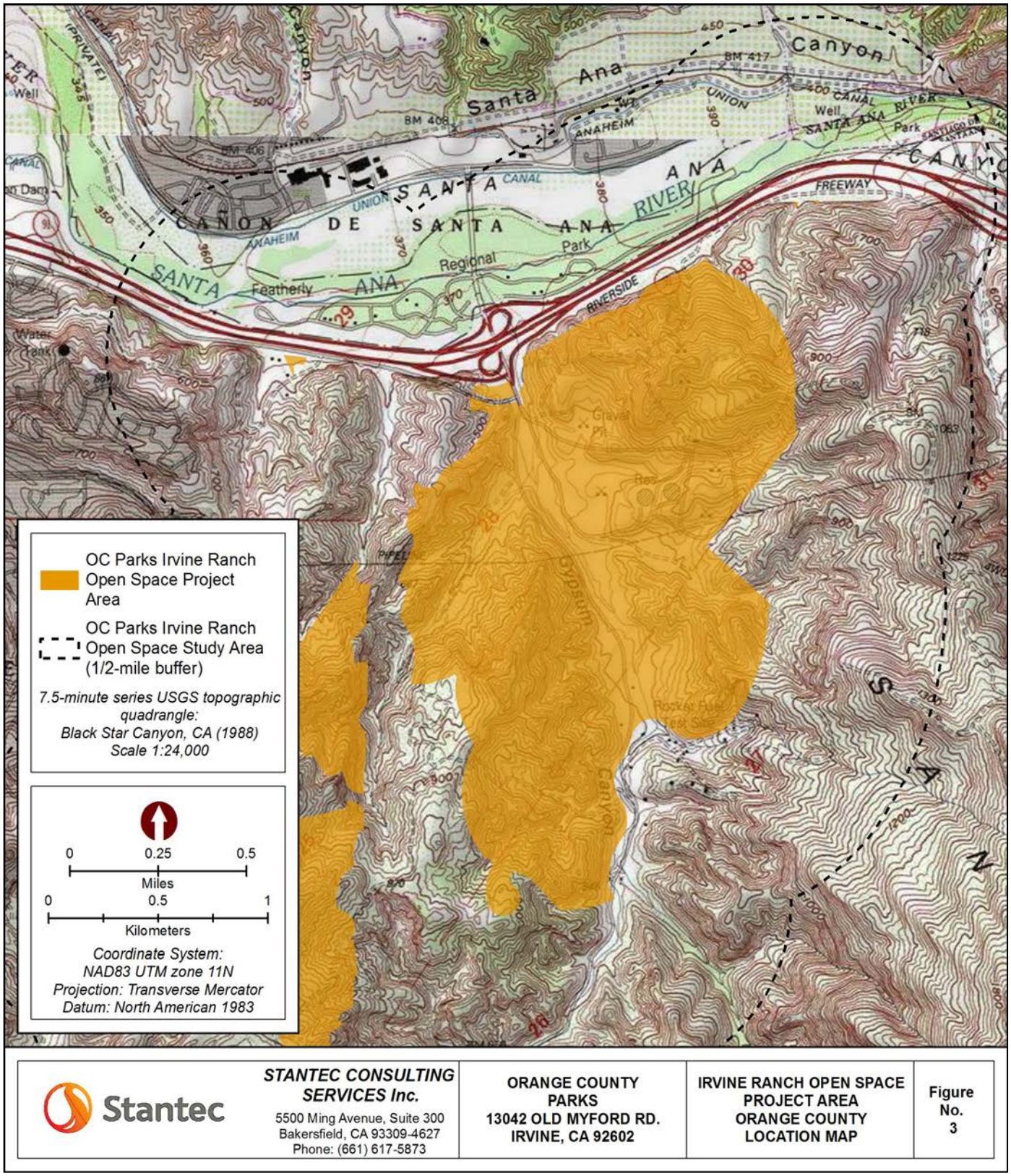


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

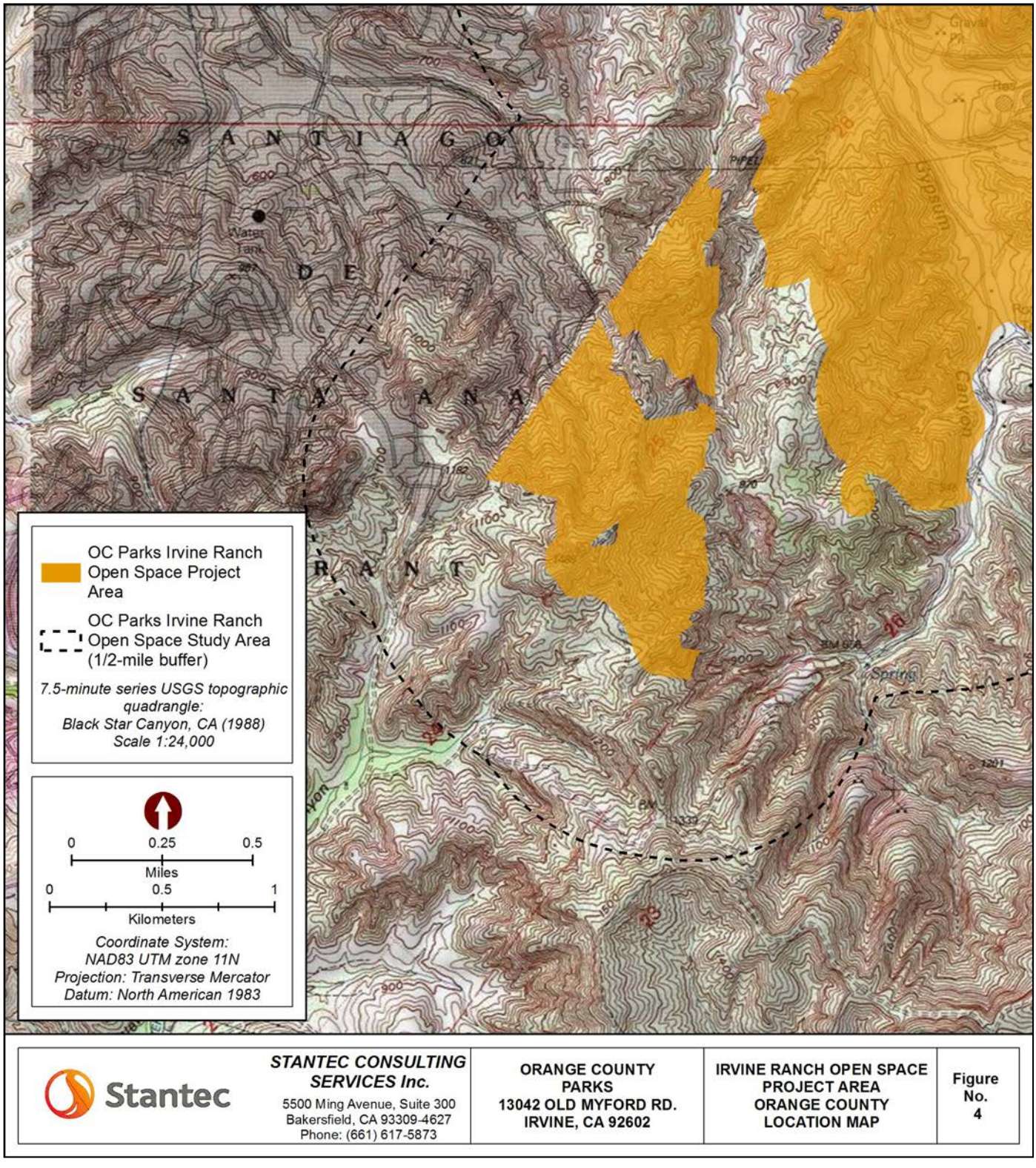


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Joyce Perry, Tribal Manager
4955 Paseo Segovia
Irvine, CA 92603

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Ms. Perry,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

A Sacred Lands File Search conducted by the NAHC identified sites located within the APE that may be impacted by the project and recommended we reach out to your Tribe. We look forward to hearing from you so we can discuss what OC Parks can do to best address your concerns.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

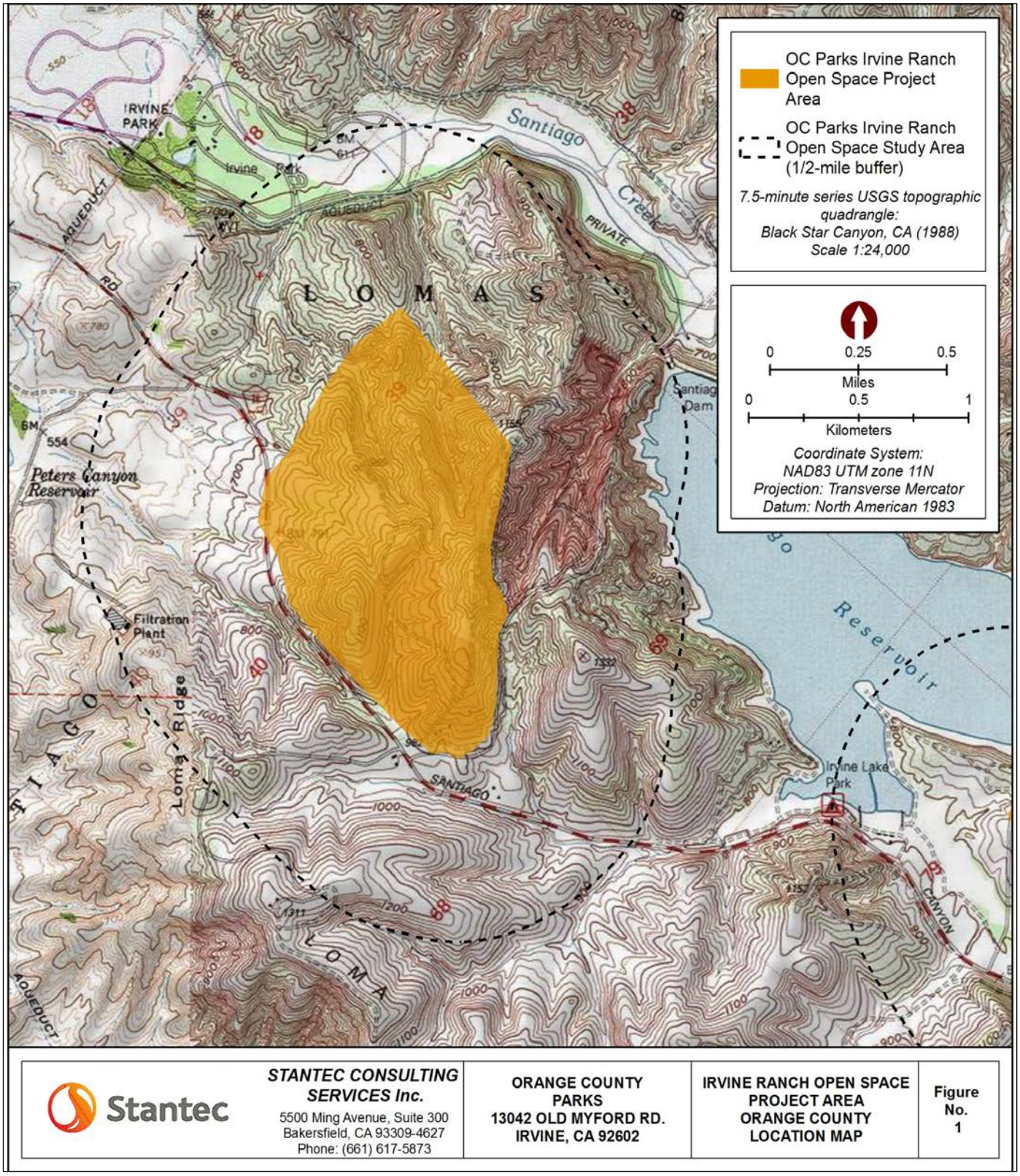


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

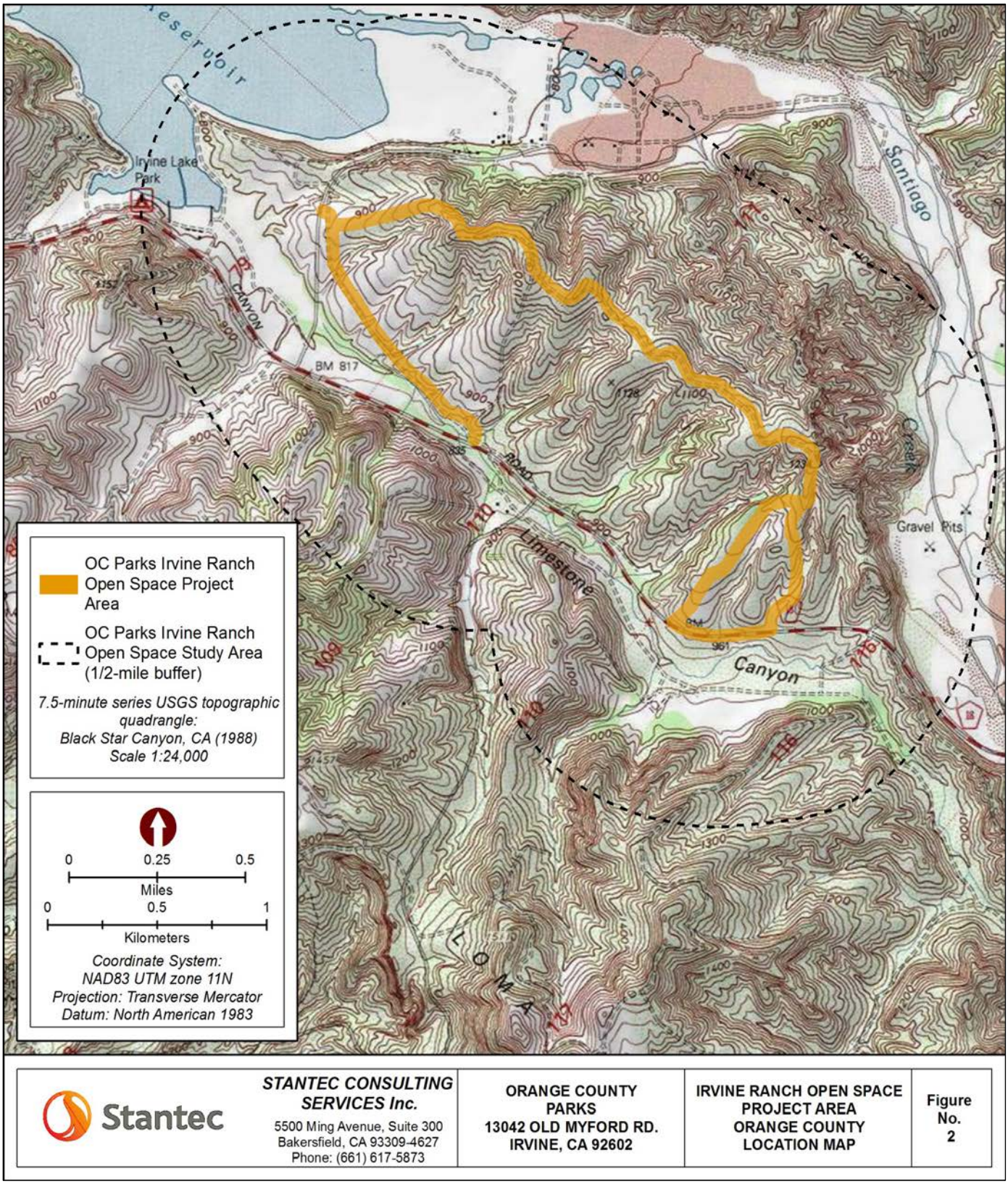


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

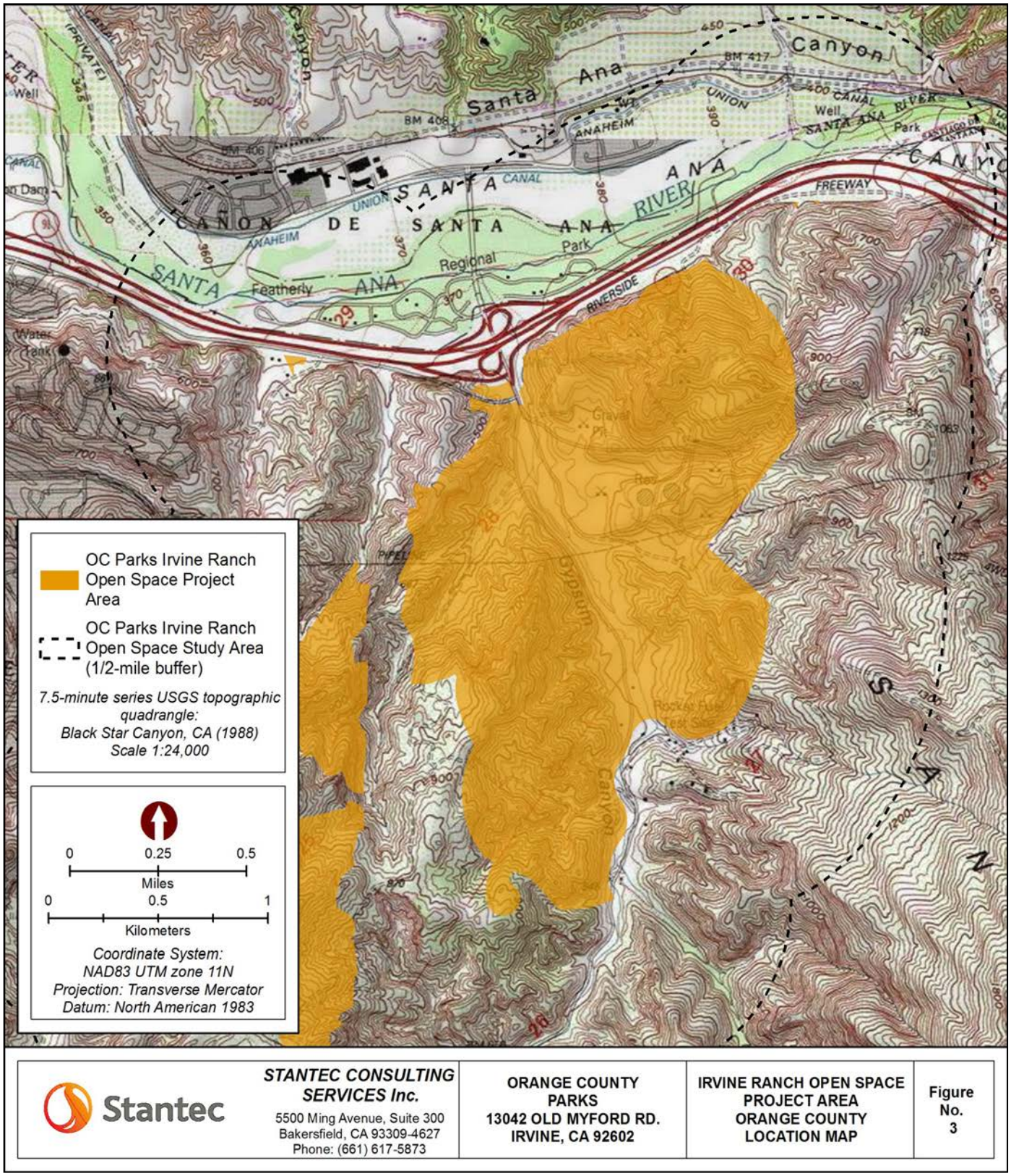


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

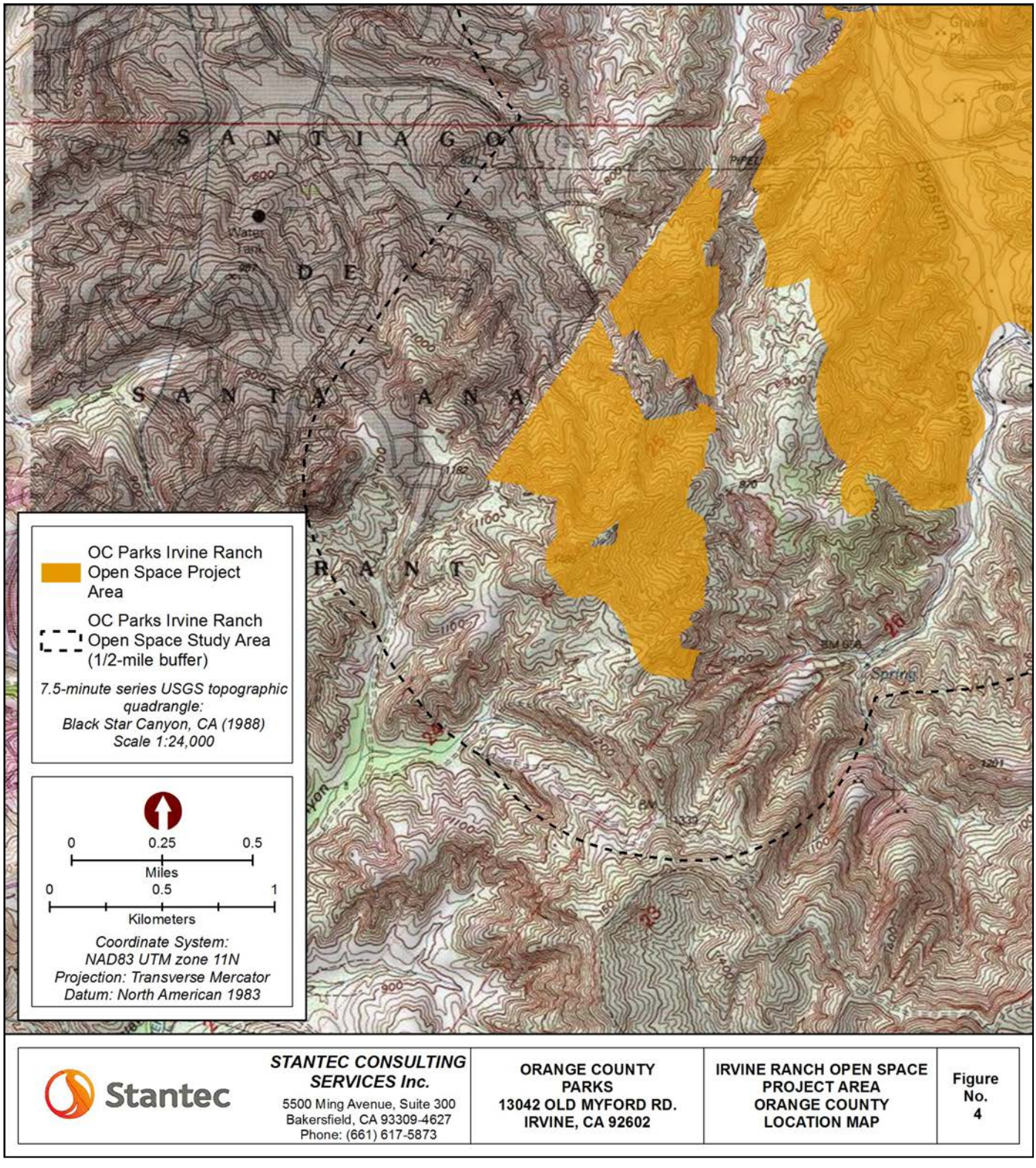


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Sycuan Band of the Kumeyaay Nations
Lisa Haws, Cultural Resources Manager
1 Kwaaypaay Court
El Cajon, CA 92019

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Ms. Haws,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

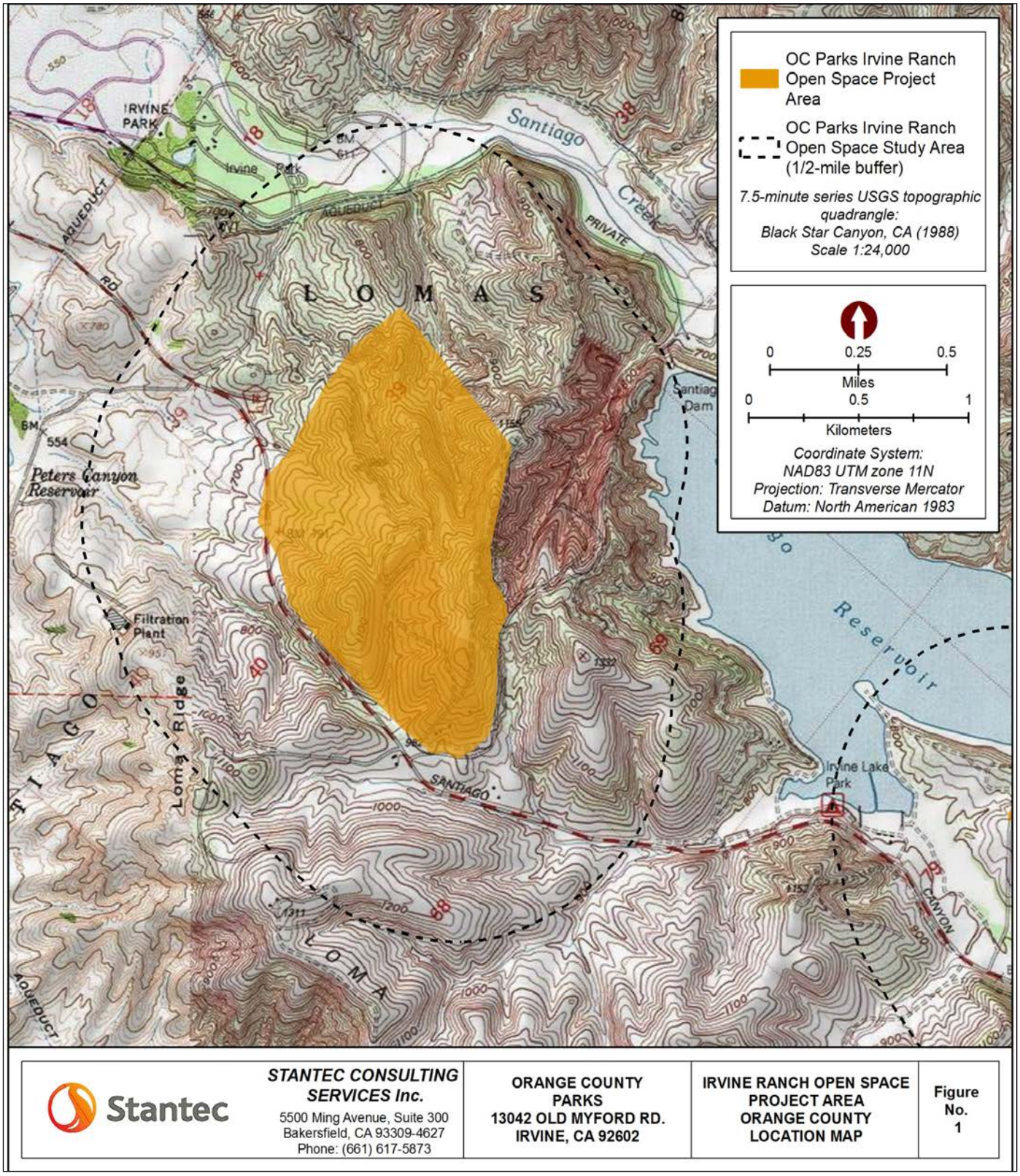


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

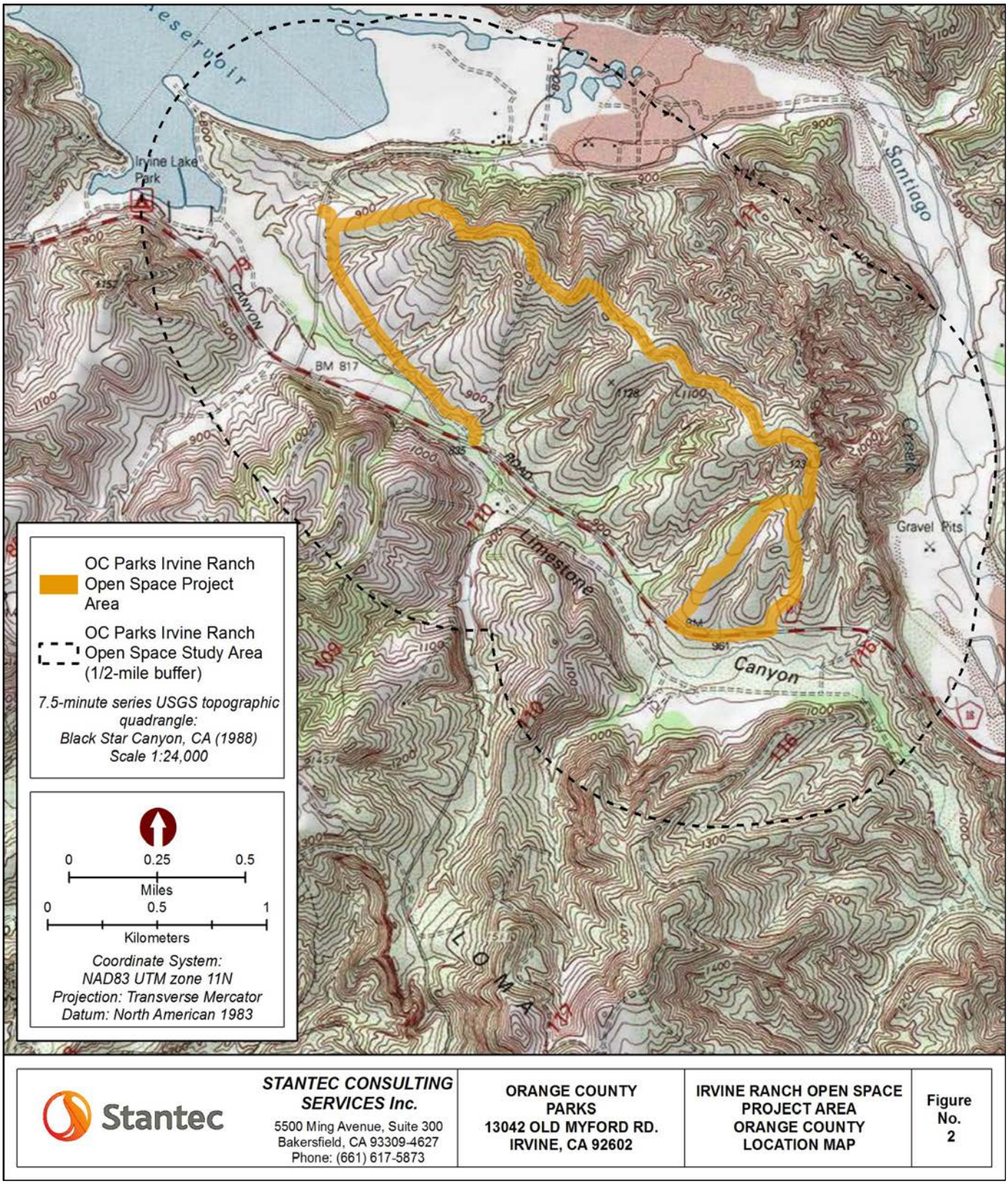


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

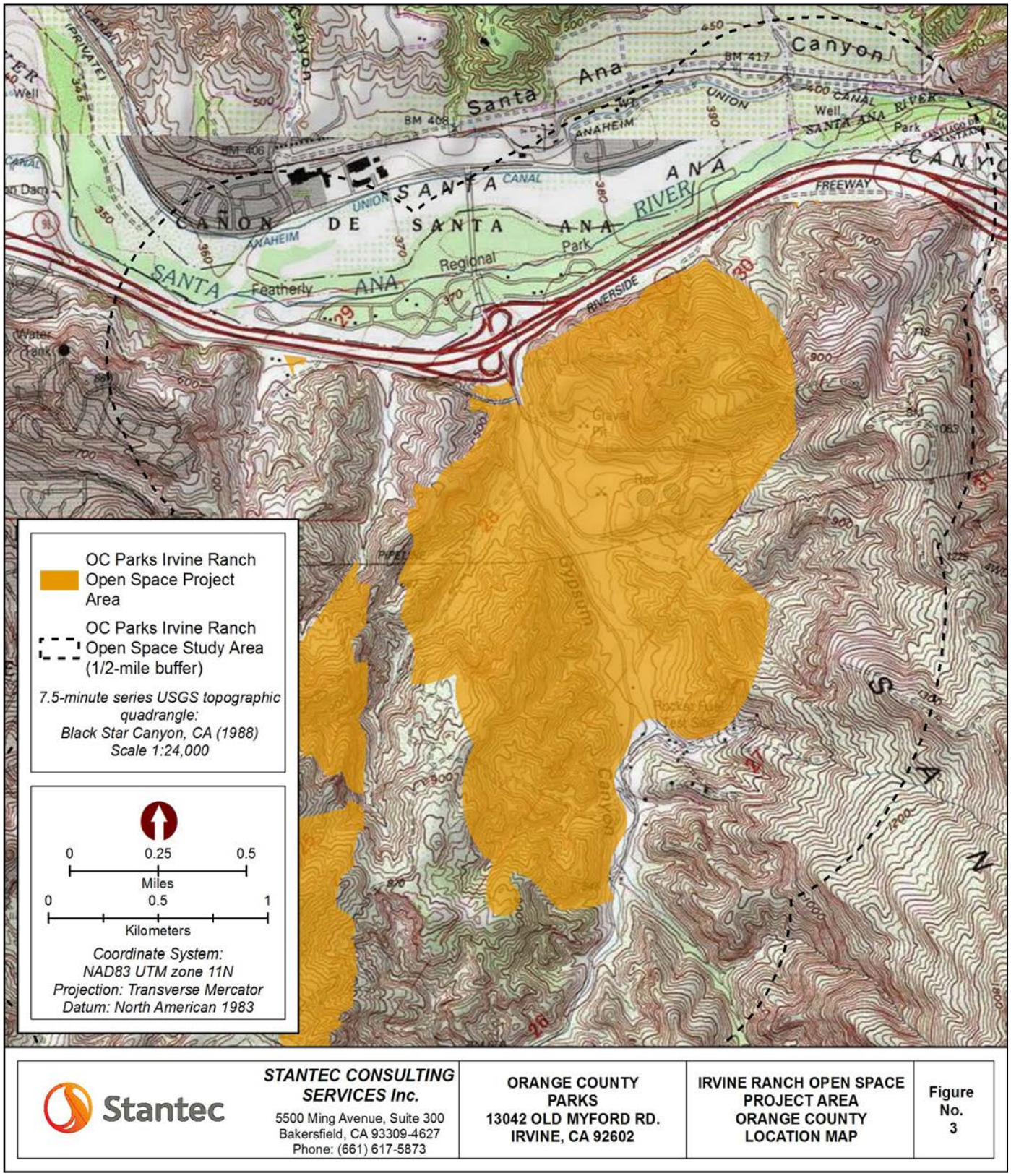


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

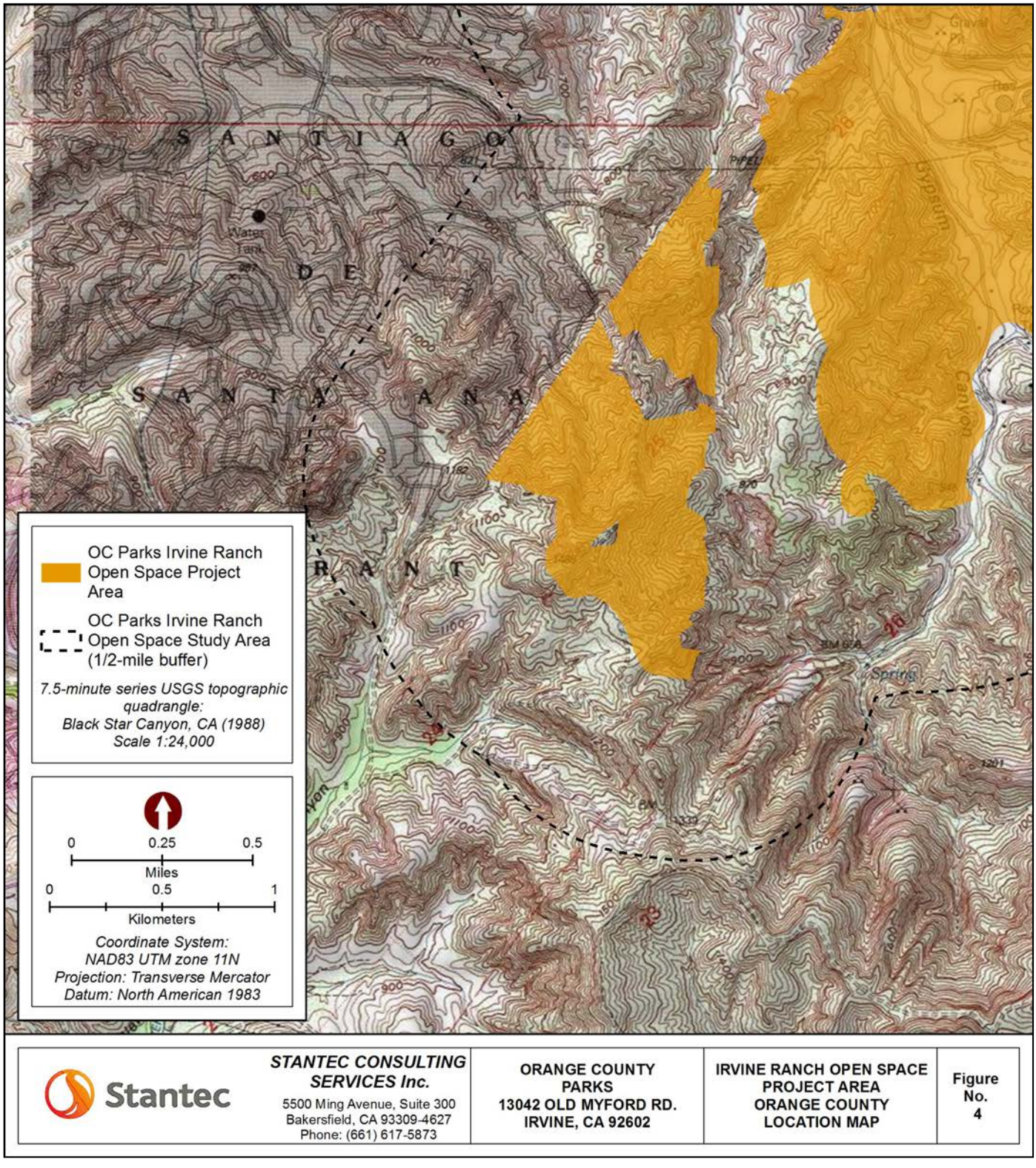


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos
San Juan Capistrano, CA 92675

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Matias Belardes,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

A Sacred Lands File Search conducted by the NAHC identified sites located within the APE that may be impacted by the project and recommended we reach out to your Tribe. We look forward to hearing from you so we can discuss what OC Parks can do to best address your concerns.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

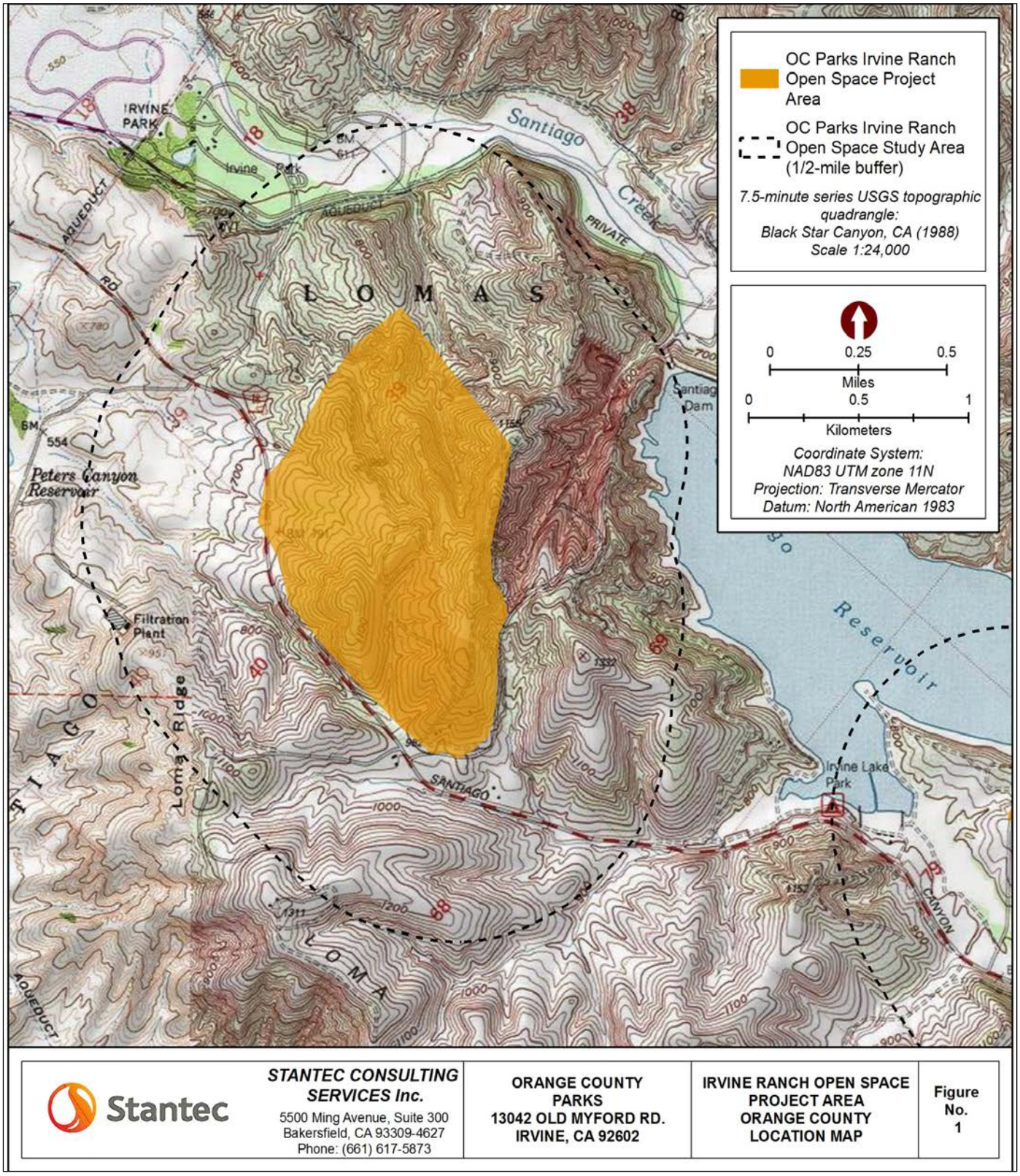


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

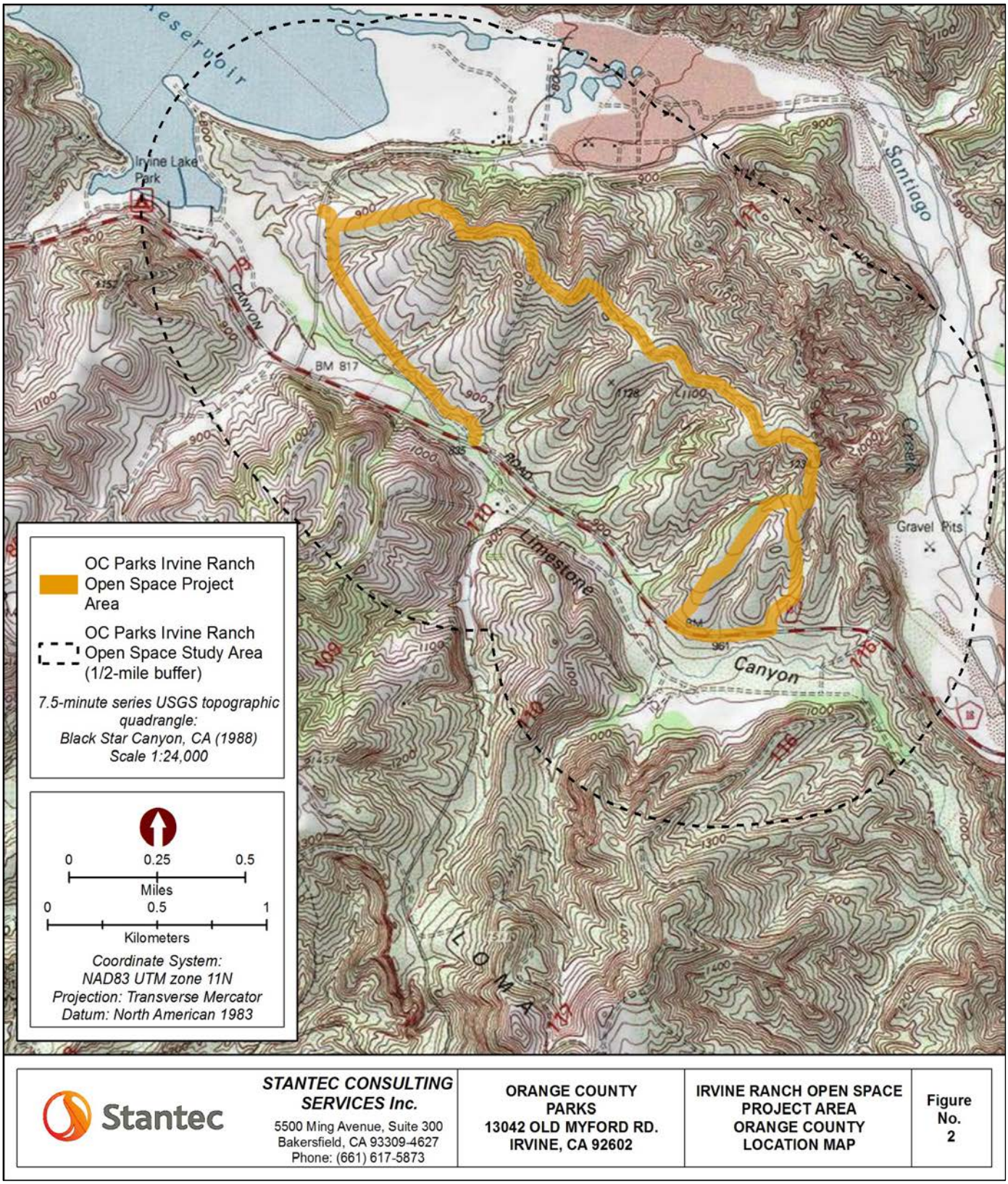


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

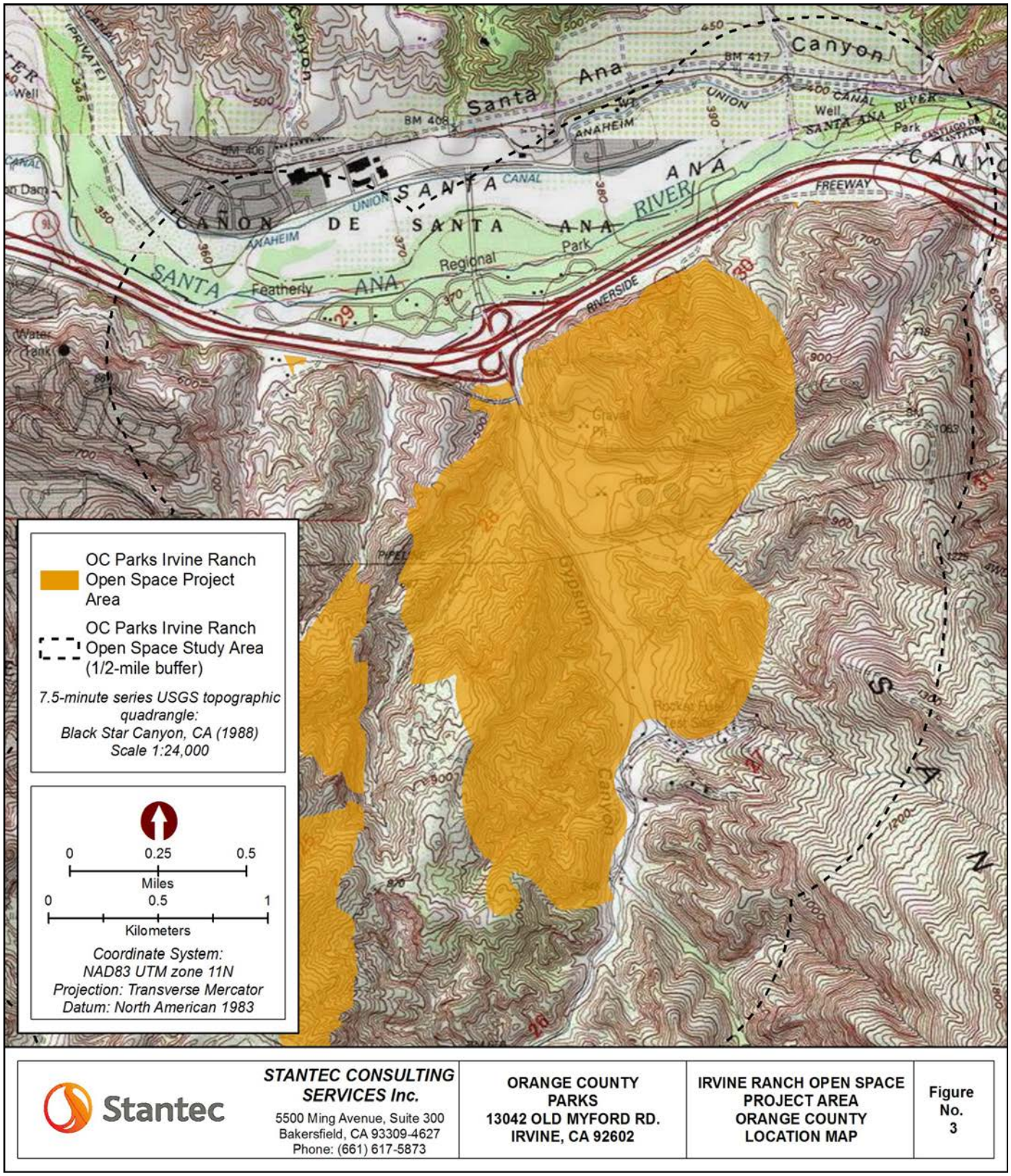


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

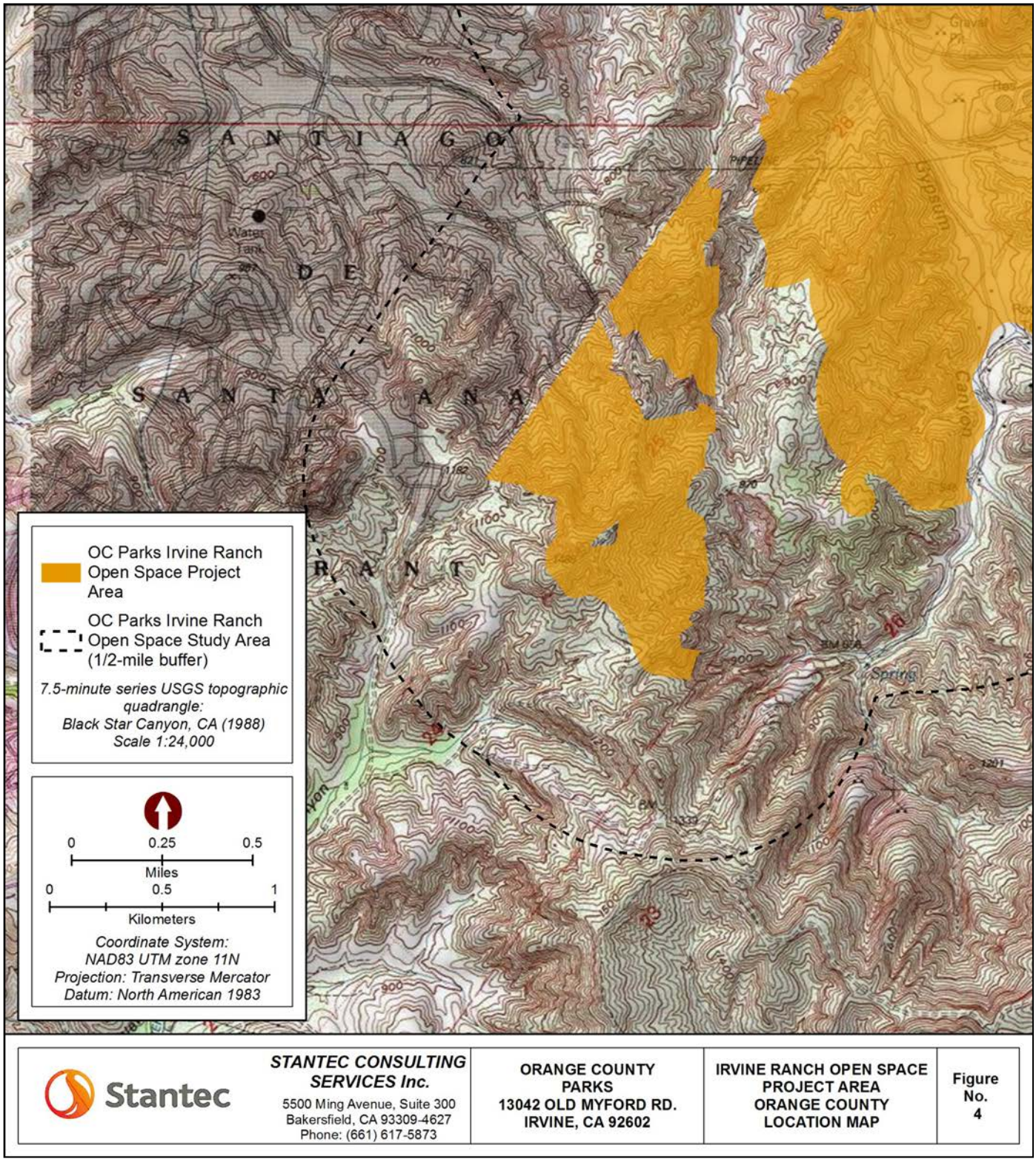


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Ewiiaapaayp Tribal Office
Michael Garcia, Chairperson
4054 Willows Road
Alpine, CA 91901

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Michael Garcia,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

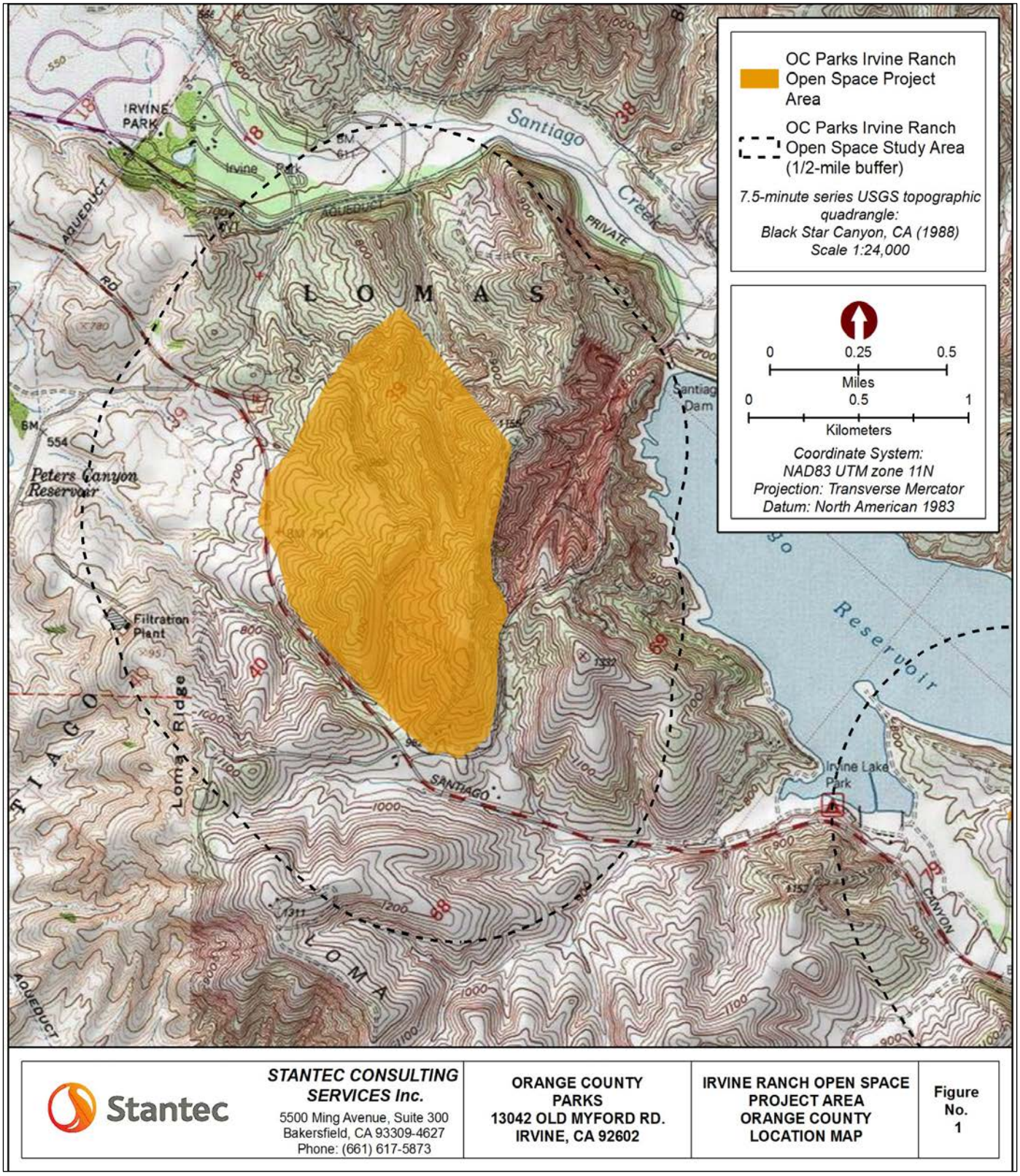


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

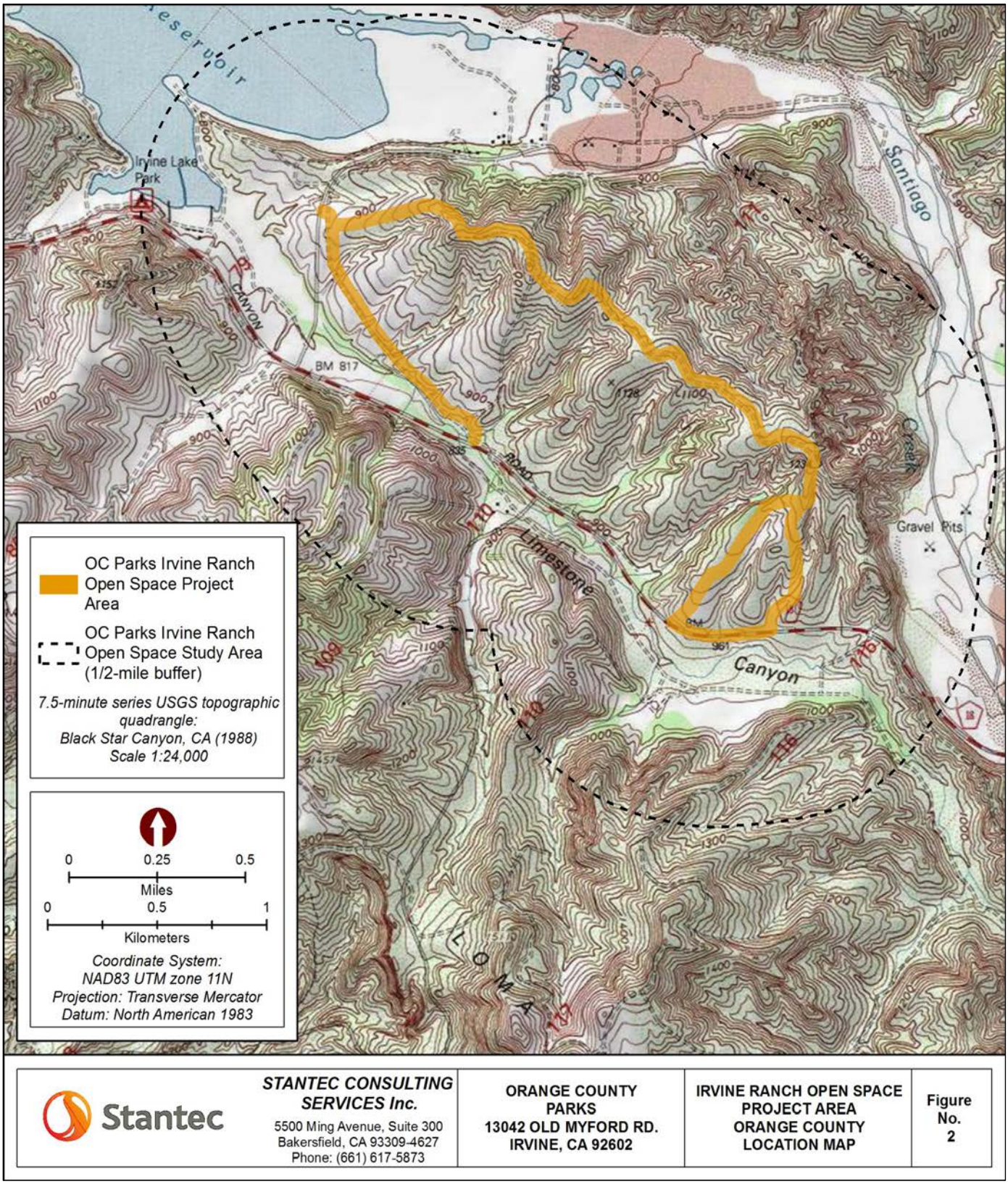


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

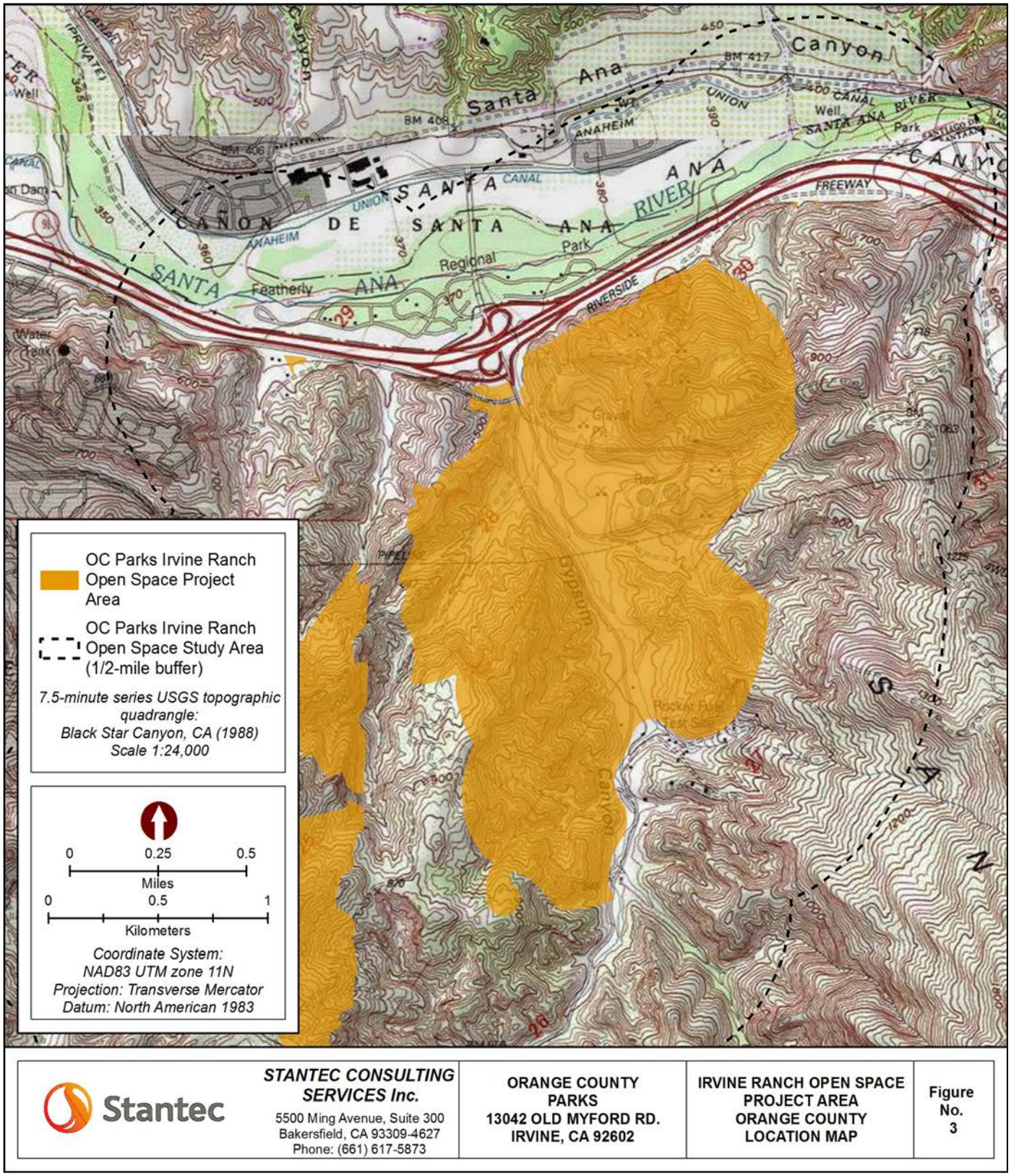


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

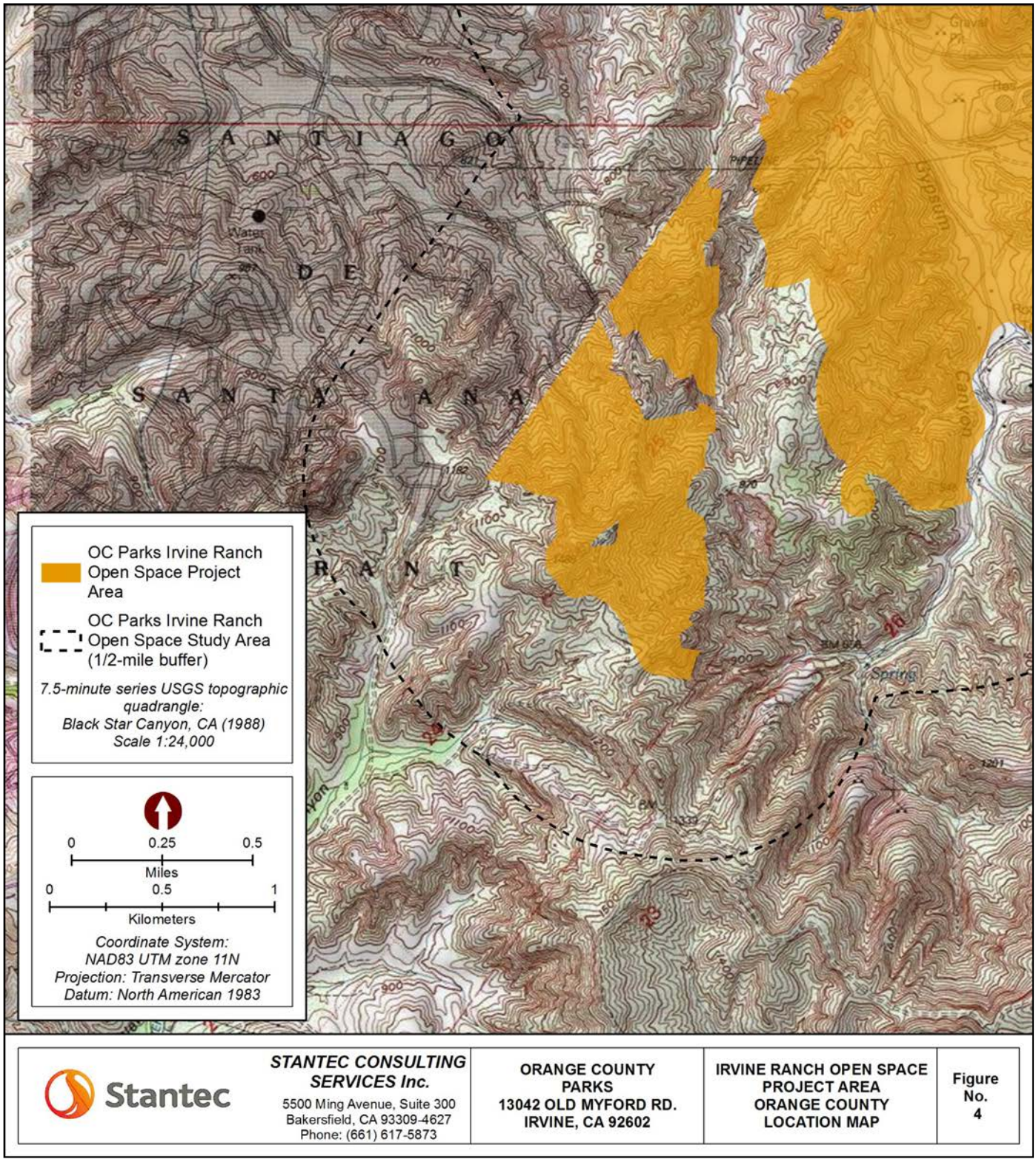


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490
Bellflower, CA 90707

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Robert Dorame,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

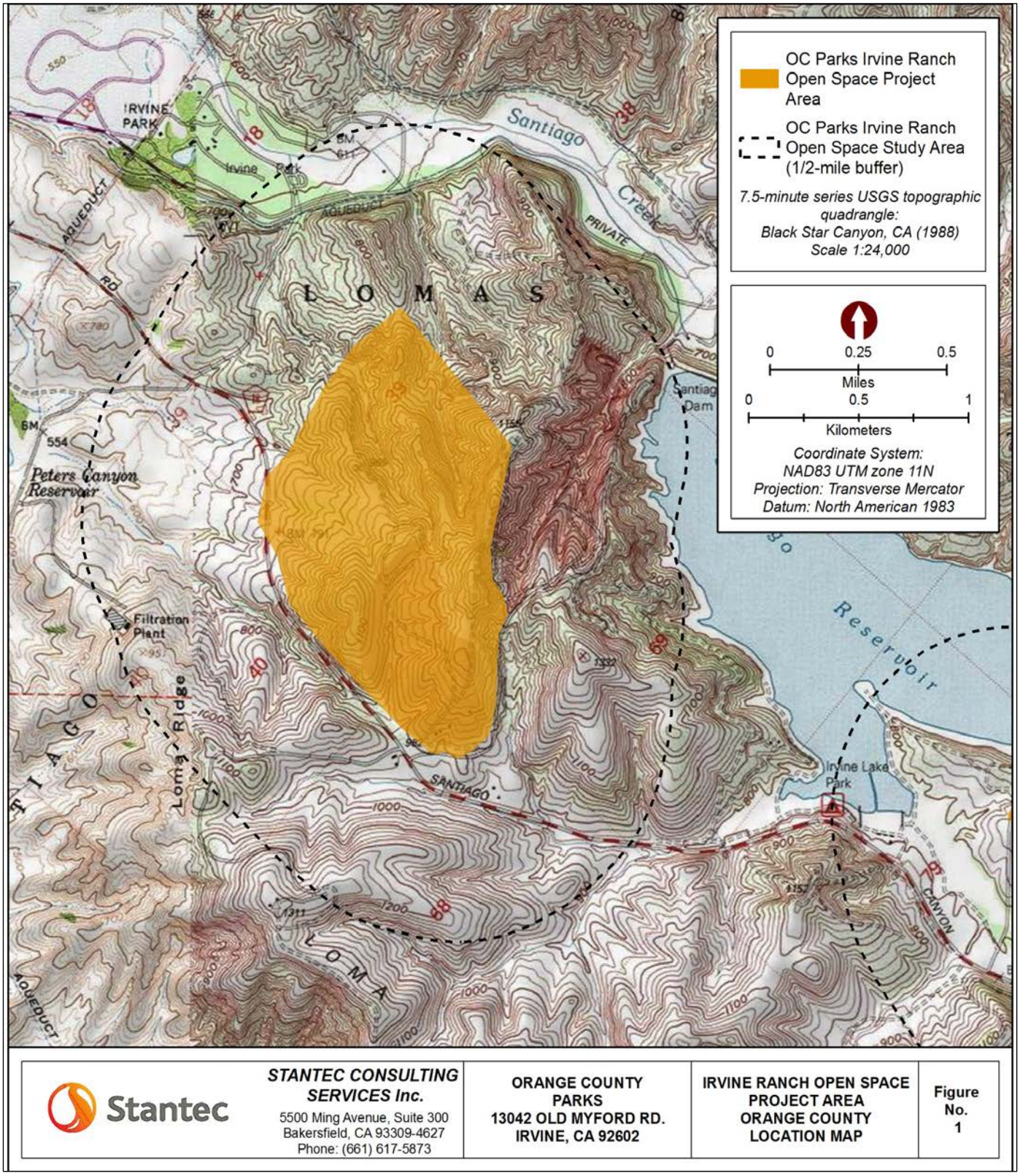


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

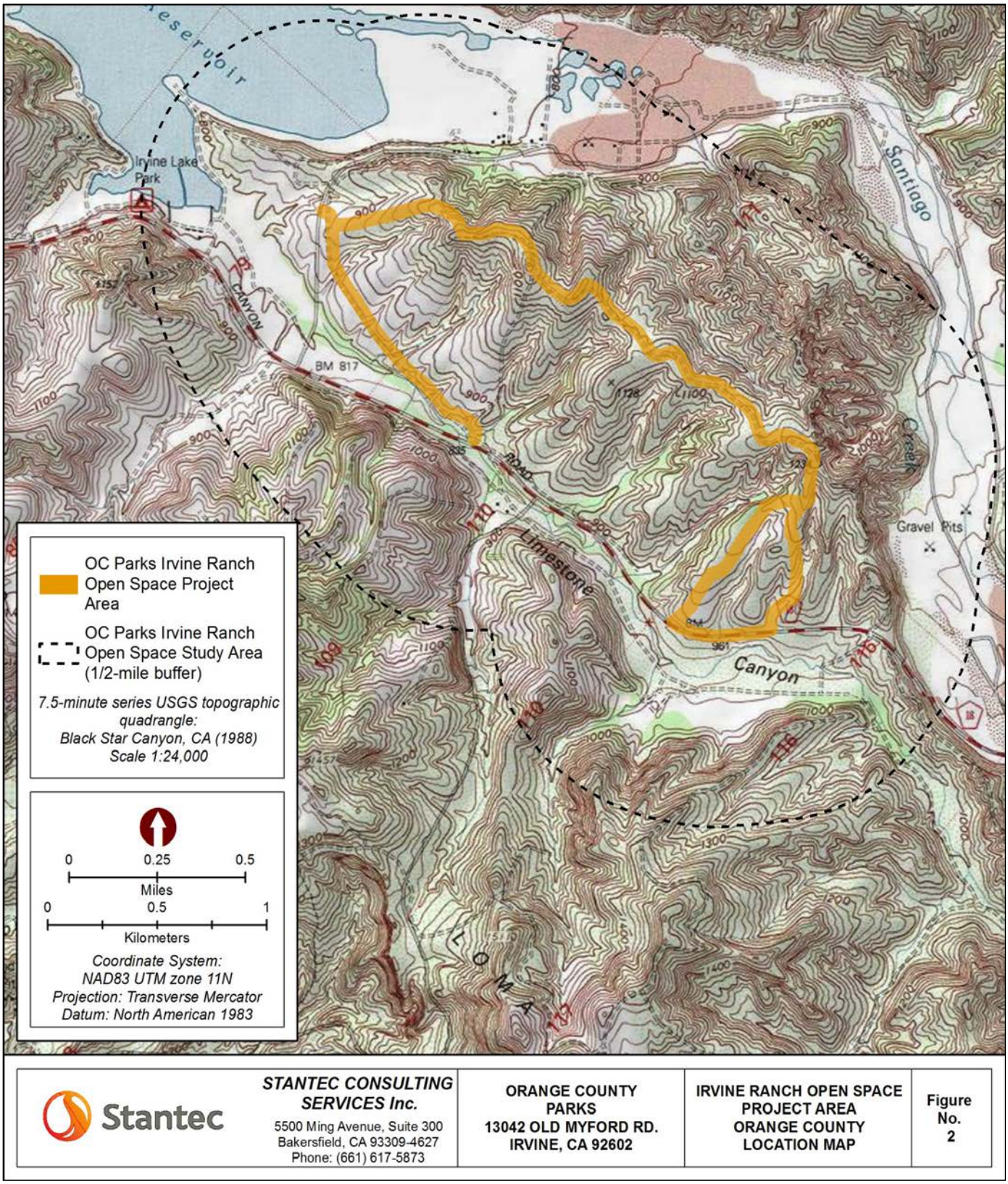


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

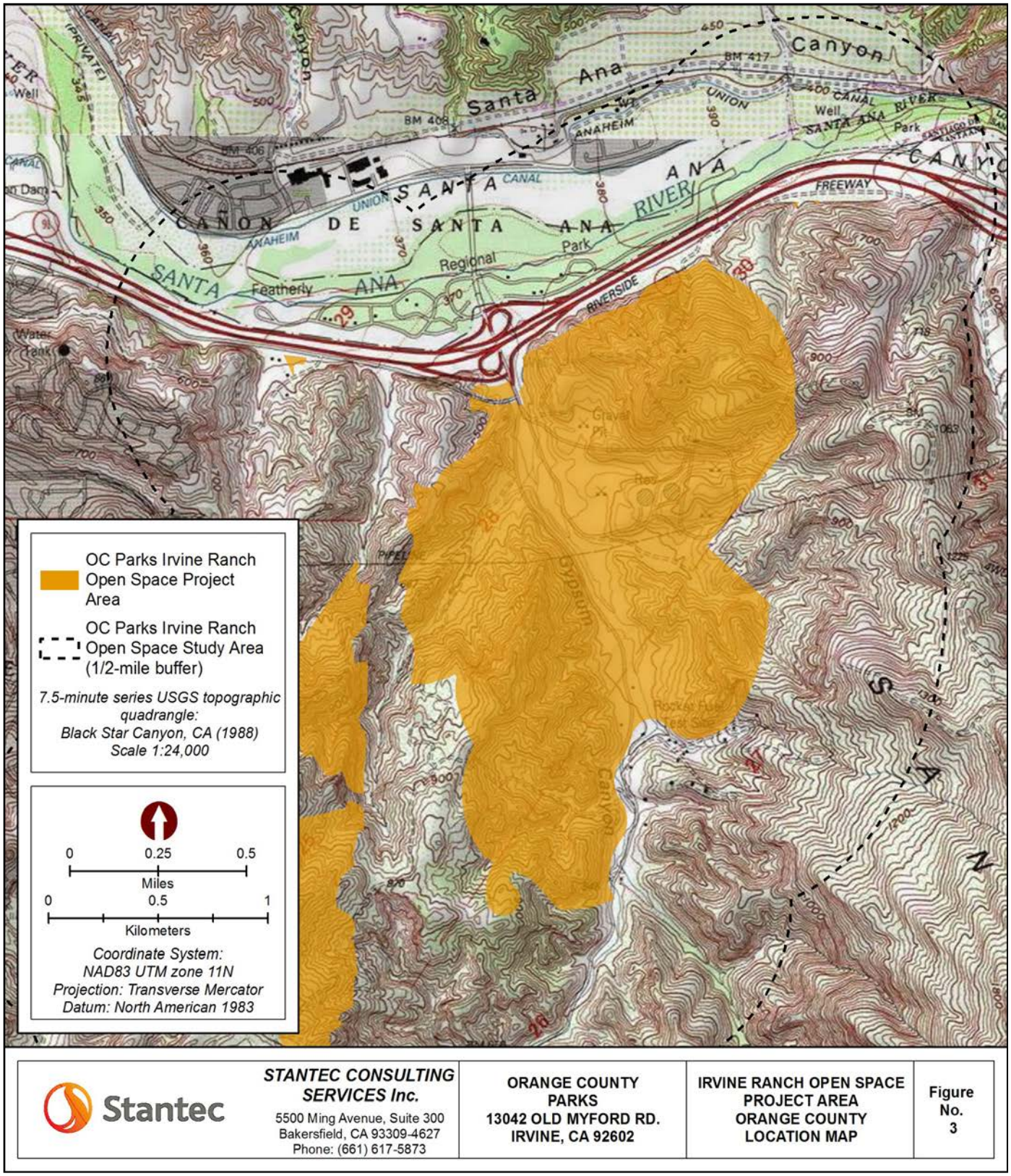


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

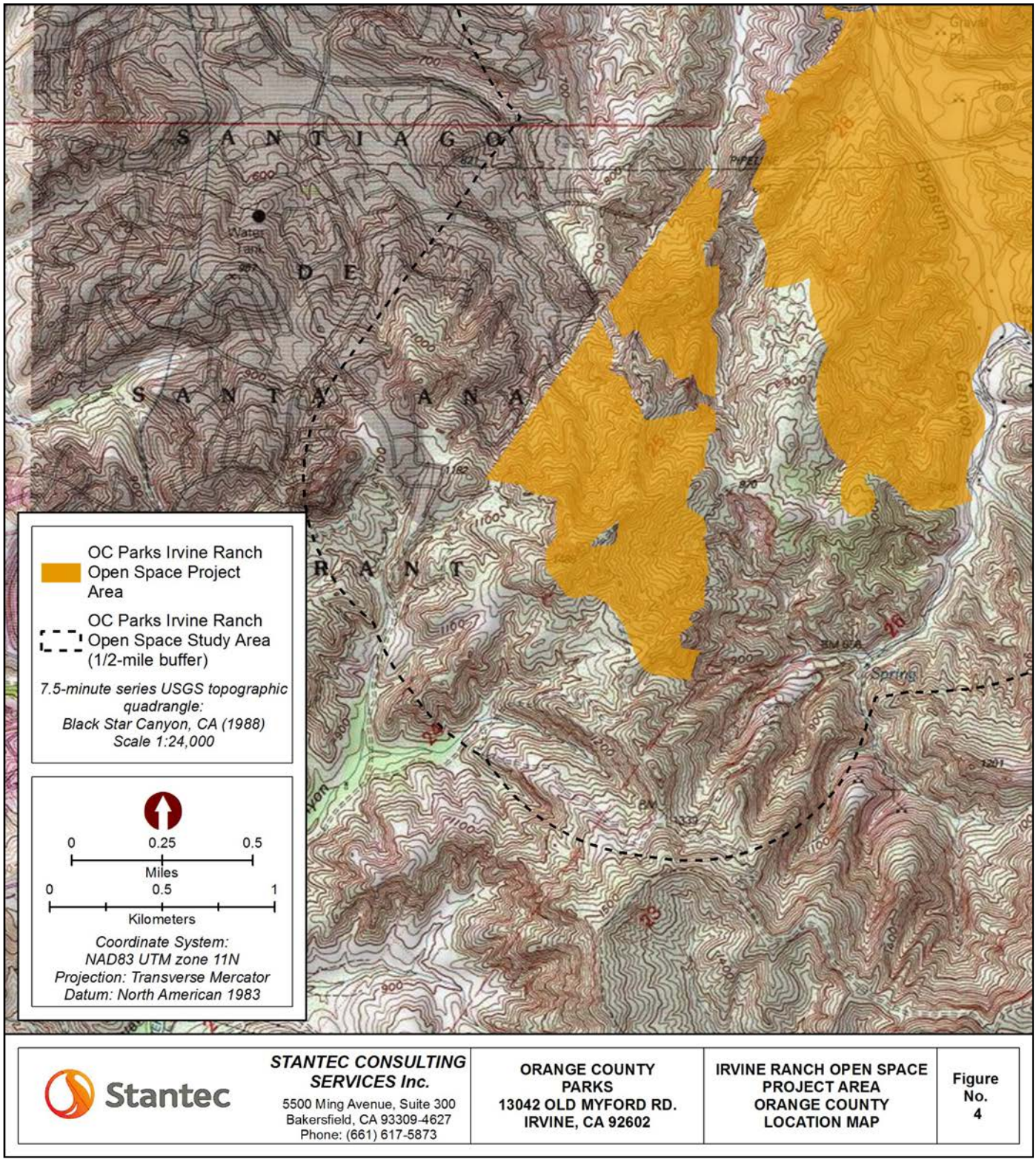


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Ralph Goff, Chairperson
Campo Band of Mission Indians
36190 Church Road, Suite 1
Campo, California 91906

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Ralph Goff,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangles.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

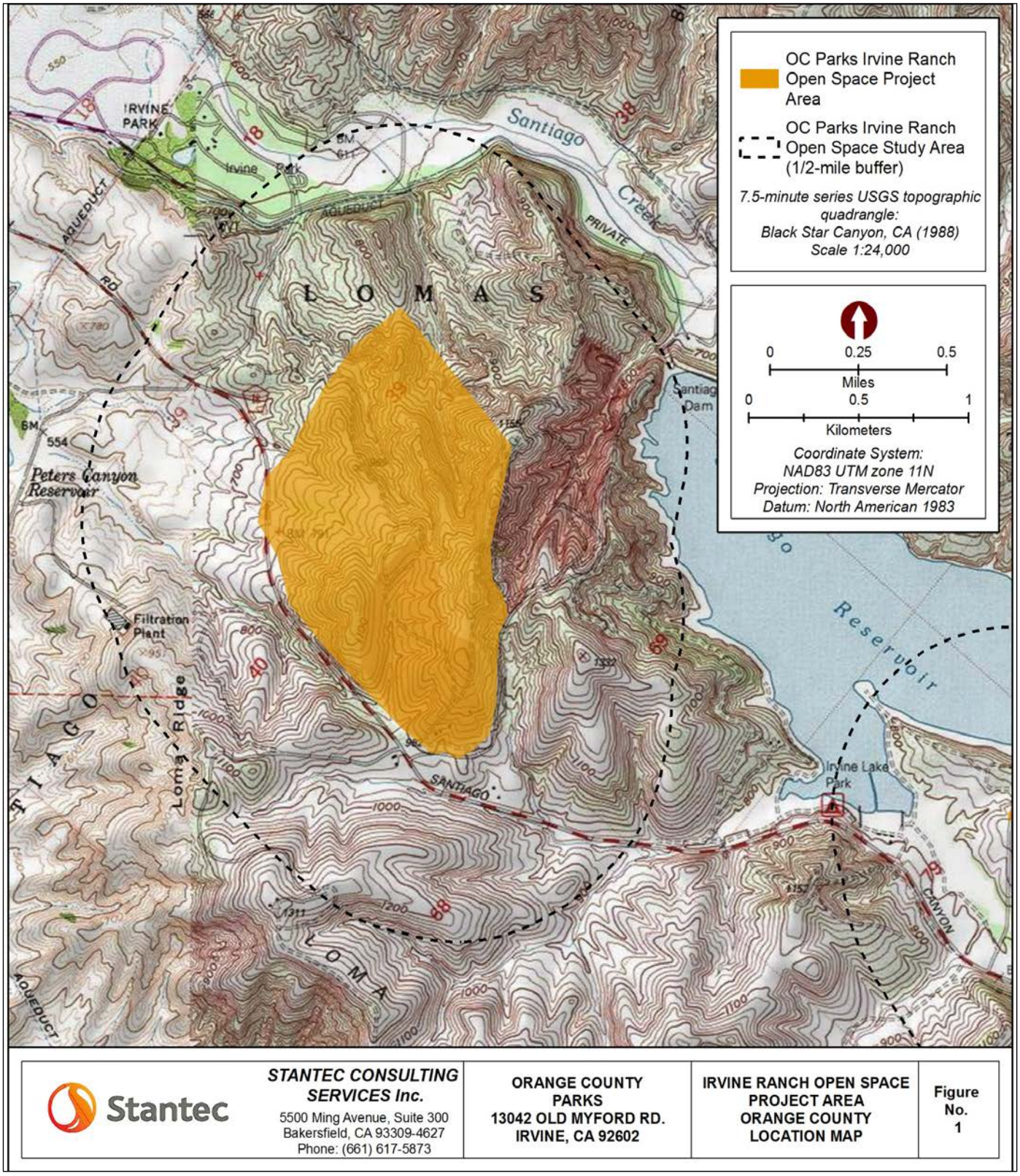


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

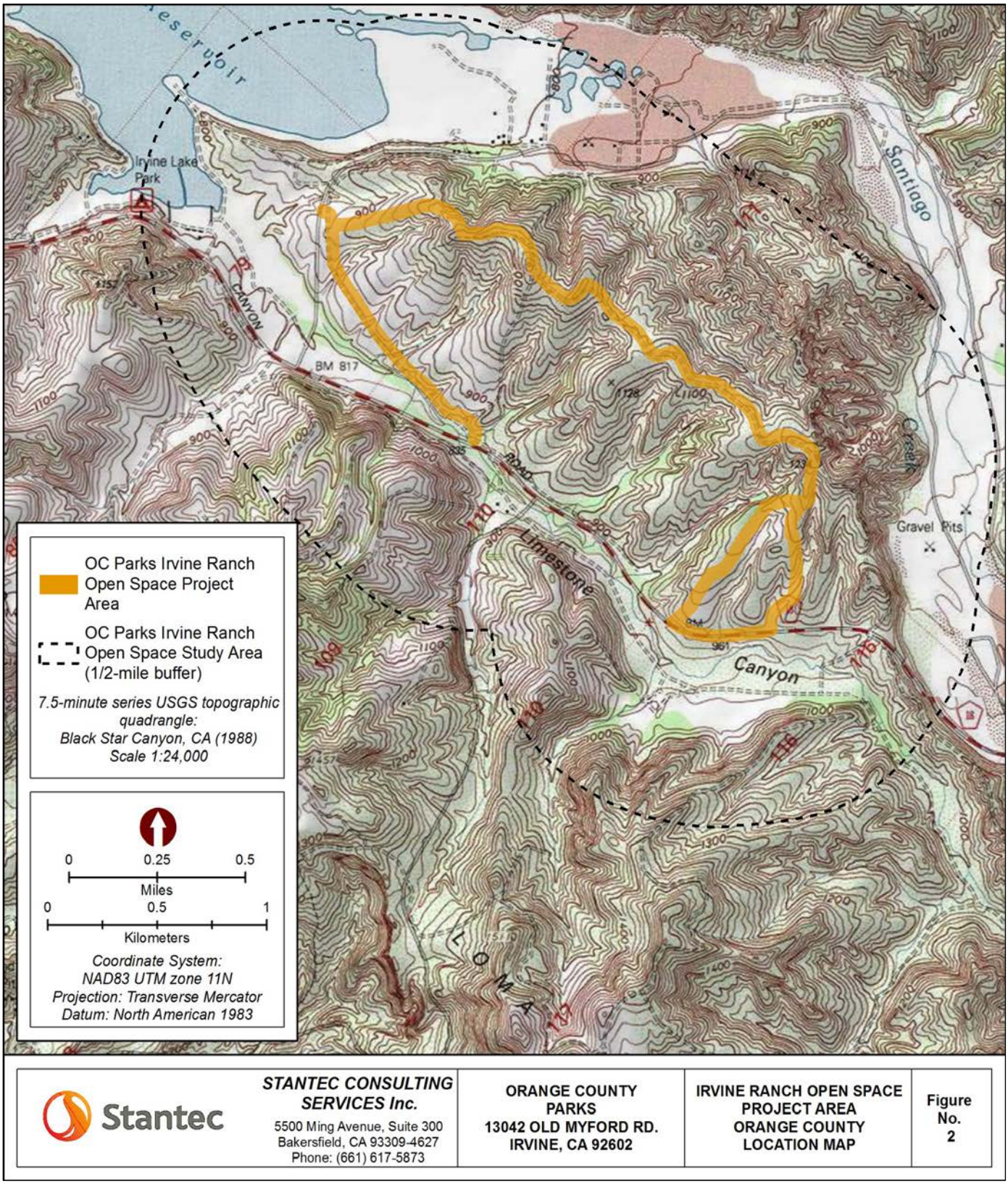


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

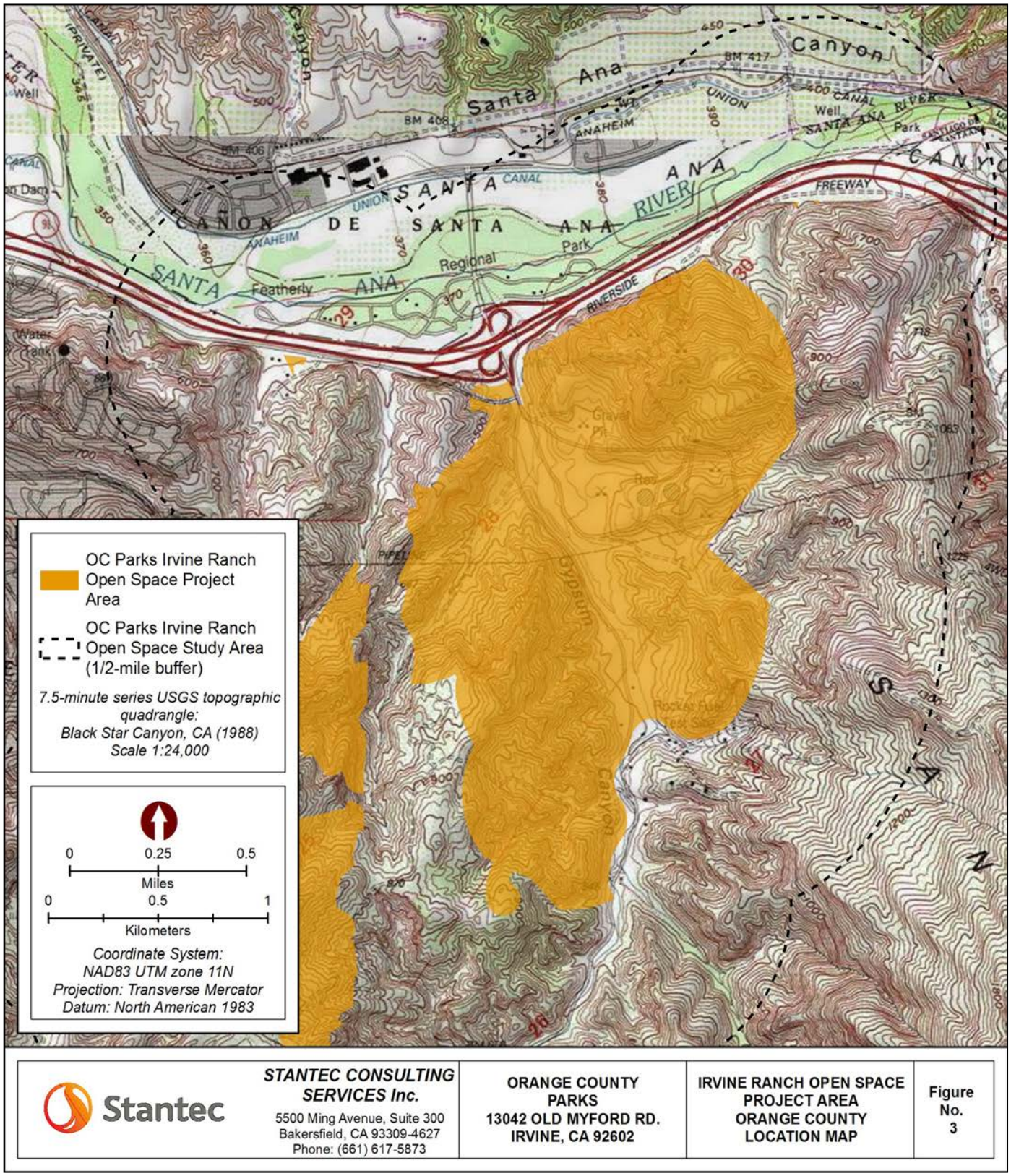


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

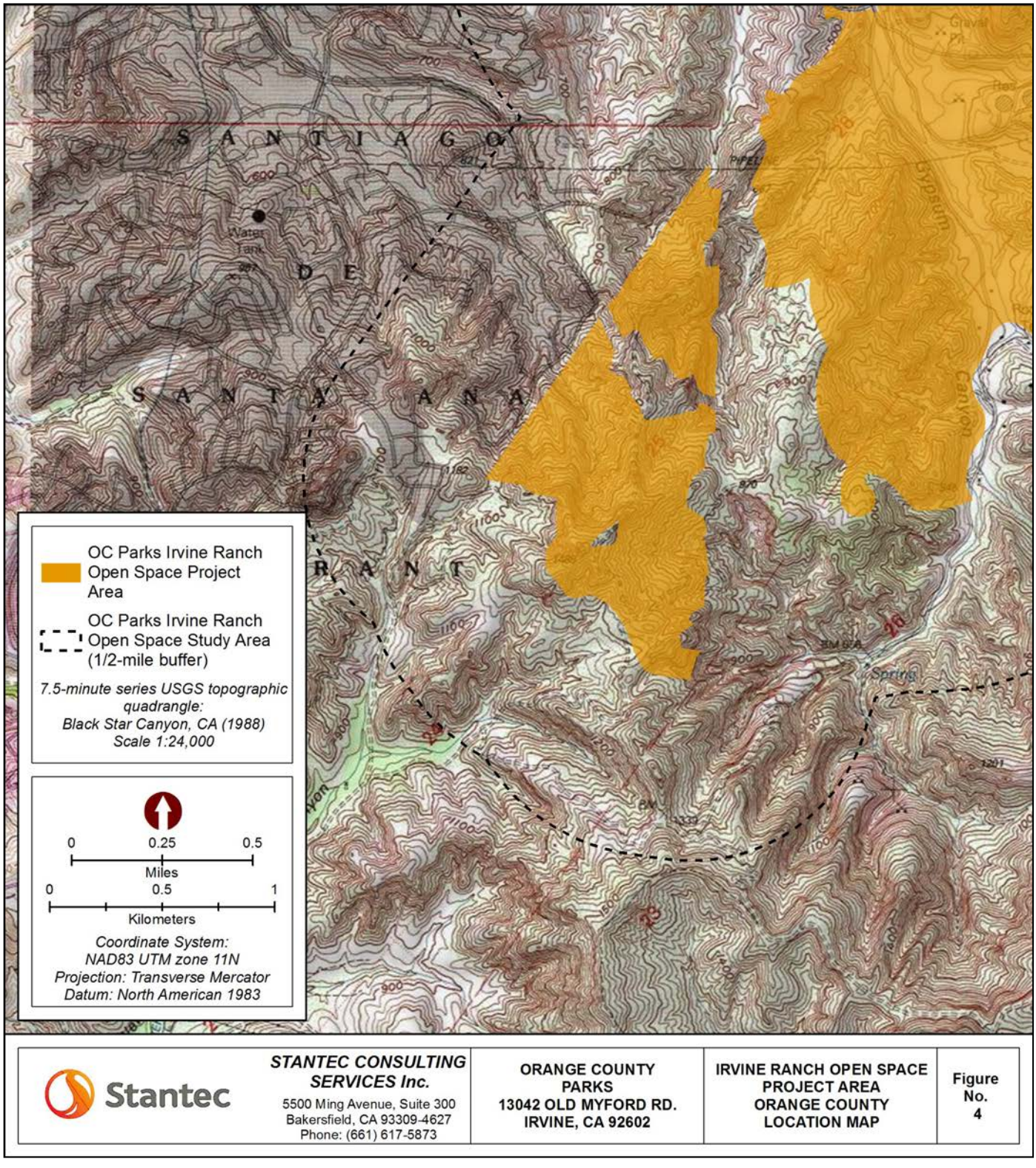


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Ewiiaapaayp Tribal Office
Robert Pinto, Chairperson
4054 Willows Road
Alpine, CA 91901

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Robert Pinto,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

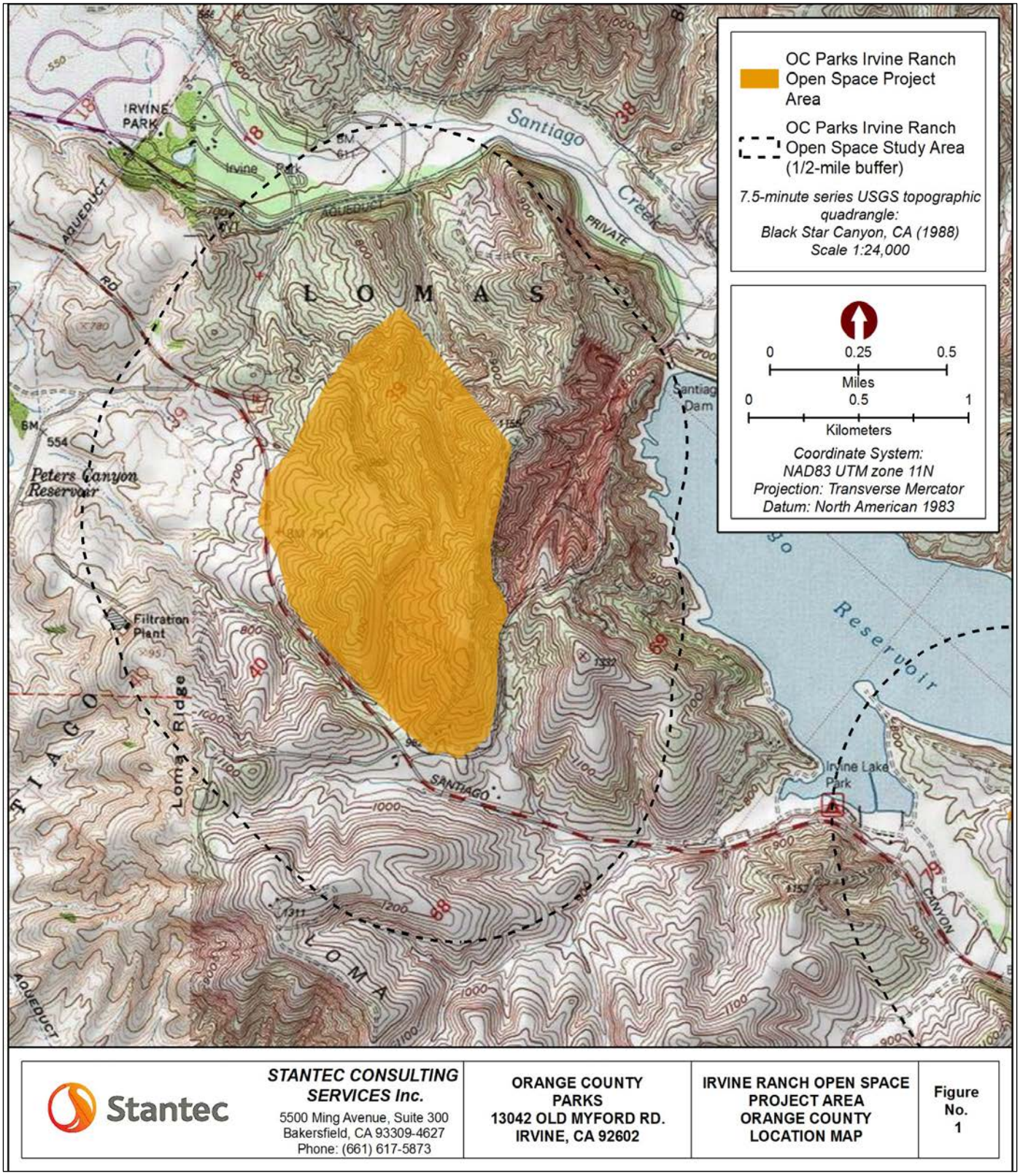


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

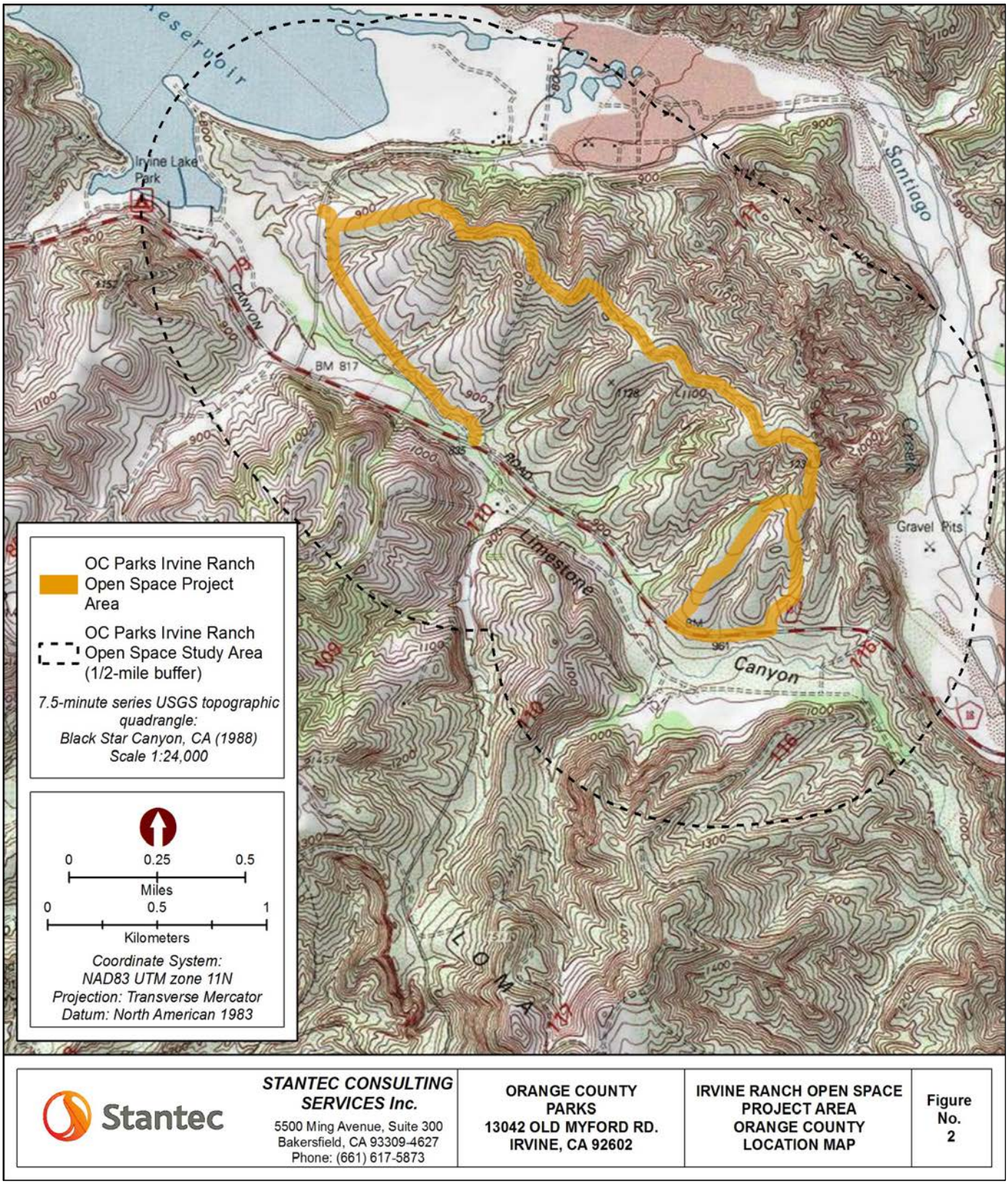


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

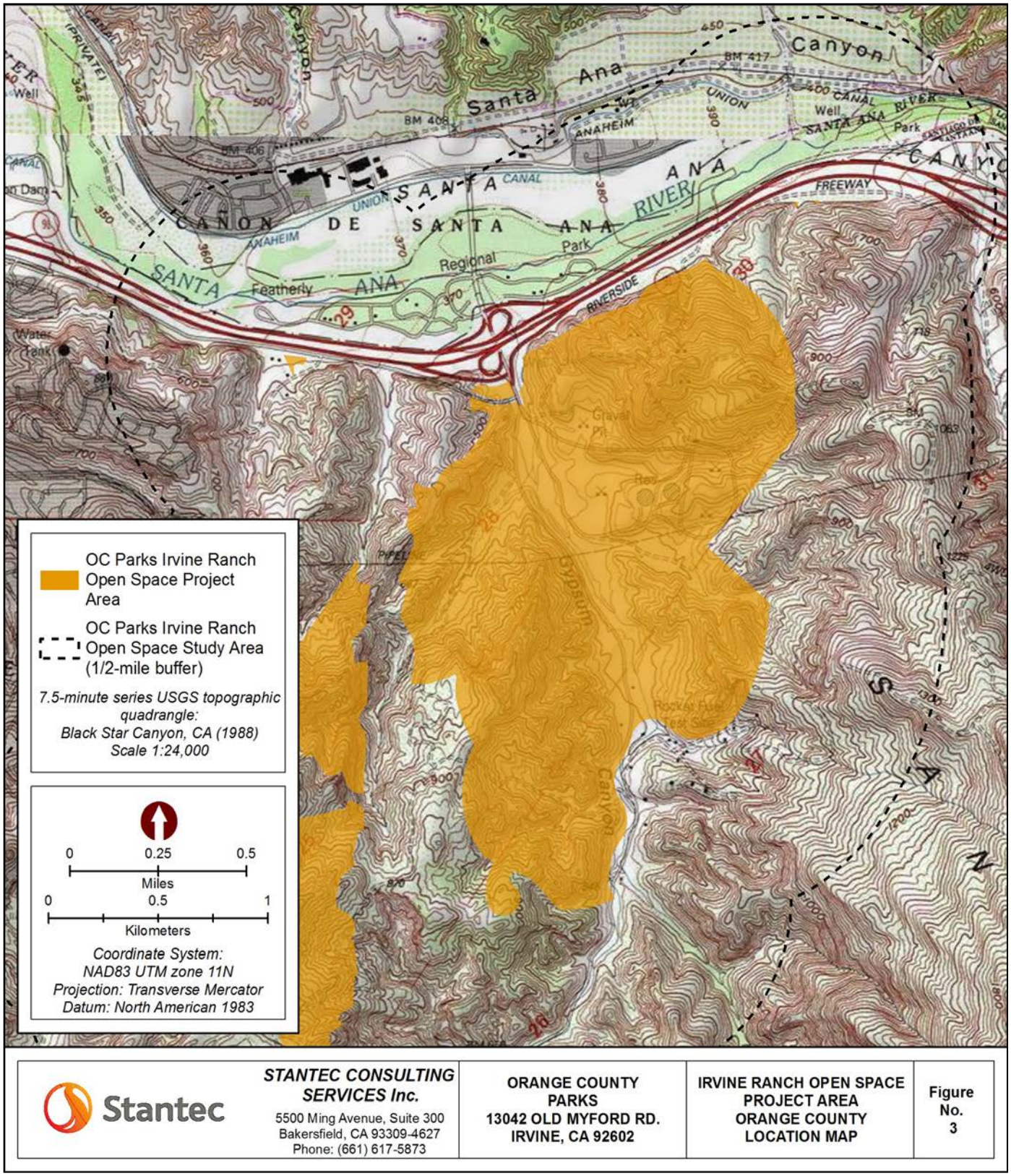


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

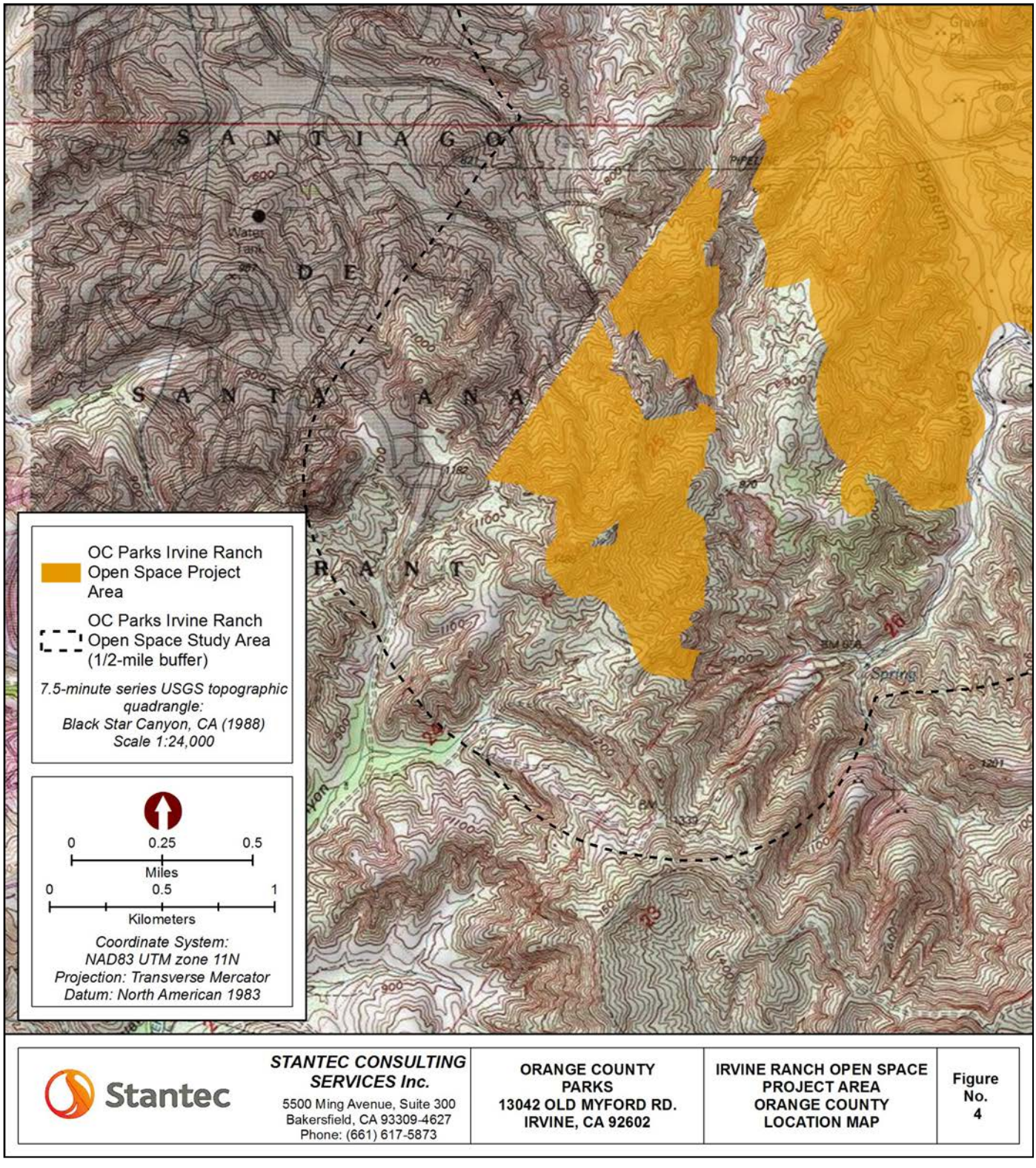


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Viejas Band of Kumeyaay Indians
Robert Welch, Chairperson
1 Viejas Grade Road
Alpine, CA 91901

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Robert Welch,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

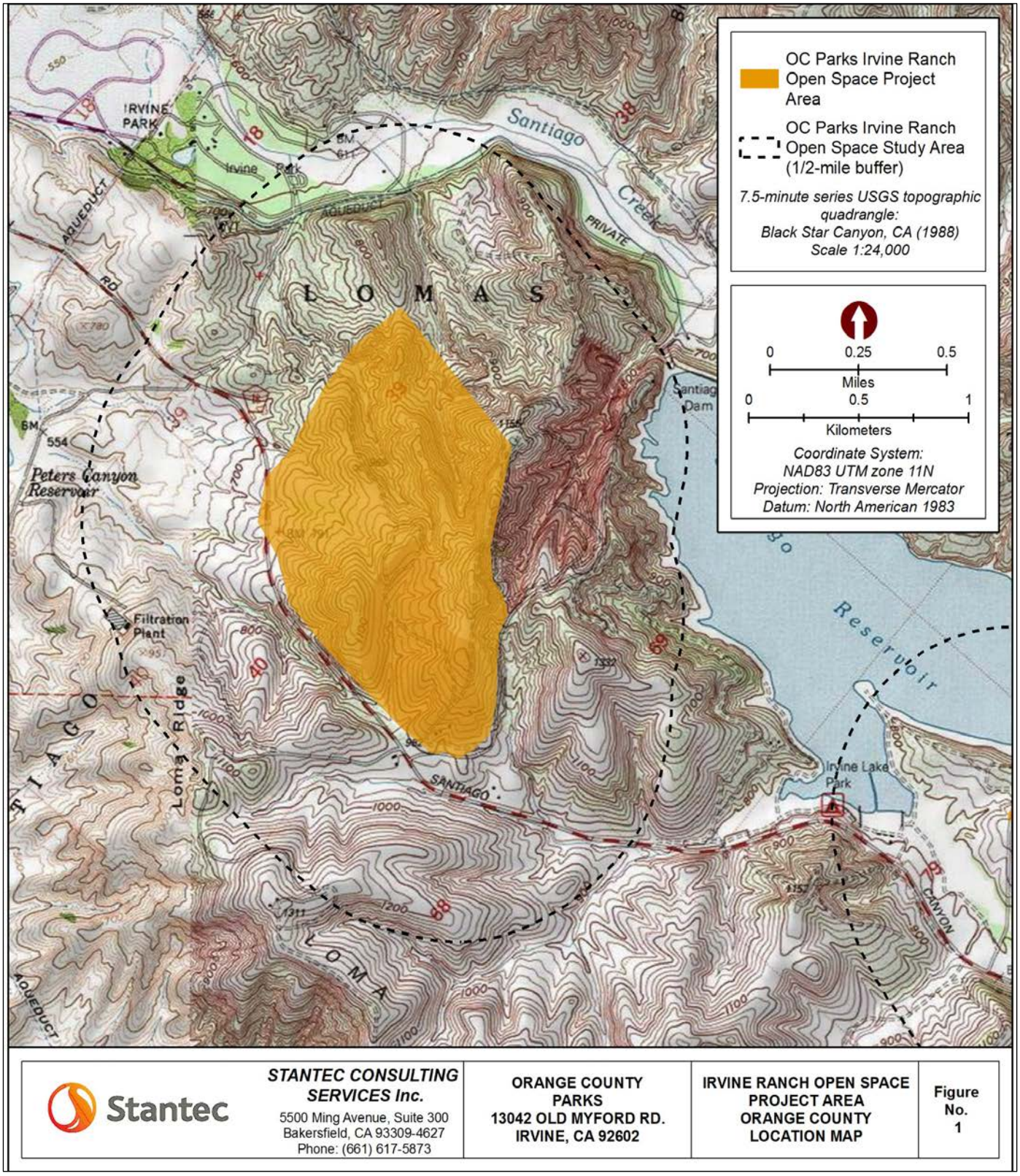


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

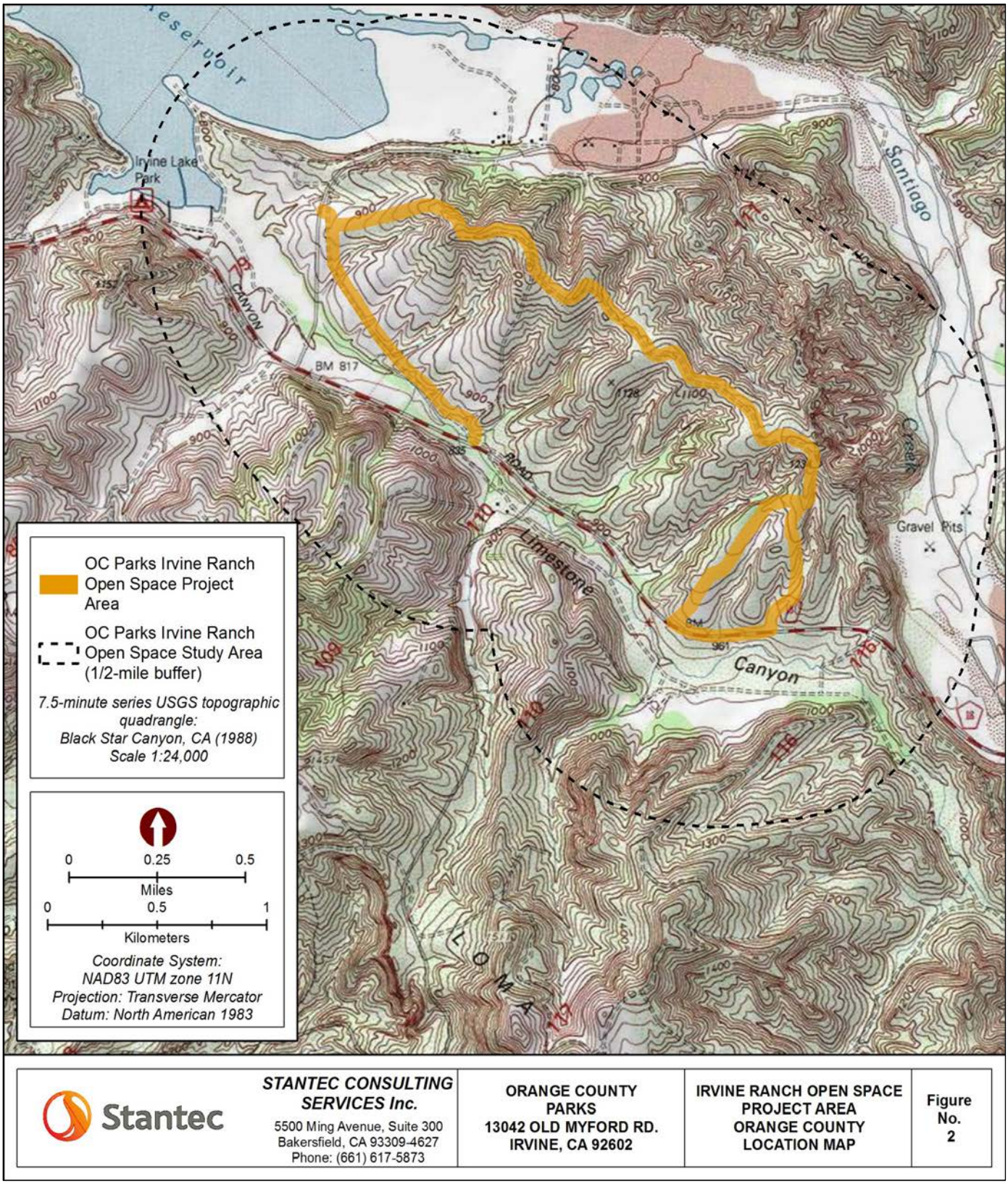


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

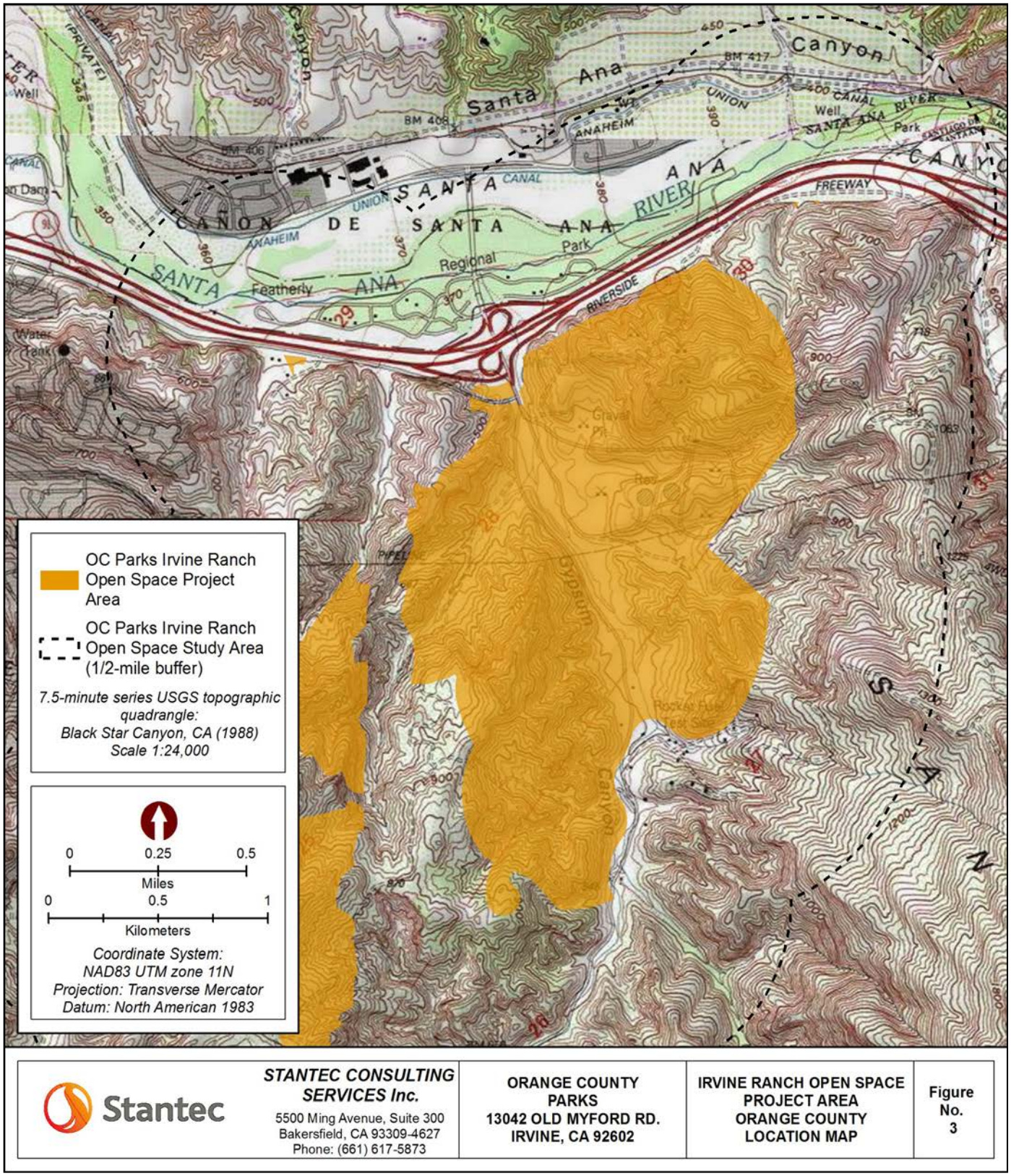


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

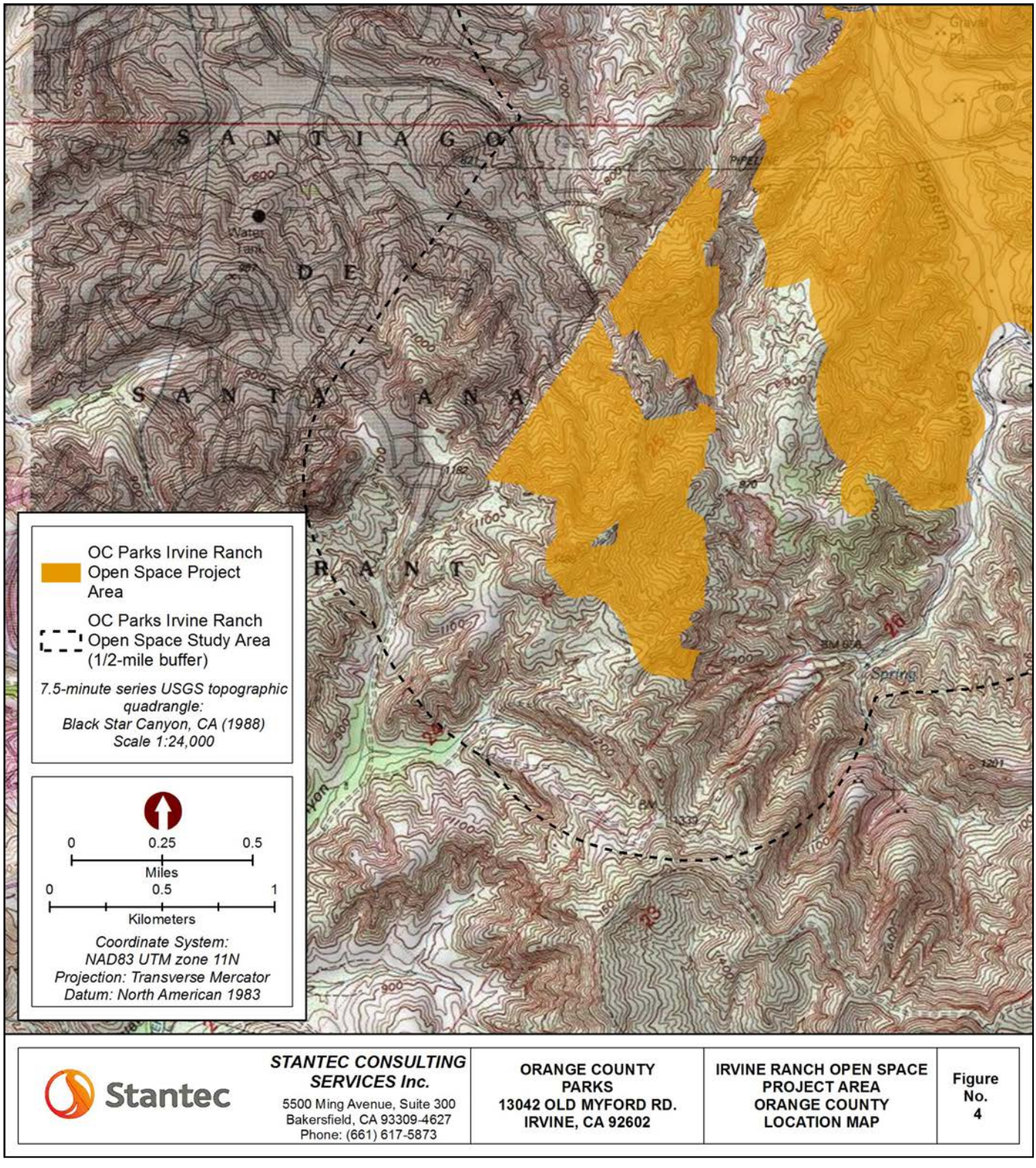


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Gabrielino/Tongva Nation
Sandonne Goad, Chairperson
106 ½ Judge John Aiso St., #231
Los Angeles, CA 90012

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Sandonne Goad,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance. Hope all is good.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

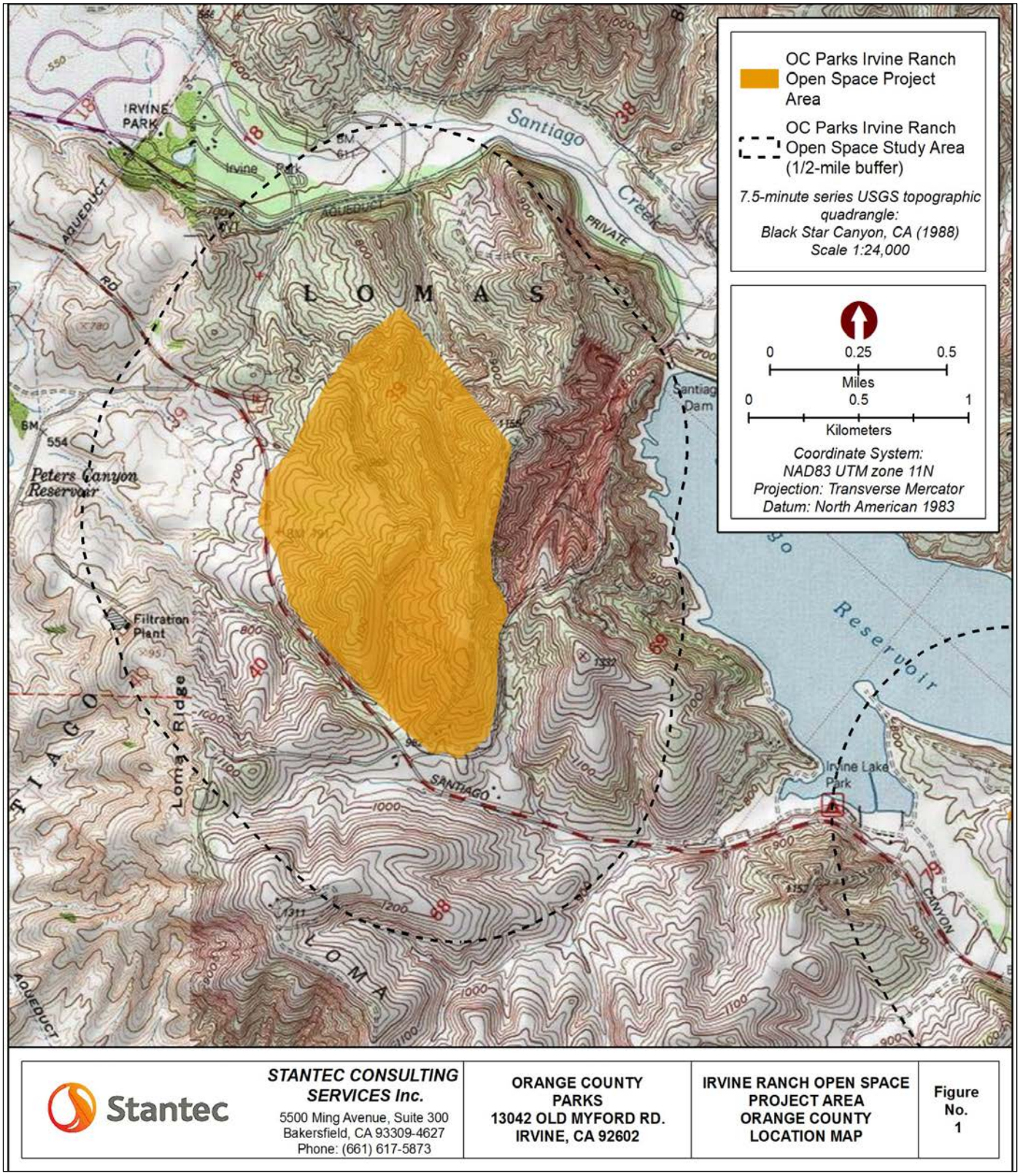


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

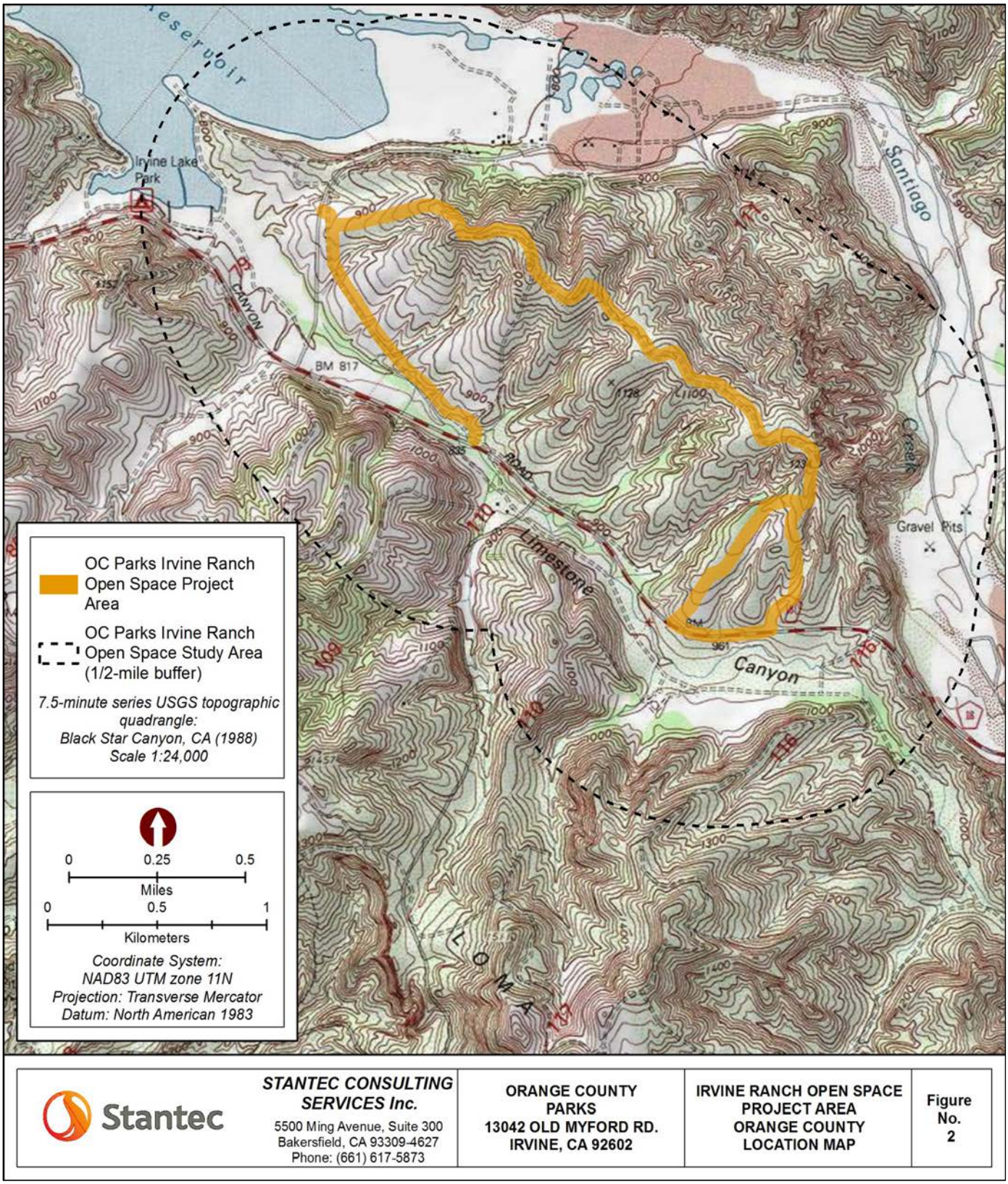


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

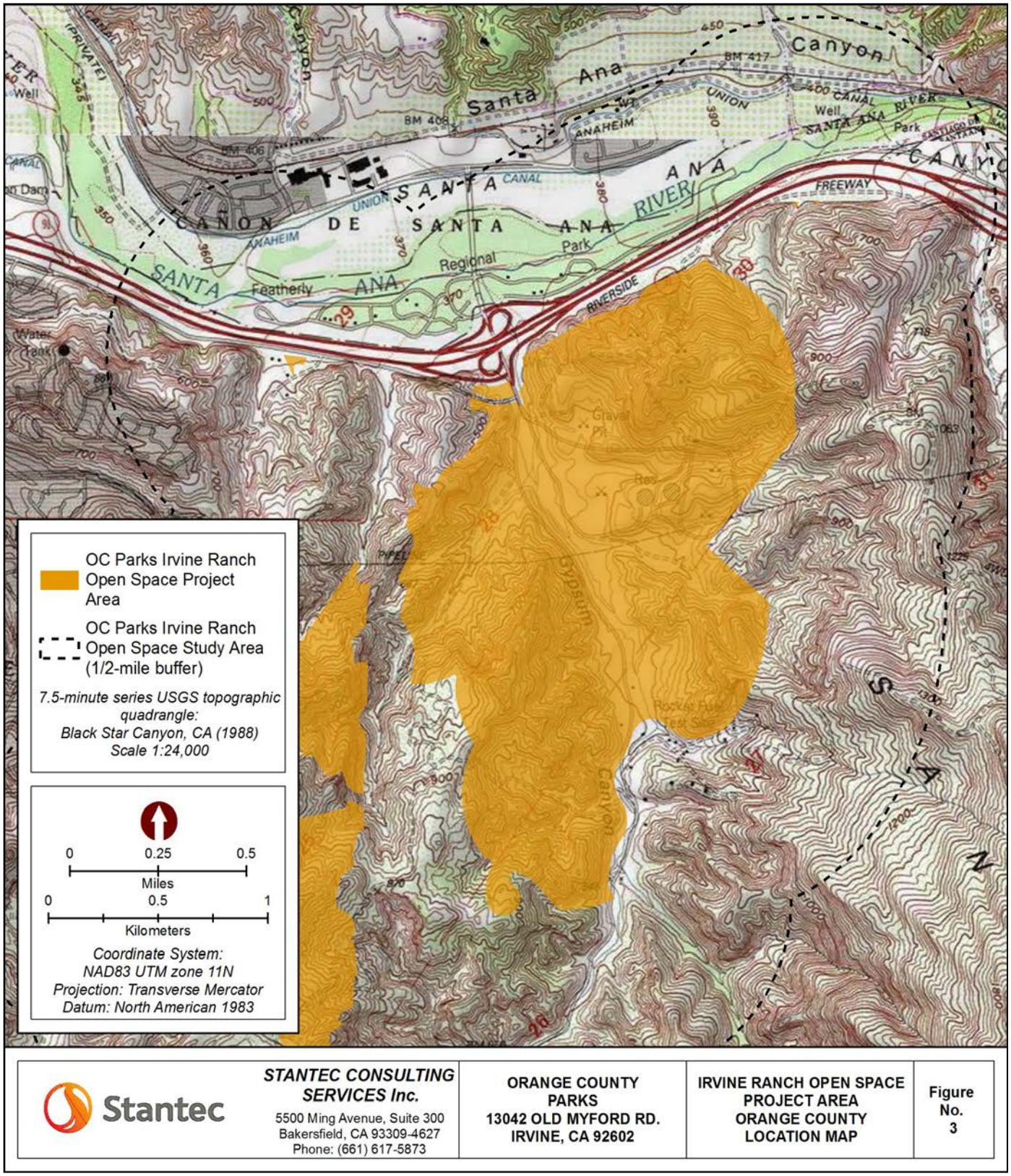


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

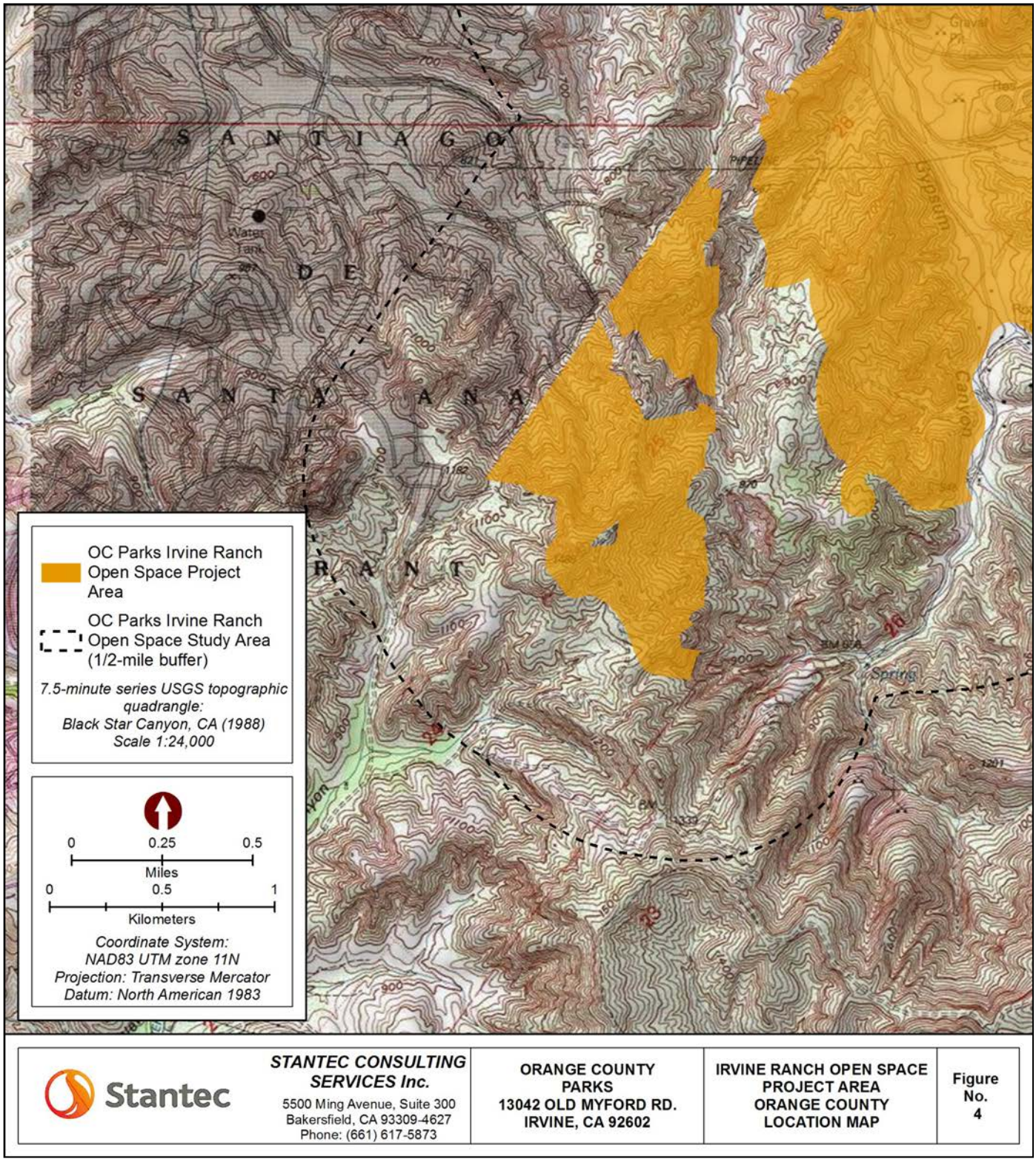


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Juaneno Band of Mission Indians
Sonia Johnston, Chairperson
P.O. Box 25628
Santa Ana, CA 92799

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Sonia Johnston,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

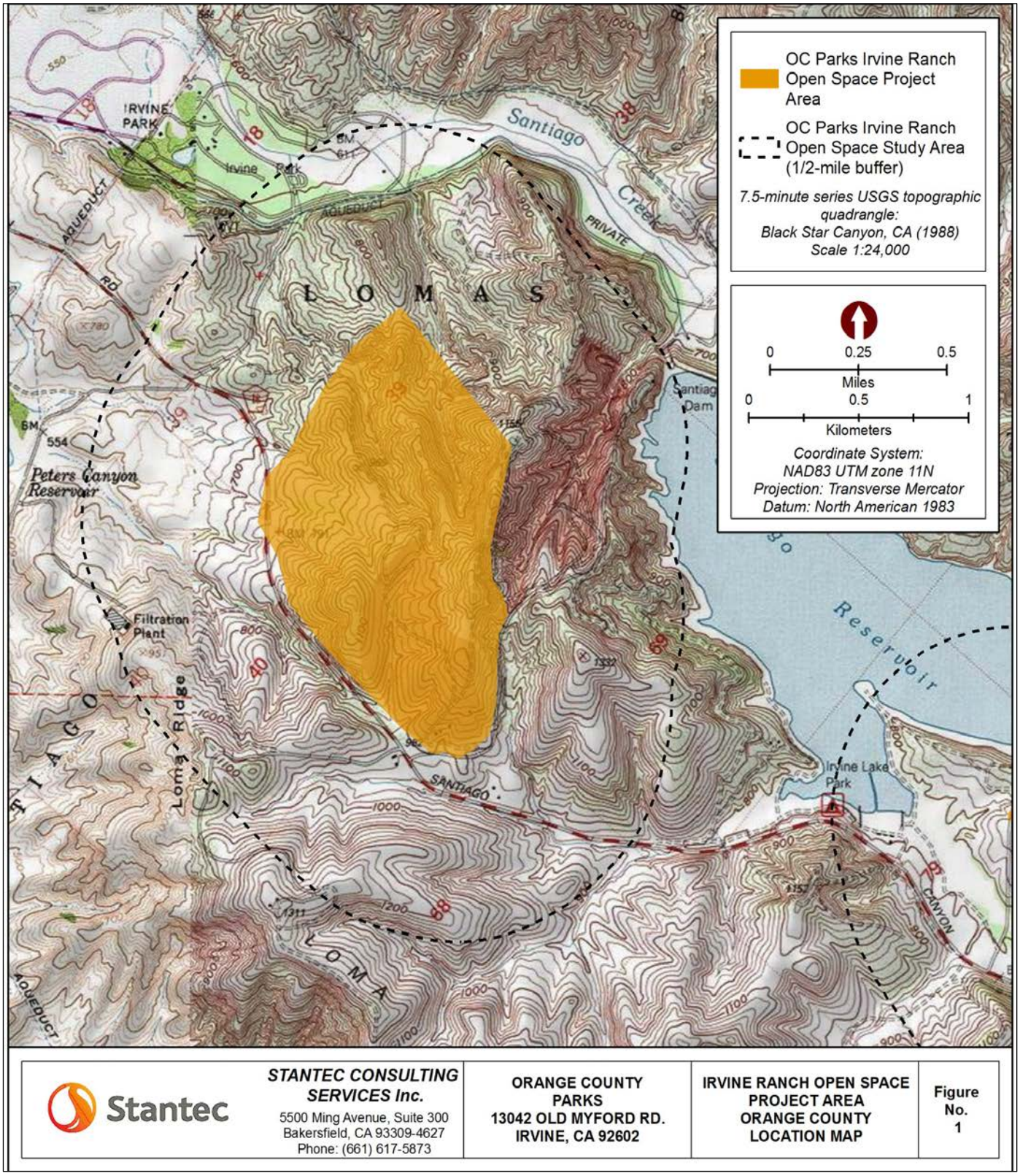


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

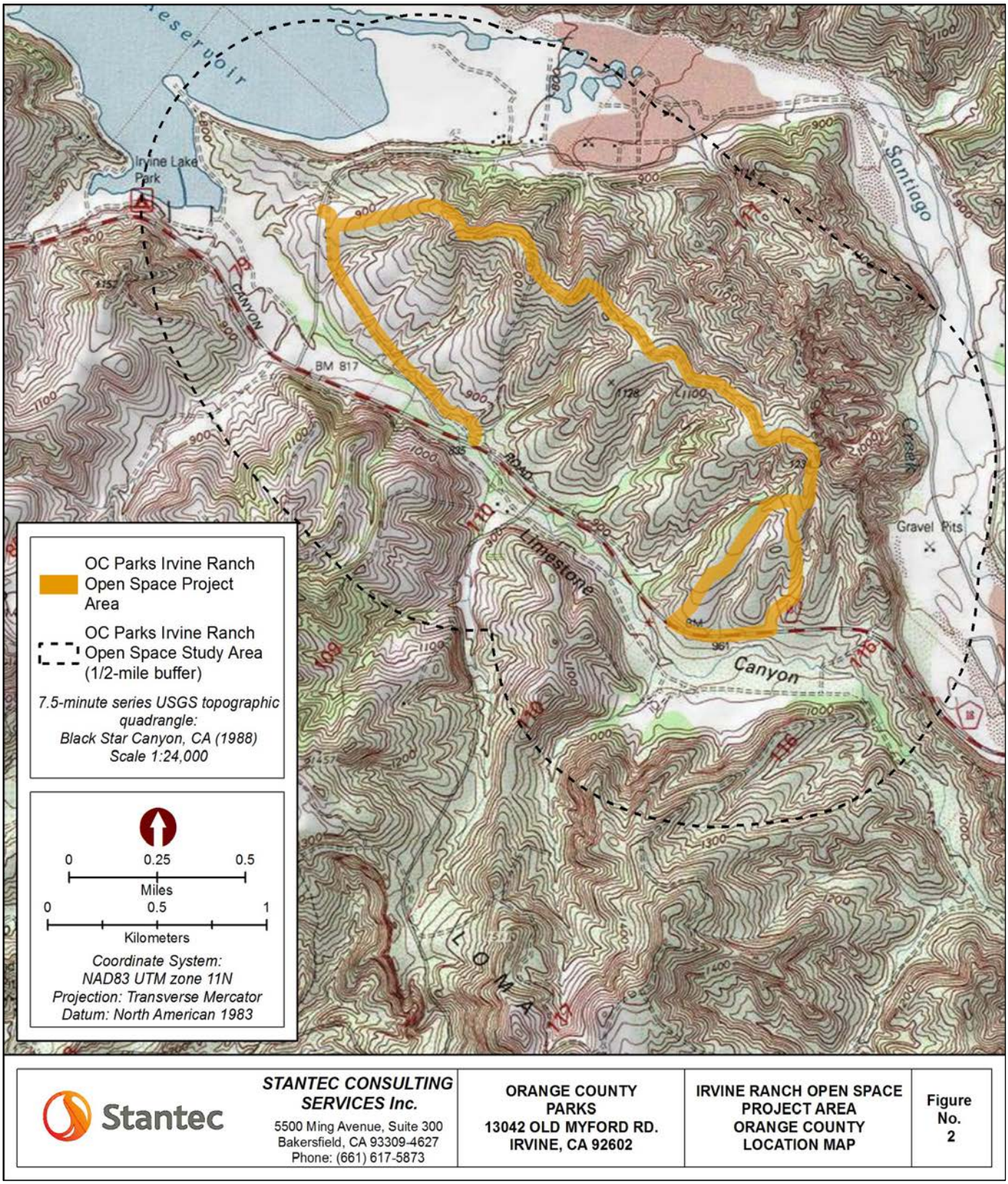


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

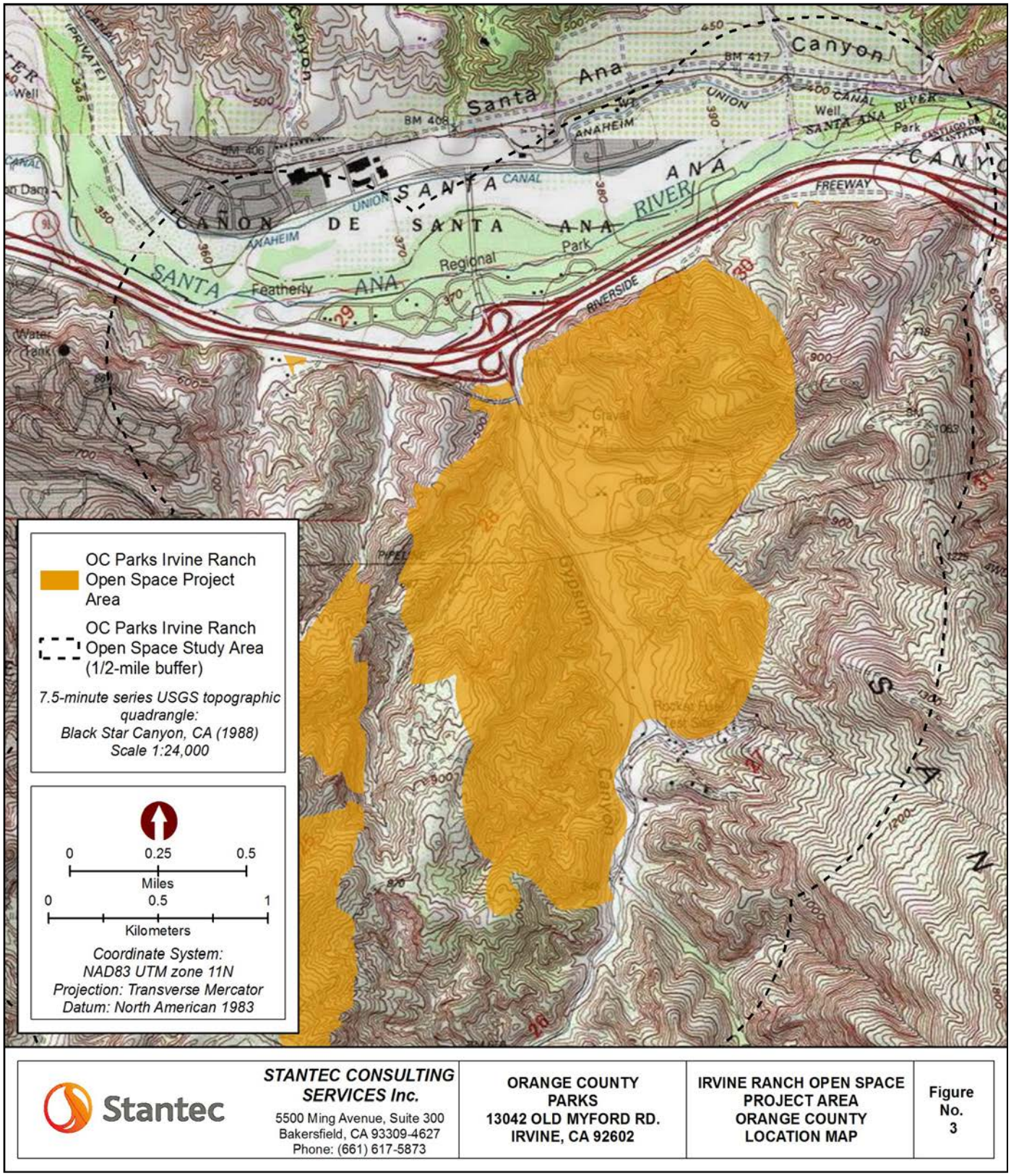


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

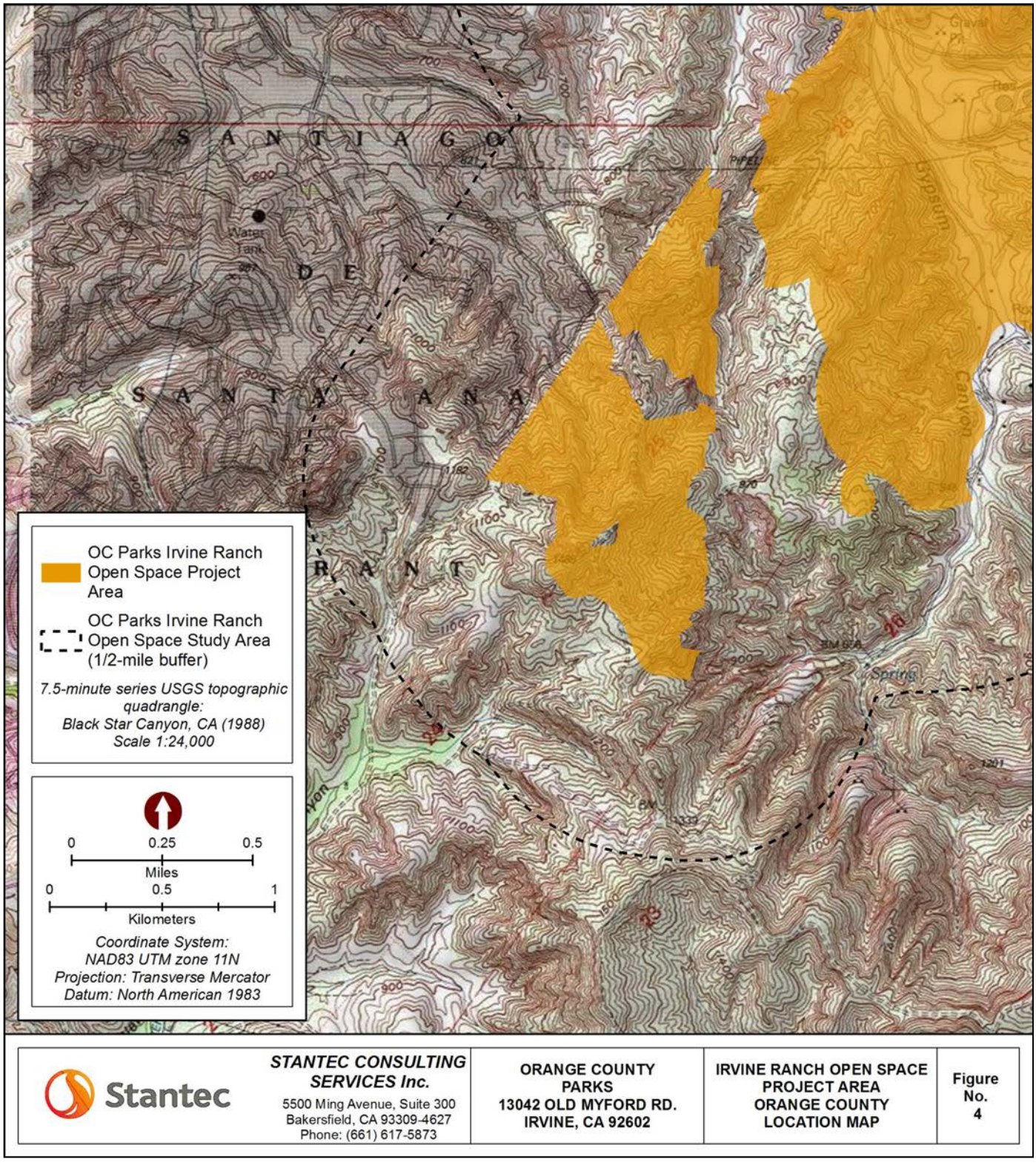


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangle.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Pauma Band of Luiseno Indians – Pauma and Yuima Reservation
Temet Aguilar, Chairperson
P.O. Box 369
Pauma Valley, CA 92061

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Temet Aguilar,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

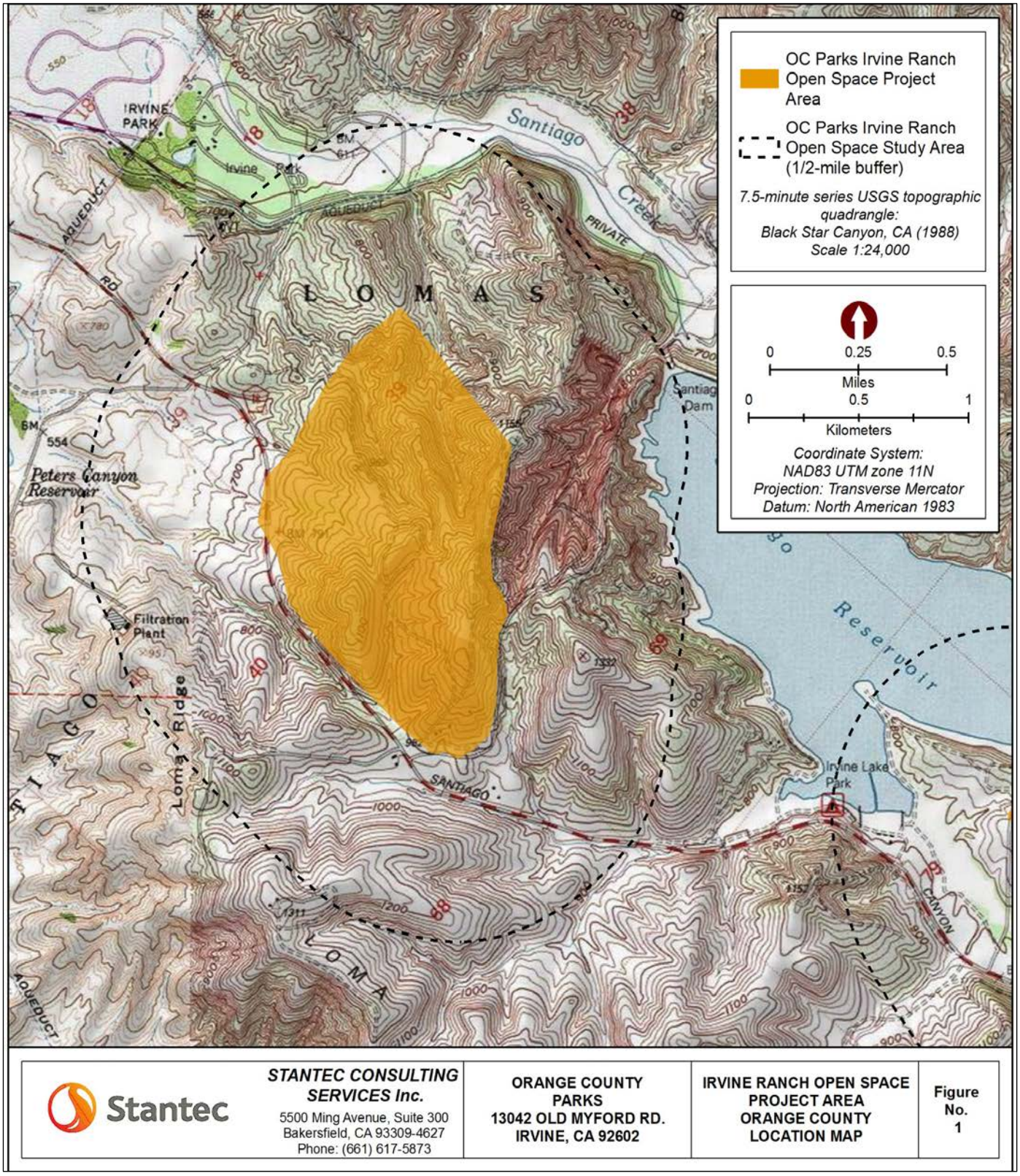


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

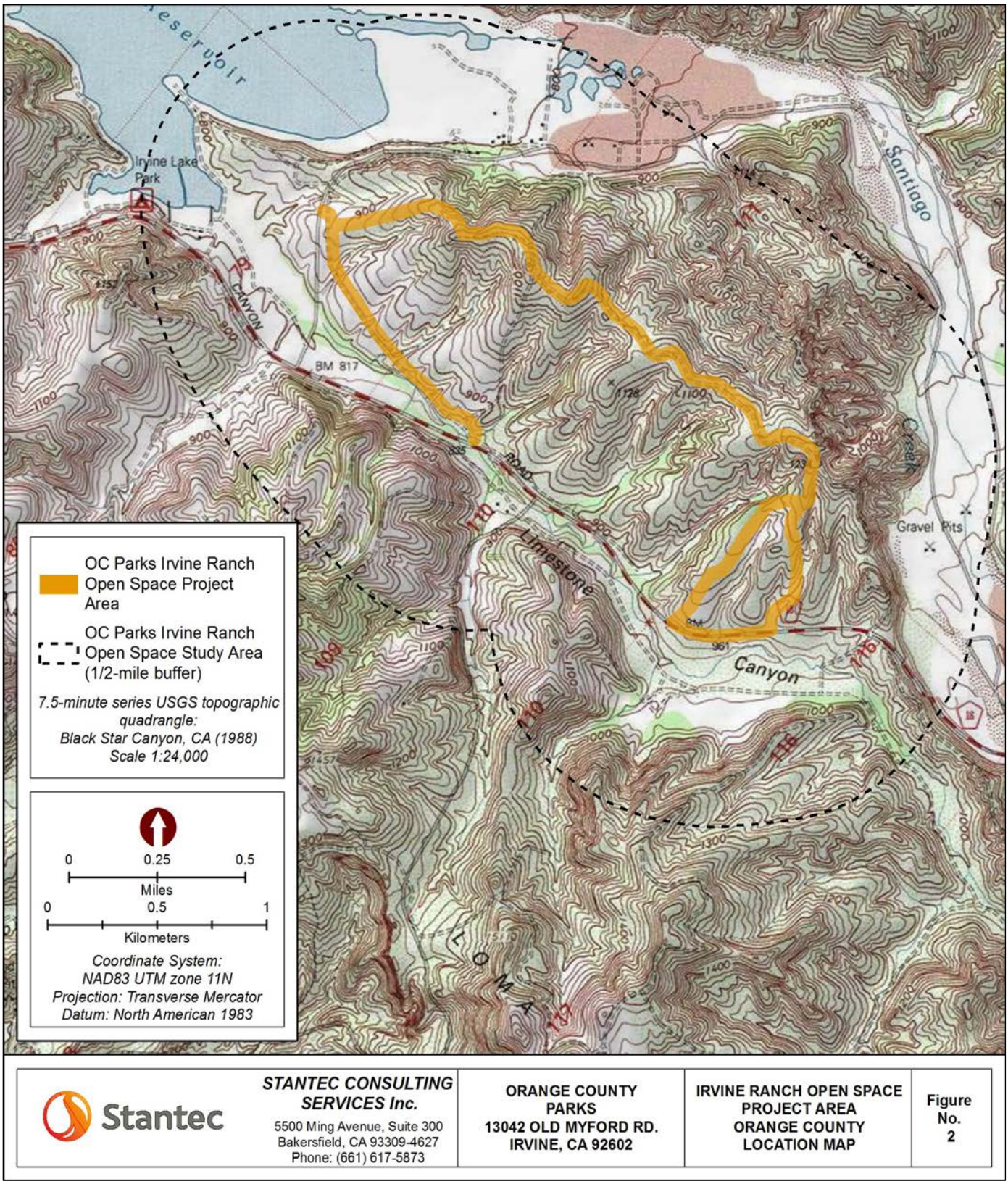


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

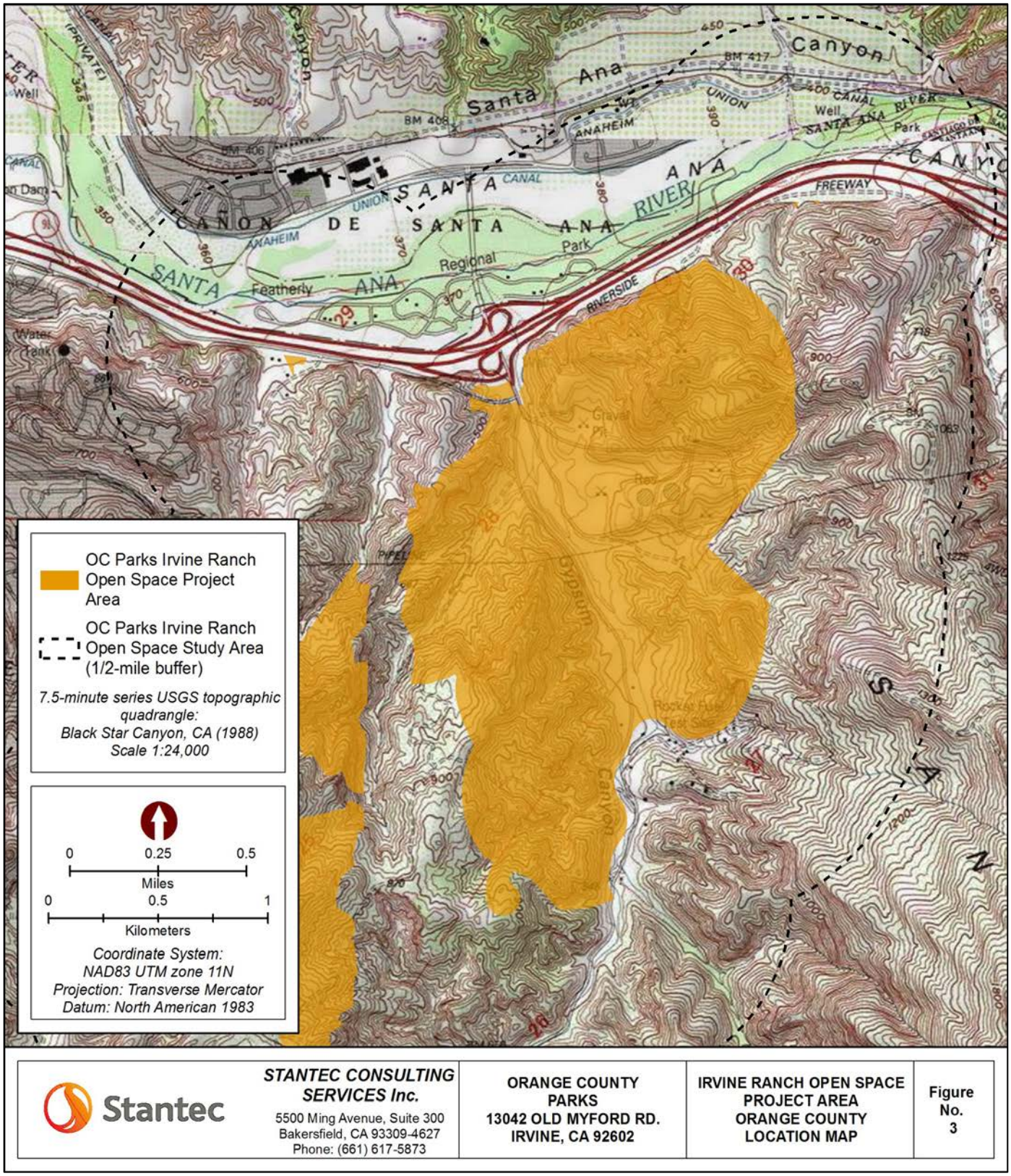


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

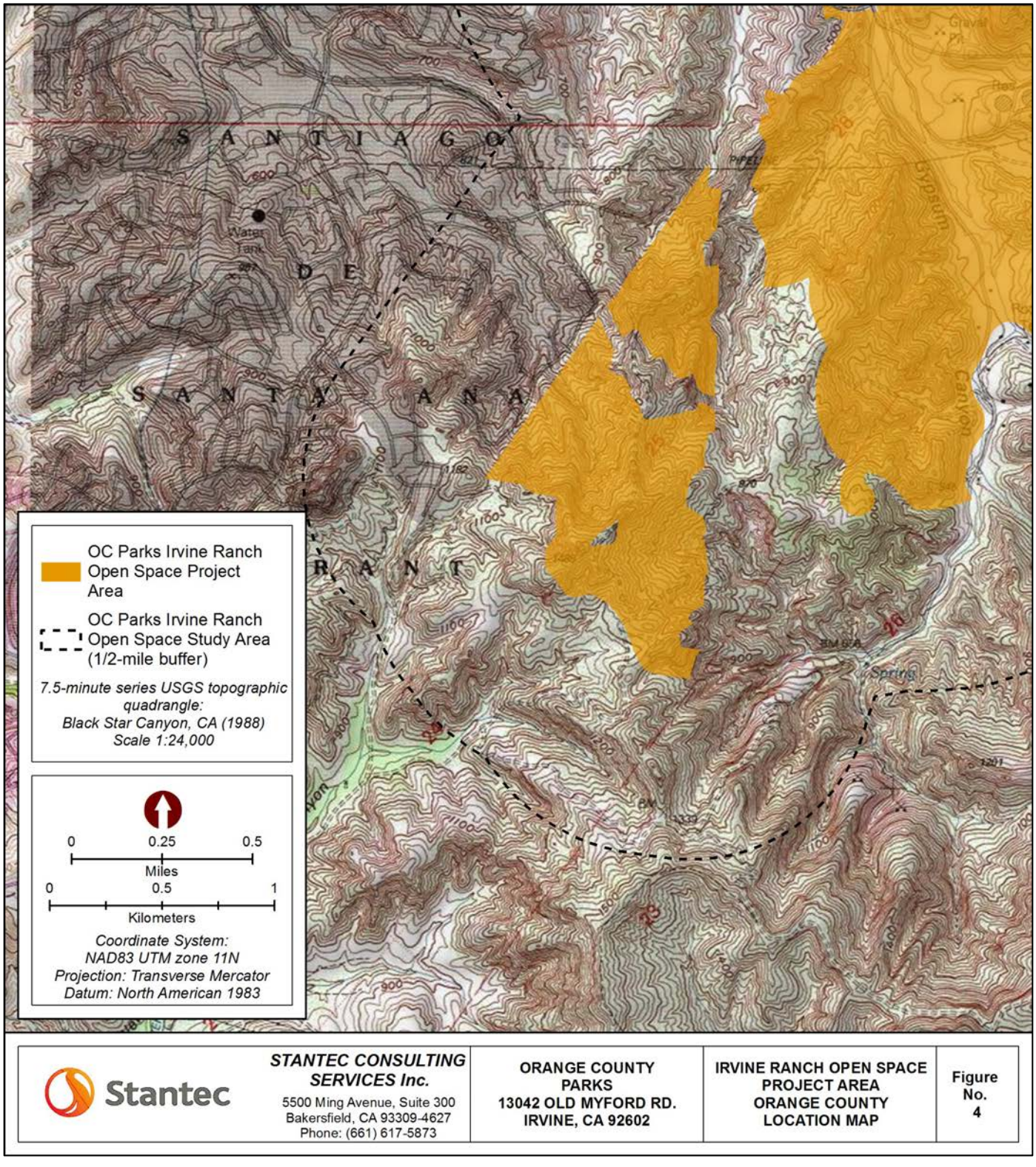


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

April 6, 2018

Juaneno Band of Mission Indians Acjachemen Nation - Romero
Teresa Romero, Chairperson
31411-A La Matanza Street
San Juan Capistrano, CA 92675

Subject: *Sacred Lands File and Native American Contacts List Request on Behalf of Orange County Parks, East Orange 1, East Orange II, and Mountain Park Conservation Easement Staging Area and Trail Improvement Projects, near Irvine and Anaheim Hills, Orange County, California*

Honorable Teresa Romero,

Stantec, on behalf of Orange County Parks, is seeking your assistance with the identification of sites of religious and cultural significance within the above referenced project. The proposed project is located on lands owned and managed by Orange County Parks (OC Parks). Your participation in the early identification of cultural resources will assure consideration of resources during the project planning phase. We welcome your recommendations and comments regarding appropriate management or treatment of resources that occur within the project area.

OC Parks manages over 60,000 acres of regional, wilderness, and historical facilities throughout Orange County. These facilities include parks, open spaces, as well as shorelines, which are enjoyed by millions of local residents and visitors each year. In 2014, through a gift of the Irvine Company, the County of Orange is the recipient of nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The property is located in north-central Orange County and is adjacent to several existing Orange County regional parks managed by OC Parks. This generous contribution of land adds some of the most scenic and unspoiled land in Orange County to OC Parks' current property inventory of nearly 39,000 acres. OC Parks is proposing to conduct improvement within portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, while the remaining properties will be maintained as is, until the Recreation and Resource Management Plan (RRMP) is prepared.

A Sacred Lands File Search conducted by the NAHC identified sites located within the APE that may be impacted by the project and recommended we reach out to your Tribe. We look forward to hearing from you so we can discuss what OC Parks can do to best address your concerns.

East Orange I

East Orange I includes approximately 363.5 acres of land. Proposed improvements include the development of a staging area and trail that will be contained within disturbed areas from the past uses. The staging area will include a decomposed granite parking lot, American with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The proposed trail will follow existing routes that were created when this portion of the property was used as a motocross racetrack known to local motorcycle enthusiasts as Saddleback Raceway.

East Orange II

The East Orange II project includes approximately 92.3 acres of land (3.9 miles) of the existing fire road/trail system situated within portions of East Orange II Conservation Easement. Proposed improvements will include the development of a trail which will be contained within disturbed areas from past and current uses. The trail will follow existing fire roads. The existing Augustine Staging Area within Limestone Canyon will serve as the access point to the existing fire road/trail system that is currently maintained for fire access and use of these areas would not require additional maintenance above and beyond that required to maintain current access. Activities planned for the Augustine Staging Area will follow current uses of a parking lot and picnic area.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Mountain Park

Mountain Park includes approximately 1040 acres of land. Improvements will include the addition of a concrete pad within the existing gravel parking lot to support ADA accessible parking, portable restrooms, and signage. A current social trail along the residential development in the eastern portion of the property shall be maintained as a "beta trail", connecting Oak Canyon Drive to South Weir Canyon Road.

Enclosed for ease of reference are the maps of the proposed project areas depicted on the Black Star Canyon USGS 7.5-minute series topographic quadrangle.

If you have questions, need additional information, or wish to comment, please contact Stantec Cultural Resource Specialist, Victoria Harvey, whose contact information is provided below.

Victoria Harvey, MA, RPA
Stantec Cultural Resources Specialist
Work: 661-396-3770
Cell: 661-549-8702
Email: Victoria.Harvey@stantec.com
Address: 5500 Ming Ave #300
Bakersfield, CA 93309

Thank you for your time and assistance.

Sincerely,

Victoria Harvey

Victoria Harvey, M.A., R.P.A.
Stantec Consulting Services, Inc.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

Project Summary

Project: East Orange I, East Orange II, and Mountain Park Conservation Easement, Orange County Parks

County: Orange County

USGS Quadrangle Name: Black Star Canyon, CA (7.5-minute)

Sections: Unsectioned portion of the Rancho Lomas De Santiago Land Grant.

East Orange 1: Located between Santiago Canyon Road and Irvine Lake

East Orange 2: Located southeast of Irvine Lake and north of Santiago Canyon Road

Mountain Park: Located in the northwestern extent of the Santa Ana Mountains approximately where the 241 Toll-road meets the 91 Freeway

Project Description: Improvements that will include packed dirt parking area, ADA approved access areas, trail improvements to existing routes, portable restrooms, and new signage.

Consulting Firm: Stantec Consulting Services, Inc.

Contact Person: Victoria Harvey

Street Address: 5500 Ming Avenue, Suite 300

City: Bakersfield Zip: 933309-4627

Phone: 661.885.3016

Fax: 661.396.3771

Email: Victoria.Harvey@stantec.com

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

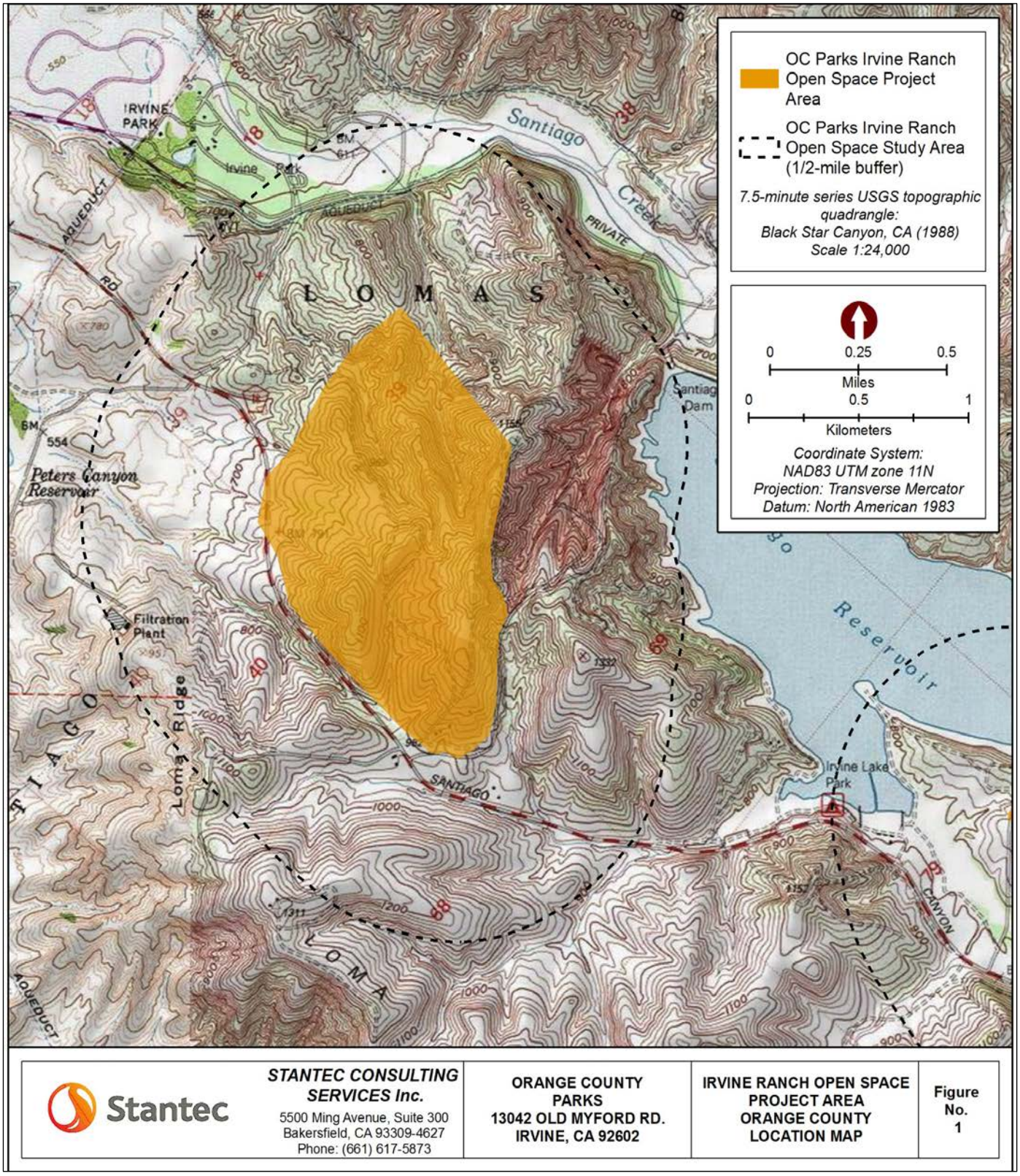


Figure 1. East Orange I Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

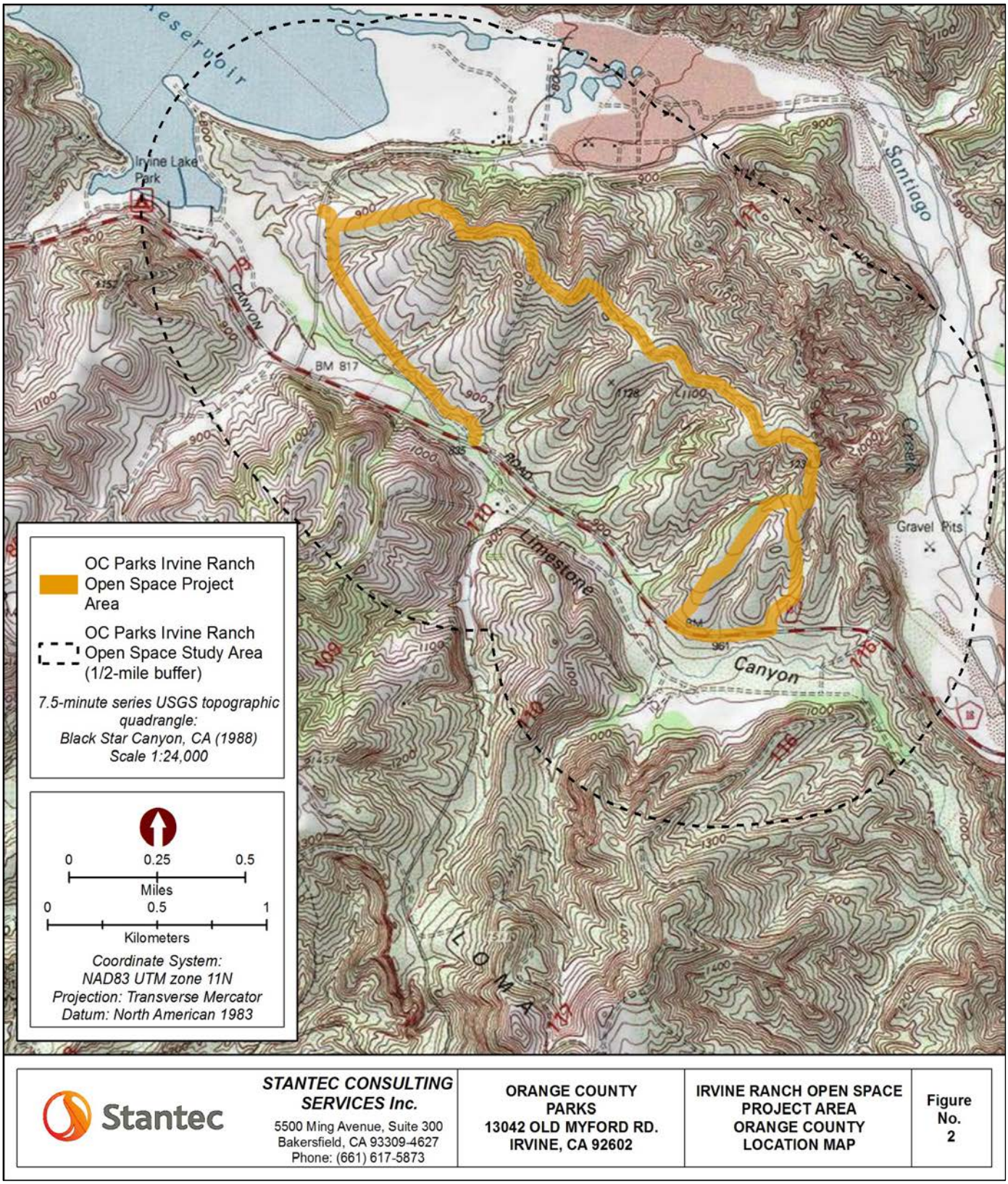


Figure 2. East Orange II Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

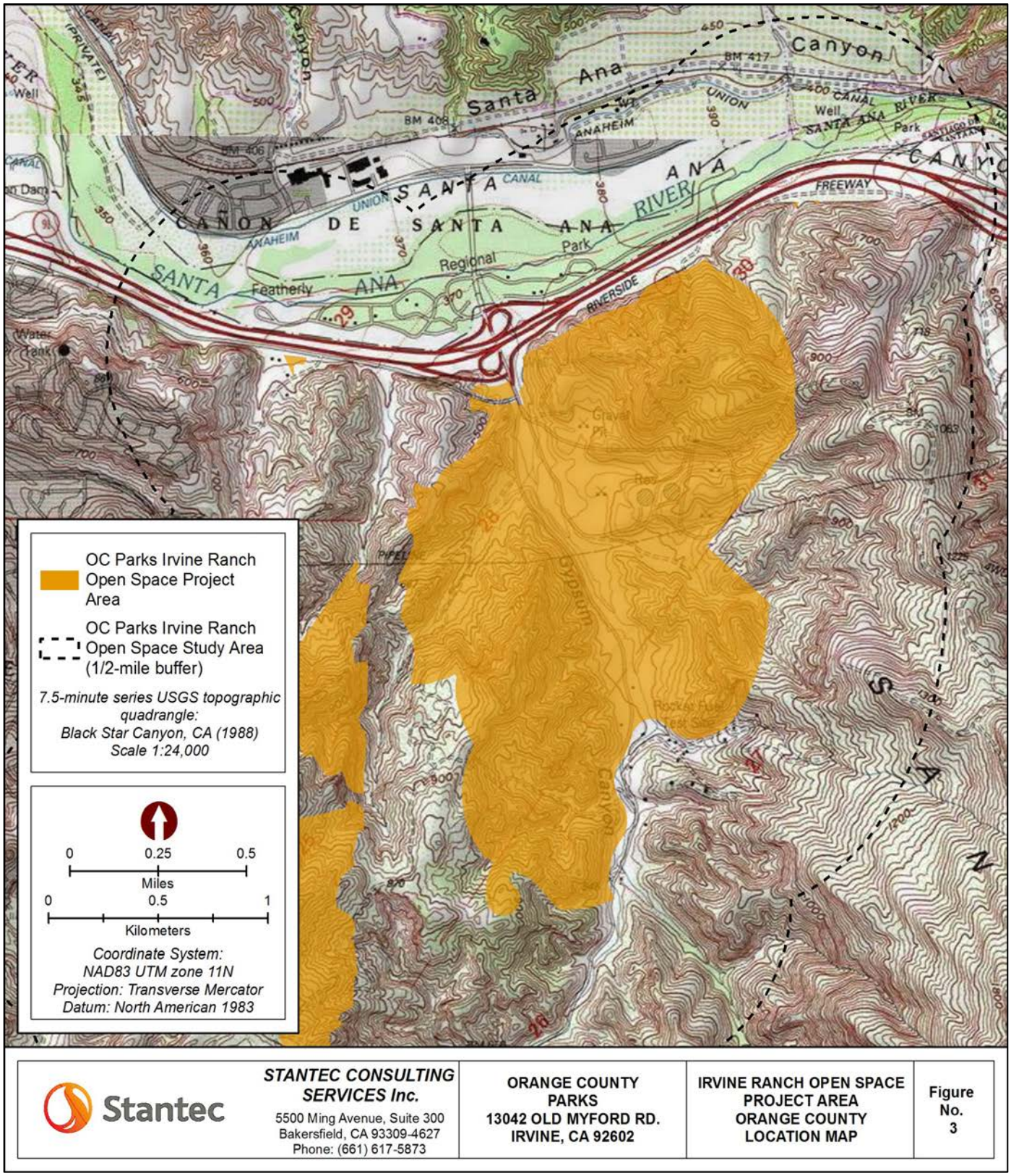


Figure 3. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

Stantec Consulting Services Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309-4627
Tel: (661) 617-5873
Fax: (661) 396-3771

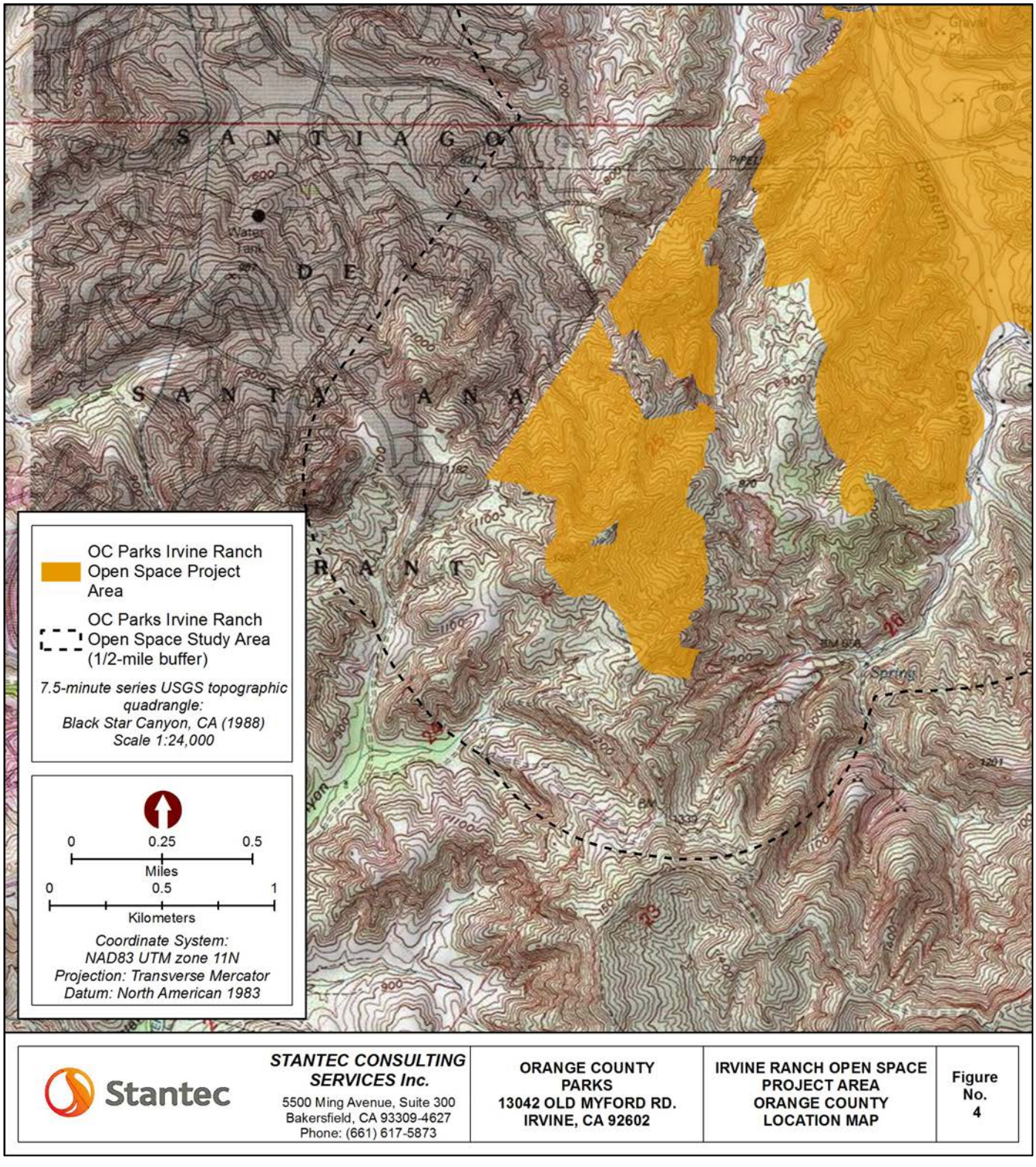


Figure 4. Mountain Park Project Area depicted on the Black Star Canyon, CA (1988) USGS 7.5-minue series topographic quadrangles.

VIEJAS
TRIBAL GOVERNMENT

P.O Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

April 11, 2018

Victoria Harvey
Cultural Resource Specialist
Stantec Consulting Services, Inc.
5500 Ming Avenue, Suite 300
Bakersfield, CA 93309

RE: East Orange I, East Orange II and Mountain Park

Dear Ms. Harvey,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has little cultural significance or ties to Viejas. We further recommend that you contact the tribe(s) closest to the cultural resources. We, however, request to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains in order for us to reevaluate our participation in the government-to-government consultation process.

Please do not hesitate to contact me if you have further questions. Please call Ernest Pingleton at 619-659-2314 or me at 619-659-2312, or email, epingleton@viejas-nsn.gov or rteran@viejas-nsn.gov. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

Affiliation	Communication Type	Recipient	Position	Recipient Affiliation	Tribe	contact info. Used	Comments
Stantec	Letter sent by USPS 4/6/2018	Ralph Goff	Chairperson	Campo Band of Mission Indians	Kumeyaay	36190 Church Road, Suite 1, Campo, California 91906 (619) 478-9046; rgoff@campo-nsn.gov	No response
Stantec	Letter sent by USPS 4/6/2018	Robert Dorame	Chairperson	Gabrielino Tongva Indians of California Tribal Council	Gabrielino	P.O. Box 490, Bellflower, California 90707 (562-761-6417 gtongva@gmail.com	No response
Stantec	Letter sent by USPS 4/6/2018	Robert Pinto	Chairperson	Ewiiaapaayp Tribal Office	Kumeyaay	4054 Willows Road, Alpine, California 91901 (619) 445-6315	No response
Stantec	Letter sent by USPS 4/6/2018	Michael Garcia	Vice Chairperson	Ewiiaapaayp Tribal Office	Kumeyaay	4054 Willows Road, Alpine, California 91901 (619) 445-6315 michaelg@leaningroack.net	No response
Stantec	Letter sent by USPS 4/6/2018	Charles Alvarez	Not stated	Gabrielino-Tongva Tribe	Gabrielino	23454 Van Owen Street, West Hills, California 91307 (310) 403-6048; roadkingcharles@aol.com	No response
Stantec	Letter sent by USPS 4/6/2018	Erica Pinto	Chairperson	Jamul Indian Village	Kumeyaay	P.O. Box 612. Jumul, California 91935 (619) 669-4785	No response
Stantec	Letter sent by USPS 4/6/2018	Andrew Salas	Chairperson	Gabrieleno Band of Mission Indians-Kizh Nation	Gabrieleno	P.O. Box 393, Covina, California 91723 (626) 926-4131; chairman@gabrielenoindians.org	No response
Stantec	Letter sent by USPS 4/6/2018	Anthony Morales	Chairperson	Gabrieleno/Tongva San Gabriel Band of Mission Indians	Gabrieleno	P.O. Box 693, San Gabriel, California 91778 (626) 483-3465	No response
Stantec	Letter sent by USPS 4/6/2018	Sandonne Goad	Chairperson	Gabrielino/Tongva Nation	Gabrielino	106 1/2 Judge John Aiso Street, #231, Los Angeles, California 90012 (951)807-0479; sgoad@gabrielino-tongva/com	No response
Stantec	Letter sent by USPS 4/6/2018	Sonia Johnston	Chairperson	Juaneno Band of Mission Indians	Juaneno	P.O. Box 25628, Santa Ana, California 92799; sonia.johnston@sbcglobal.net	No response
Stantec	Letter sent by USPS certified mail 4/9/2018	Joyce Perry	Tribal Manager	Juaneno Band of Mission Indians Acjachemen Nation-Belardes	Juaneno	4955 Paseo Segovia, Irvine, California 92603 (949) 293-8522; kaamalam@gmail.com	NAHC speifies this group as having information regarding the sites within the APE. Letter delivered April 11 at 10:54 am
Stantec	Letter sent by USPS certified mail 4/9/2018	Matias Belardes	Chairperson	Juaneno Band of Mission Indians Acjachemen Nation-Belardes	Juaneno	32161 Avenida Los Amigos , San Juan Capistrano, California 92675 (949) 293-8522	NAHC speifies this group as having information regarding the sites within the APE; package delayed as of 4/13
Stantec	Letter sent by USPS certified mail 4/9/2018	Teresa Romero	Chairperson	Juaneno Band of Mission Indians Acjachemen Nation-Romero	Juaneno	31411-A La Matanza Street, San Juan Capistrano, California 92675 (949) 488-3484; tromero@juaneno.com	NAHC speifies this group as having information regarding the sites within the APE; notice left April 11; redelivery requested
Stantec	Letter sent by USPS 4/6/2018	Gwendolyn Parada	Chairperson	La Posta Band of Mission Indians	Kumeyaay	8 Crestwood Road, Boulevard, California 91905 (619) 478-2113; LP13boots@aol.com	No response
Stantec	Letter sent by USPS 4/6/2018	Javaughn Miller	Tribal Administrator	La Posta Band of Mission Indians	Kumeyaay	8 Crestwood Road, Boulevard, California 91905 (619) 478-2113; jmiller@Lptribe.net	No response
Stantec	Letter sent by USPS 4/6/2018	Donna Yocum Not john Valenzulela	Chairperson	San Fernando Band of Mission Indians	Kitanemuk, Serrano, Tataviam	P.O. Box 221838, Newhall, California 91322; (760) 885-0955; tsen2u@hotmail.com	No response
Stantec	Letter sent by USPS 4/6/2018	Allen E. Lawson	Chairperson	San Pasqual Band of Mission Indians	Kumeyaay	P.O. Box 365, Valley Center, California 92082 (760) 749-3200; allenl@sanpasqualtribe.org	No response
Stantec	Letter sent by USPS 4/6/2018	John Flores	Environmental Coordinator	San Pasqual Band of Mission Indians	Kumeyaay	P.O. Box 365, Valley Center, California 92082 (760) 749-3200; johf@sanpasqualtribe.org	No response
Stantec	Letter sent by USPS 4/6/2018	Angela Elliott Santos	Chairperson	Manzanita Band of Kumeyaay Nation	Kumeyaay	P.O. Box 1302, Boulevard, California 91905 (619) 766-4930	No response
Stantec	Letter sent by USPS 4/6/2018	Temet Aguilar	Chairperson	Pauma Band of Luiseno Indians-Pauma and Yuima Reservation	Luiseno	P.O. Box 369, Pauma Valley, California 92061 (760) 742-1289	No response
Stantec	Letter sent by USPS 4/6/2018	Lisa Haws	Cultural Resources Manager	Sycuan Band of the Kumeyaay Nation	Kumeyaay	1 Kwaaypaay Court, El Cajon, California 92019 (619) 312-1935; lhaws@sycuan-nsn.gov	No response
Stantec	Letter sent by USPS 4/6/2018	Cody J. Martinez	Chairperson	Sycuan Band of the Kumeyaay Nation	Kumeyaay	1 Kwaaypaay Court, El Cajon, California 92019 (619) 445-2613; ssilva@sycuan-nsn.gov	No response
Stantec	Letter sent by USPS 4/6/2018	Julie Hagen	Not stated	Viejas Band of Kumeyaay Indians	Kumeyaay	1 Viejas Grade Road, Alpine, California 91901 (619) 445-3810; jhagen@viejas-nsn.gov	Letter response from Ray Teran, Resource Management, that the Tribe has no cultural significance or ties to the Viejas Tribe and therefore defers to other Tribes in the area. However, they request updates of any new develpments included cultural finds, human

APPENDIX C – SITE RECORDS (DPR-523 FORMS)



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # 30-001771
HRI #
Trinomial CA-ORA-1771H
NRHP Status Code

Other Listings
Review Code **Reviewer** **Date**

 *__Resource Name or #:__ Saddleback Park

P1. Other Identifier:
***P2. Location:** ■**Not for Publication** ☐ **Unrestricted** ***a. County:** Orange
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Black Star Canyon, CA **Date:** 1988 Unsectioned portion of Rancho Lomas De Santiago land grant, **Township**: 4 South, **Range**: 8 West**; S.B.B.M.**
c. Address: City: Zip:
d. UTM: NAD83 CONUS, Zone: 11S; (N) 431450mE / 3738477mN; (S) 431680mE / 3737016mN; (W) 430778mE / 3738058mN; (E) 431247mE / 3737881mN; approximately 180 acres.
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) From the junction of Jamboree Road and East Santiago Canyon Road in Orange, take East Santiago Canyon Road south for approximately two miles. Turn left (east) onto Santiago Canyon Sanitary Landfill and follow the paved roadway for approximately 0.5 miles. Turn left (north) onto a narrow maintenance road and continue south/southwest for approximately 300 feet. Turn right, and follow this road for approximately 600 feet. Remnants of Saddleback Park will be immediately south, west, and north of this location. A 4-ft tall, barbed wire fence follows the property line delineating the Park's boundary. The main (old) entrance to the Park is located approximately 0.25 miles south from this location.

***P3a. Description:** Saddleback Park represents remnants of a historic motocross raceway, which was first opened in 1967. The park is alleged to have been the first-off road park in the United States dedicated strictly to motocross racing. The land for the park was leased from the Irvine Company by Joe Parkhurst and Bruce Meyers, who convinced the Irvine Company that since the land bordered an active landfill, it was basically useless for development. The prototype for open riding parks, at first Saddleback was to be primarily for dune buggies, but business was slow Parkhurst convinced the Irvine Company to allow motorcycles, reasoning that it would help eliminate the riding on vacant lots near large tracts of housing developments. Also, according to some sources, the original motocross track that was designed in 1967 by Joel Robert and Rodger DeCoster, was further south and closer to the City of Irvine. However, noise complaints from the town forced the park operator (Joe Parkhurst) to move the track to its current and more known location.

***P3b. Resource Attributes:** AH2 Foundations, AH7 Trails, AH16 Other: Motocross racetrack

***P4. Resources Present:** ☐Building ☐Structure ☐Object ■Site ☐District ☐Element of District ☐Other (Isolates, etc.)



P5b. Description of Photo: Overview of Saddleback Park with remnants of Suicide Hill in center, view west (Stantec IMG_0501).

***P6. Date Constructed/Age and Sources:**
■Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
OC Parks, 13042 Old Myford Road,
Irvine, CA 92602

***P8. Recorded by:**
Hubert Switalski and Ross Way
Stantec Consulting Services, Inc.
5500 Ming Ave., Suite 300
Bakersfield, CA 93309-4627

***P9. Date Recorded:** 1/26/2018

***P10. Survey Type:** Intensive and judgmental pedestrian survey.

***P11. Report Citation:** Switalski, H., and V. Harvey. 2018. *Cultural Resources Survey Report on Behalf of Orange County Parks of Portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, Staging Area and Trail Improvement Projects, Near Irvine Lake, Orange County, California.*

***Attachments:** ☐NONE ■Location Map ■Sketch Map ■Continuation Sheet ☐Building, Structure, and Object Record ■Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

ARCHAEOLOGICAL SITE RECORD

***A1. Dimensions: a. Length** 0.9 miles (N-S) **b. Width** 0.4 miles (E-W)

Method of Measurement: ☐ Paced ☐ Taped ☐ Visual estimate ■ Other: Parcel data was captured with Trimble Juno 5 hand-held GPS unit wand aerial imagery

Method of Determination (Check any that apply.): ☐Artifacts ■Features ☐ Soil ☐ Vegetation ☐ Topography ☐ Cut bank ☐ Animal burrow ☐ Excavation ■Property boundary ☐ Other (Explain):

Reliability of Determination: ☐ High ■ Medium ☐ Low Explain: 15 Aerial imagery used to delineate the Park's boundary. However, due to dense vegetation park's boundary are most likely incompletely defined.

Limitations (Check any that apply): ☐ Restricted access ☐ Paved/built over ☐ Site limits incompletely defined ☐ Disturbances ■ Vegetation ☐ Other (Explain): None

A2. Depth: Unknown

***A3. Human Remains:** ☐ Present ☐ Absent ☐ Possible ■ Unknown (Explain): Unlikely given the site type and function

***A4. Features: Feature 1** is a faint outline of concrete foundation measuring 36 feet (E-W) by 20 feet (N-S). **Feature 2** is a larger concrete pad measuring 70 feet (E-W) by 26 feet (N-S) and it is located approximately 100 feet northeast of Feature 1. Both features appear to be located on a flat, most likely graded plateau, which may have served as the main entrance to Saddleback Park. No other surface deposits or features were identified in this location. Feature 3 is a concrete ramp measuring 30 feet (N-S) by approximately 5 feet in width. This feature was identified on a south side of a hill known as Magoo Double, and may have been used as a ramp or may have been used to reinforce part of the track.

***A5. Cultural Constituents:** None observed.

***A6. Were Specimens Collected?** ■ No ☐ Yes

***A7. Site Condition:** ☐ Good ☐Fair ■Poor: The entire Park is overgrown by 30+ years of vegetation..

***A8. Nearest Water:** The site is located approximately 1 mile south of Santiago Creek.

***A9. Elevation:** 600 to 1,060 ft.

A10. Environmental Setting: The site is located approximately one mile south of Santiago Creek and within a sandstone ridge/formation. The site is situated on a western slope of a ridge, intersected by numerous intermittent drainages and rolling hills.

A11. Historical Information: Saddleback Park represents remnants of a historic motocross raceway, which was first opened in 1967. The park is alleged to have been the first-off road park in the United States dedicated strictly to motocross racing (Short Course Racer n.d.). The land for the park carved along a ridgeline that connects two of the tallest peaks in Santa Ana Mountains, was leased from the Irvine Company by Joe Parkhurst and Bruce Meyers as a testing track for Meyers Manx buggies, which were built in Orange County. The pair quickly convinced the Irvine Company that since the land bordered an active landfill (Santiago Canyon Sanitary Landfill) it was basically useless for development. The prototype for open riding parks, at first Saddleback was to be primarily for dune buggies, but business was slow Parkhurst convinced the Irvine Company to allow motorcycles, reasoning that it would help eliminate the riding on vacant lots near large tracts of housing developments (Lawrence 2016).

Parkhurst, with the help of the visiting motocross champions from Europe, including Roger DeCoster and Joel Robert, who were inducted into the AMA (American Motocross Association) Motorcycle Hall of Fame in 1999 and 2000, respectively, designed what would become one of the most famous motocross tracks in America. The first manager of the off-road park was Vic Wilson, winner of Chuchua's First National Four-wheel Drive Grand Prix. Although originally planned to accommodate several types of off-road vehicles the park eventually decided, for safety purposes, to focus mainly on appealing to off-road motorcycles enthusiasts.

The first race was held on March 24, 1968, with two more international events held in the summer and fall of 1968, which were attended by more than 22,000 motocross enthusiasts who watched riders from England, Sweden, East Germany, and the Czech Republic compete for the top spot. With names like the Matterhorn, the Magoo Double Jump, Banzai Hill, the Wedge, and Widow Maker, the park tested many of the best riders in the world at the events but also allowed riders to test their skills all day for a $2 fee (Figs. 11 and 12). The track boasted the biggest obstacles in motocross racing, including a tri-level uphill stair steps called Suicide Mountain that was built in the early 1980s (Lawrence 2016; Short Course Racer n.d.).

A11. Historical Information (continued):

Saddleback Park was the prototype for open riding parks across the country, and Saddleback Park is possible the most famous and most often photographed track in the sport. Often called the mecca of motocross, more national stars emerged from Saddleback than any other track in the country (Vintage MX n.d.). Also, according to some sources, the original motocross track that was designed in 1967 by Joel Robert and Rodger DeCoster, was further south and closer to the City of Irvine. However, noise complaints from the town forced the park operator (Joe Parkhurst) to move the track to its current and more known location (Vintage MX n.d.).

As the Irvine Company was still the landowner they were responsible for the cost and liability of the lawsuits and legal claims inevitable in a rough sport such as motocross. In 1984, the decision to close the park as an off-road vehicle mecca was made and although there have been efforts to reopen some of the tracks for races, these efforts have not been realized. Although the 17-years of off-road rivalry has left its mark in memories and photographs, the tracks are gone, overgrown with 34-years of vegetation.

***A12. Age:** ☐Prehistoric ☐ Protohistoric ☐ 1542-1769 ☐ 1769-1848 ☐ 1848-1880 ☐1880-1914 ☐1914-1945

A13. Interpretations: None. The survey revealed that Saddleback Park appeared to have been established within most of the East Orange I Project Area. During the survey, two concrete foundations were identified near the original entrance gate, which may have been used for motorcycle rentals and/or daily operations of the park, and one concrete ramp which most likely was part of the obstacle known as Magoo Double. While heavily overgrown by 30+ years of vegetation, the tracks, especially the terraced hillside of Suicide Mountain, Magoo Double, and Webco and Banzai Hill are still visible in the landscape (Fig. 14). The survey did not reveal any structures, features, and/or artifacts that may have been associated with the early operation of the park from the late 1960s. It appears that as the park became more renowned within the motocross community, the track itself was expanded and additional course obstacles were added throughout the 70s and 80s. Furthermore, no refuse deposits or remnants associated with the daily use of the park or maintenance of motorcycles and/or equipment, were observed within the park. Given the 34-year old vegetation and to some extent maintenance activities associated with storm water diversion from the nearby landfill, it is very likely that any surface deposits were simply obscured by vegetation or may have been removed during construction of concrete culverts, drains, and catchment basins along the eastern and southern periphery of the park.

A14. Remarks: As indicated before, the original location of Saddleback Park that was designed by Roger DeCoster and Joel Robert was most likely located further south and near the City of Irvine. This current (documented) extent of Saddleback Park most likely represents its second location. Also, it is important to note that the recorded extent of Saddleback Park corresponds to the East Orange I survey area and that the actual park may extend further north outside of our survey area. Additionally, there are several faint road which extend north from the park and it is unknown whether they were part of the racetrack or they represent access and/or firebreak that may have been created after the park's closure.

A15. References:

Andrews, R. 2018. *Saddleback Park and the Magoo Double.* http://www.robandrewsmx.com/ article.php?id=139. Website visited on February 20, 2018.

Lawrence, L. 2016. *Archives: The Mecca of Motocross.* http://www.cyclenews.com/2016/08 */article/archives-mecca-motocross.* Site accessed on February 21, 2018.

Short Course Racer. (n.d.). *Saddleback Raceway.* http://www.shortcourseracer.com/ saddleback-raceway. Website visited on February 19, 2018.

Vintage MX. (n.d.). *Forgotten Tracks: Preserving Motocross History.* http://www.vintagemx.us/ *forgottentracks.htm.* Website visited on February 26, 2018.

A16. Photographs: Original Media/Negatives Kept at: Digital files kept at Stantec Consulting Services, Inc., Bakersfield, CA

***A17. Form Prepared by:** Hubert Switalski **Date:** February 25, 2018
Affiliation and Address: Stantec Consulting Services, 5500 Ming Avenue, Suite 300, Bakersfield, CA 93309

***Recorded by:** Hubert Switalski and Ross Way ***Date:** 1/26/18 ■ Continuation ☐ Update



1. Overview of Feature 1, view southeast (Stantec IMG_0532).



2. Overview of Feature 2, view southwest (Stantec IMG_0533).

***Recorded by:** Hubert Switalski and Ross Way ***Date:** 1/26/18 ■ Continuation ☐ Update



3. Overview of Feature 3, view east (Stantec IMG_0535).



4. Overview of Saddleback Park with suicide Hill in foreground (Stantec IMG_0501).



5. Photograph of Saddleback Park circa 1984 with Suicide Hill in background.



6. Photograph of Saddleback Park circa 1970s showing entrance to the park (center) and Santiago Canyon Road on the right (Andrews 2018).

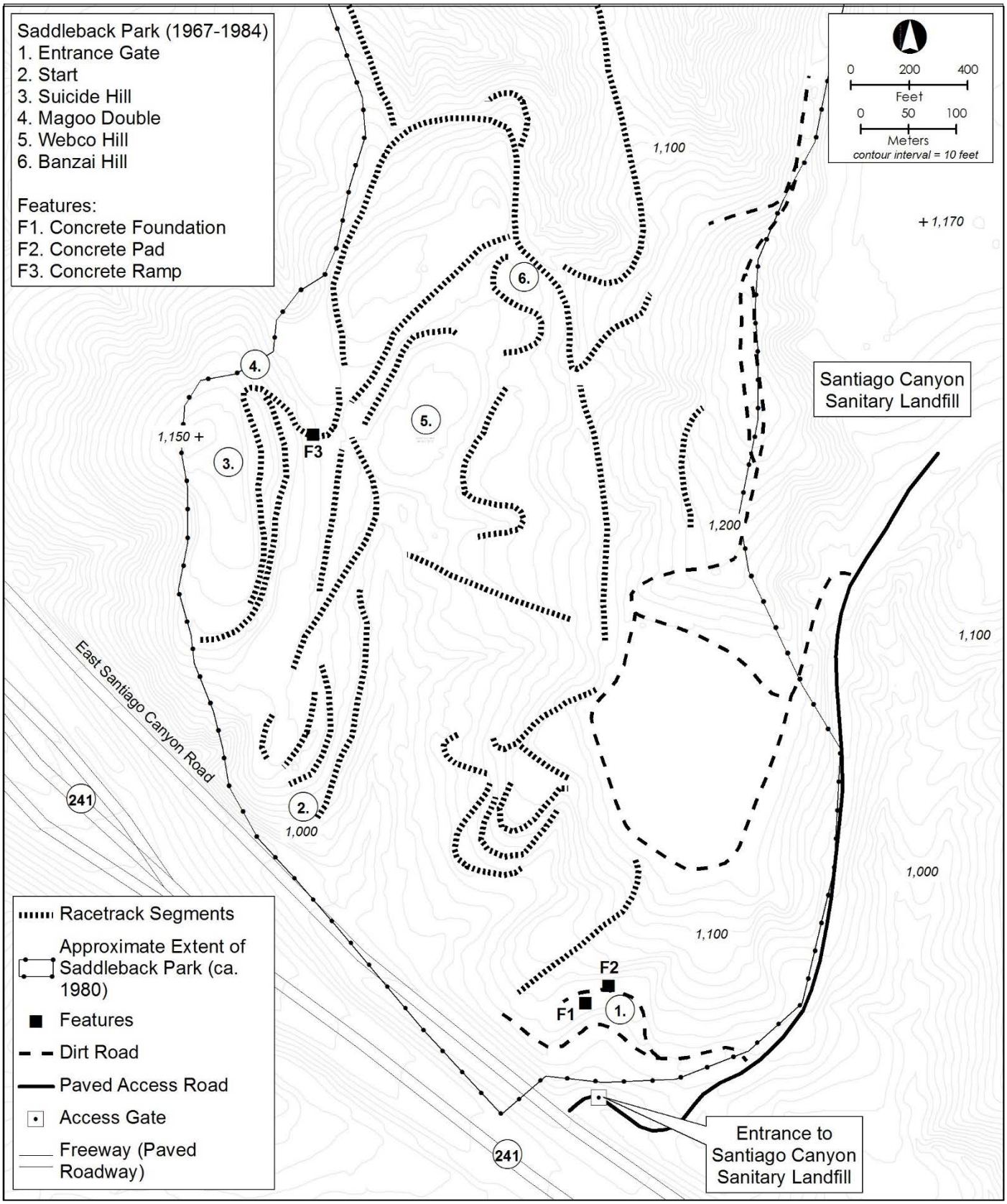


7. Photograph of Saddleback Park circa 1970 (Andrews 2018).

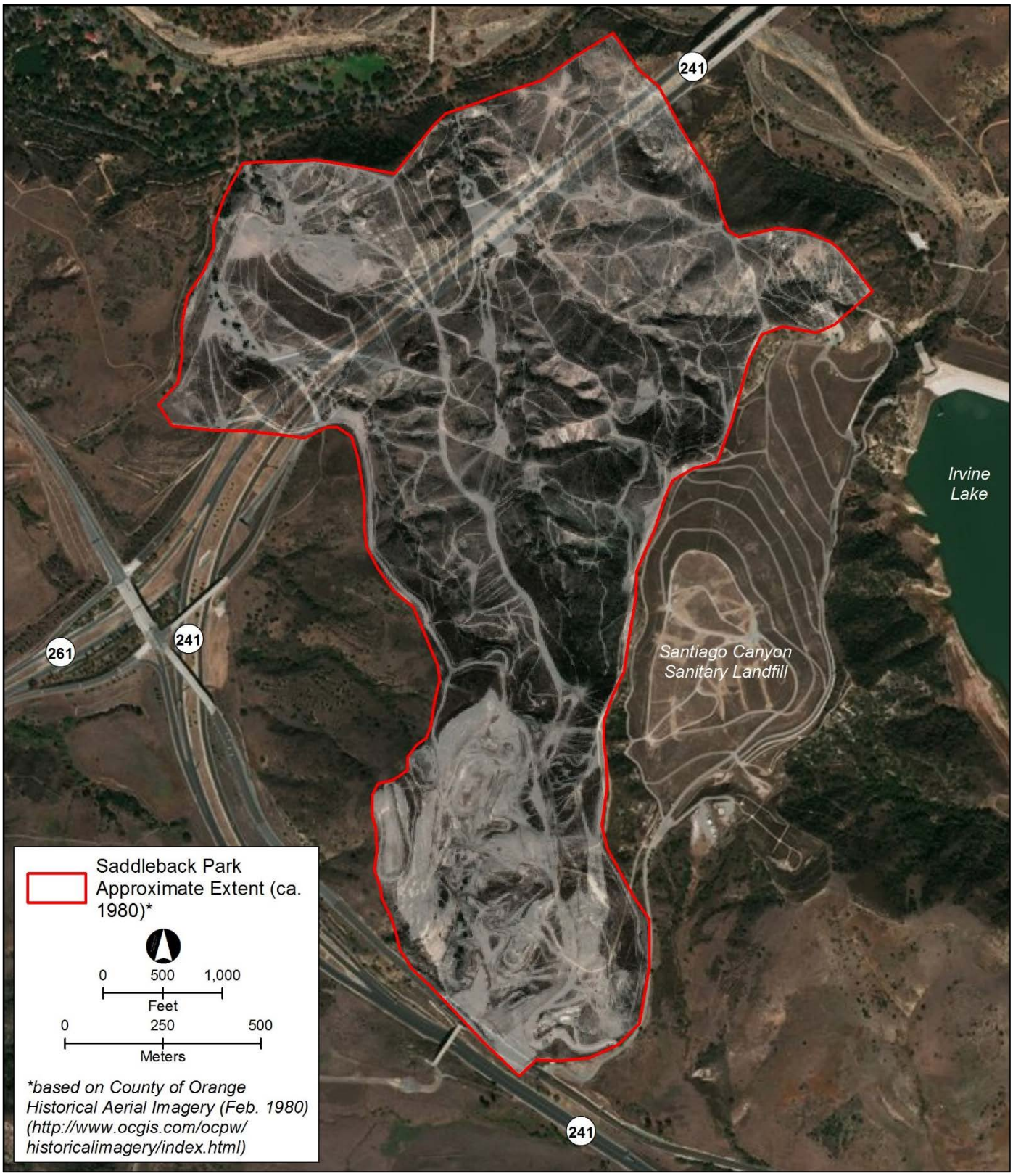


8. Photograph of Saddleback Park circa 1970s before the construction of Suicide Hill (Andrews 2018).

***Drawn By:** Hubert Switalski ***Date:** 1/26/18



***Map Name:** County of Orange Historic Aerial Imagery ***Scale:** 1:14,000 ***Date of Map:** 1980



State Of California—The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #

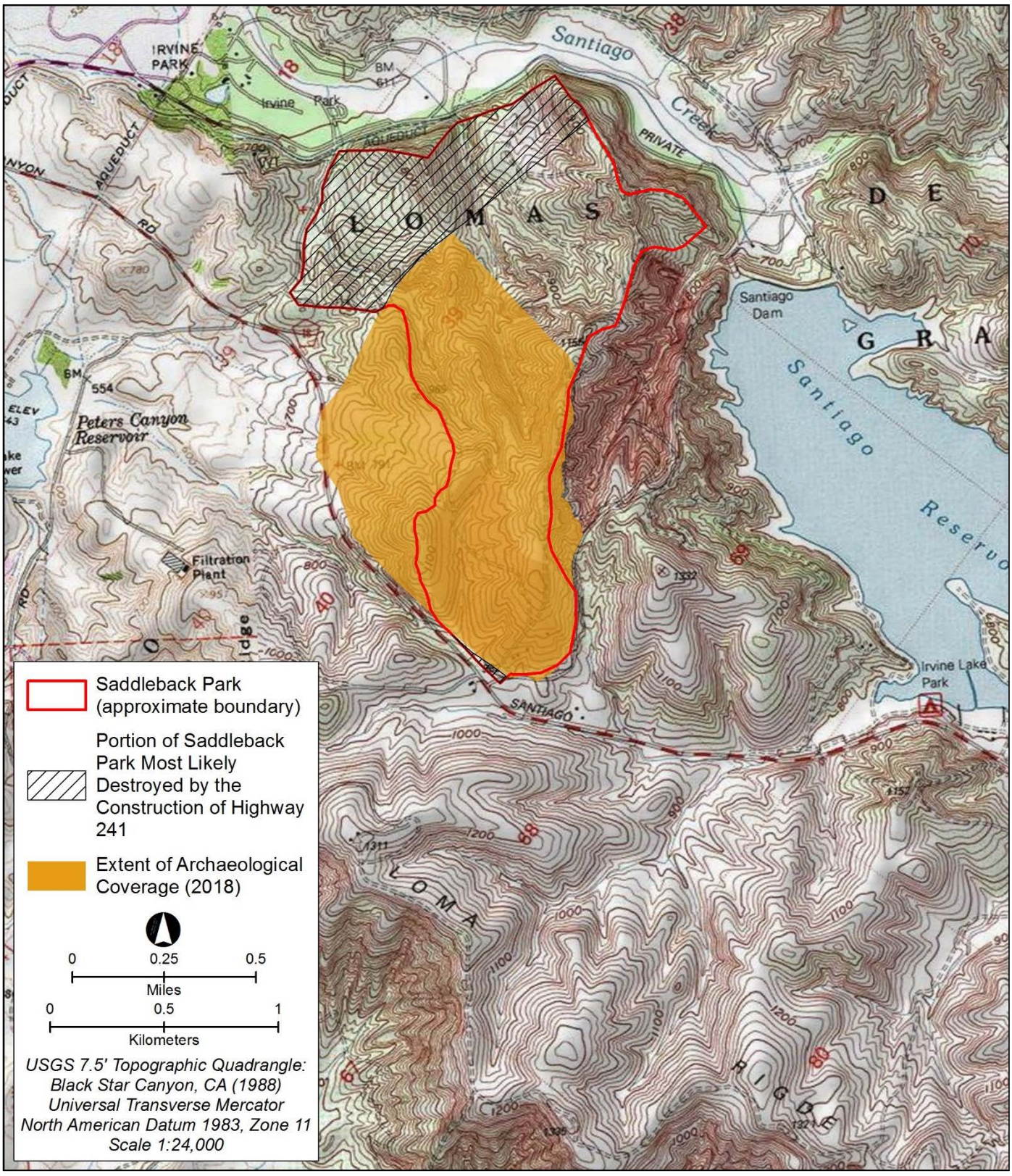
Trinomial

***Resource Name or #:** Saddleback Park

***Map Name:** Black Star Canyon

***Scale:** 1:24,000

***Date of Map:** 1988



***Required information**

***Recorded by:** Hubert Switalski ***Date:** 1/26/18 ☐Continuation ■ Update

CA-ORA-1240 (P30-001240) was documented by Sorensen et al. (1990) as a small light lithic and ground store scatter comprised of three large chert flakes, a possible hammerstone, and a bifacial mano in an area measuring 70 meters by 55 meters. The resource was documented on a flat plateau overlooking Santiago Canyon Road to the north and west. Sorensen et al. (1990) noted that the site appeared to have been mechanically bulldozed causing extensive sheet erosion and the development of gullies across the entire site. However, it is possible that the bulldozing noted by Sorensen et al. (1990) may have been the result of road grading and road maintenance conducted between 1968 and 1984 when the area was used as a motocross raceway as part of the Saddleback Park.

The site was updated and tested in 2004 by Dice and Taniguchi, who relocated the resource. However, they noted that the site appeared to be located approximately 100 meters northeast from the spot initially recorded by Sorensen et al. (1990). Dice and Taniguchi (2004:34) noted additional artifacts on the surface including one primary flake, one secondary flake, four tertiary flakes, five core fragments, two fragments of fire affected rock, a discoidal scraper, and a projectile point, both of which were collected. Overall, seven test units were excavated within the site boundary and two flakes and one core fragment were recovered from the top 5 centimeters of topsoil. No other artifacts, features, or deposits were observed during test excavation. Based on the results of testing, Dice and Taniguchi (2004:35) concluded that site CA-ORA-1240 (P30-001240) did not meet the significance criteria and should not be considered a unique resource under CEQA, nor did the resource fulfill Criterion D of the NHPA for listing in the NRHP.

This site was not relocated during the 2018 survey of East Orange I conservation easement.

References:

Dice, M., and C. Taniguchi. 2004. *Phase 2 Archaeological Testing Evaluation of Irvine Ranch Cultural Resources*. Report on file at the South Central Coastal Information Center, Fullerton.

Sorensen, J., B. Texier, P. Fulton, and G. Brown. 1990. *Site Record for CA-ORO-1240.* Record on file at the South Central Coastal Information Center, Fullerton.

Switalski, H., and V. Harvey. 2018. *Cultural Resources Survey Report on Behalf of Orange County Parks of Portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, Staging Area and Trail Improvement Projects, Near Irvine Lake, Orange County, California.* Report submitted to the South Central Coastal Information Center, Fullerton.

***Recorded by:** Hubert Switalski ***Date:** 1/26/18 ☐Continuation ■ Update

Prehistoric site CA-ORA-1294 (P30-001294) was documented by McKenna (1991) as a single rock-ring resembling a prehistoric feature and a single, granitic mano located approximately 30 meters from the rock ring. In 2004, Dice and Taniguchi revisited the site and excavated ten shovel test pits (STP) to test for potential subsurface deposits. All STPs were "excavated to a depth of at least 30 centimeters below the modern ground surface, while several were dug to 80 centimeters" (Dice and Taniguchi 2004:36). Subsurface excavations yielded four flakes and one possible fire-cracked cobble fragment, with none of the STPs exhibiting and subsurface features or midden-type soils indicative of intensive use of the area. Based on the lack of any subsurface data, it was determined that the prehistoric site CA-ORA-1294 (P30-001294) did not meet the eligibility criteria for nomination to the California Register and is not considered a unique archaeological resource for the purposes of CEQA (Dice and Taniguchi 2004:37).

This site was not relocated during the 2018 survey of East Orange I conservation easement.

References:

Dice, M., and C. Taniguchi. 2004. *Phase 2 Archaeological Testing Evaluation of Irvine Ranch Cultural Resources*. Report on file at the South Central Coastal Information Center, Fullerton.

McKenna, J. 1991. *A Phase I Cultural Resource Investigation of the Proposed Calmat, Inc. Realignment of Haul Roads in the Santiago Canyon Area Near Irvine Lake, Orange County, California*. Report on file at the South Central Coastal Information Center, Fullerton.

Switalski, H., and V. Harvey. 2018. *Cultural Resources Survey Report on Behalf of Orange County Parks of Portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, Staging Area and Trail Improvement Projects, Near Irvine Lake, Orange County, California.* Report submitted to the South Central Coastal Information Center, Fullerton.

***Recorded by:** Hubert Switalski ***Date:** 1/26/18 ☐Continuation ■ Update

Isolated find P30-100304 consists of one mano fragment and one metate fragment approximately 30 meters apart. Both groundstone fragments were documented on top of a saddle located east of Santiago Canyon. According to Padon (1995), 16 surface scrapes north and south of the isolated find were performed; however, no other surface deposits or soil discolorations were observed.

This isolate was not relocated during the 2018 survey of East Orange II conservation easement.

References:

Padon, B. 1995. *Archaeological Monitoring Report for Santiago Road Overcrossing, Orange County*. Report on file at the South Central Coastal Information Center, Fullerton.

Switalski, H., and V. Harvey. 2018. *Cultural Resources Survey Report on Behalf of Orange County Parks of Portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, Staging Area and Trail Improvement Projects, Near Irvine Lake, Orange County, California.* Report submitted to the South Central Coastal Information Center, Fullerton.

***Recorded by:** Hubert Switalski ***Date:** 1/26/18 ☐Continuation ■ Update

Isolated find P30-100460 was documented as a single, unifacial mano, located along an existing roadway (McKenna 1991). The isolated find was identified to the north of a borrow pit and near an active construction and most likely it was redeposited from elsewhere. The isolate was collected by McKenna during recordation in 1991.

This isolate was not relocated during the 2018 survey as it was collected by McKenna in 1991.

References:

McKenna, J. 1991. A Phase I Cultural Resource Investigation of the Proposed Calmat, Inc. Realignment of Haul Roads in the Santiago Canyon Area Near Irvine Lake, Orange County, California. Report on file at the South Central Coastal Information Center, Fullerton..

Switalski, H., and V. Harvey. 2018. *Cultural Resources Survey Report on Behalf of Orange County Parks of Portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, Staging Area and Trail Improvement Projects, Near Irvine Lake, Orange County, California.* Report submitted to the South Central Coastal Information Center, Fullerton.

***Recorded by:** Hubert Switalski ***Date:** 6/22/18 ☐Continuation ■ Update

Historic period resource 30-176701 was initially documented by Pletka et al. 2004 as a rocket fuel test facility, which was originally owned and operated by the McDonnell Douglas Corporation. This facility operated under the name of Astropower between 1966 and 1979. Pletka et al. (2004) observed that the facility was comprised of two main office structures, a water tank and supporting pipeline, a test pad, and an access road. During the survey in 2018 none of the features that were documented by Pletka et al. (2004) were observed and additional research based on available aerial imagery revealed that the structures were removed in the early part of 2005. No additional features or artifacts associated with this facility were observed in 2018.

References:

Pletka, S., S. Younger, and J. Marvin. 2004. *Cultural Resource Survey and Assessment, Mountain Park, Anaheim, Orange County, California.* Report on file at the South Central Coastal Information Center, Fullerton.

Switalski, H., and V. Harvey. 2018. *Cultural Resources Survey Report on Behalf of Orange County Parks of Portions of East Orange I, East Orange II, and Mountain Park Conservation Easements, Staging Area and Trail Improvement Projects, Near Irvine Lake, Orange County, California.* Report submitted to the South Central Coastal Information Center, Fullerton.

Appendix E PALEONTOLOGICAL RESOURCES TECHNICAL REPORT

PALEONTOLOGICAL EVALUATION AND INVENTORY REPORT

ORANGE COUNTY PARKS 2014 IRVINE RANCH OPEN SPACE DONATION PROJECT

Orange County Parks

Prepared for: **Stantec Consulting Services, Inc.**
290 Conejo Ridge Ave.
Thousand Oaks, CA 91361

Prepared by: **Paleo Solutions, Inc.**
911 S. Primrose Ave., Unit N
Monrovia, CA 91016

Geraldine Aron, M.S. – Project Manager
Courtney Richards, M.S. – Principal Investigator, Report Author
Joey Raum, B.S. – Report Author

PSI Report: CA18OrangeSTA01R

August 1, 2018

This page intentionally left blank.

Table of Contents

1.0 EXECUTIVE SUMMARY 6

2.0 INTRODUCTION 8
2.1 Project Description 8
2.2 Project Location 8

3.0 DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES 15

4.0 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS 16
4.1 State Regulatory Setting 16
4.1.1 California Environmental Quality Act (CEQA) 16
4.1.2 State of California Public Resources Code 16
4.2 Local Regulatory Setting 16
4.2.1 Orange County 16

5.0 METHODS 17
5.1 Analysis of Existing Data 17
5.2 Field Survey 17

6.0 ANALYSIS OF EXISTING DATA 18
6.1 Literature Search and Geologic Map Review 18
6.1.1 Sespe Formation – Late Eocene to Early Miocene 18
6.1.2 Vaqueros Formation – Oligocene to Early Miocene 19
6.1.3 Vaqueros-Sespe Formations Undifferentiated – Late Eocene to Early Miocene 19
6.1.4 Topanga Formation – Middle Miocene 19
6.1.5 Puente Formation La Vida Member – Miocene 20
6.1.6 Very Old Alluvial Fan Deposits – Early to Middle Pleistocene 21
6.1.7 Young Alluvial Fan Deposits – Late Pleistocene to Holocene 21
6.1.8 Landslide Deposits – Late Holocene 21
6.1.9 Artificial Fill (Not Mapped) – Recent 21
6.2 Paleontological Record Search Results 27

7.0 FIELD SURVEY 30

8.0 IMPACTS TO PALEONTOLOGICAL RESOURCES 41

9.0 CONCLUSIONS AND RECOMMENDATIONS 42

REFERENCES 43

APPENDIX A 45

Figures

Figure 1. Project Location Map 11
Figure 2a-c. Project Overview Maps 12
Figure 3a-d. Project Geology Maps. 23
Figure 4. Overview of region, Topanga Formation overlying Vaqueros-Sespe Formations Undifferentiated. View northeast 31
Figure 5. Holocene-aged young alluvial/colluvial deposits. View south. 31
Figure 6. Holocene-aged young alluvial fan deposits exposed in channel. View southwest. 31
Figure 7. Exposure of Holocene-aged young alluvial fan deposits along channel wall. Planar and cross bedding. View east. 31
Figure 8. Outcrop of Topanga Formation sediments on slope. View west. 31

Figure 9. Overview of canyons and exposures of Topanga Formation along east-facing slopes. View south. 31
Figure 10. Exposure of Topanga Formation overlying Vaqueros-Sespe Formations Undifferentiated. View west. 32
Figure 11. Outcrop of Topanga Formation sandstone. View west. 32
Figure 12. Outcrop of Topanga Formation sandstone. View west. 32
Figure 13. Outcrop of Topanga Formation sandstone. View west. 32
Figure 14. Outcrop of Topanga Formation sandstone. View west. 32
Figure 15. Outcrop of Vaqueros-Sespe Formations Undifferentiated sediments eroding out of canyon. View southwest. 32
Figure 16. Thick brush covering hills and drainages. Area is mapped as Vaqueros Formation. View west. 34
Figure 17. Outcrop of Topanga Formation. View northwest. 34
Figure 18. Outcrop of Sespe Formation. View north. 34
Figure 19. Outcrop of Sespe Formation. View north. 34
Figure 20. Outcrop of Puente Formation La Vida Member. View north. 34
Figure 21. Outcrop of Puente Formation La Vida Member. View north. 34
Figure 22. Outcrop of Topanga Formation. View west. 35
Figure 23. Outcrop of Topanga Formation. View west. 35
Figure 24. Outcrop of Topanga Formation. View west. 35
Figure 25. Outcrop of Topanga Formation. View east. 35
Figure 26. Outcrop of Topanga Formation. View northeast. 35
Figure 27. Outcrop of Topanga Formation. View southwest. 35
Figure 28. Outcrop of Vaqueros Formation in drainage. View northwest. 36
Figure 29. Outcrop of Vaqueros Formation. View north. 36
Figure 30. Outcrop of Vaqueros Formation. View southeast. 36
Figure 31. Vaqueros Formation sandstone. View northwest. 36
Figure 32. Vaqueros Formation sandstone. View northeast. 36
Figure 33. Vaqueros Formation sandstone. View southwest. 36
Figure 34. Fossilized shark tooth discovered in Topanga Formation silt/sandstone. View down. 37
Figure 35. Fossilized mammal bone discovered as float on valley floor. View down. 37
Figure 36. Poorly preserved invertebrate shells fossilized in Topanga Formation silt/sandstone. View down. 37
Figure 37. Poorly preserved invertebrate shells fossilized in Topanga Formation silt/sandstone. View down. 37
Figure 38. Poorly preserved invertebrate shells fossilized in Topanga Formation silt/sandstone. View down. 37
Figure 39. Poorly preserved fish scales fossilized in Topanga Formation silt/sandstone. View down. 37
Figure 40. Overview of southwestern trail area. View west. 39
Figure 41. Outcrop of Sespe Formation. View northwest. 39
Figure 42. Overview of northeastern trail terrain. View northeast. 39
Figure 43. Outcrop of Sespe Formation alongside of road. View northwest. 39
Figure 44. Outcrop of weathering Sespe Formation beneath Holocene-aged young surficial sediments. View northwest. 39
Figure 45. Overview of southwestern trail terrain. Mapped as Sespe Formation. View south. 39
Figure 46. Outcrop of Sespe Formation on hillside and drainage. View northwest. 40
Figure 47. Outcrop of Sespe Formation. View north. 40
Figure 48. Outcrop of Sespe Formation. View north. 40
Figure 49. Irvine Lake located to the northwest of East Orange II portion of the Project area. View northwest. 40
Figure 50. Outcrop of Sespe Formation. View southwest. 40
Figure 51. Outcrop of Sespe Formation. View northeast. 40

Figure 52. Outcrop of Vaqueros Formation on road surface and on adjacent slope. View west. 41
Figure 53. Outcrop of Vaqueros Formation on road surface. View west 41
Figure 54. Outcrop of Vaqueros Formation on road surface. View west. 41
Figure 55. Vaqueros Formation sandstone. View down. 41

Tables

Table 1. Orange County Parks 2014 Irvine Ranch Open Space Donation Project Summary 9
Table 2. Museum Record and Literature Search Results Summary 27
Table 3. Newly Recorded Fossil Localities 33

1.0 EXECUTIVE SUMMARY

This report presents the results of the paleontological technical study conducted by Paleo Solutions, Inc. (Paleo Solutions) in support of the Orange County Parks 2014 Irvine Ranch Open Space Donation Project (Project) located in Orange County, California. Paleo Solutions was contracted by Stantec Consulting Services, Inc. (Stantec) to conduct an analysis of existing paleontological data and a pedestrian paleontological survey of the Project area, and to provide recommendations for mitigation based on the geological and paleontological data. All paleontological work was completed in compliance with the California Environmental Quality Act (CEQA), local regulations, and best practices in mitigation paleontology (Murphey et al., 2014). See Table 1 for a Project summary.

The 2014 Irvine Ranch Open Space Donation includes nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. These parcel acres are adjacent to Irvine Lake and near the junction of the Interstate- (I-) 91 and State Route- (SR-) 241 (see Figures 1 and 2). The properties are located near existing Orange County Regional Parks and Open Space and add further acreage to the previous inventory of nearly 60,000 acres. Orange County Parks is in the process of preparing an Interim Operations Plan (IOP) for the 2014 Irvine Ranch Open Space Donation. Of the 2,300 acres, improvements are limited to the East Orange I, East Orange II, and Mountain Park properties.

The Project involves construction of new trail networks and staging areas and improvements to existing trails. The East Orange I survey area encompasses approximately 286.3 acres, and the survey lines total approximately 1.11 linear miles. This location is the site of a former motocross racing facility and is adjacent to the Santiago Landfill. A trail, which will follow the existing motocross routes, and a staging area will be constructed. The staging area will include a decomposed granite parking lot, Americans with Disabilities Act (ADA) accessible parking, portable restrooms, benches, picnic tables, and signage. The East Orange II survey lines total approximately 7.98 linear miles. New trail systems that connect with other previously existing trails will be constructed as well as access to a staging area. The Mountain Park survey lines total approximately 6.48 linear miles. Improvements include added signage and construction of ADA parking in an existing gravel parking lot. A short connection will be constructed, connecting the existing parking lot to existing trails.

The Project area is located in the Santa Ana Mountains within the northwestern portion of the Peninsular Ranges geomorphic province. The region is characterized by mostly moderate to moderately-steep relief, rounded to subrounded hills with relatively low-lying and flat valleys and washes. Vegetation is generally moderate to dense and consists of grasses, shrubs, and trees. Geologic mapping by D.M. Morton and F.K. Miller (2006) indicates that the Project area is immediately underlain by late Eocene- to early Miocene-aged Sespe Formation, Oligocene- to Miocene-aged Vaqueros Formation, late Eocene- to Miocene-aged Vaqueros-Sespe Formations undifferentiated, middle Miocene-aged Topanga Formation, Miocene-aged Puente Formation La Vida Member, early to middle Pleistocene-aged very old alluvial fan deposits, late Pleistocene- to Holocene-aged young alluvial fan deposits, and late Holocene-aged landslide deposits (Figure 3).

The Project area was evaluated based on an analysis of existing paleontological data. The three components of the analysis included a geologic map review, a literature search, and an institutional record search. The analysis of existing data was supplemented with a pedestrian field survey, which was conducted in order to search for fossil resources exposed at the Project area surface as well as to document the geological units that are exposed within the Project area. According to the record search, there are no previously recorded fossil localities within the Project area; however, there are numerous fossil localities recorded from within the Project vicinity and other areas of California from sediments similar to those mapped within the Project area.

Using the analysis of existing data, each geologic unit was evaluated on its potential for producing significant paleontological resources, taking into account Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002). Late Eocene- to early Miocene-aged Sespe Formation and middle Miocene Topanga Formation both have a very high potential for producing paleontological resources. Oligocene- to Miocene-aged Vaqueros Formation, late Eocene- to Miocene-aged Vaqueros-Sespe Formations Undifferentiated, late Miocene-aged Puente Formation La Vida Member, and early to middle Pleistocene-aged very old alluvial fan deposits all have a high potential for producing paleontological resources. Late Pleistocene- to Holocene-aged young alluvial fan deposits are estimated to be less than 11,000 years old at the surface and are considered to have no potential for producing paleontological resources, because they are typically too young to contain *in situ* fossils. Additionally, previously disturbed sediments or artificial fill, which was observed during the field survey, will not contain *in situ* fossils, since these sediments have been displaced from their original context. However, these younger deposits often overlie older geologic units with higher paleontological potential, which may be impacted at shallow depth. Fossils contained within landslide deposits typically lack stratigraphic context due to displacement from the original site of deposition, reducing scientific significance of the fossils. Therefore, the late Holocene-aged landslide deposits within the Project area are also considered to have no potential for producing paleontological resources.

There is potential for adverse impacts to scientifically significant paleontological resources during ground disturbance within late Eocene- to early Miocene-aged Sespe Formation, Oligocene- to Miocene-aged Vaqueros Formation, late Eocene- to Miocene-aged Vaqueros-Sespe Formations undifferentiated, middle Miocene-aged Topanga Formation, late Miocene-aged Puente Formation La Vida Member, and early to middle Pleistocene-aged very old alluvial fan deposits. The field survey results indicate that all of these paleontologically sensitive units, with the exception of early to middle Pleistocene-aged very old alluvial fan deposits, are currently exposed in the Project area. Additionally, several fossil localities were documented from the Topanga Formation during the field survey. Specimens included fish scales, invertebrate shell fragments, and mammal bones. No fossils were collected during the survey.

Prior to the start of construction, a paleontological resource monitoring and mitigation plan (PRMMP) should be prepared. The PRMMP should provide detailed recommended monitoring locations including locations mapped as high to very high sensitivity; a description of a worker training program; detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; and notification procedures in the event of a fossil discovery by a paleontological monitor or other project personnel. A curation agreement with the John D. Cooper Archaeological and Paleontological Center (Cooper Center) or another accredited repository approved by Orange County Parks must be obtained. Any subsurface bones or potential fossils that are unearthed during construction should be evaluated by a Qualified Paleontologist.

2.0 INTRODUCTION

This report presents the results of the paleontological technical study conducted by Paleo Solutions in support of the Orange County Parks 2014 Irvine Ranch Open Space Donation Project located in Orange County, California. Paleo Solutions was contracted by Stantec to conduct an analysis of existing paleontological data and a pedestrian paleontological survey for the Project area, and to provide recommendations for mitigation based on the geological and paleontological data. All paleontological work was completed in compliance with CEQA, local regulations, and best practices in mitigation paleontology (Murphey et al., 2014). See Table 1 for a Project summary.

2.1 Project Description

Orange County Parks is in the process of preparing an IOP for the 2014 Irvine Ranch Open Space Donation. Of the 2,300 acres, improvements are limited to the East Orange I, East Orange II, and Mountain Park properties.

The Project involves construction of new trail networks, staging areas, and parking areas as well as improvements to existing trails. The East Orange I survey area encompasses approximately 286.3 acres, and the survey lines total approximately 1.11 linear miles. This location is the site of a former motocross racing facility and is adjacent to the Santiago Landfill. A trail, which will follow the existing motocross routes, and a staging area will be constructed. The staging area will include a decomposed granite parking lot, ADA accessible parking, portable restrooms, benches, picnic tables, and signage. The East Orange II survey lines total approximately 7.98 linear miles. New trail systems that connect with other previously existing trails will be constructed as well as access to a staging area. The Mountain Park survey lines total approximately 6.48 linear miles. Improvements include added signage and construction of ADA parking in an existing gravel parking lot. A short connection will be constructed, connecting the existing parking lot to existing trails.

2.2 Project Location

The Project area is located in Orange County, California in the Santa Ana Mountains, and it includes lands granted from the 2014 Irvine Ranch Open Space Donation. The 2014 Irvine Ranch Open Space Donation includes nearly 2,300 acres, adding to the current 20,000 acres previously donated by the Irvine Company. The properties are located near existing Orange County Regional Parks and Open Space and add further acreage to the previous inventory of nearly 60,000 acres. The Project area is located near the junction of I-91 and SR-241 and the junction of SR-241 and Santiago Canyon Road (Figure 1). The Project area consists of three sections including East Orange I, East Orange II, and Mountain Park (Figures 1 and 2). The region is characterized by mostly moderate to moderately-steep relief, rounded to subrounded hills with relatively low-lying and flat valleys and washes. Vegetation is generally moderate to dense and consists of grasses, shrubs, and trees. Geologic mapping by D.M. Morton and F.K. Miller (2006) indicates that the Project area is immediately underlain by late Eocene- to early Miocene-aged Sespe Formation, Oligocene- to Miocene-aged Vaqueros Formation, late Eocene- to Miocene-aged Vaqueros-Sespe Formations undifferentiated, middle Miocene-aged Topanga Formation, Miocene-aged Puente Formation La Vida Member, early to middle Pleistocene-aged very old alluvial fan deposits, late Pleistocene- to Holocene-aged young alluvial fan deposits, and late Holocene-aged landslide deposits (Figure 3).

Table 1. Orange County Parks 2014 Irvine Ranch Open Space Donation Project Summary

Project Name	Orange County Parks 2014 Irvine Ranch Open Space Donation Project				
Project Description	The Project involves construction of new trail networks, staging areas, and parking areas as well as improvements to existing trails. Construction and improvements will be conducted at the East Orange I, East Orange II, and Mountain Park portions of the Project area.				
Project Area	The Project area is located in Orange County, California in the Santa Ana Mountains, and it includes lands granted from the 2014 Irvine Ranch Open Space Donation. The Project area is located near the junction of I-91 and SR-241 and the junction of SR-241 and Santiago Canyon Road. The Project area consists of three sections including East Orange I, East Orange II, and Mountain Park. The region is characterized by mostly moderate to moderately-steep relief, rounded to subrounded hills with relatively low-lying and flat valleys and washes. Vegetation is generally moderate to dense and consists of grasses, shrubs, and trees.				
Total Acreage and Mileage	East Orange I: 286.3 acres and 1.11 linear miles for the survey lines East Orange II: 7.98 linear miles for the survey lines Mountain Park: 6.48 linear miles for the survey lines				
Location (PLSS)	**Project Area Section**	**Quarter-Quarter**	**Section**	**Township**	**Range**
	East Orange I	Loma de Santiago – Unsectioned			
	East Orange II	Loma de Santiago, Santiago de Santa Ana – Unsectioned			
	Mountain Park	Loma de Santiago – Unsectioned			
Land Ownership	Orange County				
Topographic Map(s)	USGS Black Star Canyon (2015) 7.5' Quadrangle				
Geologic Map(s)	Geologic Map of the 30' x 60' Santa Ana Quadrangle, Southern California (Morton and Miller, 2006)				
Mapped Geologic Units(s) and age(s)	**Geologic Unit**		**Age**		**Paleontological Sensitivity**
	Artificial fill (not mapped)		Recent		None
	Landslide deposits		late Holocene		None
	Young alluvial fan deposits		late Pleistocene to Holocene		None
	Very old alluvial fan deposits		early to middle Pleistocene		High
	Puente Formation La Vida Member		Miocene		High
	Topanga Formation		middle Miocene		Very High
	Vaqueros-Sespe Formations Undifferentiated		late Eocene to Miocene		High
	Vaqueros Formation		Oligocene to Miocene		High
	Sespe Formation		late Eocene to early Miocene		Very High
Permits	No permits were required for the paleontological work conducted.				
Survey Date(s)	May 14, 15, 16, and 17, 2018				
Surveyor(s)	Joey Raum, B.S., and Kim McComas, M.S.				
Paleontological Results	Three new fossil localities were documented in the Topanga Formation during the field survey including one (1) Significant Fossil Locality and two (2) Non-Significant Fossil Occurrences. Specimens were documented but not collected and included invertebrate shells, fish scales, a shark tooth, and mammal bones.				
Previously Documented Fossil	The Natural History Museum of Los Angeles County (LACM) reported that there are no vertebrate fossil localities recorded from within the Project area. However, there are numerous localities recorded from within the Project vicinity from sediments similar to those				

Localities within the Project area	mapped in the Project area (see Section 6.2).
Conclusions and Recommendation(s)	There is potential for adverse impacts to scientifically significant paleontological resources during ground disturbance within late Eocene- to early Miocene-aged Sespe Formation, Oligocene- to Miocene-aged Vaqueros Formation, late Eocene- to Miocene-aged Vaqueros-Sespe Formations undifferentiated, middle Miocene-aged Topanga Formation, late Miocene-aged Puente Formation La Vida Member, and early to middle Pleistocene very old fan deposits. Late Pleistocene- to Holocene-aged young alluvial fan deposits are estimated to be less than 11,000 years old at the surface and are considered to have no potential for producing paleontological resources, because they are typically too young to contain *in situ* fossils. Additionally, previously disturbed sediments or artificial fill, which was observed during the field survey, will not contain *in situ* fossils, since these sediments have been displaced from their original context. However, these younger deposits often overlie older geologic units with higher paleontological potential, which may be impacted at shallow depth. Fossils contained within late Holocene-aged landslide deposits typically lack stratigraphic context due to displacement from the original site of deposition, reducing scientific significance of the fossils, and therefore these deposits are considered to have no potential for producing paleontological resources. The field survey results indicate that all mapped high and very high paleontologically sensitive units, with the exception of early to middle Pleistocene-aged very old alluvial fan deposits, are currently exposed in the Project area. Additionally, several fossil localities were documented during the field survey, and specimens included fish scales, invertebrate shell fragments, and mammal bones. No fossils were collected during the survey. No further work is recommended for the two non-significant discoveries. However, it is recommended that the significant shark tooth be collected prior to the start of construction, or avoided. Prior to the start of construction, a PRMMP should be prepared. The PRMMP should provide detailed recommended monitoring locations including locations mapped as high to very high sensitivity; a description of a worker training program; detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; and notification procedures in the event of a fossil discovery by a paleontological monitor or other project personnel. A curation agreement with the Cooper Center or another accredited repository approved by Orange County Parks must be obtained. Any subsurface bones or potential fossils that are unearthed during construction should be evaluated by a Qualified Paleontologist.

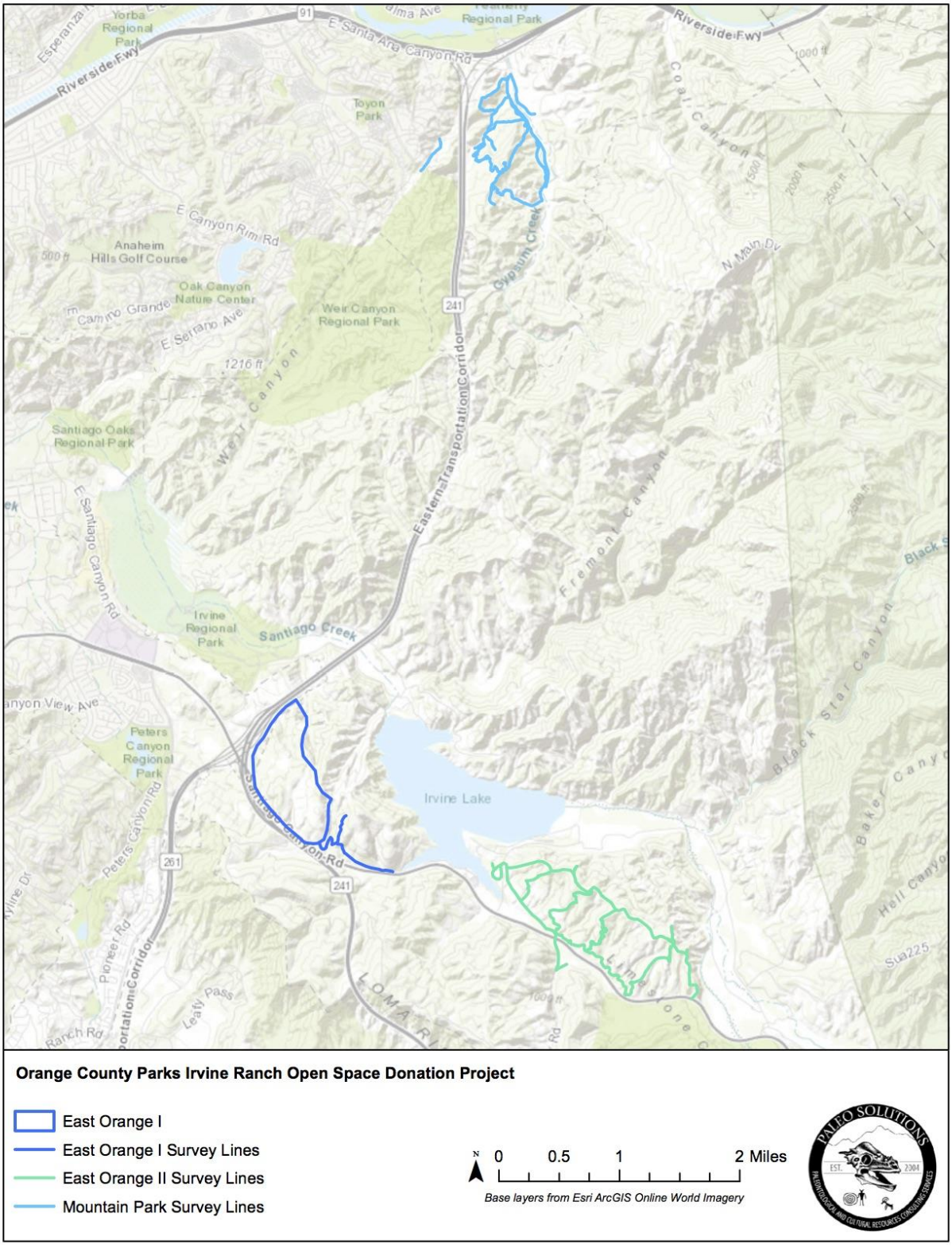


Figure 1. Project Location Map.



Figure 2a. Project Overview Map (Mountain Park).



Figure 2b. Project Overview Map (East Orange I).



Figure 2c. Project Overview Map (East Orange 2).

3.0 DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES

As defined by Murphey and Daitch (2007): "Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only fossils themselves, but also the associated rocks or organic matter and the physical characteristics of the fossils' associated sedimentary matrix.

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced. Fossils are important scientific and educational resources because they are used to:

- Study the phylogenetic relationships amongst extinct organisms, as well as their relationships to modern groups;
- Elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- Reconstruct ancient environments, climate change, and paleoecological relationships;
- Provide a measure of relative geologic dating that forms the basis for biochronology and biostratigraphy, and which is an independent and corroborating line of evidence for isotopic dating;
- Study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- Study patterns and processes of evolution, extinction, and speciation; and
- Identify past and potential future human-caused effects to global environments and climates."

Fossil resources vary widely in their relative abundance and distribution and not all are regarded as significant. According to the Bureau of Land Management (BLM) Instructional Memorandum (IM) 2009-011, a "Significant Paleontological Resource" is defined as:

> "Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be of scientific interest if it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has an identified educational or recreational value. Paleontological resources that may be considered not to have scientific significance include those that lack provenience or context, lack physical integrity due to decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities" (BLM, 2008).

Vertebrate fossils, whether preserved remains or track ways, are classified as significant by most state and federal agencies and professional groups (and are specifically protected under the California Public Resources Code). In some cases, fossils of plants or invertebrate animals are also considered significant and can provide important information about ancient local environments.

The full significance of fossil specimens or fossil assemblages cannot be accurately predicted before they are collected, and in many cases, before they are prepared in the laboratory and compared with previously collected fossils. Pre-construction assessment of significance associated with an area or formation must be made based on previous finds, characteristics of the sediments, and other methods that can be used to determine paleoenvironmental and taphonomic conditions.

4.0 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section of the report presents the state and local regulatory requirements pertaining to paleontological resources that will apply to this Project.

4.1 State Regulatory Setting

4.1.1 California Environmental Quality Act (CEQA)

The procedures, types of activities, persons, and public agencies required to comply with CEQA are defined in the Guidelines for Implementation of CEQA (State CEQA Guidelines), as amended on March 18, 2010 (Title 14, Section 15000 et seq. of the California Code of Regulations) and further amended January 4th, 2013. One of the questions listed in the CEQA Environmental Checklist is: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (State CEQA Guidelines Section 15064.5 and Appendix G, Section V, Part C).

4.1.2 State of California Public Resources Code

The State of California Public Resources Code (Chapter 1.7), Sections 5097 and 30244, includes additional state level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts to paleontological resources resulting from development on state lands, and define the excavation, destruction, or removal of paleontological "sites" or "features" from public lands without the express permission of the jurisdictional agency as a misdemeanor. As used in Section 5097, "state lands" refers to lands owned by, or under the jurisdiction of, the state or any state agency. "Public lands" is defined as lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

4.2 Local Regulatory Setting

4.2.1 Orange County

The Orange County General Plan Resources Element (2011) contains explicit guidelines for paleontological resources in the Cultural Resources portion of the document. Additionally, Orange County has a paleontological certification program to identify qualified paleontologists for work within the County. Two goals and four objectives address paleontological resources. Cultural Resources Goal 1 requires the County to raise the awareness and appreciation of Orange County's cultural and historic heritage. To achieve this, Objective 1.1 requires that the County facilitate and participate in activities that inform people about the social, cultural, economic, and scientific values of Orange County's heritage. Objective 1.2 requires that the County work through the Orange County Historical Commission in the areas of history, paleontology, archaeology, and historical preservation.

Goal 2 states that the County shall encourage through a resource management effort the preservation of the County's cultural and historic heritage. Objective 2.1 states that the County shall promote the preservation and use of buildings, sites, structures, objects, and districts of importance in Orange County through the administration of planning, environmental, and resource management programs. Objective 2.2 requires that the County take all reasonable and proper steps to achieve the preservation of archaeological and paleontological remains, or their recovery and analysis to preserve cultural, scientific, and educational values. The following policies addressing archaeological, paleontological, and historical resources shall be implemented at appropriate stage(s) of planning, coordinated with the processing of a project application, as follows:

- Identification of resources shall be completed at the earliest stage of project planning and review such as general plan amendment or zone change.
- Evaluation of resources shall be completed at intermediate stages of project planning and review such as site plan review, subdivision map approval, or at an earlier stage of project review.
- Final preservation actions shall be completed at final stages of project planning and review such as grading, demolition, or at an earlier stage of project review.

Additionally, Orange County has a well-defined set of guidelines regarding paleontological resources, their disposition, and distribution throughout the County (Cooper and Eisentraut, 2002).

5.0 METHODS

This paleontological analysis of existing data included a geologic map review, a literature search, and a museum record search. The analysis of existing data was supplemented with a paleontological field survey. The goal of this report is to identify the paleontological potential of the Project area and make recommendations for the mitigation of adverse effects on paleontological resources that may occur as a result of the proposed construction. Paleontological sensitivity assignments were determined based on information contained in the Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002). Kim McComas, M.S., and Joey Raum, B.S., conducted the paleontological field survey. Joey Raum, B.S., completed the background research and co-authored this report with Courtney Richards, M.S. Courtney Richards, M.S., performed the technical review of this report. GIS maps were prepared by Barbara Webster, M.S. Geraldine Aron, M.S., and Courtney Richards, M.S., oversaw all aspects of the Project as the Project Manager and Paleontological Principal Investigator, respectively.

Paleo Solutions will retain an archival copy of all Project information including field notes, maps, and other data.

5.1 Analysis of Existing Data

Paleo Solutions reviewed geologic mapping of the Project area and 0.25-mile buffer by D.M. Morton and F.K. Miller (2006). The literature reviewed included published and unpublished scientific papers. A paleontological museum record search was conducted at the Natural History Museum of Los Angeles County (LACM). Samuel McLeod, Ph.D., performed the LACM search. The results of the LACM museum record search (dated June 15, 2018) are attached as Appendix A. Additional record searches of online databases were completed by Paleo Solutions staff.

5.2 Field Survey

The field survey was conducted by Paleo Solutions staff members Joey Raum, B.S., and Kim McComas, M.S., on May 14, 15, 16, and 17, 2018. The paleontological survey was performed in order to determine the

paleontological potential of the geologic deposits underlying the Project area. The survey was conducted after a review of aerial photographs indicated the Project area included areas of undisturbed native sediment. The pedestrian survey included inspection of the Project area with the majority of the focus occurring in areas with native bedrock and sediment exposures. Rock and sediment exposures as well as the surrounding areas were photographed and documented. Reference points were acquired using a GPS unit. Sediment and bedrock lithologies were recorded and analyzed and used to better interpret the Project's paleontological potential, and thus better understand the Project's potential impact.

6.0 ANALYSIS OF EXISTING DATA

The Project area is located within the northwestern portion of the Peninsular Ranges Geomorphic Province, a region characterized by northwest-trending fault-bounded mountain ranges, broad intervening valleys, and low-lying coastal plains (Yerkes et al., 1965). The Peninsular Ranges extend approximately 920 miles from the Los Angeles Basin to the southern tip of Baja California and vary in width from approximately 30 to 100 miles. Bedrock units include pre-Cretaceous igneous rocks of the Southern California Batholith and Tertiary marine and nonmarine sedimentary units (Yerkes et al., 1965; Norris and Webb, 1976). The Project area is specifically located within the northwestern portion of the Santa Ana Mountains. The Santa Ana Mountains comprise a fault block that has been uplifting since the Pleistocene along the Elsinore Fault Zone, which bounds the block's northeastern edge (Hyatt, 1934). These mountains tilt southwesterly towards the Coastal Plain and comprise folded Tertiary rocks and Mesozoic plutonic basement rocks (Hyatt, 1934).

6.1 Literature Search and Geologic Map Review

Geologic mapping by D.M. Morton and F.K. Miller (2006) indicates that the Project area is immediately underlain by late Eocene- to early Miocene-aged Sespe Formation, Oligocene- to Miocene-aged Vaqueros Formation, late Eocene- to Miocene-aged Vaqueros-Sespe Formations Undifferentiated, middle Miocene-aged Topanga Formation, Miocene-aged Puente Formation La Vida Member, early to middle Pleistocene-aged very old alluvial fan deposits, late Pleistocene- to Holocene-aged young alluvial fan deposits, and late Holocene landslide deposits. Additional geologic units are mapped in the Project vicinity (Morton and Miller, 2006), but they are not anticipated to be encountered during Project construction and are therefore not discussed in this report or considered in the paleontological analysis.

Each geologic unit potentially impacted by ground-disturbing activities, and their paleontological potential, are discussed below. The geographic distribution of the geologic units in the Project area, as mapped by Morton and Miller (2006) are shown in Figure 3.

6.1.1 Sespe Formation – Late Eocene to Early Miocene

The Sespe Formation is late Eocene- to early Miocene-aged (approximately 37.2 to 18 million years old) and consists of nonmarine sequences of sandstone and conglomerate. The Sespe Formation was originally described by Watts (1897), was later described by Eldridge and Arnold (1907), and was finally redefined by Kew (1924) for nonmarine conglomeratic deposits exposed in Sespe Creek in Ventura County. The Sespe Formation consists of two sedimentation megasequences, each hundreds of meters thick and fining up section (Howard, 1988). The lower megasequence consists of sediments derived mostly from the Mojave Desert that were deposited by west-flowing braided fluvial and flash flood systems (Howard, 1988). The sedimentary regression in this lower megasequence coincides with eustatic sea level drop at the end of the Eocene, approximately 33 million years ago (Howard, 1988). The upper megasequence contains sediments derived from the Mojave Desert and the Franciscan Complex that were deposited in response to eustatic sea level rise following a drop in the early Oligocene (approximately 31 million years ago) (Howard, 1988). This eustatic sea level drop is denoted in the strata by an erosional unconformity during this time, which also marks the boundary between the two megasequences (Howard, 1988). The upper megasequence depositional systems evolved from braided to meandering streams upsection, which coincides with eustatic sea level drop

(Howard, 1988). Sespe Formation sediments generally consist of gray to red colored, thick to massive bedded, mudstone, sandstone, and pebble- to cobble-conglomerate with clasts composed of granitic and metamorphic rocks and quartzite (Morton and Miller, 2006; Howard, 1988). The Sespe Formation lies stratigraphically below the Oligocene- to Miocene-aged Vaqueros Formation and is mapped in both the East Orange I and II sections of the Project area (Morton and Miller, 2006; Figure 3b-d).

Online paleontological database record searches for the Sespe Formation did not yield any fossil specimens recorded from within Orange County. However, numerous vertebrate fossils are known from the Sespe Formation in Ventura County. Recorded specimens include crocodile (Crocodylidae), softshell turtle (Trionychidae), turtle (*Hadrianus*), rodent (*Simimys simplex*, *Metanoiamys fantasma*, *Pareumys milleri*, *Griphomys alecer*, *Leptotomus burkei*, *Rapamys fricki*, *Eohaplomys servus*, *Eohaplomys matutinus*, *Eohaplomys tradux*, *Ischyrotomus tapensis*), elephant shrew (*Sespedectes singularis*, *Proterixoides davisi*), rhinoceros (*Subhyracodon kewi*), oreodont (*Protoreodon tardus*, *Sespia californica*), odd-toed ungulate (*Amynodontopsis*, *Triplopus woodi*), brontothere (*Teleodus californicus*), protoceratid (*Leptoreodon edwardsi*), and primate (*Chumashius balchi, Yaquius travisi, Craseops sylvestris*, *Dyseolemur pacificus*) (UCMP, 2018; Table 2). The Sespe Formation is assigned a very high potential for producing significant paleontological resources in Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

6.1.2 Vaqueros Formation – Oligocene to Early Miocene

The Vaqueros Formation is Oligocene- to early Miocene-aged (approximately 33.9 to 18 million years old) and comprises shallow marine and paralic deposits. The unit was originally described by Hamlin (1904) for exposures of sandstone in Los Vaqueros Valley and Reliz Canyon. The Vaqueros Formation has a maximum thickness of approximately 6,000 feet or more and lies stratigraphically above, and also interfingers with, the Sespe Formation and below the Topanga Formation (Morton and Miller, 2006). Sediments generally consist of medium- to coarse-grained, well-sorted, thin- to thick-bedded biotitic sandstone and interbedded greenish to reddish mudstone. The Vaqueros Formation is mapped in portions of the East Orange I and East Orange II areas (Morton and Miller, 2006; Figure 3b-d).

The Vaqueros Formation sediments characteristically contain the invertebrate sea snail fossil, *Turritella inezana* (Table 2) (Arnold, 1906). The Vaqueros Formation is assigned a high potential for producing significant paleontological resources in Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

6.1.3 Vaqueros-Sespe Formations Undifferentiated – Late Eocene to Early Miocene

The Vaqueros-Sespe Formations Undifferentiated is late Eocene- to early Miocene-aged and consists of interbedded marine Vaqueros Formation and nonmarine Sespe Formation sediments (Morton and Miller, 2006) (see Sections 6.1.1 and 6.1.2). The Vaqueros-Sespe Formations Undifferentiated is mapped throughout much of the Mountain Park area (Morton and Miller, 2006; Figure 3a).

The paleontological potential for the Vaqueros and Sespe Formations Undifferentiated is similar to the potential for the individual units—Vaqueros and Sespe Formations (see Sections 6.1.2 and 6.1.1, respectively). The Vaqueros-Sespe Formations Undifferentiated is assigned a high paleontological sensitivity in Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

6.1.4 Topanga Formation – Middle Miocene

The Topanga Formation is early to middle Miocene-aged (approximately 18 to 12 million years old) and comprises moderate to deep marine deposits consisting dominantly of sandstone, siltstone, and shale. The Topanga Formation was originally named by Kew (1923) for exposures in the Santa Monica Mountains, and it extends through the southern, eastern, northern, and northwestern areas of the Los Angeles Basin, as well as the southern part of the eastern Ventura Basin (Campbell et al., 2007). The Topanga Formation is approximately 6,000 feet thick, and sediments consist of gray to tan colored, massive to vaguely bedded, friable sandstone interbedded with light gray, thinly bedded, soft and crumbly siltstone and clay shale beds of

varying colors with some finer sandstone and calcareous concretions or lenses (Morton and Miller, 2006; Kew, 1923). The Topanga Formation lies stratigraphically above the Oligocene- to Miocene-aged Vaqueros Formation and below the Miocene-aged Puente Formation and is mapped in both the East Orange I and Mountain Park portions of the Project area (Morton and Miller, 2006; Figure 3a-c).

The Topanga Formation has produced numerous significant fossil resources, including vertebrates, invertebrates, plants, and microfossils. Recorded vertebrate specimens from Los Angeles and Orange counties include ray (*Myliobatis*), dogfish shark (*Squalus sericulus*), angel shark (*Squatina lerichei*), mackerel shark (*Isurus tumulus*), requiem shark (*Negaprion*, *Galeocerdo aduncus*), weasel shark (*Hemipristis serra*), hooked tooth mako shark (*Isurus planus*, *Isurus tumulus*), white shark (*Carcharodon tembloris*), megalodon (*Carcharocles megalodon*), shorebird (*Alcodes* aff. *ulnulus*), duck (Anatidae), albatross (*Diomedea*), shearwater (*Puffinus priscus*), booby (*Sulidae*), mouse (*Leidymys*), rabbit (*Archaeolagus*), horse (Equidae, *Parapliohippus carrizoensis*), sea cow (*Dusisiren reinharti*, *Hydrodamalis cuestae*, *Dioplotherium allisoni*), hippopotamus-like creature (*Desmostylus hesperus*,), walrus (*Neotherium*), pinniped (*Eotaria citrica*, *Allodesmus*), camel (*Aepycamelus*), and whale (Cetotheriidae, *Zarhinocetus errabundus*) (PBDB, 2018; UMCP, 2018; Table 2). Additionally, the Topanga Formation is known to contain mantis shrimp (*Topangasquilla gravesi*) and mollusks such as snail (*Turritella ocoyana*) and scallop (*Vertipecten bowersi*) (PBDB, 2018; CDC, 1976; Table 2). Parts of the Topanga Formation are composed of distorted oyster shells and the tests of single-celled amoeboid protists (CDC, 1976). Furthermore, in Ventura County, the Calabasas and Modelo formations, both of which have been correlated with Topanga Formation, have produced fossilized remains of plant, foraminifera, and fish (UCMP, 2018; Winterer and Durham, 1962; Table 2). The Topanga Formation is assigned a very high potential for producing significant paleontological resources in Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

6.1.5 Puente Formation La Vida Member – Miocene

The Miocene Puente Formation was first described in detail by G.H. Eldridge and R. Arnold (1907). The formation consists of shale, siltstone, sandstone, and pebble to cobble conglomerate and has an unknown maximum thickness of more than 13,000 feet (Eldridge and Arnold, 1907). The Puente Formation is contemporaneous with the Monterey Formation (Cooper, 1981; Critelli et al., 1995). The Puente Formation was deposited when the ocean still covered much of southern California. Rapid uplift of landward sediments due to the geologically rapid convergence of the Pacific and Farallon plates caused the production of large amounts of terrestrially derived sediments. At that time, submarine canyons along the coast shed two main "megasequences" of turbidites (comparable to oceanic landslides) off the continental shelf and into the ocean basin, where they were interbedded with slower accumulating silts and clays (Critelli et al., 1995). The formation is subdivided into four members, which from oldest to youngest include the La Vida Member, Soquel Member, Yorba Member, and Sycamore Canyon Member. The La Vida Member is mapped within both the East Orange I and II portions of the Project area (Morton and Miller, 2006; Figure 3b-d).

The basal La Vida member is late Miocene in age (13.5 to 10 million years old) and consists of light gray to black, friable, massive to well bedded siltstone (Critelli et al, 1995; Morton and Miller, 2006). This unit is up to 3,800 feet thick in the central portion of its range and is interpreted to be marine basin slope to outer fan facies. It is part of the basal turbidite 'megasequence' that also contains the Soquel Member (Cooper, 1981; Critelli et al., 1995; Morton and Miller, 2006).

Puente Formation sediments in Orange County have produced fossil remains of bony fish (Osteichthyes) (UCMP, 2018; Table 2). Numerous vertebrate fish fossil localities are also recorded from the Puente Formation in Chino Hills, San Bernardino County. Recorded specimens include herring family (Clupeidae), extinct herring (*Etringus* sp., *Xyne grex*), bristlemouth (*Cyclothone* sp.), lantern fish family (Myctophidae), ray-finned fish (*Teleostei* sp.), extinct bony fish (*Ganolytes cameo*.), extinct croaker (*Lompoquia* sp.), alder (*Alnus* sp.), deep-sea smelt (*Bathylagus* sp.), bonito (cf. *Sarda* sp.), jack fish (*Pseudoseriola* sp.), pipefish (*Sygnathus* sp.), and extinct viperfish (*Chauliodus eximius*) (Aron and Raum, 2017; Table 2). Additionally, numerous new localities were recorded during construction of the Tehachapi Renewable Transmission Project in Chino Hills, and

include fossilized plant, fish, and mammal. Specimens recorded include plane or sweetgum tree (*Platanus* or *Liquidambar*), algae (Algae), legume seed pod (Fabaceae cf. *Cersis*), sumac (Anacardiaceae), ray-finned fish (Teleostei sp.), lanternfish (Myctophidae), extinct bony fish (*Ganolytes cameo*), bristlemouth fish (*Cyclothone* sp.), spiny ray-finned fish (*Acanthomorpha* sp.), extinct bony fish (*Eclipes* sp.), drumfish (Sciaenidae sp.), extinct drumfish (*Lompoquia*), hammerhead shark (*Sphyrna* sp.), mammal (Mammalia), and whale (Cetacean) (Aron and Raum, 2017; Table 2). The Puente Formation La Vida Member is assigned a high potential for producing significant paleontological resources in Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

6.1.6 Very Old Alluvial Fan Deposits – Early to Middle Pleistocene

Very old alluvial fan deposits were deposited during the early to middle Pleistocene (approximately 2.5 million years ago to 781,000 years ago) (Morton and Miller, 2006). These sediments consist of reddish-brown colored, well-indurated, mostly well-dissected, moderately sorted alluvial fan deposits with mostly sand and gravel (Morton and Miller, 2006). Very old alluvial fan deposits are mapped in the East Orange II area (Morton and Miller, 2006; Figure 3c-d).

Taxonomically diverse and locally abundant Pleistocene animals and plants have been collected from older alluvial deposits throughout southern California and include mammoth (*Mammuthus*), mastodon (*Mammut*), camel (Camelidae), horse (Equidae), bison (*Bison*), giant ground sloth (*Megatherium*), peccary (Tayassuidae), cheetah (*Acinonyx*), lion (*Panthera*), saber tooth cat (*Smilodon*), capybara (*Hydrochoerus*), dire wolf (*Canis dirus*), and numerous taxa of smaller mammals (Rodentia) (Blake, 1991; Jahns, 1954; Jefferson, 1991; Table 2). The very old alluvial fan deposits assigned a high potential for producing significant paleontological resources in Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

6.1.7 Young Alluvial Fan Deposits – Late Pleistocene to Holocene

Young alluvial fan deposits are late Pleistocene- to Holocene-aged and include surficial sediments consisting of unconsolidated to moderately consolidated alluvial silt, sand, pebbles, cobbles and boulders that were deposited in canyon and mountain drainage systems (Morton and Miller, 2006). These sediments may be variable in color, though they are often tan to brown. Quaternary young sediments are mapped in all three portions of the Project area including East Orange I, East Orange II, and Mountain Park (Morton and Miller, 2006; Figure 3a-d).

Late Pleistocene- to Holocene-aged young alluvial fan deposits are considered too young (less than 11,000 years old) to contain scientifically significant in-situ fossils. These sediments, however, may shallowly overlie older more fossiliferous sedimentary units. Young alluvial fan deposits have no potential for producing significant paleontological resources based on Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

6.1.8 Landslide Deposits – Late Holocene

Landslide deposits within the Project area were formed during the Holocene (approximately 11,000 years ago to present) and consist of abruptly displaced sections of hills or mountains resulting from tectonic and hydro forces. These deposits were displaced during the Holocene and contain unconsolidated detrital sediments and sections of sedimentary, plutonic, and metamorphic bedrock (Morton and Miller, 2006). Although the landslide events are relatively young, the overall structure of the bedrock may be preserved. Landslide deposits are mapped in all three portions of the Project area including East Orange I, East Orange II, and Mountain Park (Morton and Miller, 2006; Figure 3a-d). Fossils contained within these deposits typically lack stratigraphic context due to displacement from the original site of deposition, reducing scientific significance of the fossils. Landslide deposits have no potential for producing significant paleontological resources based on Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

6.1.9 Artificial Fill (Not Mapped) – Recent

Artificial fill comprises recent deposits of previously disturbed sediments emplaced by construction operations and are found in areas where recent construction has taken place. Color is highly variable and

sediments are mottled in appearance. These sediments are not mapped within the Project area but were observed during the field survey, particularly in areas that have been graded. Although these materials may contain fossil resources, they have been removed from their original locations and, therefore, lack significance. Artificial fill has no potential for producing significant paleontological resources based on Orange County's model curation program for paleontological resources (Cooper and Eisentraut, 2002).

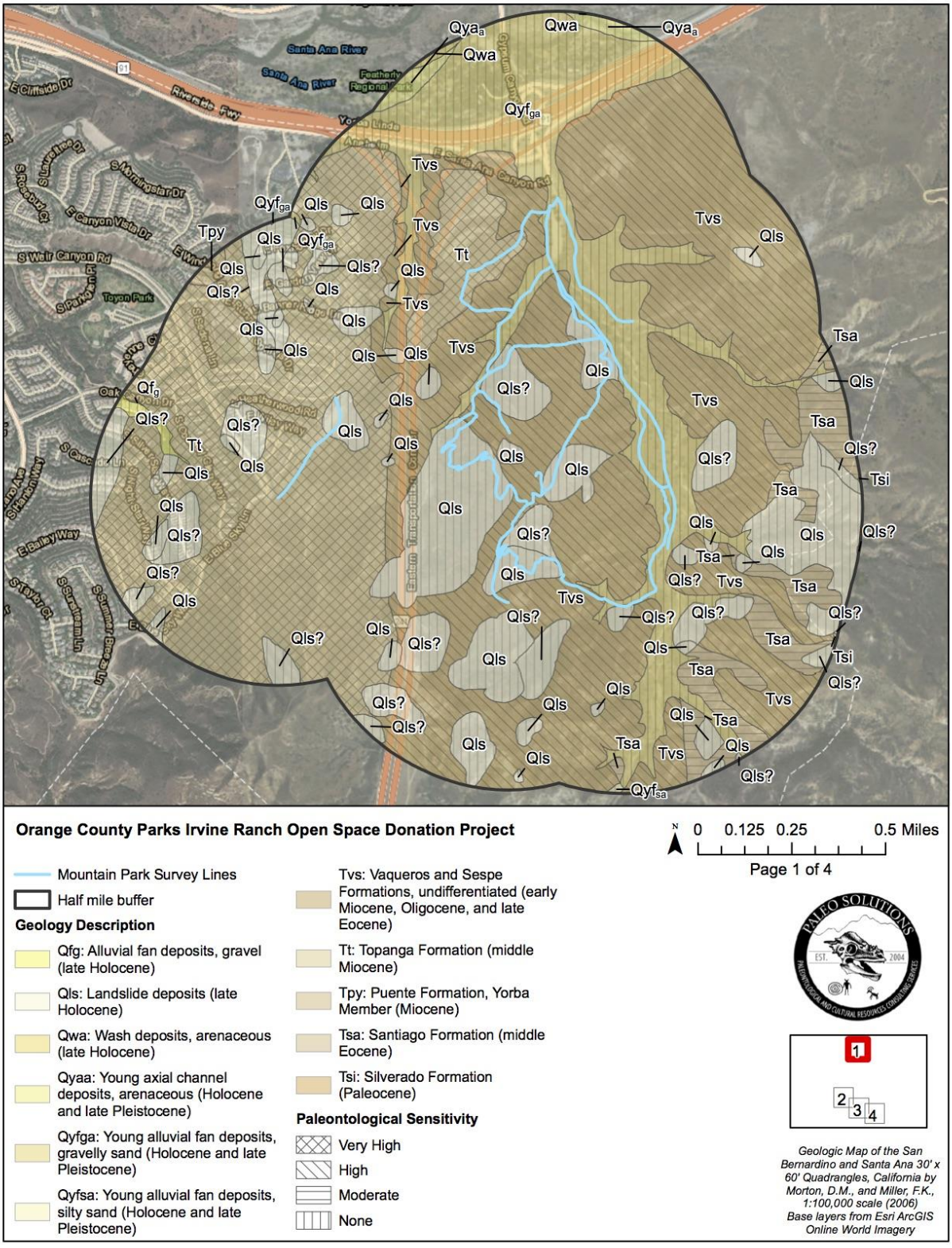


Figure 3a. Project Geology Map (Mountain Park).

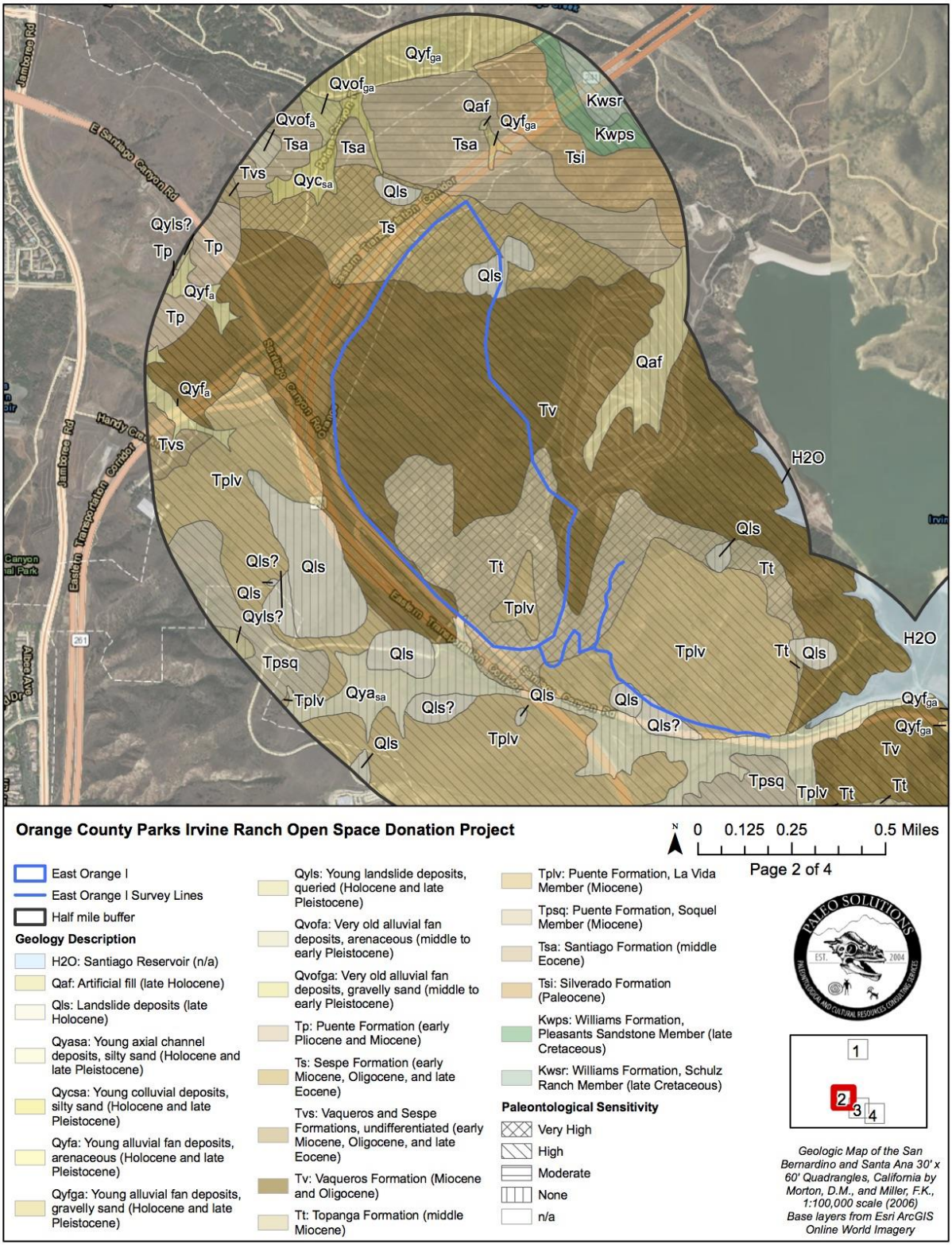


Figure 3b. Project Geology Map (East Orange I).

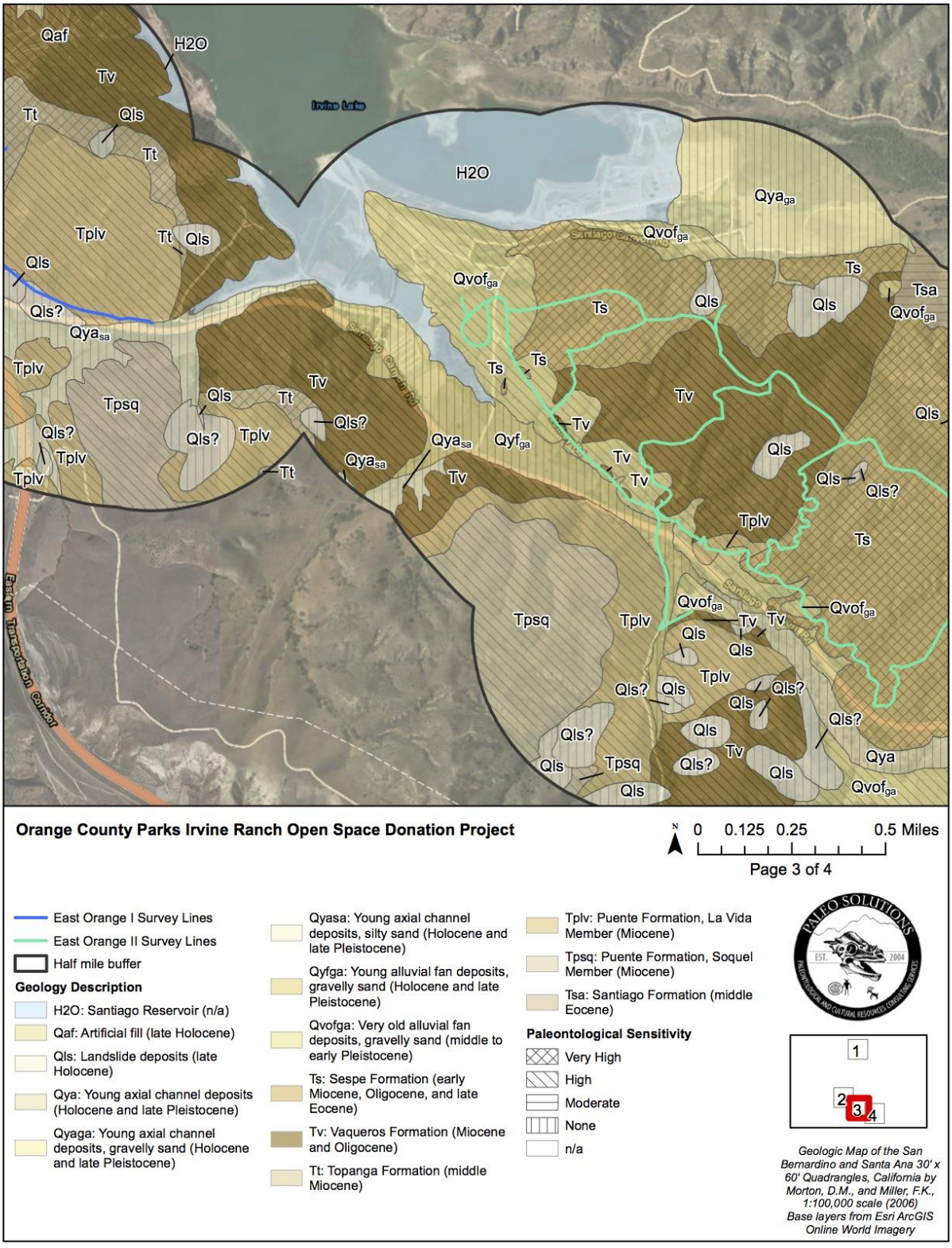


Figure 3c. Project Geology Map (East Orange I and East Orange II).

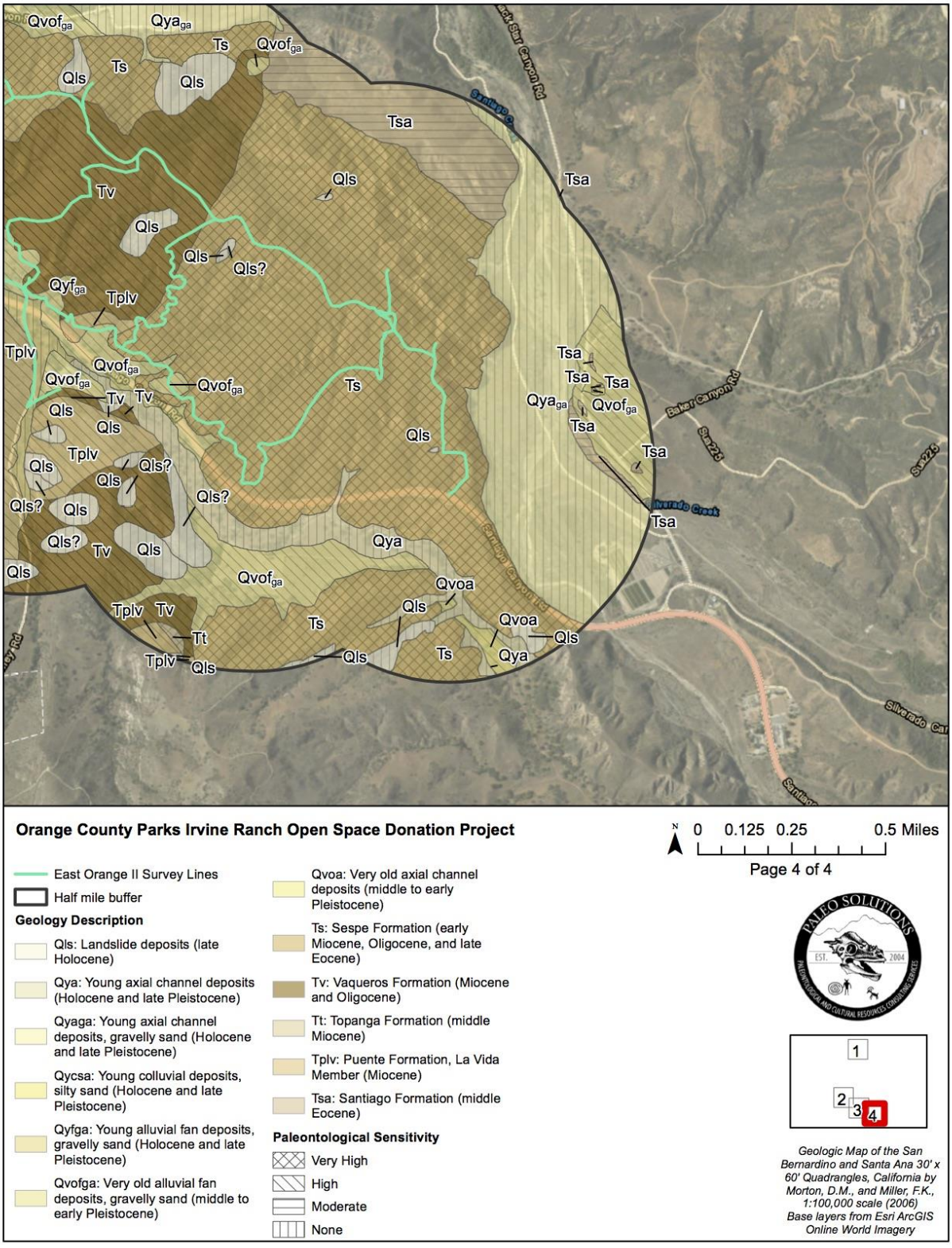


Figure 3d. Project Geology Map (East Orange II).

6.2 Paleontological Record Search Results

Paleo Solutions requested a paleontological search of records maintained by the LACM. The museum responded on June 15, 2018 (see Appendix A) that there are no vertebrate fossil localities recorded from within the Project area. However, there are numerous localities recorded from within the Project vicinity from sediments similar to those underlying the Project area (McLeod, 2018).

Locality LACM 4943, which is recorded from Quaternary older (Pleistocene-aged) alluvium (similar in age and deposition to very old alluvial fan deposits) and is located west of the Project area, produced fossil horse (*Equus*) (McLeod, 2018; Table 2). Locality LACM 6287, which is recorded from the Puente Formation and is located adjacent to the southeastern portion of the Project area, produced fossil tonguefish (*Symphurus*) (McLeod, 2018; Table 2). The Topanga Formation has yielded four vertebrate fossil localities within the Project vicinity including LACM 6292, 3891, 4008, and 4009. Locality LACM 6292, which is located adjacent to the southwestern portion of the Project area, produced fossil dog shark (*Mustelus*) (McLeod, 2018; Table 2). Localities LACM 3891, 4008, and 4009, which are located west-northwest of the southwestern portion of the Project area, collectively produced fossil whale (Cetacea), sirenian (Dugongidae), and hippopotamus-like creature (*Desmostylus*) (McLeod, 2018; Table 2). The Vaqueros-Sespe Formations Undifferentiated have yielded six vertebrate fossil localities within the Project vicinity include LACM 4315, 1905, 3383, 3384, 3385, and 6624. Locality LACM 4315, which is located north of the Project area, produced fossil shark (*Cetorhinus*), requiem shark (*Carcharhinus*), angel shark (*Squatina*), and stingray (Dasyatidae) (McLeod, 2018; Table 2). Locality 1905, which is located adjacent to the southeastern portion of the Project area, produced fossil bonito shark (*Isurus smithi*) and mammal (Mammalia) (McLeod, 2018; Table 2). Localities LACM 3383, 3384, 3385, and 6624, which are located north of the southwestern portion of the Project area, collectively produced fossil eagle ray (*Myliobatis*), bonito shark (*Isurus planus*), hippopotamus-like creature (*Desmostylus*) and toothed whale (Odontoceti) (McLeod, 2018; Table 2). Based on the fossil assemblages, these localities documented from the Vaqueros-Sespe Formations Undifferentiated are likely from Vaqueros facies (McLeod, 2018).

Table 2. Museum Record and Literature Search Results Summary

Locality Number	Geologic Unit	Common Name	Scientific Name	Location	Source
Multiple Localities	Sespe Formation (Eocene to early Miocene)	crocodile	Crocodylidae	Ventura County	UCMP, 2018
		softshell turtle	Trionychidae		
		turtle	*Hadrianus*		
		rodent	*Simimys simplex*		
		rodent	*Metanoiamys fantasma*		
		rodent	*Pareumys milleri*		
		rodent	*Griphomys alecer*		
		rodent	*Leptotomus burkei*		
		rodent	*Rapamys fricki*		
		rodent	*Eohaplomys servus*		
		rodent	*Eohaplomys matutinus*		
		rodent	*Eohaplomys tradux*		
		rodent	*Ischyrotomus tapensis*		
		elephant shrew	*Sespedectes singularis*		
		elephant shrew	*Proterixoides davisi*		
		rhinoceros	*Subhyracodon kewi*		
		oreodont	*Protoreodon tardus*		
		oreodont	*Sespia californica*		
		odd-toed ungulate	*Amynodontopsis*		
		odd-toed ungulate	*Triplopus woodi*		
		brontothere	*Teleodus californicus*		
		protoceratid	*Leptoreodon edwardsi*		
		primate	*Chumashius balchi*		
		primate	*Yaquius travisi*		
		primate	*Craseops sylvestris*		

Locality Number	Geologic Unit	Common Name	Scientific Name	Location	Source
		primate	*Dyseolemur pacificus*		
Not Recorded	Vaqueros Formation (Oligocene to early Miocene)	sea snail	*Turritella inezana*	southern California	Arnold, 1906
LACM 4315	Vaqueros-Sespe Formations Undifferentiated (late Eocene to early Miocene)	shark requiem shark angel shark stingray	*Cetorhinus* *Carcharhinus* *Squatina* Dasyatidae	north of Project area	McLeod, 2018
LACM 1905	Vaqueros-Sespe Formations Undifferentiated (late Eocene to early Miocene)	bonito shark mammal	*Isurus smithi* Mammalia	adjacent to southeastern Project area	McLeod, 2018
LACM 3383, 3384, 3385, and 6624	Vaqueros-Sespe Formations Undifferentiated (late Eocene to early Miocene)	eagle ray bonito shark hippopotamus-like creature toothed whale	*Myliobatis* *Isurus planus* *Desmostylus* Odontoceti	adjacent to southwestern Project area	McLeod, 2018
Not Recorded	Topanga Formation (Miocene)	plant foraminifera mantis shrimp mollusk scallop ray dogfish shark angel shark mackerel shark requiem shark requiem shark weasel shark hooked tooth mako shark white shark megalodon shorebird duck albatross shearwater booby mouse rabbit horse horse sea cow sea cow sea cow hippopotamus-like creature walrus pinniped pinniped camel whale whale	- - *Topangasquilla gravesi* *Turritella ocoyana* *Vertipecten bowersi* *Myliobatis* *Squalus sericulus* *Squatina lerichei* *Isurus tumulus* *Negaprion* *Galeocerdo aduncus* *Hemipristis serra* *Isurus planus* *Carcharodon tembloris* *Carcharocles megalodon* *Alcodes* aff. *ulnulus* Anatidae *Diomedea* *Puffinus priscus* Sulidae *Leidymys* *Archaeolagus* Equidae *Parapliohippus carrizoensis* *Dusisiren reinharti* *Hydrodamalis cuestae* *Dioplotherium allisoni* *Desmostylus hesperus* *Neotherium* *Eotaria citrica* *Allodesmus* *Aepycamelus* Cetotheriidae *Zarhinocetus errabundus*	Los Angeles and Orange counties, California	CDC, 1976; PBDB, 2018; UCMP, 2018
LACM 6292	Topanga Formation (Miocene)	dogshark	*Mustelus*	adjacent to southwestern Project area	McLeod, 2018

Locality Number	Geologic Unit	Common Name	Scientific Name	Location	Source
LACM 3891, 4008, and 4009	Topanga Formation (Miocene)	whale sirenian hippopotamus-like creature	Cetacea Dugongidae *Desmostylus*	west-northwest of southwestern Project area	McLeod, 2018
UCMP V68103	Puente Formation (Miocene)	Osteichthyes	bony fish	Orange County	UCMP, 2018
LACM 6287	Puente Formation (Miocene)	tonguefish	*Symphurus*	adjacent to southeastern Project area	McLeod, 2018
Multiple Localities	Puente Formation (Miocene)	algae fruit? seed? plane or sweetgum tree legume seed pod sumac ray-finned fish lanternfish extinct bony fish bristlemouth fish spiny ray-finned fish extinct bony fish drumfish extinct bony fish extinct croaker hammerhead shark mammal whale	Algae Plante undet. *Platanus* or *Liquidambar* Fabaceae cf. *Cersis* Anacardiaceae Teleostei sp. Myctophidae *Ganolytes cameo* *Cyclothone* sp. *Acanthomorpha* sp. *Eclipes* sp. Sciaenidae *Ganolytes cameo* *Lompoquia* *Sphyrna* sp. Mammalia undet. Cetacean undet.	Chino Hills, San Bernardino County	Aron and Raum, 2017
Not Recorded	Puente Formation (Miocene)	herring family extinct herring extinct herring bristlemouth lantern fish family ray-finned fish extinct bony fish extinct croaker alder deep-sea smelt bonito jack fish pipefish extinct viperfish	Clupeidae *Etringus* sp. *Xyne grex* *Cyclothone* sp. Myctophidae Teleostei sp. *Ganolytes cameo* *Lompoquia* sp. *Alnus* sp. *Bathylagus* sp. cf. *Sarda* sp. *Pseudoseriola* sp. *Sygnathus* sp. *Chauliodus eximius*	Chino Hills, San Bernardino County	Aron and Raum, 2017
LACM 4943	Quaternary older alluvium (Pleistocene)	horse	*Equus*	west of Project area	McLeod, 2018
Not Recorded	Quaternary older alluvium (Pleistocene)	mammoth mastodon camel horse bison giant ground sloth peccary cheetah lion saber tooth cat capybara dire wolf rodent	*Mammuthus* *Mammut* Camelidae Equidae *Bison* *Megatherium* Tayassuidae *Acinonyx* *Panthera* *Smilodon* *Hydrochoerus* *Canis dirus* Rodentia	southern California	Jahns 1954; Cooper and Eisentraut, 2002; Jefferson, 1991

7.0 FIELD SURVEY

The field survey was conducted on May 14, 15, 16, and 17, 2018 by Joey Raum, B.S., and Kim McComas, M.S., and involved inspection of the Project area with the purpose of recording any paleontological resources that may be exposed at the surface and also interpreting the paleontological sensitivity of the geologic units that occur within the Project area. The Project area consists of three sections including Mountain Park, East Orange I, and East Orange II. Although the intent was to survey the entire Project area, a large portion of the East Orange I portion was only visually inspected due to the high density of vegetation. The survey focus included inspecting areas that contain native sediment outcrops of geologic units with high and very high sensitivities. Areas of the alignment that are mapped as low paleontological sensitivity were quickly traversed to confirm geologic mapping.

Mountain Park

The Mountain Park portion of the Project area was surveyed on May 17, 2018. The terrain consisted mostly of moderate to moderately-steep relief, subrounded hills with moderate to steep relief drainages and slope faces and relatively low-lying and flat valley areas and washes. Vegetation was relatively thin compared to East Orange I and East Orange II and consisted of grasses, sparse shrubs and some oak trees. There was an approximately north-south trending wash along the eastern boundary where Holocene-aged young alluvial fan deposits were exposed. Additional sediment exposures were on slopes and in drainages. In places where outcrops were not well lithified and resistant, they were weathered into badlands style topography. Geologic units observed in the Mountain Park area included young alluvial deposits, Topanga Formation, and Vaqueros-Sespe Formations Undifferentiated.

Young alluvial deposits covered much of the ground surface and were observed to be between 3 to 5 feet thick where they were overlying older sedimentary units. These sediments consisted of light to medium gray brown colored, poorly to moderately compacted, poorly to moderately sorted, silt with subrounded to rounded pebbles and cobbles composed of plutonic clasts (Figure 5). On slopes, the alluvial veneer was relatively thinner (less than one foot thick). Young alluvial fan deposits were exposed in vertical sections as thick as 6 feet within the north-south trending wash located along the eastern boundary. These sediments consist of poorly to moderately compacted, moderately to poorly sorted, fine- to medium-grained, light colored and arkosic sandstone with coarser-grained lenses, planar and cross bedding (Figures 6 and 7). Topanga Formation sediments were exposed on hillsides in sections as thick as 100 feet or more. Sediments consisted of gray to blue-gray, and orange colored, well lithified, fine- to medium-grained silty sand with subangular granule- to small pebble-sized and some pebble-sized clasts consisting of plutonic clasts (Figures 8 through 14). Some planar bedding was observed in the coarser gravel beds. Vaqueros-Sespe Formations Undifferentiated sediments were exposed on hillsides in sections as thick as 50 feet or more. A clear contact between these sediments and the overlying Topanga Formation sediments was observed along the eastern-facing slopes (Figures 4, 9, and 10). Sediments consisted of red-purple to red, yellow, light gray, blue-gray colored, well lithified, well sorted, medium- to coarse-grained sandstone with some conglomeratic beds consisting of rounded pebble- to cobble-sized plutonic clasts (Figures 4, 9, 10, and 15). Planar bedding and cross stratification were both observed in the sediments. No fossils were observed within Topanga Formation or Vaqueros-Sespe Formations Undifferentiated sediments in the Mountain Park area.



Figure 4.



Figure 5.



Figure 6.

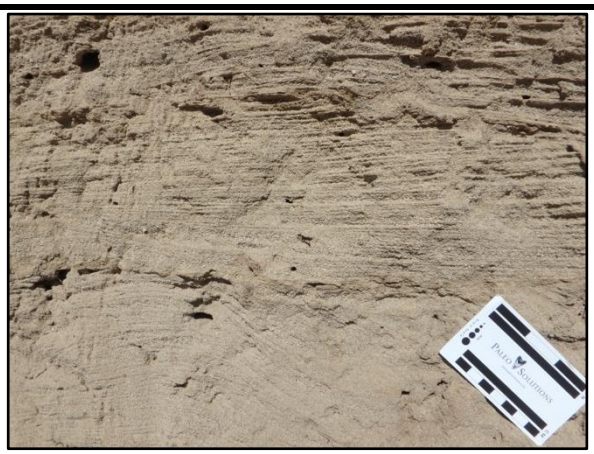


Figure 7.



Figure 8.



Figure 9.

Figure 4. Overview of region, Topanga Formation overlying Vaqueros-Sespe Formations Undifferentiated. View northeast.
Figure 5. Holocene-aged young alluvial/colluvial deposits. View south.
Figure 6. Holocene-aged young alluvial fan deposits exposed in channel. View southwest.
Figure 7. Exposure of Holocene-aged young alluvial fan deposits along channel wall. Planar and cross bedding. View east.
Figure 8. Outcrop of Topanga Formation sediments on slope. View west.
Figure 9. Overview of canyons and exposures of Topanga Formation along east-facing slopes. View south.



Figure 10.



Figure 11.



Figure 12.



Figure 13.



Figure 14.



Figure 15.

Figure 10. Exposure of Topanga Formation overlying Vaqueros-Sespe Formations Undifferentiated. View west.
Figure 11. Outcrop of Topanga Formation sandstone. View west.
Figure 12. Outcrop of Topanga Formation sandstone. View west.
Figure 13. Outcrop of Topanga Formation sandstone. View west.
Figure 14. Outcrop of Topanga Formation sandstone. View west.
Figure 15. Outcrop of Vaqueros-Sespe Formations Undifferentiated sediments eroding out of canyon. View southwest.

East Orange I

The East Orange I portion of the Project area was surveyed on May 14 and 15, 2018. The site is located adjacent to the Santiago Landfill. The terrain consisted mostly of moderate relief, rounded hills and moderate to moderately-steep drainages that were densely covered with grass and shrubs and relatively low-lying and flat valleys and washes (Figure 16). Sediments were exposed in slopes and drainages, although exposure was relatively limited due to the dense vegetation. Geologic units observed in the East Orange I area included Holocene-aged young alluvial deposits, Puente Formation, Topanga Formation, Vaqueros Formation, and Sespe Formation.

Young alluvial deposits covered much of the ground surface and were observed to be between 2 to 6 feet thick where they were overlying older sedimentary units. On slopes, the alluvial veneer was relatively thinner (less than one foot thick). Puente Formation La Vida Member sediments were exposed in outcrops as thick as 25 feet. These sediments consisted of buff, yellow, pink, orange, and red colored, well lithified, clean fine-grained sand with some coarse-grained units (Figures 20 and 21). No fossils were observed within Puente Formation La Vida Member sediments in the East Orange I area. Topanga Formation sediments were exposed in outcrops as thick as 20 feet. Sediments consisted of buff, tan, yellow, orange, reddish brown, gray to blue-gray colored, moderately to well lithified although weathered, moderately to well sorted, fine- to coarse-grained sandstone with subrounded to subangular granules composed of plutonic clasts (Figures 17, and 22 through 27). These sediments were often highly weathered (particularly into chips) and mineralized with gypsum. Vaqueros Formation sediments were exposed in outcrops ranging from 4 to 10 feet thick. These sediments consisted of beige, buff, tan, pale yellow, and gray colored, well lithified, massive, well to moderately sorted, matrix-supported, fine-grained sand with subangular to subrounded granules composed of plutonic clasts and some coarse-grained sand beds with subangular to subrounded pebbles as well as some very fine mudstone units (Figures 28 through 33). No fossils were observed within Vaqueros Formation sediments in the East Orange I area. Sespe Formation sediments were exposed in the northern portion of the East Orange I area. Here, a 30 foot thick south-facing exposure located at the base of a canyon displayed sediments consisting of pale yellow, beige, tan colored, well lithified, fine- to medium-grained sandstone, with subrounded pebbles and cobbles composed of plutonic clasts (Figures 18 and 19). No fossils were observed within Sespe Formation sediments in the East Orange I area.

Three new fossil localities were recorded in the East Orange I area including one Significant Fossil Locality (SFL) and two Non-Significant Fossil Occurrences (NFOs) (Table 3). The single SFL, Locality F180514-22-02, was discovered as surface float among Topanga Formation silt/sandstone and consisted of one shark tooth with missing fragment and root (Figure 34). Localities F180514-22-01 and F180514-16-01 were both recorded as non-significant. Locality F180514-22-01 was discovered as surface float (*ex situ*) in a low-lying creek and consisted of five large mammal bones that were determined in the field to be partially mineralized (i.e., fossilized) (Figure 35). Locality F180514-16-01 was discovered *in situ* within Topanga Formation silt/sandstone and consisted of fossilized invertebrate shells (Figures 36, 37, and 38). Additionally, poorly preserved fish scales, which appear as small (less than one centimeter) glossy red globules were also observed within Topanga Formation sediments (Figure 39).

Table 3. Newly Recorded Fossil Localities

Field Locality Number	Date Discovered	Description	Geologic Formation	Stratigraphic Context (*in situ*/*ex situ*)	Significance (SFL/NFO)	Collected? (Yes/No)
F180514-22-01	05/14/2018	Fossilized mammal bones (5)	Quaternary alluvium (float)	*ex situ*	NFO	No
F180514-22-02	05/14/2018	Shark tooth (1)	Topanga Formation	*ex situ*	SFL	No
F180514-16-01	05/14/2018	Invertebrate shell fragments (10+)	Topanga Formation	*in situ*	NFO	No



Figure 16.



Figure 17.



Figure 18.



Figure 19.



Figure 20.



Figure 21.

Figure 16. Thick brush covering hills and drainages. Area is mapped as Vaqueros Formation. View west.
Figure 17. Outcrop of Topanga Formation. View northwest.
Figure 18. Outcrop of Sespe Formation. View north.
Figure 19. Outcrop of Sespe Formation. View north.
Figure 20. Outcrop of Puente Formation La Vida Member. View north.
Figure 21. Outcrop of Puente Formation La Vida Member. View north.


Figure 22.


Figure 23.


Figure 24.


Figure 25.


Figure 26.


Figure 27.

Figure 22. Outcrop of Topanga Formation. View west.
Figure 23. Outcrop of Topanga Formation. View west.
Figure 24. Outcrop of Topanga Formation. View west.
Figure 25. Outcrop of Topanga Formation. View east.
Figure 26. Outcrop of Topanga Formation. View northeast.
Figure 27. Outcrop of Topanga Formation. View southwest.



Figure 28.



Figure 29.



Figure 30.

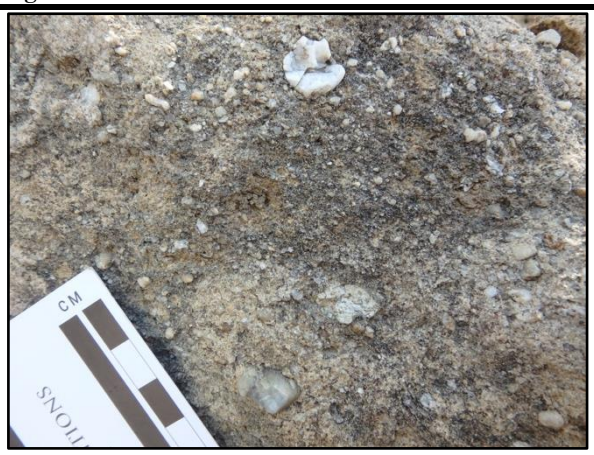


Figure 31.



Figure 32.



Figure 33.

Figure 28. Outcrop of Vaqueros Formation in drainage. View northwest.
Figure 29. Outcrop of Vaqueros Formation. View north.
Figure 30. Outcrop of Vaqueros Formation. View southeast.
Figure 31. Vaqueros Formation sandstone. View northwest.
Figure 32. Vaqueros Formation sandstone. View northeast.
Figure 33. Vaqueros Formation sandstone. View southwest.



Figure 34.



Figure 35.



Figure 36.



Figure 37.



Figure 38.



Figure 39.

Figure 34. Fossilized shark tooth discovered in Topanga Formation silt/sandstone. View down.
Figure 35. Fossilized mammal bone discovered as float on valley floor. View down.
Figure 36. Poorly preserved invertebrate shells fossilized in Topanga Formation silt/sandstone. View down.
Figure 37. Poorly preserved invertebrate shells fossilized in Topanga Formation silt/sandstone. View down.
Figure 38. Poorly preserved invertebrate shells fossilized in Topanga Formation silt/sandstone. View down.
Figure 39. Poorly preserved fish scales fossilized in Topanga Formation silt/sandstone. View down.

East Orange II

The East Orange II portion of the Project area was surveyed on May 16, 2018. The terrain consisted mostly of moderate relief, rounded hills and moderate to steep drainages and slopes with some very steep slopes and relatively low-lying and flat valleys and washes. The northeastern survey line follows an existing fire access road, which lies along the ridge. The southwestern survey line follows an existing path, which lies along the valley floor. The middle northeast trending survey lines, which traverse the slopes, do not correspond to existing trails or roads. Sediments were exposed in slopes and drainages adjacent to or lying directly in the survey lines. Sediments were generally weathered in many of the exposures throughout the canyons, although there are more prominent and resistant exposures along many of the slope faces. Geologic units observed in the East Orange II area included Holocene-aged young alluvial deposits, Vaqueros Formation, and Sespe Formation. Early to middle Pleistocene-aged very old alluvial fan deposits were also mapped in this portion of the Project, although these sediments were not observed during the survey.

Young alluvial deposits covered much of the ground surface and were observed to be between 2 to 4 feet thick where they were overlying older sedimentary units. On slopes, the alluvial veneer was relatively thinner (less than one foot thick). Vaqueros Formation sediments consisted of buff, beige, gray, and yellow colored, well lithified but weathered and crumbly, fine- to medium-grained sandstone with siltstone (Figures 52 through 55). No fossils were observed within Vaqueros Formation sediments in the East Orange II area. Sespe Formation sediments were prominently exposed along the northeastern portion of the East Orange II area. Here outcrops resistant bands of sandstone and conglomerate on the canyon faces in exposures more than 200 feet thick (Figures 41, 43, 47, and 48). Sespe Formation sediments consisted of pink to red, beige, and gray colored, well lithified but weathered and crumbly, massively to thickly-bedded, moderately to moderately-well sorted, coarse-grained sand with subrounded to subangular granules and small pebbles composed of plutonic clasts and some conglomerate beds with rounded pebbles and cobbles composed of plutonic clasts (Figures 41, 43, 45, 46, 48, 50, and 51). No fossils were observed within Sespe Formation sediments in the East Orange II area.



Figure 40.



Figure 41.



Figure 42.



Figure 43.



Figure 44.



Figure 45.

Figure 40. Overview of southwestern trail area. View west.
Figure 41. Outcrop of Sespe Formation. View northwest.
Figure 42. Overview of northeastern trail terrain. View northeast.
Figure 43. Outcrop of Sespe Formation alongside of road. View northwest.
Figure 44. Outcrop of weathering Sespe Formation beneath Holocene-aged young surficial sediments. View northwest.
Figure 45. Overview of southwestern trail terrain. Mapped as Sespe Formation. View south.


Figure 46.


Figure 47.


Figure 48.


Figure 49.


Figure 50.


Figure 51.

Figure 46. Outcrop of Sespe Formation on hillside and drainage. View northwest.
Figure 47. Outcrop of Sespe Formation. View north.
Figure 48. Outcrop of Sespe Formation. View north.
Figure 49. Irvine Lake located to the northwest of East Orange II portion of the Project area. View northwest.
Figure 50. Outcrop of Sespe Formation. View southwest.
Figure 51. Outcrop of Sespe Formation. View northeast.



Figure 52.



Figure 53.



Figure 54.



Figure 55.

Figure 52. Outcrop of Vaqueros Formation on road surface and on adjacent slope. View west.
Figure 53. Outcrop of Vaqueros Formation on road surface. View west
Figure 54. Outcrop of Vaqueros Formation on road surface. View west.
Figure 55. Vaqueros Formation sandstone. View down.

8.0 IMPACTS TO PALEONTOLOGICAL RESOURCES

Impacts on paleontological resources can generally be classified as either direct, indirect or cumulative. Direct adverse impacts on surface or subsurface paleontological resources are the result of destruction by breakage and crushing as the result of surface disturbing actions including construction excavations. In areas that contain paleontologically sensitive geologic units, ground disturbance has the potential to adversely impact surface and subsurface paleontological resources of scientific importance. Without mitigation, these fossils and the paleontological data they could provide if properly recovered and documented, could be adversely impacted (damaged or destroyed), rendering them permanently unavailable to science and society.

Indirect impacts typically include those effects which result from the continuing implementation of management decisions and resulting activities, including normal ongoing operations of facilities constructed within a given project area. They also occur as the result of the construction of new roads and trails in areas that were previously less accessible. This increases public access and therefore increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting. Human activities that increase erosion also cause indirect impacts to surface and subsurface fossils as the result of exposure, transport, weathering, and reburial.

Cumulative impacts can result from incrementally minor but collectively significant actions taking place over a period of time. The incremental loss of paleontological resources over time as a result construction-related surface disturbance or vandalism and unlawful collection would represent a significant cumulative adverse impact because it would result in the destruction of non-renewable paleontological resources and the associated irretrievable loss of scientific information.

Excavations in the Project area that impact late Eocene- to early Miocene-aged Sespe Formation (very high sensitivity), Oligocene- to Miocene-aged Vaqueros Formation (high sensitivity), late Eocene- to Miocene-aged Vaqueros-Sespe Formations Undifferentiated (high sensitivity), middle Miocene-aged Topanga Formation (very high sensitivity), late Miocene-aged Puente Formation La Vida Member (high sensitivity), and early to middle Pleistocene-aged very old alluvial fan deposits, either at the surface or at depth beneath previously disturbed sediments or younger sedimentary deposits, may well result in adverse direct impacts on scientifically important paleontological resources.

Excavations entirely within previously disturbed sediments, late Pleistocene- to Holocene-aged young alluvial deposits, or late Holocene landslide deposits are unlikely to uncover significant fossil vertebrate remains; furthermore, any recovered resources from these surficial sediments will lack stratigraphic context. However, younger deposits were observed during the survey to shallowly overlie older *in situ* sedimentary deposits.

9.0 CONCLUSIONS AND RECOMMENDATIONS

There is potential for adverse impacts to scientifically significant paleontological resources during ground disturbance within late Eocene- to early Miocene-aged Sespe Formation, Oligocene- to Miocene-aged Vaqueros Formation, late Eocene- to Miocene-aged Vaqueros-Sespe Formations undifferentiated, middle Miocene-aged Topanga Formation, late Miocene-aged Puente Formation La Vida Member, and early to middle Pleistocene-aged very old alluvial fan deposits. Late Pleistocene- to Holocene-aged young alluvial deposits are estimated to be less than 11,000 years old at the surface and are considered to have no potential for producing paleontological resources, because they are typically too young to contain *in situ* fossils. Additionally, previously disturbed sediments or artificial fill, which was observed during the field survey, will not contain *in situ* fossils, since these sediments have been displaced from their original context. However, these younger deposits were observed during the survey to overlie older geologic units with higher paleontological potential, which may be impacted at shallow depth. Fossils contained within late Holocene-aged landslide deposits typically lack stratigraphic context due to displacement from the original site of deposition, reducing scientific significance of the fossils, and therefore these deposits are considered to have no potential for producing paleontological resources. The field survey results indicate that all mapped high and very high paleontologically sensitive units, with the exception of early to middle Pleistocene-aged very old alluvial fan deposits, are currently exposed in the Project area. Additionally, several fossil localities were documented during the field survey, and specimens included fish scales, invertebrate shell fragments, and mammal bones. No fossils were collected during the survey. No further work is recommended for the two NFOs. However, it is recommended that the significant shark tooth be collected prior to the start of construction, or avoided.

Prior to the start of construction, a PRMMP should be prepared. The PRMMP should provide detailed recommended monitoring locations including locations mapped as high to very high sensitivity; a description of a worker training program, detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; and notification procedures in the event of a fossil discovery by a paleontological monitor or other project personnel. A curation agreement with the LACM or another accredited repository must be obtained. Any subsurface bones or potential fossils that are unearthed during construction should be evaluated by a Qualified Paleontologist.

REFERENCES

Arnold, R.A. 1906. The Tertiary and Quaternary Pectens of California: USGS Professional Paper 47, p. 264.

Aron, G.L. and J.T. Raum. 2017. Final paleontological monitoring report: Tehachapi Renewable Transmission Project 500 kV Underground, San Bernardino County, California. Prepared for Southern California Edison Company and Resource Sciences and Planning, LLC. Dated March 2017.

Bureau of Land Management (BLM). 2008. Assessment and Mitigation of Potential Impacts to Paleontological Resources: BLM Instruction Memorandum No. 2009-011.

Campbell, R.H., T.H. McCulloh, and J.G. Vedder. 2007. The Miocene Topanga Group of southern California: a 100 year history of changes in stratigraphic nomenclature. Open-File Report 2007-1385, U.S. Geo- logical Survey, Reston, VA.

California Department of Conservation (CDC). 1976. Environmental Geology of Orange County, California. Open-File Report 79-8. 120-127 pp.

Cooper, J.D. 1981. Geology of the eastern Puente Hills: in M.S. Woyski (ed) Tour and Field Guide, National Association of Geology Teachers, Far Western Section. Chevron Oil Field Research Co., Fullerton CA, p. 35-54.

Cooper, J. D., and P.J. Eisentraut. 2002. Orange County Archaeo/Paleo Curation Guidelines, Procedures and Policies - Draft Document. Prepared for County of Orange, Board of Supervisors.

Critelli, S., P.E. Rumelhart, and R.V. Ingersoll, R.V. 1995. Petrofacies and Provenance of the Puente Formation (middle to upper Miocene), Los Angeles Basin, Southern California; implications for rapid uplift and accumulation rates. *Journal of Sedimentary Research.65*, p. 656 – 667.

Eldridge, G. H. and R. Arnold. 1907. The Santa Clara Valley, Puente Hills, and Los Angeles oil districts, southern California: U.S. Geol. Survey Bull. 309, 266 p.

Hamlin, H. 1904. Water Resources of the Salinas Valley, California: USGS Water-Supply and Irrigation Paper, No. 89. p. 91.

Howard, J.L. 1988. Sedimentation of the Sespe Formation in Southern California. *In* Santa Barbara and Ventura Basins – Tectonics, Structure, Sedimentation, and Oilfields along an East-West Transect. Pp. 53-70.

Hyatt, E. 1934. South Coastal Basin Investigation, Geology and Groundwater Storage Capacity of Valley Fill. Division of Water Resources Bulletin No. 45. p 23-34.

Kew, W.S. 1923. Geologic formations of a part of southern California and their correlation: American Association of Petroleum Geologists Bulletin, v. 7, 411-420 pp.

Kew, W.S.W. 1924. Geology and oil resources of a part of Los Angeles and Ventura Counties, California. U.S. Geological Survey Bulletin 753, 202p.

McLeod, S.A. 2018. Paleontological Resources for the Proposed Stantec Orange County Parks Irvine Ranch Open Space Donation Project, in the Santa Ana Mountain, Orange County California. Prepared for Paleo Solutions. Dated 15 June 2018.

Morton, D.M., and F.K. Miller. 2006. Geologic Map of the 30' x 60' Santa Ana Quadrangle, Southern California. Open Fill Report 99-172, Scale (1:100,000).

Murphey, P.C., and D. Daitch. 2007. Paleontological overview of oil shale and tar sands areas in Colorado, Utah and Wyoming: U.S. Department of Energy, Argonne National Laboratory Report Prepared for the U.S. Department of Interior Bureau of Land Management, 468 p. and 6 maps (scale 1:500,000).

Murphey, P.C., Knauss, G.E., Fisk, L.H., Demere, T.A., Reynolds, R.E., Trujillo, K.C., and Strauss, J.J. 2014. A foundation for best practices in mitigation paleontology: Proceedings of the 10th Conference on Fossil Resources. Dakoterra vol. 6, p. 243-285.

Norris, R.M., Webb, R.W. 1976. Geology of California, John Wiley & Sons, N.Y.

Orange County General Plan. 2011. Available at: http://ocplanning.net/planning/generalplan2005

PaleoBiology Database (PBDB). 2016. Online search of the PaleoBiology Database, accessed May 17-25, 2018.

Society of Vertebrate Paleontologists (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. 11 p. Online: http://vertpaleo.org/PDFS/68/68c554bb-86f1-442f-a0dc-25299762d36c.pdf

University of California Museum of Paleontology (UCMP). 2018. Online search of the University of California Museum of Paleontology database, accessed, May 17-25, 2018.

Watts, W.L. 1897. Oil and gas yielding formations of Los Angeles, Ventura and Santa Barbara Counties, California: California Mining Bur. Bull., v. 11, p. 1-72.

Winterer, E. L., and D.L. Durham. 1962, Geology of southeastern Ventura Basin, Los Angeles County, California: U. S. Geological Survey Professional Paper 334-H, p. 275-366.

Yerkes, R.F., T.H. McCulloh, J.E. Schoellhamer, and J.G. Vedder. 1965. Geology of the Los Angeles Basin, California; an introduction: Professional Paper.

APPENDIX A

Natural History Museum of Los Angeles County Record Search Results

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

15 June 2018

Paleo Solutions, Inc.
911 South Primrose Avenue, Unit N
Monrovia, CA 91016

Attn: Barbara Webster, GIS Specialist & Archaeologist

re: Paleontological resources for the proposed Orange County Parks Irvine Ranch Open Space Donation Project, in the Santa Ana Mountains, Orange County, project area

Dear Barbara:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Orange County Parks Irvine Ranch Open Space Donation Project, in the Santa Ana Mountains, Orange County, project area as outlined on the portion of the Black Star Canyon USGS topographic quadrangle map that you requested via e-mail on 1 June 2018. We do not have any vertebrate fossil localities that lie directly within the proposed project area, but we do have localities adjacent or nearby from the same sedimentary deposits that occur in the proposed project area.

On the eastern side of the northern parcel of the proposed project areas, the lower lying drainage of Gypsum Canyon, the surface deposits consist of younger Quaternary Alluvium. These deposits typically do not contain significant vertebrate fossils in the uppermost layers, but older sedimentary deposits at relatively shallow depth may well contain significant fossil vertebrate remains. On the southwestern margin of the southeastern parcel of the proposed project areas there are surface deposits of older Quaternary Alluvium. Our closest vertebrate fossil locality from older Quaternary deposits is LACM 4943, west of the proposed project areas in the City of Orange east of the Santa Ana River along Fletcher Avenue east of Glassell Street, that produced a specimen of fossil horse, *Equus*, at a depth of 8-10 feet below the surface.

Inspiring wonder, discovery and responsibility for our natural and cultural worlds.

Where the southern extension of the southeastern parcel of the proposed project areas crosses Limestone Canyon, there are exposures of the lowest La Vida Member of the marine late Miocene Puente Formation. Our closest Puente Formation locality, LACM 6287, that occurs along Santiago Canyon Road in Limestone Canyon adjacent to the southern extension of the southeastern parcel, produced fossil specimens of tonguefish, *Symphurus*.

In the western portion of the northern parcel of the proposed project areas, and in the southern portion of the southwestern parcel, there are exposures of the marine middle Miocene Topanga Formation. Our closest vertebrate fossil locality from the Topanga Formation is LACM 6292, along Santiago Canyon Road adjacent to the western border of the southwestern parcel of the proposed project areas, produced a fossil specimen of dog shark, *Mustelus*. Our next closest vertebrate fossil localities from the Topanga Formation are LACM 3891 and 4008-4009, all west to west-northwest of the southwestern parcel of the proposed project areas in the El Modena foothills, that produced fossil specimens of four-legged marine mammals, *Desmostylus*, sirenians, Dugongidae, and whales, Cetacea.

Rocks of the mostly marine Vaqueros Formation and the mostly terrestrial Sespe Formation, ranging in age from the late Eocene through the early Miocene, intergrade and interdigitate so that they are difficult to distinguish, and in this area are typically referred to as the Sespe / Vaqueros Formations undifferentiated. Most of the terrain in the three parcels of the proposed project areas has exposes of these Sespe / Vaqueros rocks. Immediately north of the northern parcel of the proposed project areas, just west of Gypsum Canyon, our Sespe / Vaqueros locality LACM 4315 produced fossil specimens of shark, *Cetorhinus*, requiem shark *Carcharhinus*, angel shark, *Squatina*, singray, Dasyatidae, thus probably from the Vaqueros facies of the Sespe / Vaqueros Formations undifferentiated. Our Sespe / Vaqueros Formations locality LACM 1905, situated along Santiago Canyon Road in Limestone Canyon just outside of the southeastern portion of the southeastern parcel of the proposed project areas, produced fossil specimens of bonito shark, *Isurus smithi*, and unidentified mammal, Mammalia. Just north and east of the northern portion of the southwestern parcel of the proposed project areas, our Sespe / Vaqueros Formation localities LACM 3383-3385 and LACM 6624, produced fossil specimens of eagle ray, *Myliobatis*, bonito shark, *Isurus planus*,four-legged marine mammals, *Desmostylus*, and toothed whales, Odontoceti.

Shallow excavations in the younger Quaternary Alluvium exposed in Gypsum Canyon in the northern parcel of the proposed project areas are unlikely to uncover significant fossil vertebrate remains. Deeper excavations there that extend down into the older sedimentary deposits, and any excavations in the exposures of the Puente Formation, the Topanga Formation, or the Sespe / Vaqueros Formations undifferentiated elsewhere in the proposed project areas, however, may well encounter significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be closely monitored to quickly and professionally recover any potential vertebrate fossils without impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice