CASTAIC AREA MULTI-USE TRAILS PLAN

INITIAL STUDY
AND
PROPOSED MITIGATED NEGATIVE DECLARATION

Volume III
Appendices D–I

Prepared for:

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May 13, 2016

Appendix D

Cultural Resources Analysis

Sapphos environmental inc.

May 13, 2016
Job Number: 1020-085
Castaic Area Multi-Use Trails Plan Project

MEMORANDUM FOR THE RECORD
2.6 1020-085.M06

TO: County of Los Angeles Department of Parks and Recreation
(Ms. Olga Ruano, Mr. Zachary Likins, and Mr. Frank Moreno)

FROM: Sapphos Environmental, Inc.
(Mr. Eugen Ruzi)

SUBJECT: Castaic Area Multi-Use Trails Plan Cultural Resources Assessment

FIGURES:
1. Regional Vicinity Map
2. Local Vicinity Map
3. Topographic Map with USGS 7.5-minute Quadrangle Index

APPENDICES:
A. Previous Cultural Resource Studies
B. Map of Cultural Resources within the APE (confidential information redacted)
C. Native American Correspondence

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EXECUTIVE SUMMARY

This Memorandum for the Record (MFR) documents the results of the programmatic evaluation of the existing conditions associated with the proposed Castaic Area Multi-Use Trails Plan (proposed project) as they pertain to cultural resources in accordance with Appendix G of the California Environmental Quality Act (CEQA) Guidelines.[1] Based on the results of the records are archival research and map review conducted by Sapphos Environmental, Inc., the construction, recreational use, and maintenance activities associated with the proposed project would have the potential to result in impacts to cultural resources that would be mitigated to below the level of significance with mitigation measures. The scope of evaluation of cultural resources includes paleontological resources, archaeological and historic resources, and Native American sites and human remains.

Paleontological Resources

There are ten geologic units that underlie the proposed project area that have a moderate to high potential for containing unique paleontological resources. Where construction of the trails requires excavation in these geologic units, there is a potential to have significant impacts on vertebrate fossil remains that constitute unique paleontological resources pursuant to CEQA. Such impacts would be reduced to below the level of significance through preparation and implementation of a Paleontological Resources Management Plan to ensure that the unanticipated discovery of unique paleontological resources during ground-disturbing activities are appropriately salvaged, recorded, and reposited.

Archaeological and Historic Resources and Native American Sacred Sites

There are recorded archaeological and historic resources within the proposed project area. Additionally, the potential exists for the unanticipated discovery of buried significant historical and unique archaeological resources, including tribal cultural resources, during ground-disturbing activities in native soils. Exposure or displacement of historical resources and unique archaeological resources is a significant impact that would be reduced to below the level of significance through preparation and implementation of a Cultural Resources Management Plan to ensure that the unanticipated discovery of unique archaeological, or significant historic or tribal cultural resources during ground-disturbing activities are appropriately salvaged, recorded, and reposited.

Human Remains

There are known prehistoric burial sites within the proposed project area. Additionally, the potential exists for the unanticipated discovery of human remains interred outside of a formal cemetery and Native American sacred sites, during ground-disturbing activities in native soils. Disturbance of human remains and Native American sacred sites is a significant impact that would be reduced to below the level of significance through preparation and implementation of a Cultural Resources Management Plan specifying the appropriate protocols for required notifications of the discovery of human remains, and subsequent repatriation or disposition of such remains consistent with the requirements of the Government Code and Native American Graves Protection and Repatriation Act.

[1] California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

INTRODUCTION

This MFR addresses provides the County of Los Angeles (County) with the substantial evidence used to a make a determination that the potential for significant impacts to cultural resources that could result from construction, operation, and maintenance of the proposed project would be reduced to below the level of significance through application of the specified mitigation measures. This assessment is based on record search and archival research conducted within the Trails Planning Area. In accordance with CEQA, this cultural resource study encompasses paleontological resources, archaeological resources, historical resources, human remains, and addresses the presence of Native American tribal cultural resources. This MFR presents the results of these efforts and provides a programmatic impact analyses and mitigation recommendations related to cultural resources within the Trails Planning Area.

PURPOSE

The purpose of this MFR is to support the County in the development of a multi-use trail plan that would minimize the impacts on the surrounding community, Native Americans most likely descendants identified by the Native American Heritage Commission (NAHC). It is understood that the County expects to move forward with the proposed project and seeks funding for construction, operation, and maintenance of the proposed project. This MFR provides the requisite information related to impacts on cultural resources to support the County's decision-making process in relation to the proposed project. The evaluation of the potential for the proposed project to result in significant impacts to cultural resources was undertaken in accordance with Appendix G of the State CEQA Guidelines and the Los Angeles County General Plan. This MFR presents the results of these efforts and provides impact analyses.

LOCATION

The Castaic project area, which encompasses approximately 78 square miles (approximately 50,000 acres) in the Castaic area of the Santa Clarita Valley, is located in the northwestern portion of the unincorporated area of the County (Figure 1, *Regional Vicinity Map*). The Castaic project area is bound by the Angeles National Forest to the north, the City of Santa Clarita to the southeast, Highway 126 to the south, and Ventura County to the west (Figure 2, *Local Vicinity Map*). The Castaic project area includes three existing County trails (approximately 4.9 miles) and approximately 74.7 miles of adopted County Trail System proposed trails. The Santa Clarita Valley is centrally located between the San Gabriel Mountains to the east, the Sierra Pelona Mountains to the northeast, the Topatopa Mountains to the west, the San Emigdio Mountains and Tehachapi Mountains to the north, and the Santa Susana Mountains and Santa Monica Mountains to the south within the Transverse Ranges, a group of east-west trending mountains paralleling the Pacific Ocean between Santa Barbara and San Diego Counties. The Castaic project area is located on the U.S. Geological Survey (USGS) 7.5-minute series Val Verde, Newhall, Whitaker Peak, and Warm Springs Mountain topographic quadrangles.[2,3,4,5] (Figure 3, *Topographic Map with USGS 7.5-minute Quadrangle Index*).

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[2] U.S. Geological Survey. 2015. 7.5-Minute Series, Val Verde, California, Topographic Quadrangle. Reston, VA.

[3] U.S. Geological Survey. 2015. 7.5-Minute Series, Newhall, California, Topographic Quadrangle. Reston, VA.

[4] U.S. Geological Survey. 2015. 7.5-Minute Series, Whitaker Peak, California, Topographic Quadrangle. Reston, VA.

[5] U.S. Geological Survey. 2015. 7.5-Minute Series, Warm Springs Mountain, California, Topographic Quadrangle. Reston, VA.

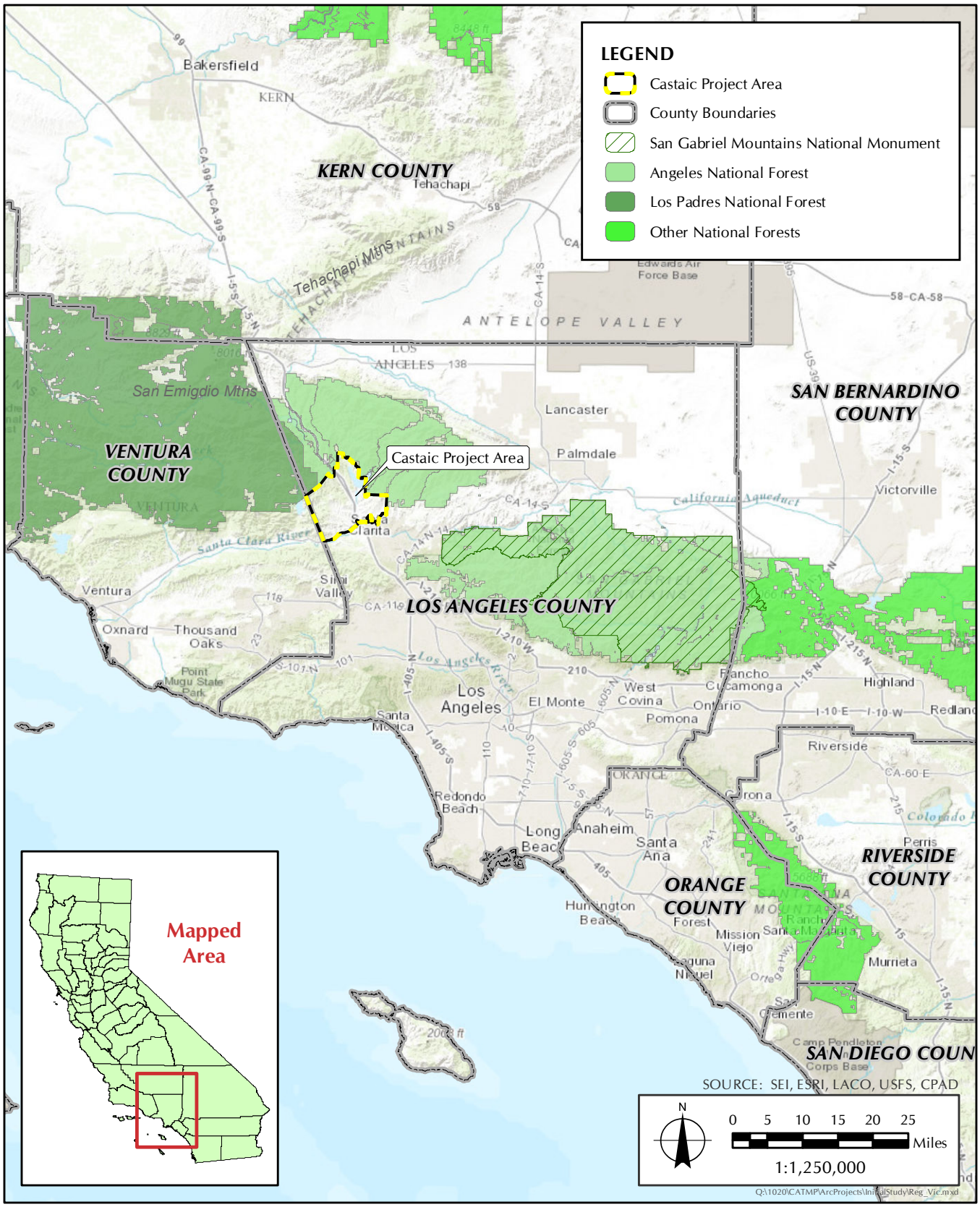

FIGURE 1

Regional Vicinity Map

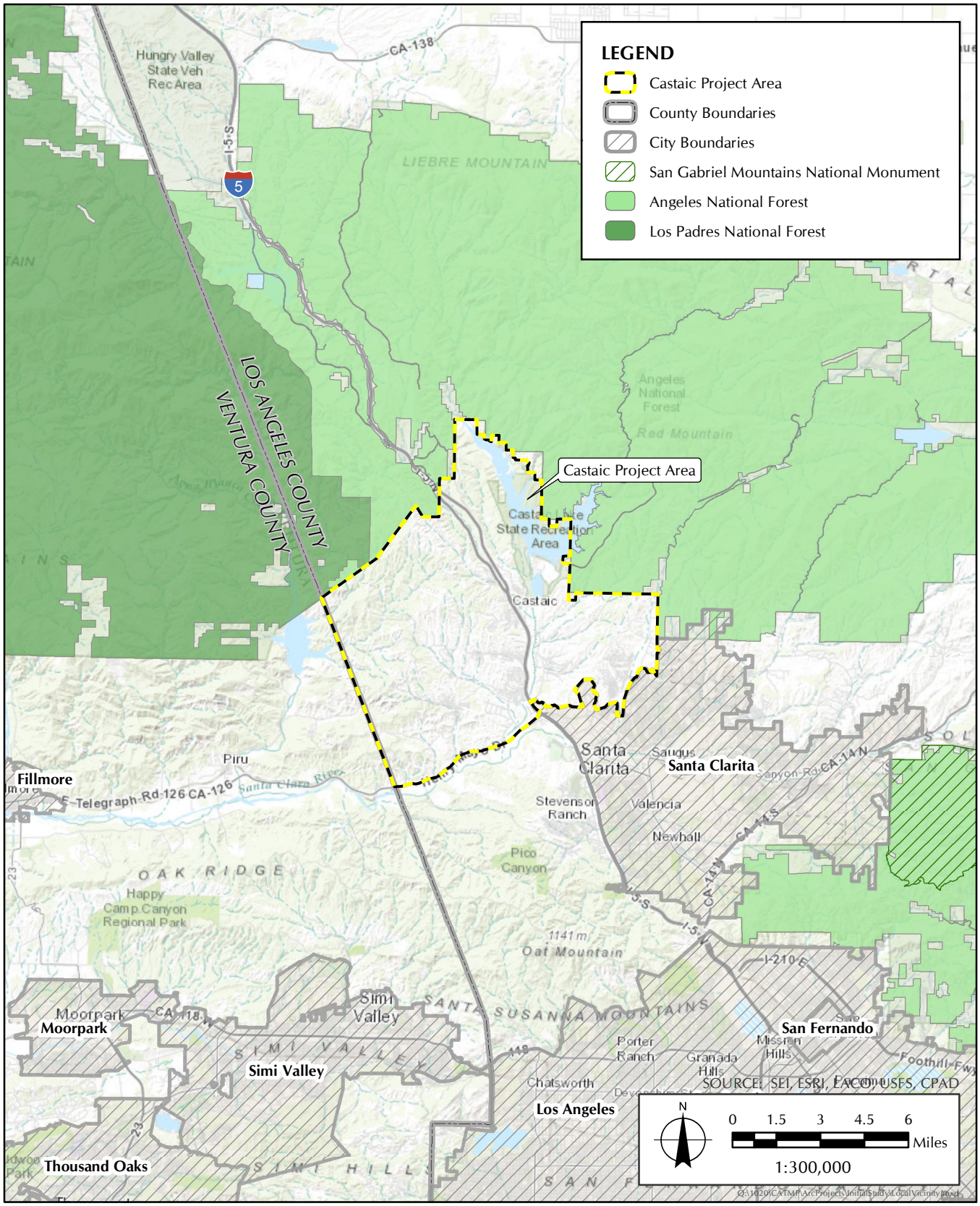

FIGURE 2

Local Vicinity Map

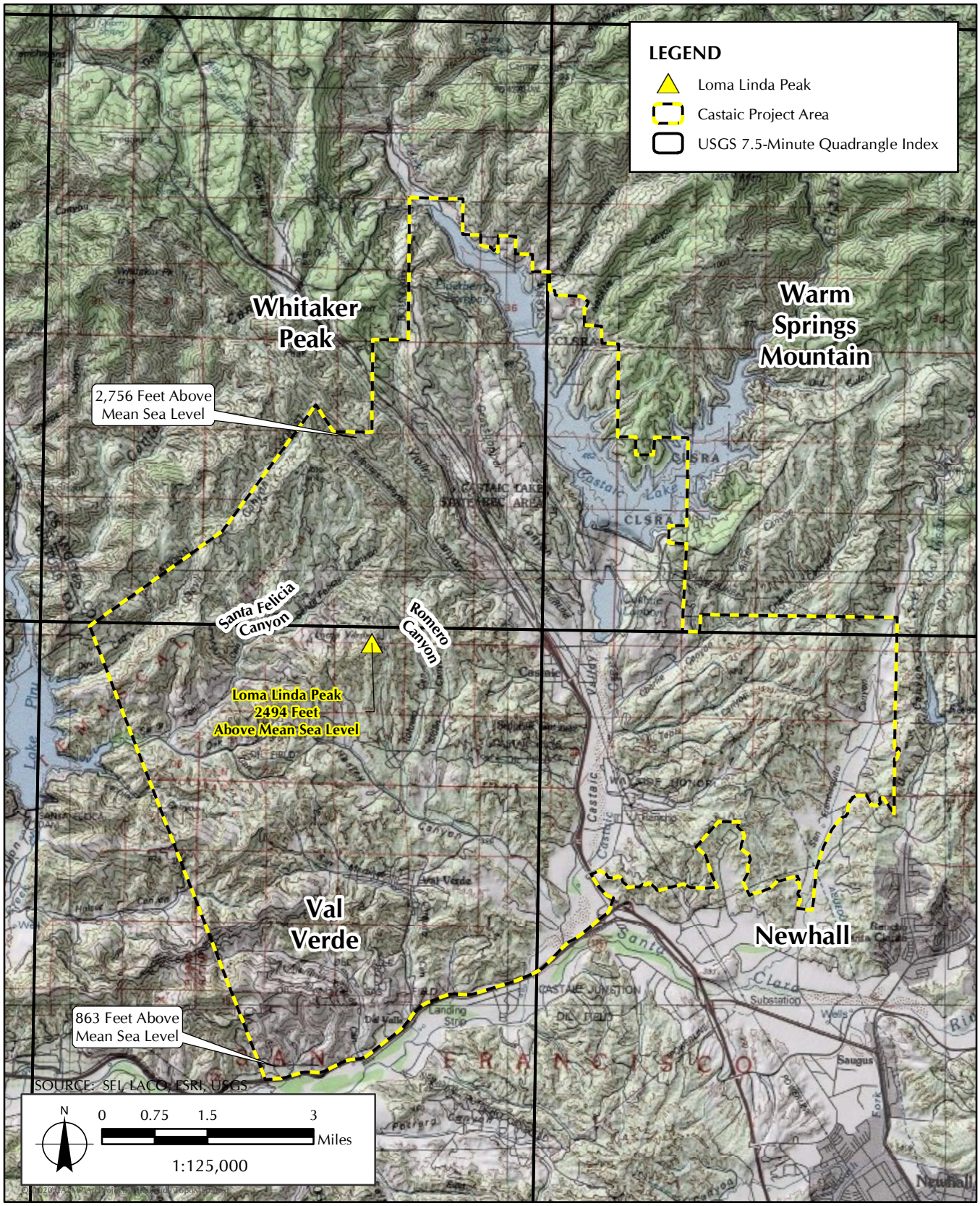

FIGURE 3

Topographic Map with United States Geological Survey 7.5 Minute Quadrangle Index

The elevation of the Castaic project area ranges from approximately 863 feet above mean sea level (MSL) in the Santa Clara River bed at the southern edge of the Castaic project area to approximately 2,756 feet above MSL along the northern edge of the Castaic project area, approximately 0.7 mile southwest of Interstate 5. Loma Linda Peak, at an elevation of approximately 2,494 feet above MSL, is located between Santa Felicia Canyon and Romero Canyon, approximately 0.2 mile south of the northern edge of the Val Verde topographic quadrangle.

PROJECT DESCRIPTION

The proposed project would work to encourage and promote new multi-use trails and recommend improvements to existing trails, providing an alignment to incorporate a transition throughout the Castaic project area to additional areas, jurisdictions, and prime destinations within and adjacent to the Castaic project area. The plan would recommend conditions for improvement of unmet local recreation demands in the 5th Supervisorial District. The proposed project would develop a complete multi-use trail system connecting user groups and local populations to desired recreation destinations and experiences, with unified transition to the trails of adjacent jurisdictions, compatibility with adjacent land uses and environmental resources, and incorporate a sustainable design that is consistent with the County Trails Manual.

The proposed project includes approximately 100 miles of proposed multi-use trails and related staging areas, bike skills parks, parking areas, and other supporting trail facilities in the Castaic Area of the Santa Clarita Valley Planning Area (Figure 4, *Castaic Area Multi-Use Trails Plan*). The proposed trails would provide connections to the Angeles National Forest, trails in the City of Santa Clarita, and trails in the Newhall Ranch Specific Plan. The trails would be multi-use and range from 3 to 12 feet wide based on site conditions, with adequate space for combined pedestrian, equestrian, and mountain biking use, in accordance with the County of Los Angeles Trails Manual guidelines (Table 1, *County Trail Types*).

TABLE 1
COUNTY TRAIL TYPES

Trail Type	Tread / Trail Width	Intensity of Use	Impact	Surface Type
Pedestrian	10–11 feet	High	High	Crusher fines / decomposed granite
Recreational Pathway	8–10 feet	High	High	Natural surface
Natural Trail 1	7–10 feet	High	Medium	Natural surface
Natural Trail 2	5–8 feet	Medium to high	Low	Natural surface
Natural Trail 3	2–3 feet	Low	Minimal	Natural surface

SOURCE: County of Los Angeles Department of Parks and Recreation. Adopted May 17, 2011. Revised June 2013. *County of Los Angeles Trails Manual*. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

The proposed project includes 18 trail routes, consisting of four existing trail segments, 10 trail segments that have been planned per developer obligations, and 57 proposed trail segments (Table 2, *Existing, Planned per Developer Obligations, and Proposed Trail Segments*). The proposed trail segments would provide connections to the Santa Felicia SEA, the Angeles National Forest, Newhall Ranch trails and the Santa Clara River Trail, City of Santa Clarita trails, under Interstate-5, and to Castaic Lake.

Consistent with Section 4.3.6, *Way-finding Signs*, of the County Trails Manual, the proposed project would include regular trail signs at trailheads, trail amenity locations, street and trail intersections, and the boundaries of trail easements on private property and National Forest lands.[6] Also consistent with the recommendations of the County Trails Manual, reassurance marker signs would be posted at eye level (62 inches above the ground surface) at every quarter (0.25) mile of trail that visually mark the trail line and identify the name of the trail and quarter milepost number in order to orient trail users and search and rescue services in the case of an emergency. As each trail segment is constructed, the County Department of Parks and Recreation would be responsible for sending the Los Angeles County Fire Department and the Los Angeles County Sheriff's Department the location of each quarter milepost along the trail for emergency response purposes.

6 County of Los Angeles Department of Parks and Recreation. Revised June 2013. County of Los Angeles Trails Manual. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
Castaic Creek (CC)	CC1 (Sports Complex)	1.24	Natural	No existing trail. Dirt road, de facto trail route along Castaic Creek. De facto trail that does not cross private property. Crossing of drainage at RV park will wash out periodically unless an alternative crossing (bridge) is developed.
	CC2 (Pitchess)	2.63	Natural	No existing trail. Existing dirt road from Tapia Canyon Road along Interstate 5 and creekbed, including under the freeway bridge. Potential for trailhead at southern end of segment.
	CC3 (Commerce Center East)	0.76	SUB	No existing trail. Portion of segment parallels existing dirt road. Planned trail per developer obligations generally follows 2007 County adopted trail routes; alignment reflects subdivision plans.
	CC4 (Commerce Center Undercrossing)	0.25	Natural	No existing trail. Within Castaic creekbed and along paved utility road. Slightly modified from 2007 County adopted trail routes to meet proposed subdivision trail.
	CC5 (Commerce Center Bike Trail)	0.46	SUB	No existing trail. Along paved utility road adjacent to creekbed. Planned trail per developer obligations follows the subdivision plan indicating proposed bike trail with 10' minimum equestrian trail.
	CC6 (Commerce Center – 126)	0.48	SUB	No existing trail. Parallels Franklin Parkway and Castaic Creek. Planned trail per developer obligations follows the subdivision plan indicating proposed sidewalk and equestrian trail.
Castaic Dam (CD)	CD1 (Castaic Upper Parking)	1.39	Natural	No existing trail. Parking lot median, follows existing switchbacks (dirt path) leading to and along existing Pine Ridge Fire Road. Connection from 2007 County adopted trail routes to upper parking lot at Castaic Lake.
	CD2 (Castaic Dam Crossing)*	1.76	Natural	No existing trail. Follows paved road from upper parking lot at Castaic Lake, across Castaic Dam, to Lake Hughes Road. Dam crossing, bridging east and west sides of Castaic Lake. Subject to further coordination with State Department of Water Resources..
	CD3 (Lake Hughes East)	1.60	ROW	No existing trail. Unpaved ROW along Lake Hughes Road. On-street connection from potential lagoon trailhead to parking lot on the east side of the dam.
Cliffie Stone Extension (CE)	CE1 (San Francisquito Wash - Upper)	0.63	Natural	No existing trail. Parallels existing dirt road/path along San Francisquito Canyon wash. Passes from subdivision land into multiple private parcels. Runs adjacent to the street, but may need to enter street ROW.
	CE2 (Tesoro Del Valle – SF Wash)	0.52	Natural	No existing trail. Parallels existing dirt road / de facto route within San Francisquito Canyon wash. Realigned 2007 County adopted trail. Passes through Tesoro Del Valle but is not including in subdivision plans.
	CE3 (San Francisquito Wash - Lower)	0.55	ROW	No existing trail. Parallels existing dirt road / de facto route within San Francisquito Canyon wash. Realigned 2007 County adopted trail
	CE4 (Lady Linda)	0.55	Natural	No existing trail. Follows existing dirt road (Lady Linda Lane). Follows Lady Linda Lane to connect to proposed trailhead.
	CE5 (Cliffie Stone – From Lady Linda-Low Ridge)	0.53	ROW	No existing trail. Follows portions of existing de facto dirt path/road to the west of San Francisquito Canyon Road. Primarily follows Cliffie Stone Extension identified in subdivision alignment.
	CE6 (Cliffie Stone – From Lowridge-Tesoro)	0.26	ROW	No existing trail. Dirt ROW exists along San Francisquito Canyon Road. Crosses road ROW but original ROW does not match existing street.
	CE7 (North Park – Cliffie Stone Extension)	0.62	Natural	No existing trail or de facto route. Follows 2007 County adopted alignment through subdivision until southern end, then branches west to meet Cliffie Stone Trail. Owned by MRCA but part of Tesoro subdivision.
	CE8 (North Park Trail Connector)	0.08	Natural	No existing trail or de facto route. Connection to North Park Trail. Leaves subdivision property and enters Newhall Land parcel.
Charlie Canyon (CL)	CL1 (Charlie Canyon Road)	3.61	Natural	No existing trail. Follows existing dirt roads (Tapia Canyon Road and Charlie Canyon Road), and what appears to be a de facto ridgeline path. Realigned from 2007 County adopted trail routes to follow road on County property.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	CL2 (Charlie Canyon – Tesoro Del Valle)	0.37	Natural	No existing trail. Follows existing dirt road or de facto path. Trail enters subdivision parcels but is not on subdivision plans.
	CL3 (San Francisquito Connection)	0.16	Natural	No existing trail. Follows existing dirt road or de facto path. Connection to San Francisquito Trail.
Chiquito Canyon (CO)	CO1 (Chiquito Canyon and Creek)	3.52	Natural	No existing trail. Modified 2007 County adopted alignment to follow creek instead of Chiquito Canyon Road.
	CO2 (Jackson St)	0.21	ROW	No existing trail. Parallels two existing paved roads – Lincoln Avenue and Jackson Street. Follows existing street.
	CO3 (Chiquito Canyon and Creek – South)	1.04	Natural	No existing trail. Follows portions of Jackson Street and existing de facto dirt path or road. Requires access beyond locked gate. Realigned from 2007 County adopted alignment to minimize parcel crossings.
	CO4 (Chiquito Canyon and Creek – North)	1.05	SUB	No existing trail. Parallels portion of Del Valley Road. Planned trail per developer obligations - modified 2007 County adopted alignment to remain within subdivision parcels. Subdivision alignment not determined.
Cliffie Stone (CS)	CS1 (Cliffie Stone – San Francisquito Motorway)	0.68	Natural	No existing trail. Follows existing ridgeline Farmer John Lat dirt road and paved utility access road. Tesoro Del Valle Property. Requires access along utility road.
	CS2 (Cliffie Stone Trail [Tesoro])	1.16	Natural	Existing trail
	CS3 (Cliffie Stone Trail [San Francisquito)	1.73	Natural	Existing trail
Elderberry Forebay (EF)	EF1 (Forebay Connection)	4.76	Natural	No existing trail. Follows existing dirt road and topography. May have security issues with dam and pipes at northern edge. Only include if Elderberry Forebay Dam is useable.
	EF2 (Forebay – Limit 2)	0.81	Natural	No existing trail. Parallels portion of Elderberry Forebay road. Dam connection to northeastern corner route. Only include if Elderberry Forebay Dam is useable.
	EF3 (Forebay – Limit 1)	0.72	Natural	No existing trail. Parallels portion of Elderberry Forebay road. Dam connection to northeastern corner route. Only include if Elderberry Forebay Dam is useable.
	EF4 (Northern Limit)	4.76	Natural	No existing trail. Parallels portions of existing roads: Goodell Road and USFS Route 6N13. Northeast connection to USFS roads. Extends beyond Castaic project area.
Hasley Canyon (HC)	HC1 (Hasley – Santa Felicia)	3.48	Natural	No existing trail. Follows existing unpaved Ayala Road for a portion of proposed route. Connects Hasley Canyon to Santa Felicia SEA. Requires passage beyond locked gate at Hasley Canyon.
	HC2 (Hasley – Claremont)	0.70	Natural	No existing trail. Follows existing de facto path or dirt road. Trail falls within subdivision area but is not included in existing subdivision plans. Avoids using street ROW. Connects to 2007 County adopted trail alignment at northern end.
	HC3 (Hasley Canyon End)	0.16	Natural	No existing trail. Realigned 2007 County adopted trail alignment.
	HC4 (Hasley Road West)	0.33	ROW	No existing trail. Parallels existing paved Hasley Canyon Road. Follows 2007 County adopted trail alignment along public ROW. Ends at road.
	HC5 (Hasley Road East)	0.57	ROW	No existing trail. Parallels existing paved Hasley Canyon Road. Realigned 2007 County adopted trail to avoid private parcel conflict, avoid a creek crossing, and to more directly connect to other trail segments.
	HC6 (Hasley Creek)	0.26	Natural	Existing de facto trail along Hasley Canyon Road. Realigned 2007 County adopted trail to follow de facto trails.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	HC7 (Hasley-Los Valles)	0.56	SUB	No existing trail. Existing de facto trail along Hasley Canyon Road. Planned trail per developer obligations - realigned 2007 County adopted trail to follow de facto trails. Within subdivision area a planned subdivision trail is not indicated.
	HC8 (Hasley Canyon Trail)	1.68	Natural	Existing trail
	HC9 (Commerce Center)	0.21	ROW	No existing trail. Existing paved maintenance road along channelized creek. Line to proposed subdivision trails. Crosses under Commerce Center Drive and uses maintenance road.
	HC10 (Commerce Center NW)	0.61	SUB	No existing trail. Parallels creek bed. Planned trail per developer obligations generally follows 2007 County adopted alignment, but realigned to avoid the creek bed where possible.
Interstate Paintball (IP)	IP1 (Interstate 5 to Ridge Route)	3.30	Natural	No existing trail. Existing utility access dirt roads. Follows utility access roads. Northern end will need switchbacks to drop to Ridge Route Rd.
	IP2 (Paintball Site)	0.65	Natural	No existing trail. Existing dirt roads and paved roads. Connects through former paintball site and proposed bike skills park. Alignment to be determined by park design.
	IP3 (Santa Felicia to 5 Connection)	3.67	Natural	No existing trail. Existing dirt roads along portions of alignment. Connection from former paintball site to Santa Felicia SEA. Undercrossing at Interstate-5 will need to be evaluated for safety.
	IP4 (Between Interstate 5)	3.14	Natural	No existing trail. Existing utility access dirt roads between I-5 North and I-5 south. Picks up from the end of Castaic Road and continues to paintball site.
Lake West (LW)	LW1 (Northlake North)	3.28	Natural	No existing trail. Existing dirt roads. Follows 2007 County adopted trail route.
	LW2 (Northlake Central)	1.10	Natural	No existing trail. Existing dirt roads. Follows 2007 County adopted trail route.
	LW3 (Lagoon-Lake)	4.05	Natural	Existing dirt roads, including a portion of Cutler Canyon Fire Road and Vista Ridge Fire Road, and paved Castaic Lake State Recreation Area road. Includes a portion of Pro's Uphill Open Trail and Castaic Brick Trail of Castaic Lake State Recreation Area.[1] Follows 2007 County adopted trail route.
North Park Trail	North Park Trail	0.33	Natural	Existing trail
Romero Canyon (RC)	RC1 (Romero-Santa Felicia)	1.88	Natural	No existing trail. Follows existing dirt road/path. Portions follow narrow ridgelines.
	RC2 (North of High School)	0.13	Natural	No existing trail. Currently a construction site. Connection to Castaic High School path.
	RC3 (Castaic High School)	0.56	SUB	No existing trail. Currently a construction site leading to Romero Canyon Road. Planned trail per developer obligations – alignment needs verification from development plan.
	RC4 (Romero Canyon Rd)	1.89	Natural	No existing trail. Parallels Romero Canyon Road. Follows private road.
Santa Felicia (SA)	SA1 (Santa Felicia Upper Loop)	7.59	Natural	No existing trail. Existing dirt road. Minimal constraints.
	SA2 (Santa Felicia Lower Loop)	5.80	Natural	No existing trail. Existing dirt road. Portions follow narrow ridgelines.
San Francisquito (SF)	SF1 (San Francisquito Motorway)	0.34	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Follows San Francisquito Motorway to the edge of the Castaic project area.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	SF2 (San Francisquito Motorway Bypass)	1.09	Natural	No existing trail. De facto ridgeline dirt road/path. Two parallel alternative routes. Single alignment pending further study. Partially inside Tapia Ranch.
	SF3 (San Francisquito – Tapia)	1.15	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Passes through Tesoro Del Valle, not included in subdivision plans.
	SF4 (San Francisquito – West Creek)	0.85	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Follows utility road. Connects San Francisquito and Cliffie Stone Trails to West Creek.
Sloan Canyon (SC)	SC1 (Sloan Canyon West)	1.14	Natural	No existing trail. Existing dirt roads and construction sites. Portions follow narrow ridgelines.
	SC2 (Homestead at Sloan Canyon)	0.68	SUB	No existing trail. Existing construction site and unpaved Sloan Canyon Road. Planned trail per developer obligations follows existing dirt road.
	SC3 (Sloan Canyon Dr)	1.52	ROW	No existing trail. Parallels Sloan Canyon Road and Lake Hughes Road. On-street connection. Crosses under Interstate 5. Requires coordination with Los Angeles County Public Works.
	SC4 (Lake Hughes at Lagoon)	0.19	ROW	No existing trail. Parallels Lake Hughes Road south of Castaic Lagoon. Connects Castaic Creek to Castaic Lake.
Tapia Canyon (TC)	TC1 (Sports Complex – Tapia)	0.24	SUB	No existing trail. Parallels Tapia Canyon Road. Planned trail per developer obligations – Tapia Ranch development plans to build path to Castaic Road.
	TC2 (Tapia Bypass)	2.74	SUB	No existing trail. Parallels Tapia Canyon Road and Wayside Canyon Road in between undeveloped portions of Tapia Canyon. Planned trail per developer obligations – part of Tapia Ranch development plan. Portions follow 2007 County adopted alignment.
	TC3 (Tapia – San Francisquito)	1.11	Natural	No existing trail. Appears to be a de facto trail or dirt path between Tapia Canyon Road and San Francisquito Motorway. Partially within Tapia Ranch development.
	TC4 (Tapia – Cliffie Stone)	1.03	Natural	No existing trail. A portion of alignment route follows an existing dirt road/path. A portion parallels dirt roads/paths: Quail Haven Trail, Las Tunas Trail, and Lady Linda Lane. Trail would need to traverse a significant elevation change over the ridge at northern end.
Val Verde (VV)	VV1 (Kennsington Rd)	2.31	Natural	No existing trail. Follows a few de facto dirt roads/paths. Requires access along private roads at either end of the alignment.
	VV2 (Chiquito – Val Verde)	0.94	Natural	No existing trail. Follows edge of Val Verde Park and drainage. Follows drainage, marked as privately owned for portions but appears to all be LA County Flood Control property.
West Creek (WC)	WC1 (West Creek – Tapia)	1.49	Natural	No existing trail. Parallels two existing dirt roads: Company Road and Wayside Lateral Road. Requires connection through cul-de-dac in West Creek.
	WC2 (West Creek – Tapia – Tesoro)	1.30	Natural	No existing trail. Follows a portion of existing de facto dirt road/paths and a portion of Tapia Canyon Road. Within subdivision property, but alignment not included in subdivision. Connects West Creek development to Tapia Ranch area.
TOTAL				
Total of 18 Routes	**Total of 71 Trail Segments** • 4 Existing Segments • 10 Segments planned per developer obligations • 57 Proposed Trail Segments			**Total Of 102.94 Miles in Trail Planning Castaic project area** • 4.90 Miles Existing Trails • 8.14 Miles Planned trails per developer obligations (no existing trail) • 89.90 Miles Proposed and Under Consideration

NOTES: *Subject to negotiation with California State Department of Water Resources (DWR) - Future negotiations with DWR and pending state and county agreement renewal. SUB = Multi-Use Subdivision Trail. ROW = New Designation
SOURCE: [1] Friends of Castaic Lake. Accessed 12 April 2016. *Castaic Lake – Trail Map*. Available at: http://castaiclake.com/map_trails.html

The proposed project would involve the development of five simple trailheads at access points, up to three bike skills park amenities, four equestrian amenities, and nine staging areas and trail amenities (Table 3, *Proposed Trail Related Facilities*). The bike skills parks would occupy up to 45 acres.

TABLE 3
PROPOSED TRAIL RELATED FACILITIES

Trail Related Facility Type	Related Facility Name (Size)
Trail Access Only • Trailheads only	Upper Ridge Route Road
	Sloan Canyon
	Castaic Road
	West Creek
	Hasley Canyon Equestrian Center
Bike Skills Park Amenities • Restrooms • Drinking Fountains • Rest Areas/Seating • Shade Structures	Castaic Sports Complex (up to 10 acres)
• Pump Tracks (no pedaling required) • Progressive Jumps (natural soil with compacted dirt jumps) • Balance Skills Features (e.g., wooden teeter-totter) • Rock/Technical Features (e.g., rock garden with narrow width trails) • Flow Trails (start at higher elevation for downhill ride)	Upper Lagoon (up to 5 acres)
• Trails (over variety of terrain, for all ages) • Road Handling Skills Areas (hard-packed soil course) • Beginner, Intermediate, and Expert Skills Courses (for all ages) • Advanced Downhill Course (steep terrain, jumps, turns, obstacles) • Slalom Course (two adjacent trails for competition)	Ridge Route Road (up to 30 acres)
Equestrian Amenities • Trailheads • Parking	Tapia Canyon Road
• Restrooms • Drinking Fountains (for humans, equine, or pets) • Picnic Tables	Castaic Lake Upper Lot
• Shade Structures • Horse Arenas • Gathering Areas	Tesoro Del Valle
• Horse Ties and Rails	Castaic Sports Complex
Staging Areas and Trail Amenities • Trailheads • Parking • Restrooms • Drinking Fountains (for humans, equine, or pets) • Benches/Seating • Picnic Tables	Old Road
	Hasley Canyon
	Chiquito Canyon
	Santa Felicia
	Castaic Lagoon
	Lady Linda
	Ridge Route Road
	Castaic Sports Complex

TABLE 3
PROPOSED TRAIL RELATED FACILITIES

Trail Related Facility Type	Related Facility Name (Size)
• Shade Structures • Wayfinding Signage • Interpretive Signage • Gathering Areas • Horse Ties and Rails • Bike Racks	Castaic Lake State Recreation Area Upper Lot

Restrooms would be design and required to demonstrate compliance with the standards of the Santa Clarita Valley Sanitation District or the County of Los Angeles Department of Public Health for Onsite Wastewater Treatment Systems (OWTS), as applicable.

Trails and supporting facilities within a one-mile radius of officially designated and eligible State scenic highways would be designed, constructed, and maintained (where construction equipment is involved) to preserve scenic resources, including but not limited to trees, rock outcroppings, and historic buildings, within the scenic highway corridor. Where construction of trails or related supporting facilities requires cuts into the slope (which can be seen from a far distance), the visual character of the slope would be restored by planting locally native vegetation as a visual screen. Similarly, restrooms and other supporting structures would be constructed of materials that blend into the landscape, with locally native vegetative screening.

As stated in the County Trails Manual, the hours for operation for County trails are typically from dawn to dusk (County Code 17.04.330). In accordance with the guidelines in Section 4.3.18, *Lighting*, of the County Trails Manual, where lighting features are provided for safety and wayfinding reasons, lighting would installed in a manner to be non-intrusive to adjacent uses, avoid detracting from a natural outdoors experience for trail users, and directed downward to avoid light pollution or spillover in general.[7]

REGULATORY FRAMEWORK

Federal

Historic Sites Act of 1935

The Historic Sites Act (HAS; 49 Stat. 666; 16 USC 461–467) became law on August 21, 1935, and declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance." The National Historic Preservation Act (NHPA) expanded the scope to include important state and local resources. Provisions of NHPA established the National Register maintained by the National Park Service, advisory councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs. Section 106 of the NHPA requires all federal agencies to consult the Advisory Council before continuing any activity affecting a property listed

7 County of Los Angeles Department of Parks and Recreation. Adopted by the Board of Supervisors on May 17, 2011. Revised June 2013. County of Los Angeles Trails Manual. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

on or eligible for listing on the National Register. The Advisory Council has developed regulations for Section 106 to encourage coordination of agency cultural resource compliance requirements (Executive Order 11593).

United States Department of Transportation (USDOT) Act of 1966 (Section 4[f])

Section 4(f) of the USDOT Act of 1966 affords special protection to public recreational lands and facilities, including local parks and school facilities that are open and available to the general public for recreational purposes, significant cultural resources, historical resources, and natural wildlife refuges. Federally funded transportation improvement projects are prohibited from the encroachment (direct or constructive use, or a take) of Section 4(f) lands unless it can be demonstrated that no feasible and prudent alternative exists.

National Historic Preservation Act of 1966

Enacted in 1966, the National Historic Preservation Act (NHPA; Public Law 89-665; 16 USC 470 et seq.) declared a national policy of historic preservation and instituted a multifaceted program, administered by the National Parks Service, to encourage the achievement of preservation goals at the federal, state, and local levels. The NHPA authorized the expansion and maintenance of the National Register of Historic Places (NRHP), established the position of State Historic Preservation Officer and provided for the designation of State Review Boards, set up a mechanism to certify local governments to carry out the purposes of the NHPA, assisted Native American tribes to preserve their cultural heritage, and created the Advisory Council on Historic Preservation (ACHP). Section 106 of the NHPA states that federal agencies with direct or indirect jurisdiction over federally funded, assisted, or licensed undertakings must take into account the effect of the undertaking on any historic property that is included in, or eligible for inclusion in, the NRHP, and that the ACHP must be afforded an opportunity to comment, through a process outlined in the ACHP regulations at 36 Code of Federal Regulations (CFR) Part 800, on such undertakings.

The National Park Service administers two Federal recognition programs, the National Register of Historic Places (NRHP) and the National Historic Landmarks Program.

National Register of Historic Places

Working with State Historic Preservation Offices, Tribal Historic Preservation Offices, and Federal Preservation Offices, the National Park Service maintains the NRHP. This is the official list of properties that are deemed worthy of preservation. Properties listed in the NRHP tell stories that are important to a local community, the citizens of a specific state, or all Americans. Properties listed in the NRHP may be owned by private individuals, universities, non-profits, governments, and/or corporations.

The NRHP was established by the NHPA of 1966 as "an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment." The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

Criterion A: It is associated with events that have made a significant contribution to the broad patterns of our history.
Criterion B: It is associated with the lives of persons who are significant in our past.
Criterion C: It embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction.
Criterion D: It has yielded, or may be likely to yield, information important in prehistory or history.

Cemeteries, birthplaces, or graves of historic figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, and properties that are primarily commemorative in nature are not considered eligible for the NRHP unless they satisfy certain conditions. In general, a resource must be at least 50 years of age to be considered for the NRHP, unless it satisfies a standard of exceptional importance.

National Landmarks Program

The National Park Service also administers the National Historic Landmarks (NHL) Program. Properties designated as NHLs tell important stories related to the history of the nation overall. These properties must also possess a high level of historic integrity. All properties designated NHLs are automatically included in the NRHP.

Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines

The Standards and Guidelines are prepared under the authority of Sections 101(f) (g), and (h), and Section 110 of the National Historic Preservation Act of 1966, as amended. The Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. These standards and guidelines are not regulatory and do not set or interpret agency policy. They are intended to provide technical advice about archaeological and historic preservation activities and methods. The National Park Service (NPS) has not republished "The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation" since 1983 (48 FR 44716). NPS has updated portions of the Standards and Guidelines. NPS has officially revised portions and published the revisions in the Federal Register, such as the Historic Preservation Project standards and the treatment definitions. The purposes of the Standards are:

- To organize the information gathered about preservation activities.
- To describe results to be achieved by Federal agencies, States, and others when planning for the identification, evaluation, registration and treatment of historic properties.
- To integrate the diverse efforts of many entities performing historic preservation into a systematic effort to preserve our nation's culture heritage.

Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR Part 68, 1995)

The current version of The Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR Part 68, 1995) consists of four treatment standards—Preservation, Rehabilitation, Restoration and Reconstruction—and is regulatory for NPS Grants-in-Aid programs.

The Secretary of the Interior's Standards for Rehabilitation (36 CFR Part 67, 1990), which are included in the treatment standards, are regulatory for the Federal Historic Preservation Tax Incentives program and used as the criteria to determine if a project qualifies as "a certified rehabilitation." The 1990 and the 1995 versions of the Rehabilitation Standards are identical except for their use of "shall" and "will," respectively. The Secretary of the Interior's Standards for the Treatment of Historic Properties, in particular the Standards for Rehabilitation, are intended as general guidance for work on all historic properties and are widely used and have been adopted at the Federal, State and local levels.

Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act (NAGPRA; Public Law 101-601; 25 USC 3001–3013) also applies if human remains of Native American origin are discovered on federal land. NAGPRA requires federal agencies and federally assisted museums to return "Native American cultural items" to the federally recognized Indian tribes or Native Hawaiian groups with which they are associated. Regulations (43 CFR Part 10) stipulate the following procedures be followed. If Native American human remains are discovered, the following provisions would be followed to comply with regulations:

- Notify, in writing, the responsible federal agency;
- Cease activity in the area of discovery and protect the human remains;
- Certify receipt of the notification;
- Take steps to secure and protect the remains;
- Notify the Native American tribes or tribes likely to be culturally affiliated with the discovered human remains within one working day; and
- Initiate consultation with the Native American tribe or tribes in accordance with regulations described in 43 CFR, Part 10, Subpart B, Section 10.5.

State

California Implementation of Federally and State-Mandated Historic Preservation Program

The California State Office of Historic Preservation (OHP) is responsible for administering federally and state mandated historic preservation programs to further the identification, evaluation, registration and protection of California's irreplaceable archaeological and historical resources under the direction of the State Historic Preservation Officer (SHPO), a gubernatorial appointee, and the State Historical Resources Commission.

OHP's responsibilities include:

- Identifying, evaluating, and registering historic properties;
- Ensuring compliance with federal and state regulatory obligations;
- Encouraging the adoption of economic incentives programs designed to benefit property owners; and
- Encouraging economic revitalization by promoting a historic preservation ethic through preservation education and public awareness and, most significantly, by demonstrating leadership and stewardship for historic preservation in California.

OHP reviews and comments on thousands of federally sponsored projects annually pursuant to Section 106 of the National Historic Preservation Act and state programs and projects pursuant to Sections 5024 and 5024.5 of the PRC. OHP also reviews and comments on local government and state projects pursuant to CEQA.

The purpose of OHP's project review program is to promote the preservation of California's heritage resources by ensuring that projects and programs carried out or sponsored by federal and state agencies comply with federal and state historic preservation laws and that projects are planned in ways that avoid any adverse effects to heritage resources. If adverse effects cannot be avoided, the OHP assists Lead Agencies in developing measures to minimize or mitigate such effects.

OHP administers the NRHP, the California Register of Historical Resources, the California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements; all register nominations must be submitted to the Commission for review and approval.

National Register of Historic Places

Applications to nominate California properties to the NRHP are submitted to OHP for review and approval by the State Historic Resources Commission. Authorized under the NHPA, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archaeological resources. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior. Prior to forwarding Nomination Packages for consideration for the National Register, OHP must review the package and make a determination that it conforms to the guidelines published by National Park Service Bulletin 16A. If approved by the SHRC, the nomination is sent to the State Historic Preservation Officer for nomination to the National Register.

California Register of Historical Resources

The California Register is an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change. The criteria for eligibility for the California Register are based upon National Register criteria. These criteria are:

Criterion 1: Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California of the United States;

Criterion 2: Associated with the lives of persons important to local, California or national history;

Criterion 3: Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values; and

Criterion 4: Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

The California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register

automatically includes the following:

- California properties listed in the National Register of Historic Places (Category 1 in the State Inventory of Historical Resources) and those formally Determined Eligible for listing in the National Register of Historic Places (Category 2 in the State Inventory)
- California Registered Historical Landmarks from No. 0770 onward
- Those California Points of Historical Interest that have been evaluated by the Office of Historic Preservation (OHP) and have been recommended to the State Historical Resources Commission for inclusion in the California Register

Other resources which may be nominated for listing in the California Register include:

- Historical resources with a significance rating of Categories 3 through 5 in the State Inventory. (Categories 3 and 4 refer to potential eligibility for the National Register, while Category 5 indicates a property with local significance);
- Individual historical resources;
- Historical resources contributing to historic districts; and
- Historical resources designated or listed as a local landmark.

Additionally, a historic resource eligible for listing in the California Register must meet one or more of the criteria of significance described above and retain enough of its historic character or appearance to be recognizable as a historic resource and to convey the reasons for its significance. Historical resources that have been rehabilitated or restored may be evaluated for listing.

California Historical Landmarks

California Historical Landmarks are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. The specific standards now in use were first applied in the designation of Landmark # 770. California Historical Landmarks #770 and above are automatically listed in the California Register of Historical Resources.

To be designated as a California Historical Landmark, a resource must meet at least one of the criteria listed below; have the approval of the property owner(s); be recommended by the State Historical Resources Commission; and be officially designated by the Director of California State Parks.

Criteria for Designation. To be eligible for designation as a Landmark, a resource must meet at least one of the following criteria:

- The first, last, only, or most significant of its type in the state or within a large geographic region (Northern, Central, or Southern California).
- Associated with an individual or group having a profound influence on the history of California.
- A prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in a region of a pioneer architect, designer or master builder.

Effects of Designation.

- Limited protection: Environmental review may be required under California Environmental Quality Act (CEQA) if property is threatened by a project. Contact your local planning agency for more information.
- Local assessor may enter into contract with property owner for property tax reduction (Mills Act).
- Local building inspector must grant code alternative provided under State Historic Building Code. Registration will be recorded on the property deed.
- Automatic listing in California Register of Historical Resources.
- Bronze plaque at site (underwritten by local sponsor) ordered through OHP; highway directional sign available through local Department of Transportation (Caltrans) district office.

California Points of Historical Interest

If a site is primarily of local interest, it may meet the criteria for the California Points of Historical Interest Program. California Points of Historical Interest are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points of Historical Interest designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register. No historical resource may be designated as both a Landmark and a Point. If a Point is subsequently granted status as a Landmark, the Point designation will be retired.

Criteria for Designation. To be eligible for designation as a Point of Historical Interest, a resource must meet at least one of the following criteria:

- The first, last, only, or most significant of its type within the local geographic region (City or County).
- Associated with an individual or group having a profound influence on the history of the local area.
- A prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in the local region of a pioneer architect, designer or master builder.

Effects of Designation.

- Limited protection: Environmental review may be required under CEQA if property is threatened by a project. Contact your local planning agency for more information.
- Local assessor may enter into contract with property owner for property tax reduction (Mills Act).
- Local building inspector must grant code alternative provided under State Historic Building Code.
- Registration is recorded on property deed.
- A small enamel directional sign (no text) available through local Caltrans district office. Owner may place his or her own marker at the site.

California Environmental Quality Act[8]

Pursuant to CEQA, a *historical resource* is a resource listed in, or eligible for listing in, the California Register of Historical Resources (CRHR). In addition, resources included in a local register of historic resources or identified as significant in a local survey conducted in accordance with state guidelines are also considered historical resources under CEQA, unless a preponderance of the facts demonstrates otherwise. According to CEQA, the fact that a resource is not listed in or determined eligible for listing in the CRHR, or is not included in a local register or survey, shall not preclude a Lead Agency from determining that the resource may be a historic resource as defined in California Public Resources Code (PRC) Section 5024.1.[9]

CEQA applies to archaeological resources when (1) the archaeological resource satisfies the definition of a historical resource or (2) the archaeological resource satisfies the definition of a "unique archaeological resource." A unique archaeological resource is an archaeological artifact, object, or site that has a high probability of meeting any of the following criteria:[10]

(1) The archaeological resource contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.

(2) The archaeological resource has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) The archaeological resource is directly associated with a scientifically recognized important prehistoric or historic event or person.

California Health and Safety Code, Section 7050 and Sections 18950 through 18961

Consistent with the provisions of Section 50907.9 of the PRC, Section 7050 of the Health and Safety Code HSC) authorizes the Native American Heritage Commission (NAHC) to regulate Native American concerns regarding the excavation and disposition of Native American cultural resources. Among its duties, the Commission is authorized to resolve disputes relating to the treatment and disposition of Native American human remains and items associated with burials. Upon notification of the discovery of human remains by a county coroner, the Commission notifies the Native American group or individual most likely descended from the deceased.

The State Historic Building Code (HSC; Sections 18950–18961 provide alternative building regulations and building standards for the rehabilitation, preservation, restoration (including related reconstruction), or relocation of buildings or structures designated as historic buildings. Such alternative building standards and building regulations are intended to facilitate the restoration or change of occupancy so as to preserve their original or restored architectural elements and features, to encourage energy conservation and a cost-effective approach to preservation, and to provide for the safety of the building occupants.

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8 *California Public Resources Code*, Division 13, Sections 21083.2 and 21084.1.

9 *California Code of Regulations*. Title 14, Chapter 3: "Guidelines for the Implementation of the California Environmental Quality Act as Amended October 6, 2005," Section 15064.5(a).

10 *California Public Resources Code*. Division 13, Section 21083.2(g).

California Penal Code Section 622 – Destruction of Historical Properties

This section of the California Penal Code makes it a misdemeanor for anyone (except the owner) to willfully injure or destroy anything of archaeological interest or value whether on private lands or within any public park or place. In addition, Penal Code Section 622.5 sets the penalties for the damage or removal of cultural resources.

Senate Bill 18 – Traditional Tribal Cultural Places

Senate Bill (SB) 18, enacted in 2004, requires local governments to consult with Native American groups at the earliest point in the local government land use planning process. The consultation intends to establish a meaningful dialogue regarding potential means to preserve Native American places of prehistoric, archaeological, cultural, spiritual, and ceremonial importance. It allows for tribes to hold conservation easements and for tribal cultural places to be included in open space planning.

Assembly Bill 52

AB 52 creates a new category of environmental resources that must be considered under CEQA: "tribal cultural resources." AB 52 is applicable to a project for which a Notice of Preparation (NOP) is filed on or after July 2015. Although the NOP for the 2016 RTP/SCS PEIR was filed in March 2015, and is therefore not subject to the provisions of AB 52, a brief summary of the provisions of AB 52 is provided for informational purposes and for consideration by future projects.

AB 52 adds tribal cultural resources to the categories of cultural resources in CEQA, which had formerly been limited to historic, archaeological, and paleontological resources. "Tribal cultural resources" are defined as either (1) "sites, features, places cultural landscapes, sacred places and objects with cultural value to a California Native American tribe" that are included in the state register of historical resources or a local register of historical resources, or that are determined to be eligible for inclusion in the state register; or (2) resources determined by the lead agency, in its discretion, to be significant based on the criteria for listing in the state register.

Recognizing that tribes may have expertise with regard to their tribal history and practices, AB 52 requires lead agencies to provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if they have requested notice of projects proposed within that area. If the tribe requests consultation within 30 days upon receipt of the notice, the lead agency must consult with the tribe. Consultation may include discussing the type of environmental review necessary, the significance of tribal cultural resources, the significance of the project's impacts on the tribal cultural resources, and alternatives and mitigation measures recommended by the tribe.

The parties must consult in good faith, and consultation is deemed concluded when either the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource (if such a significant effect exists) or when a party concludes that mutual agreement cannot be reached.

County

Los Angeles County General Plan 2035

The County's cultural resources objective, found in the Conservation and Natural Resources Element of the General Plan 2035, is to preserve and protect cultural resources including historic, archaeological, and paleontological resources.[11] Under this objective, the County has established the following policies:[12]

Policy C/NR 14.1: Mitigate all impacts from new development on or adjacent to historic, cultural, and paleontological resources to the greatest extent feasible.

Policy C/NR 14.2: Support an inter-jurisdictional collaborative system that protects and enhances historic, cultural and paleontological resources.

Policy C/NR 14.3: Support the preservation and rehabilitation of historic buildings.

Policy C/NR 14.4: Ensure proper notification procedures to Native American tribes in accordance with Senate Bill 18 (2004).

Policy C/NR 14.6: Ensure proper notification and recovery processes are carried out for development on or near historic, cultural, and paleontological resources.

Los Angeles County Historical Landmarks and Records Commission

The Los Angeles County Board of Supervisors established and has maintained the Los Angeles County Historical Landmarks and Records Commission (Commission) pursuant to Los Angeles County Code Chapter 3.30. Pursuant to Section 26490 of the California Government Code, the Commission is designated as a historical records commission to foster and promote the preservation of historical records. The Los Angeles County Historical Landmarks and Records Commission (Commission) considers and recommends to the Board of Supervisors local historical landmarks defined to be worthy of registration by the State of California, either as California Historical Landmarks or as Points of Historical Interest. The Commission may also comment for the Board on applications relating to the NRHP. The Commission is also charged with fostering and promoting the preservation of historical records. In its capacity as the memorial plaque review committee of the County of Los Angeles, the Commission screens applications for donations of historical memorial plaques and recommends to the Board plaques worthy of installation as County property.[13]

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[11] Los Angeles County Department of Regional Planning. Adopted 6 October 2015. Los Angeles County 2035 General Plan: Chapter 9: Conservation and Natural Resources Element. Available at: http://planning.lacounty.gov/assets/upl/project/gp_final-general-plan-ch9.pdf

[12] Los Angeles County Department of Regional Planning. Adopted 6 October 2015. Los Angeles County 2035 General Plan: Chapter 9: Conservation and Natural Resources Element. Available at: http://planning.lacounty.gov/assets/upl/project/gp_2035_Chapter9_2014.pdf

[13] County of Los Angeles Department of Auditor-Controller (J. Tyler McCauley, Auditor-Controller). 21 October 2002. Sunset Review for the Los Angeles County Historical Landmarks and Records Commission. Available at: http://auditor.co.la.ca.us/cms1_003345.pdf

STUDY METHODS

Paleontological Resources Records Search and Map Review

The presence of recorded paleontological resources and fossil localities within proposed project area were assessed using information obtained from geologic maps of the San Fernando Valley were also examined to evaluate the potential for the geological deposits within the Castaic project area to yield unique paleontological resources.[14]

Based on the results of the records and map searches, each of the geologic units identified within the Castaic project area were characterized according to their potential to yield paleontological resources. The geological formations were categorized using a three-tiered sensitivity classification scheme:

- **High Potential:** Sedimentary geologic units and other geologic units that have yielded unique paleontological resources
- **Moderate Potential:** Older alluvial geologic units
- **Low to No Potential:** Metamorphic and igneous geologic units and younger alluvial geologic units

Archaeological and Historic Resources Records Search and Literature Review

Cultural resources records searches were conducted at the South Central Coastal Information Center (SCCIC), housed at California State University, Fullerton, on July 17, 2015. The search included reviews of all known relevant cultural resource survey reports within the Castaic project area to ascertain the presence of known prehistoric and historic archaeological resources.

Native American Sacred Sites and Human Remains

Coordination with the Native American Heritage Commission (NAHC) was initiated for the Castaic Area Multi-Use Trails Plan Project on August 10, 2015.[15] The NAHC was requested to conduct a Sacred Lands File Records Search for the presence of Native American sacred sites and human remains within the project area. A written response from NAHC was received by Sapphos Environmental, Inc. on January 20, 2016, stating that the Sacred Lands File search indicates no recorded Native American cultural resources within the project area.[16] On the recommendation of the NAHC, Sapphos Environmental, Inc. sent letters to six (6) Native American contacts classified by the NAHC as potential sources of information related to cultural resources in the vicinity of the proposed Castaic Area Multi-Use Trails Plan Project. The letters advised the tribes and specific individuals of the proposed project and its geographic area and requested information regarding cultural resources within the vicinity of the Castaic Area Multi-Use Trails Plan Project, including feedback or concerns related to the project. On February 9, 2016, a response from the Fernandeño Tataviam Band of Mission Indians stated that the project area is of extreme risk to cultural and tribal resources and that they would like to consult with the Lead Agency regarding project

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[14] Jennings, C.W., and R.G. Strand. 1969. *Geologic Map of California, Los Angeles Sheet, 1:250,000*. Sacramento, CA: California Geological Survey, California Division of Mines and Geology.

[15] Holland, Karl, Sapphos Environmental, Inc., Pasadena, CA. 10 August 2015. Letter to Native American Heritage Commission, Sacramento, CA.

[16] Totton, Gayle, Native American Heritage Commission, Sacramento, CA. January 20, 2016. Emailed to Eugen Ruzi, Sapphos Environmental, Inc., Pasadena, CA. Subject: Letter Response

mitigation. Another group, the Soboba Band of Luiseño Indians, on February 25, 2016 expressed no specific concerns with the project, but did request that the appropriate consultation to take place between tribes, project proponents and government agencies. This latter group suggested consultation with Gabrieleño tribes; however, additional discussions with NAHC revealed that consultations with the tribes listed in the initial NAHC letter would be sufficient.[17] A third group's response (on March 1, 2016), the San Manuel Band of Mission Indians, had no concerns with the project, since the project area lays outside their Tribe's ancestral territories.

RESULTS

Paleontological Resources

During the Miocene and Pliocene Periods (23.7 to 1.6 million years ago), most of the greater Los Angeles Basin and the surrounding hills, including the Castaic area, was submerged. Los Angeles County is one of the richest areas in the world for both fossil marine vertebrates and land vertebrates from rock deposited over the last 25 million years. Although Rancho La Brea (in the City of Los Angeles) has been highly publicized, there are many other areas of Los Angeles County, including the Castaic Valley and surrounding areas, which contain equally important fossil occurrences.

The surficial geology of Castaic Lake and surrounding areas was mapped by Dibblee between 1993 and 1997.[18,19,20,21] The following rock units/formations have the potential to yield significant paleontological resources based on previous collections and/or age and lithology and are given high paleontological sensitivity: the Saugus Formation (non-marine Pliocene and Pleistocene)[22]; Pico Formation (marine Pliocene)[23,24]; Towsley Formation (marine late Miocene to early Pliocene)[25]; the Sisquoc Formation (marine late Miocene); the Castaic Formation (marine late

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17 Ruzi, Eugen, Sapphos Environmental, Inc., Pasadena, CA. 10 August 2015. Letter to Native American Heritage Commission, Sacramento, CA.

18 Dibblee, T. W., Jr. 1993. Geologic Map of the Val Verde Quadrangle, Los Angeles and Ventura Counties, California. Dibblee Geological Foundation DF-50 (Ehrenspeck, H. E., ed.), scale 1:24,000, colored, one cross-section. Available online at: http://www.sbnature.org/dibblee/newweb/maps_catalog.html

19 Dibblee, T. W., Jr. 1996a. Geologic Map of the Newhall Quadrangle, Los Angeles County, California. Dibblee Geological Foundation Map DF-56 (Ehrenspeck, H. E., ed.), scale 1:24,000, colored, two cross-sections. Available at: http://www.sbnature.org/dibblee/newweb/maps_catalog.html

20 Dibblee, T. W., Jr. 1997a. Geologic Map of the Warm Springs Mountain Quadrangle, Los Angeles County, California. Dibblee Geological Foundation Map DF-64 (Ehrenspeck, H. E., ed.), scale 1:24,000, colored, three cross-sections. Available at: http://www.sbnature.org/dibblee/newweb/maps_catalog.html

21 Dibblee, T. W., Jr. 1997b. Geologic Map of the Whitaker Peak Quadrangle, Los Angeles and Ventura Counties, California. Dibblee Geological Foundation Map DF-63 (Ehrenspeck, H. E., ed.), scale 1:24,000, colored, three cross-sections. Available at: http://www.sbnature.org/dibblee/newweb/maps_catalog.html

22 Jefferson, G. T., 1991. "A Catalogue of Late Quaternary Vertebrates from California, Part Two, Mammals." *Natural History Museum of Los Angeles County Technical Reports*, no. 7, 129 p. Los Angeles, CA: Natural History Museum of Los Angeles County.

23 Squires, R. L., Groves, L.T., and J. T. Smith. 20 November 2006. "New Information on Molluscan Paleontology and Depositional Environments of the Upper Pliocene Pico Formation, Valencia Area, Los Angeles County, Southern California." *Los Angeles County Museum of Natural History Contributions in Science* 511. Los Angeles, CA: Natural History Museum of Los Angeles County.

24 Fierstine, H.L., Huddleston, R.W, and G.T. Takeuchi. 2012. "Catalog of Neogene Bony Fishes of Southern California: A Systematic Inventory of all Published Accounts." *Occasional Papers of the California Academy of Sciences*, 206 p.

25 Kern, J. P. 1973. "Early Pliocene Marine Climate and Environments of Eastern Ventura Basin, Southern

Miocene)[26,27,28] the Monterey Formation; the Mint Canyon Formation (non-marine Miocene)[29,30,31]; and the San Francisquito Formation (marine Paleocene). Igneous and metamorphic rocks have a low potential for yielding significant paleontological resources, and are therefore assigned low paleontological sensitivity within the Castaic project area.

Areas of Younger Quaternary Alluvium are characterized by a low potential for containing unique paleontological resources. These areas are predominately located in stream terraces of Santa Clarita River and its tributaries. Stream-terrace deposits are widely distributed most extensively near the town of Saugus and in the immediate vicinity of the Santa Clara River. The deposits consist of crudely stratified, poorly consolidated reddish-brown gravel, sand, and silt.

Archaeological and Historic Resources

Prehistoric Context

Several prehistoric cultural chronologies have been proposed for the coastal Southern California region with three of the most frequently cited sequences developed by William Wallace,[32] Claude Warren,[33] and Chester King.[34] Such chronologies provide a framework to discuss archaeological data in relation to broad cultural changes seen in the archaeological record. The chronological sequence presented herein represents an updated synthesis of these schemes as compiled by Glassow and others[35] for the Northern California Bight. This geographic area consists of the coastal area from Vandenberg Air Force Base south to Palos Verdes, as well as the Channel Islands and adjacent inland areas, including the San Fernando Valley and Los Angeles Basin.[36] The prehistoric

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California." *University of California Publications in Geologic Science*s 96:1-117. Berkeley and Los Angeles, CA: University of California Press.

26 Kellogg, R., 1925. "Additions to the Tertiary History of the Pelagic Mammals on the Pacific Coast of North America." *Carnegie Institution of Washington*, No. 348: 1-120. Washington, D.C.: Judd & Detweiler, Inc.

27 Kellogg, R., 1929. "A New Cetothere from Southern California." *Bulletin of the Department of Geological Sciences* 18: 449-457. Berkeley, CA: University of California Publications.

28 Repenning, C. A. and R. H. Tedford. 1977. "Otarioid Seals of the Neogene." *U.S. Geological Survey Professional Paper* 992: 1-93.

29 Maxson, J. H. 1930. *A Tertiary Mammalian Fauna from the Mint Canyon Formation of Southern California*. Carnegie Institution of Washington Publications 404:77-112.

30 Axelrod, D. I. 1940. "The Mint Canyon Flora of Southern California: A Preliminary Statement." *American Journal of Science* 238: 577-585.

31 Mount, J. D. 1971. "A Late Miocene Flora from the Solemint Area, Los Angeles County, California." *Bulletin of the Southern California Paleontological Society* 3:1-4.

32 Wallace, William J. 1955. "A Suggested Chronology for Southern California Coastal Archaeology." *Southwestern Journal of Anthropology 11*: 214–30.

33 Warren, Claude M. 1968. "Cultural Tradition and Ecological Adaptation on the Southern California Coast." In *Archaic Prehistory in the Western United States*, ed. Cynthia Irwin-Williams. Eastern New Mexico University Contributions in Anthropology No. 1. Portales, NM: Eastern New Mexico University.

34 King, Chester. 1990. *Evolution of Chumash Society: A Comparative Study of Artifacts Used for Social System Maintenance in the Santa Barbara Channel Region before AD 1804*. New York, NY: Garland.

35 Glassow, Michael A., Lynn H. Gamble, Jennifer E. Perry, and Glenn S. Russell. 2007. "Prehistory of the Northern California Bight and the Adjacent Transverse Ranges." In *California Prehistory, Colonization, Culture, and Complexity*, ed. Terry L. Jones and Kathryn A. Klar. New York, NY: Altamira.

36 Glassow, Michael A., Lynn H. Gamble, Jennifer E. Perry, and Glenn S. Russell. 2007. "Prehistory of the Northern California Bight and the Adjacent Transverse Ranges." In *California Prehistory, Colonization, Culture, and Complexity*, ed. Terry L. Jones and Kathryn A. Klar. New York, NY: Altamira.

sequence of the Northern California Bight can be divided into four broad temporal categories (Table 4, *Southern California Coastal Regional Chronology*). It should be noted that the prehistoric chronology for the region is being refined on a continuing basis, with new discoveries and improvements in the accuracy of dating techniques.

TABLE 4
SOUTHERN CALIFORNIA COASTAL REGIONAL CHRONOLOGY

Epoch	Coastal Region	Dates
Terminal Pleistocene / Early Holocene	Paleo-Coastal Period	Circa 9500 to 7000/6500 BC
Middle Holocene	Millingstone Period	Circa 7000/6500 to 1500/1000 BC
Late Holocene	Intermediate Period	1500/1000 BC to AD 750
Late Holocene	Late Period	AD 750 to Spanish contact

Terminal Pleistocene and Early Holocene: Paleo-Coastal Period (Circa 9500 to 7000/6500 BC)

Although data on early human occupation for the Southern California coast are limited, archaeological evidence from the northern Channel Islands suggests initial settlement within the region occurred at least 12,000 years before present (BP). At Daisy Cave (CA-SMI-261) on San Miguel Island, radiocarbon dates indicate an early period of use in the terminal Pleistocene, sometime between 9600 and 9000 calibrated (cal) BC.[37] Evidence of early human occupation in the Northern California Bight has also been found on nearby Santa Rosa Island, where human remains from the Arlington Springs Site (CA-SRI-1730) have been dated between 11,000 and 10,000 cal BC.[38] Archaeological data recovered from these and other coastal Paleoindian sites indicate a distinctively maritime cultural adaptation, termed the "Paleo-Coastal Tradition,"[39] which involved the use of seafaring technology and a subsistence regime focused on shellfish gathering and fishing.[40]

Relatively few sites have been identified in Los Angeles County that date to the terminal Pleistocene and early Holocene. Currently, the earliest reliable date for human occupation in the area derives from the La Brea Tar Pits (CA-LAN-159), where human bone has been dated to 8520 cal BC.[41] Evidence of possible early human occupation has also been found at the sand dune bluff site of Malaga Cove (CA-LAN-138), located between Redondo Beach and Palos Verdes.[42] Researchers have proposed that archaeological remains recovered from the lowermost cultural

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37 Erlandson, J.M., D.J. Kennett, B.L. Ingram, D.A. Guthrie, D.P. Morris, M.A. Tveshov, G.J. West, and P.L. Walker 1996. "An Archaeological and Paleontological Chronology for Daisy Cave (CA-SMI-261), San Miguel Island, California." *Radiocarbon*, *38*: 355–73.

38 Johnson, J.R., T.W. Stafford Jr., H.O. Ajie, and D.P. Morris. 2002. "Arlington Springs Revisited." In *Proceedings of the Fifth California Islands Symposium*, ed. D. Browne, K. Mitchell, and H. Chaney, pp. 541–45. Santa Barbara, CA: USDI Minerals Management Service and The Santa Barbara Museum of Natural History.

39 Moratto, M.J. 1984. California Archaeology, pp. 103-113. Academic Press, New York.

40 Rick, T.C., J.M. Erlandson, and R.L. Vellanoweth. 2001. "Paleocoastal Fishing along the Pacific Coast of the Americas: Evidence from Daisy Cave, San Miguel Island, California." *American Antiquity*, *66*: 595–614.

41 Berger, R., R. Protsch, R. Reynolds, C. Rozaire, and J.R. Sackett. 1971. *New Radiocarbon Dates Based on Bone Collagen of California Indians*. Los Angeles, CA: Contributions to the University of California Archaeological Survey.

42 Walker, Edwin Francis. 1951. *Five Prehistoric Archaeological Sites in Los Angeles County, California*. F. W. Hodge Anniversary Publication Fund VI. Los Angeles, CA: Southwest Museum.

stratum at the site, which include shell, animal bone, and chipped stone tools, may date as early as 8000 cal BC.[43,44]

Middle Holocene: Millingstone Period (Circa 7000/6500 to 1500/1000 BC)

The Millingstone Period or Horizon, also referred to as the "Encinitas Tradition,"[45,46] is the earliest well-established cultural occupation of the coastal areas of the region. The onset of this period, which began sometime between 7000 and 6500 cal BC, is marked by the expansion of populations throughout the Northern California Bight. Regional variations in technology, settlement patterns, and mortuary practices among Millingstone sites have led researchers to define several local manifestations or "patterns" of the tradition.[47] Groups that occupied the Santa Clarita Valley are thought to have been relatively small and highly mobile during this time, with a general subsistence economy focused on the gathering of shellfish and plant foods, particularly hard seeds, with hunting being of less importance.[48]

Two temporal subdivisions have been defined for the portion of the Topanga Pattern falling within the Millingstone Period: Topanga I (circa 6500 to 3000 BC) and Topanga II (circa 3000 to 1000 BC).[49] Topanga I assemblages are characterized by abundant manos and metates, core tools and scrapers, charmstones, cogged stone, and discoidals; projectile points are quite rare with those present resembling earlier, large, leaf-shaped forms.[50] Secondary inhumations with associated cairns are the most common burial form at Millingstone sites with small numbers of extended inhumations also identified. The subsequent Topanga II phase largely represents a continuation of the Topanga pattern with site assemblages characterized by numerous manos and metates, charmstones, cogged stones, discoidals, and some stone balls. A significant technological change in ground stone occurs at this time with the appearance of mortars and pestles at Topanga II sites suggesting the adoption of balanophagy by coastal populations.[51] The quantity of projectile points also notably increases in Topanga II site deposits indicating that the hunting of large game may have played a greater role in the subsistence economy than in earlier times. While secondary burials continue to be quite common, a few flexed inhumations have also been recovered from archaeological contexts dating to the Topanga II phase.

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43 Moratto, M.J. 1984. *California Archaeology*, pp. 132. Academic Press, New York.

44 Wallace, W.J. 1986. "Archaeological Research at Malaga Cove." In *Symposium: A New Look at Some Old Sites*, ed. G.S. Breschini and T. Haversat. Salinas, CA: Coyote Press.

45 Sutton, Mark Q. 2010. "The Del Rey Tradition and Its Place in the Prehistory of Southern California." *Pacific Coast Archaeological Society Quarterly*, *44*(2): 1–54.

46 Sutton, Mark Q., and Jill K. Gardner. 2010. "Reconceptualizing the Encinitas Tradition of Southern California." *Pacific Coast Archaeological Society Quarterly*, *42*(4): 1–64.

47 Sutton, Mark Q., and Jill K. Gardner. 2010. "Reconceptualizing the Encinitas Tradition of Southern California." *Pacific Coast Archaeological Society Quarterly*, *42*(4): 1–64.

48 Glassow, Michael A., Lynn H. Gamble, Jennifer E. Perry, and Glenn S. Russell. 2007. "Prehistory of the Northern California Bight and the Adjacent Transverse Ranges." In *California Prehistory, Colonization, Culture, and Complexity*, ed. Terry L. Jones and Kathryn A. Klar. New York, NY: Altamira.

49 Sutton, Mark Q., and Jill K. Gardner. 2010. "Reconceptualizing the Encinitas Tradition of Southern California." *Pacific Coast Archaeological Society Quarterly*, *42*(4): 1–64, 8.

50 Glassow, Michael A., Lynn H. Gamble, Jennifer E. Perry, and Glenn S. Russell. 2007. "Prehistory of the Northern California Bight and the Adjacent Transverse Ranges." In *California Prehistory, Colonization, Culture, and Complexity*, ed. Terry L. Jones and Kathryn A. Klar. New York, NY: Altamira.

51 Sutton, Mark Q., and Jill K. Gardner. 2010. "Reconceptualizing the Encinitas Tradition of Southern California." *Pacific Coast Archaeological Society Quarterly*, *42*(4): 1–64, 41.

Late Holocene: Intermediate Period (1500/1000 BC to AD 750)

The Intermediate Period, which encompasses the early portion of the "Del Rey Tradition" as defined by Sutton,[52] begins around 3500 BP. At this time, significant changes are seen throughout the coastal areas of Southern California in material culture, settlement systems, subsistence strategies, and mortuary practices. These new cultural traits have been attributed to the arrival of Takic speaking people from the southern San Joaquin Valley.[53] Biological, archaeological, and linguistic data indicate that the Takic groups who settled in the Santa Clarita Valley were ethnically distinct from the preexisting Hokan-speaking Topanga populations and are believed to be ancestral to ethnographic Tataviam groups.

Intermediate Period sites within the Santa Clarita Valley are represented by the "Angeles Pattern" of the Del Rey Tradition.[54] Three temporal subdivisions have been defined for the portion of the Angeles Pattern that falls within the Intermediate Period: Angeles I (1500 to 600 BC), Angeles II (600 BC to AD 400), and Angeles III (AD 400 to 750).[55] The onset of the Angeles I phase is characterized by the increase and aggregation of regional populations and the appearance of the first village settlements. The prevalence of projectile points, single-piece shell fishhooks, and bone harpoon points at Angeles I sites suggests a subsistence shift in the Intermediate Period with an increased emphasis on fishing and terrestrial hunting and less reliance on the gathering of shellfish resources. Regional trade or interaction networks also appeared to develop at this time with coastal populations in Los Angeles County obtaining small steatite artifacts and *Olivella* shell beads from the southern Channel Islands and obsidian from the Coso Volcanic Field.[56] Finally, marked changes are seen in mortuary practices during the Angeles I phase with flexed primary inhumations and cremations replacing extended inhumations and cairns.

The Angeles II phase largely represents a continuation and elaboration of the Angeles I technology, settlement, and subsistence systems. One exception to this pattern is the introduction of a new funerary complex around 2600 BP consisting of large rock cairns or platforms which contain abundant broken tools, faunal remains, and cremated human bone. These mortuary features have generally been thought to represent the predecessor of the Southern California Mourning Ceremony.[57] Several important changes in the archaeological record mark the beginning of the Angeles III phase. At this time, larger seasonal villages characterized by well-developed middens and cemeteries were established along the coast or inland areas. Archaeological data from Angeles III sites indicate that residents of these settlements practiced a fairly diverse subsistence strategy

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52 Sutton, Mark Q. 2010. "The Del Rey Tradition and Its Place in the Prehistory of Southern California." *Pacific Coast Archaeological Society Quarterly*, *44*(2): 1–54.

53 Sutton, Mark Q. 2009. "People and Language: Defining the Takic Expansion in Southern California." *Pacific Coast Archaeological Society Quarterly*, *41*(2&3): 31-93.

54 Sutton, Mark Q. 2010. "The Del Rey Tradition and Its Place in the Prehistory of Southern California." *Pacific Coast Archaeological Society Quarterly*, *44*(2): 1–54.

55 Sutton, Mark Q., and Jill K. Gardner. 2010. "Reconceptualizing the Encinitas Tradition of Southern California." *Pacific Coast Archaeological Society Quarterly*, *42*(4): 1–64, 8.

56 Koerper, Henry C., Roger D. Mason, and Mark L. Peterson. 2002. "Complexity, Demography, and Change in Late Holocene Orange County." In *Catalysts to Complexity: Late Holocene Societies of the California Coast*, ed. M. Erlandson and Terry L. Jones. *Perspectives in California Archaeology*, Vol. 6. Los Angeles, CA: University of California, Los Angeles, Institute of Archaeology.

57 Sutton, Mark Q. 2010. "The Del Rey Tradition and Its Place in the Prehistory of Southern California." *Pacific Coast Archaeological Society Quarterly*, *44*(2): 1–54.

which included the exploitation of both marine and terrestrial resources.[58] Notable technological changes occurred at this time with the introduction of the plank canoe and bow and arrow.[59] The appearance of new *Olivella* bead types at Angeles III sites indicates a reconfiguration of existing regional exchange networks with increased interaction with populations in the Gulf of California.[60] Finally, cremations increase slightly in frequency at this time with inhumations no longer placed in an extended position.[61]

Late Holocene: Late Period (AD 750 to Spanish Contact)

The Late Period dates from approximately AD 750 until Spanish contact at AD 1542. Sutton[62] has divided this period, which falls within the larger Del Rey Tradition, into two phases: Angeles IV (AD 750–1200) and Angeles V (AD 1200–1550). The Angeles IV phase is characterized by the continued growth of regional populations and the development of large, sedentary villages.

Several new types of material culture appear during the Angeles IV phase including Cottonwood series points, birdstone and "spike" effigies, *Olivella* cupped beads, and *Mytilus* shell disk beads. The presence of Southwestern pottery, Patayan ceramic figurines, and Hohokam shell bracelets at Angeles IV sites suggests some interaction between groups in Southern California and the Southwest. Notable changes are seen in regional exchange networks after 800 BP with an increase in the number and size of steatite artifacts, including large vessels, elaborate effigies, and *comals*, recovered from Angeles V sites. The presence of these artifacts suggests a strengthening of trade ties between coastal Los Angeles populations and the southern Channel Islands.[63] Finally, Late Period mortuary practices remain largely unchanged from the Intermediate Period with flexed primary inhumations continuing to be the preferred burial method.

Regional Ethnography

Native American territorial occupation of the Santa Clarita Valley is traditionally assigned to the Tataviam group; however, the Chumash, Gabrielino, Kitanemuk and Serrano territories are thought to have bordered the outer limits of the Santa Clarita Valley.[64,65,66] For this study, a description of Tataviam ethnography is provided.

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58 Sutton, Mark Q. 2010. "The Del Rey Tradition and Its Place in the Prehistory of Southern California." *Pacific Coast Archaeological Society Quarterly*, *44*(2): 1–54.

59 Glassow, Michael A., Lynn H. Gamble, Jennifer E. Perry, and Glenn S. Russell. 2007. "Prehistory of the Northern California Bight and the Adjacent Transverse Ranges." In *California Prehistory, Colonization, Culture, and Complexity*, ed. Terry L. Jones and Kathryn A. Klar. New York, NY: Altamira.

60 Koerper, Henry C., Roger D. Mason, and Mark L. Peterson. 2002. "Complexity, Demography, and Change in Late Holocene Orange County." In *Catalysts to Complexity: Late Holocene Societies of the California Coast*, ed. M. Erlandson and Terry L. Jones. *Perspectives in California Archaeology*, Vol. 6. Los Angeles, CA: University of California, Los Angeles, Institute of Archaeology.

61 Sutton, Mark Q. 2010. "The Del Rey Tradition and Its Place in the Prehistory of Southern California." *Pacific Coast Archaeological Society Quarterly*, *44*(2): 1–54.

62 Sutton, Mark Q. 2010. "The Del Rey Tradition and Its Place in the Prehistory of Southern California." *Pacific Coast Archaeological Society Quarterly*, *44*(2): 1–54.

63 Koerper, Henry C., Roger D. Mason, and Mark L. Peterson. 2002. "Complexity, Demography, and Change in Late Holocene Orange County." In *Catalysts to Complexity: Late Holocene Societies of the California Coast*, ed. M. Erlandson and Terry L. Jones. *Perspectives in California Archaeology*, Vol. 6. Los Angeles, CA: University of California, Los Angeles, Institute of Archaeology.

64 Bean, L.J., and C.R. Smith. 1978. "Gabrielino." In *Handbook of North American Indians*, Vol. 8, ed. R.F. Heizer. Washington, DC: Smithsonian Institution.

The Tataviam

The existing ethnographic data on the Tataviam is limited and limited archaeological research has been directly linked to this group. Most of what is known about the Tataviam comes from the work of two anthropologists, John Harrington and Alfred Kroeber, and from data obtained from the San Fernando Mission's registers, as well as the limited archaeological record.[67] In addition, a recent synthesis of mission's registers has greatly expanded our understanding on Tataviam ethnography.[68]

Tataviam territory was bounded by the Chumash to the west, the Kitanemuk to the north, the Serrano to the east, and the Gabrielino to the south. Thus, their material culture, subsistence strategies, rock art representation, and religious practices resemble those of their neighbors, primarily the Gabrielino and Inland Chumash, as well as the Serrano and even the Kawaiisu, who were located to the north of the Kitanemuk.[69,70]

The Tataviam territory extended from the northwest to the southeast, and encompassed portions of the Antelope, San Fernando, and Santa Clarita Valleys. The center of their territory is assumed to have been the Santa Clarita Basin area (upper portion of the Santa Clara River), east of Piru Creek, just north of what is currently known as the Los Angeles Metropolitan area.[71] The northern portion of their territory probably included the foothills of Liebre Mountain and Sawmill Mountain, located at the southwestern edge of the Antelope Valley. The northeast boundary of Tataviam territory included the south-facing slopes of Sawmill Mountain and Sierra Pelona, extending southeast to Soledad Pass. The southeastern boundary is unclear but it is likely that the upper Soledad Canyon–Acton area was part of Tataviam territory, at least sometime during the Late Prehistoric period. The southern boundary included the high portions of the San Gabriel Mountains and continued to the west towards the Santa Susana Mountains. Piru Creek appears to be the westernmost boundary of the Tataviam territory.[72,73] Tataviam territory included portions of the Lake Hughes/Gorman/West of Lancaster, Castaic/Santa Clarita/Agua Dulce, and Acton initiative subareas.

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65 King, C., and T. Blackburn. 1978. "Tataviam." In *Handbook of North American Indians*, Vol. 8, ed. R.F. Heizer. Washington, DC: Smithsonian Institution, p. 535.

66 Grant, C. 1978. "Eastern Coastal Chumash." In *Handbook of North American Indians*, Vol. 8, ed. R.F. Heizer. Washington, DC: Smithsonian Institution, p. 538.

67 King, Chester D., and Thomas C. Blackburn. 1978. "Tataviam." In *Handbook of North American Indians, Volume 8: California, ed*. William C. Sturtevant. Washington, DC: Smithsonian Institute, p. 535-537.

68 King, Chester D. 2004. "*Ethnographic Overview of the Angeles National Forest Tataviam and San Gabriel Mountain Serrano Ethnohistory*." Prepared for: U.S. Department of Agriculture Southern California Province Angeles National Forest, Arcadia, CA

69 King, Chester D., and Thomas C. Blackburn. 1978. "Tataviam." In *Handbook of North American Indians, Volume 8: California, ed*. by William C. Sturtevant. Washington, DC: Smithsonian Institute, pp. 535-537.

70 Heizer, R.F. (ed). 1978. "Key to Tribal Territories." In *Handbook of North American Indians, Volume 8: California, ed*. William C. Sturtevant. Washington, DC: Smithsonian Institute, p. ix.

71 Johnson, John R. 1990. "Tataviam Geography and Ethnohistory." In J*ournal of California and Great Basin Anthropology*, 12(2): 191-214. Banning, CA: Malki Museum, Inc.

72 King, Chester D., and Thomas C. Blackburn. 1978. "Tataviam." In *Handbook of North American Indians, Volume 8: California, ed*. William C. Sturtevant. Washington, DC: Smithsonian Institute, pp. 535-537.

73 Johnson, John R. 1990. "Tataviam Geography and Ethnohistory." In *Journal of California and Great Basin Anthropology*, 12(2): 191-214. Banning, CA: Malki Museum, Inc.

Linguistically the Tataviam (also known as Alliklik)[74] are considered to be part of the Takic subfamily of the Uto Aztecan linguistic family, who moved inland towards the west and along the California coast. The time frame of the Takic expansion is not clearly defined, because migration of the population throughout the region took place at different times. Moratto indicates that Uto-Aztecan speakers migrated to California and that by the end of the Early period (circa 1500–1200 BC) Takic groups, such as the Tataviam, the Gabrielino, and the northern Serrano, already had firmly established territories.[75]

Ethnographic and archaeological information indicates that the Tataviam lived in villages of various sizes, with large centers occupied by about 200 people, widely separated from each other. Large villages were considered to be the major centers. Very small satellite communities of 10 to 15 people were located near the large centers, while mid-size settlements of 20 to 60 people were situated among the large villages. The total Tataviam population at the time of contact is assumed not to have exceeded 1,000 people.[76] The village located at Vasquez Rocks is known as the Agua Dulce Village. According to King et al.,[77] the Agua Dulce Village was larger than the surrounding villages and was probably an important economic and political center. Alliances with other villages were maintained through intermarriage and trade. It is estimated that the population of the Agua Dulce Village was possibly as low as 50 people during the early portion of the Middle period and approximately 200 to 300 people towards the end of the Middle period and throughout the Historic period (after AD 1200).[78]

Tataviam subsistence strategies were very similar to those of neighboring groups. A variety of plant foods was part of their diet, including the buds of the yucca plant (*Yucca whipplei*), a major staple, as well as coast live oak acorns (*Quercus agrifolia*), sage (*Salvia mellifera*), juniper berries (*Juniperus californica*), and berries of holly-leaf cherry (*Prunus ilicifolia*). Their diet was also supplemented with insects, small mammals, deer, and possibly pronghorn.[79] The Tataviam cooked the flower stalks of the plant in earth ovens lined with rocks. The final product was stored and consumed throughout the year. The flowers, seeds, and leaves at the base of the plant were also consumed. Archaeological evidence suggests that the Tataviam, as well as most native Southern Californians, traveled a long distance to collect acorns during certain times of the year. Ethnographic information indicates that acorn was primarily processed using bedrock mortars.

The Tataviam mortuary practices were influenced by their immediate neighbors, and archaeological evidence indicates that the Tataviam practiced both cremation and inhumation.

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74 Kroeber, A. 1925. *Handbook of the Indians of California*. New York: Dover Publications, Inc., p. 995. (Used the term Alliklik, which was the name used by neighboring Chumash groups and roughly translates grunters or stammerers. The Kitanemuk used the term Tataviam or people facing the sun when referring to the inhabitants of the sunny upper Santa Clara River. The term Alliklik is considered to be derogatory, and therefore ceased to be used in literature around the mid-1970s.)

75 Moratto, Michael J. [1984] 2004. *California Archaeology*. Salinas, CA: Coyote Press.

76 King, Chester D., and Thomas C. Blackburn. 1978. "Tataviam.: In *Handbook of North American Indians, Volume 8: California, ed*. William C. Sturtevant. Washington, DC: Smithsonian Institute, pp. 535-537.

77 King, Chester D., Charles Smith and Tom King. 1974. Archaeological Report Related to the Interpretation of Archaeological Resources Present at Vasquez Rocks County Park. Prepared for: County of Los Angeles Department of Parks and Recreation, p. 43.

78 King, Chester D., Charles Smith and Tom King. 1974. Archaeological Report Related to the Interpretation of Archaeological Resources Present at Vasquez Rocks County Park. Prepared for: County of Los Angeles Department of Parks and Recreation, p. 33.

79 King, Chester D., and Thomas C. Blackburn. 1978. "Tataviam." In *Handbook of North American Indians, Volume 8: California, ed*. William C. Sturtevant. Washington, DC: Smithsonian Institute, pp. 535-537.

Among the groups influencing the Tataviam were the Chumash; Coastal and inland Chumash were among the few that used inhumation exclusively.[80] The Gabrielino practiced both, inhumation and cremation,[81] until the establishment of the missions, when cremation was eliminated and inhumation alone became the norm. The Serrano cremated their deceased,[82] while the Kitanemuk preferred inhumation.[83] Based on his research of the Gabrielino, McCawley[84] mentions that inhumation (more common along coastal groups) may have been a result of cultural influence by the Chumash or a practice adopted because of a scarcity of fuel required for cremations.[85] With interment came the practice of grave goods, a practice favored by most of the tribes in California. Grave goods usually consisted of beads of various materials, knifes, projectile points, and exotic trade items among other objects. Ethnographic studies, as well as archaeological evidence regarding the presence or absence of grave goods, and their quality, has been an important archaeological tool to determine social hierarchy among individuals in specific social groups. Excavations at two burial sites in the Agua Dulce Village (CA-LAN-361 and CA-LAN-373) show social differentiation, which is reflected as the presence of exotic trade items in the graves, or complete lack of any grave goods.

Historic Context

European Discovery and the Mission Period (1769–1821)

The first Europeans to pass through the Santa Clarita Valley were a group of Spanish explorers on their way to Monterey Bay from San Diego. Under the leadership of Gaspar de Portolá, the exploration party entered the Santa Clarita Valley on August 8, 1769, after previously crossing the Santa Monica Mountains and San Fernando Valley. The explorers named a river they encountered after St. Clare, thus giving the name of the Santa Clarita Valley and community. The group then headed north on their way to Santa Barbara.

In August of 1795, an exploration party set out to identify a site for a new mission, to be located between the San Gabriel Mission and the San Buenaventura Mission. The requirements included that the land be viable for crops, be near a source of abundant water, and have an indigenous population that could be converted to Catholicism. With these objectives met, a site for the new mission was decided upon in the upper half of the Los Encinos Valle, as the San Fernando Valley was then called. The San Fernando Mission was established on September 8, 1797, and was the seventeenth mission founded by the Catholic Church in California. Father Fermin Francisco Lausen was appointed in charge of the mission. The name given to the mission honored King Ferdinand III of Spain (1217–1251). In order to assist in the establishment of the San Fernando Mission, several other California missions sent nearly 1,000 animals that included cattle, horses, mules, and sheep. Many native inhabitants of the Santa Clarita Valley, such as the Tataviam, were forcibly taken to

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80 Kroeber, A.L. 1925. *Handbook of the Indians of California*. New York: Dover Publications, Inc., p. 556.

81 McCawley, William. 1996. *The First Angelinos: The Gabrielino Indians of Los Angeles*. Banning, CA: Malki Museum Press, p. 157.

82 Bean, Lowell J., and Charles R. Smith. 1978. "Serrano." In *Handbook of North American Indians, Volume 8: California, ed*. William C. Sturtevant. Washington, DC: Smithsonian Institute, pp. 570-574.

83 Blackburn, Thomas C., and Lowell J. Bean. 1978. "Kitanemuk." In *Handbook of North American Indians, Volume 8: California, ed*. William C. Sturtevant. Washington, DC: Smithsonian Institute, pp. 564-569.

84 McCawley, William. 1996. *The First Angelinos: The Gabrielino Indians of Los Angeles*. Banning, CA: Malki Museum Press.

85 McCawley, William. 1996. *The First Angelinos: The Gabrielino Indians of Los Angeles*. Banning, CA: Malki Museum Press, p. 157.

the newly-constructed mission. While living at the mission, they were under the direction of the priests who required the Native Americans to farm (wheat, barley, corn, beans, peas, and fruit trees); raise cattle; cure hides; tend vineyards; make wine; and practice a trade, such as carpentry, masonry, tailoring or shoemaking. The mission's ranch lands eventually grew to include the Santa Clarita Valley.

The Mexican Period (1821–1846)

In 1821, when Mexico declared its independence from Spain, initially little changed for the missions. At that time there were approximately 1,000 Native Americans living and working at the San Fernando Mission. However, in 1834, the Mexican government secularized the California Missions, which resulted in the San Fernando Mission being turned over to Don Pedro Lopez, who acted as mission *majordomo* (governor of the mission). Between 1840 and 1846, six separate land grants were carved out of the former Rancho Misión San Fernando Rey de España. Eulogio de Célis was the first to acquire the entire 116,858-acre ranch for an estimated $14,000. Further encroachments on mission lands in the valley included Tujunga (1840), El Escorpión (1845), El Encino (1845), La Providencia (1845), and Cahuenga (1846). In 1846, California governor Pio Pico authorized the sale of remaining mission land to raise money to defend Mexican California from an inevitable American takeover.

Up to this period, gold was thought to be a myth in California. Native Americans told Spanish explorers they were familiar with gold, but for the entirety of Spanish California and the majority of Mexican California, none had been discovered. However, in 1842 the first gold in California in was discovered at Placerita Canyon, near Santa Clarita, by Francisco Lopez, Manuel Cota, and Domingo Bermudez.[86] The discovery set off a miniature gold rush in the Santa Clarita Valley, sending hundreds of local residents to the canyon in search of riches; however, the first shipment of gold from California only contained 18.3 ounces.[87]

The American Period (1850–present)

After Californian statehood was established in 1850, mining developed into a major presence in the Santa Clarita Valley region. In 1861, mines began operating in Soledad Canyon, initially pursuing copper but eventually switching to produce the majority of gold recovered in Los Angeles County.[88] Soledad Canyon mines include the Red Rover, Don, and Emma mines. Iron, quartz and titanium were additionally mined periodically from Soledad Canyon. Beginning during the first half of the 20th century, mining in the Santa Clarita Valley began to shift toward aggregate production and continues to the present.[89]

Petroleum was another natural resource to have an impact on the Santa Clarita Valley. Beginning in the 1860s, Los Angeles-based residents began prospecting for oil in the Santa Clarita Valley. On September 26, 1876, one of the first commercially successful oil wells on the west coast of the

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86 Guinn, J.M. 1915. *An Extended A History of California and an Extended History of Los Angeles and Environs*. Los Angeles, CA: Historic Record Company.

87 Guinn, J.M. 1915. *An Extended A History of California and an Extended History of Los Angeles and Environs*. Los Angeles, CA: Historic Record Company.

88 Blanchard, Hugh. "Mines of the Soledad." Available at: http://www.lagoldmines.com/index.php?page=143075.txt. Accessed 8 October 2014.

89 Santa Clarita Historical Society. "Soledad Canyon Mining Operations." Available at: http://www.scvhistory.com/scvhistory/jk0017.htm. Accessed 8 October 2014.

United States began producing at Pico Canyon in southwest Santa Clarita Valley.[90] The discovery led to an oil boom, creating the boom town of Mentryville, named after the owner of the successful well. The town included a school, blacksmith, machine shop, and bakery, but began to collapse at the turn of the century as new oil fields were quickly appearing.[91] Oil production in the Santa Clarita Valley continues to this day.

The construction of the Los Angeles Aqueduct was also important to the development of the Santa Clarita Valley. The entire construction of the aqueduct required thousands of laborers, housed in camps alongside the aqueduct route, which left an imprint on the local economies. Becoming the country's largest municipal water system at the time, the Los Angeles Aqueduct was completed in 1913. Obtaining water continued to have an impact on the Santa Clarita Valley, but the St. Francis Dam, completed in 1926, was to have a devastating impact on the region. The St. Francis Dam was constructed in San Francisquito Canyon in an ambitious plan to secure water for the growing Los Angeles metropolitan region. On the night of March 12/13, 1928, the dam failed catastrophically, unleashing an incredible volume of water on the Santa Clarita Valley.[92] The resulting flood killed 432 people, not including an unknown amount of migrant workers, and caused extensive damage to the Santa Clarita Valley. The failure of the St. Francis Dam is the largest engineering catastrophe in United States during the 20th century and is the second-worst disaster in California history, next to the 1906 San Francisco earthquake.

Cultural Resources Characterization

Previous Archaeological Studies in the Castaic Area Multi-Use Trails Plan

The results of the literature reviews indicate that 185 archaeological studies (survey, excavation, and monitoring) have been conducted within the proposed project area (Appendix A, *Previous Cultural Resource Studies*). The record search indicates that an estimated 32,000 acres have been previously surveyed in the project area, comprising approximately 42 percent of the entire Castaic project area. Appendix A provides an overview of the previous surveys conducted within the Castaic Trails Plan area.

Previously Recorded Archaeological Resources

The results of the records searches determined that there are 89 archaeological sites within the boundaries of the Castaic Trails Plan area. From these 89 resources, 40 are of prehistoric age; 45 are of historic age; and four are multicomponent archaeological sites (containing both prehistoric and historic components). From the 40 prehistoric resources, 11 are isolates and 29 are prehistoric sites. Descriptions of these resources are provided in Table 5, *Previously Recorded Archaeological Resources*. In addition, large areas within the proposed project area are located within the Angeles National Forest, a State Historical Landmark and a Point of Historical Interest.

The record search indicates that an estimated 32,000 acres have been previously surveyed in the proposed project area, which constitutes approximately 42 percent of the proposed project area.

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90 Worden, Leon. 1997. "The Story of Mentryville: California's Pioneer Oil Town." Available at: http://www.scvhistory.com/mentryville/mstory.htm. Accessed October 8, 2014.

91 Worden, Leon. 1997. "The Story of Mentryville: California's Pioneer Oil Town." Available at: http://www.scvhistory.com/mentryville/mstory.htm. Accessed October 8, 2014.

92 Rogers, J.D. "The 1928 St. Francis Dam Failure and Its Impact on American Civil Engineering." Available at: http://web.mst.edu/~rogersda/st_francis_dam/St-Francis-Dam-for-ASCE-Press.pdf. Accessed February 4, 2016.

From the 89 recorded resources within the proposed project area, only one is listed in the CRHR. This resource (P-19-002233, a prehistoric campsite) is an individual property determined eligible for the NRHP by a consensus through Section 106 process, and it is listed in the CRHR. However, the resource is not in the immediate impact area, which comprises a 60-foot buffer along the proposed trail alignment and related elements. In total, 52 of the 89 recorded resources are situated within a quarter-mile buffer zone of the proposed trail alignment, but only 12 are located within the immediate impact area (Table 5). The map of the resources within the APE is on file with the County of Los Angeles Department of Parks and Recreation and is withheld from public review to protect the resources (Appendix B, *Map of Cultural Resources Within the APE* [confidential information redacted, on file with the County]). A proposed trail segment passes through the Angeles National Forest, which is State Historical Landmark No. 717.

TABLE 5
PREVIOUSLY RECORDED ARCHAEOLOGICAL RESOURCES

Primary Number	Time Period		Description	Located within APE	Located within ¼ Mile Buffer of APE
	Prehistoric	Historic			
P-19-000036	x	x	Bowers cave		x
P-19-000323	x		#1 Castaic Res. - Daires Ranch Site		x
P-19-000324	x		Elderberry Canyon Site		x
P-19-000325	x		Prehistoric Rockshelter		x
P-19-000327	x	x	Prehistoric Artifact Scatter		x
P-19-000437	x		Elderberry #2		x
P-19-001221	x		Prehistoric Rockshelter		x
P-19-001222	x	x	Prehistoric Rockshelter		x
P-19-001445		x	Historic Water Well Pumping Station		x
P-19-001446		x	Foundation of Two Buildings (Historic)	x	
P-19-001447		x	Foundation a Building (Historic)		x
P-19-001448		x	Historic Cemetery		x
P-19-001646	x		Prehistoric Village		x
P-19-001647	x		Small Lithic Scatter (Prehistoric)		x
P-19-001648	x		Small Lithic Scatter (Prehistoric)		x
P-19-001649	x		Small Lithic Scatter (Prehistoric)		x
P-19-001650	x		Prehistoric Village	x	
P-19-001651	x	x	Large Milling Station (Prehistoric)	x	
P-19-001652	x		Small Lithic Scatter (Prehistoric)		x
P-19-001653	x		Large Lithic Scatter (Prehistoric)		x
P-19-001654	x		Large Milling Station (Prehistoric)		x
P-19-001655	x		Prehistoric Artifact Scatter and Rubble Pile		x
P-19-001656	x		Small Lithic Scatter (Prehistoric)		x
P-19-001657	x		Small Lithic Scatter (Prehistoric)		x

TABLE 5
PREVIOUSLY RECORDED ARCHAEOLOGICAL RESOURCES

Primary Number	Time Period		Description	Located within APE	Located within ¼ Mile Buffer of APE
	Prehistoric	Historic			
P-19-001658	x		Small Lithic Scatter (Prehistoric)		x
P-19-001659	x		Small Lithic Scatter (Prehistoric)		x
P-19-001660		x	Historic Stone Structure		x
P-19-001661	x		Small Lithic Scatter (Prehistoric)		x
P-19-001662	x		Small Milling Station (Prehistoric)	x	
P-19-001663	x		Moderate Lithic Scatter (Prehistoric)		x
P-19-001664	x		Prehistoric Habitation Site		x
P-19-001665		x	Burned Oil Drilling Locale (Historic)		x
P-19-001666	x		Prehistoric Habitation Site		x
P-19-001667		x	Hathaway Ranch		x
P-19-001668		x	Historic Mining Camp		x
P-19-001669		x	Historic Pad with Oil/Water Pump and Platform		x
P-19-001670		x	Historic Mining Camp		x
P-19-001671		x	Historic Mining Camp		x
P-19-001672		x	Ranch Complex (Historic)		x
P-19-002070		x	Clougherty Ranch Caretaker's House	x	
P-19-002071		x	Harry Carey Ranch, Clougherty Ranch		x
P-19-002072		x	Small Scatter of Historic Debris	x	
P-19-002233	x		Chiquito Cyn Camp #2		x
P-19-002235	x		Chiquito Canyon Village		x
P-19-002242	x		Martinez Grande Cave		x
P-19-003038		x	Well Site 1		x
P-19-003046		x	Uncle Charlie's House		x
P-19-003580		x	Historic Cabin Foundation		x
P-19-003581		x	Debris of a Cairn (Historic)		x
P-19-004282	x		Prehistoric Midden, Hearth and Oven	x	
P-19-004321		x	Historic Refuse Deposit	x	
P-19-004475	x		Small Lithic Scatter (Prehistoric)		x
P-19-004476	x		Groundstone Scatter (Prehistoric)		x
P-19-004477		x	Wooden Telephone Pole Fragments		x
P-19-004478		x	Telephone Alignment Segment		x
P-19-100006		x	Large Wooden Planks (Historic)		x
P-19-100027		x	US Forrest Service Boundary Monument		x

TABLE 5
PREVIOUSLY RECORDED ARCHAEOLOGICAL RESOURCES

Primary Number	Time Period		Description	Located within APE	Located within ¼ Mile Buffer of APE
	Prehistoric	Historic			
P-19-100146		x	Mining Activity Tools Debris (Historic)		x
P-19-100147		x	Historic Artifact Scatter		x
P-19-100148		x	Harrow with Metal Wheels, Nuts and Bolts		x
P-19-100149		x	Historic Water Trough		x
P-19-100592		x	Historic Artifact (Glass) Scatter		x
P-19-186535		x	Los Angeles National Forest	x	
P-19-189816		x	Sloan Canyon Road	x	
P-19-190655		x	Harry Carey Ranch District, Farmer John / Clougherty Ranch		x
P-19-190656		x	Harry Carey Ranch - Main House		x
P-19-190657		x	Harry Carey Ranch - Joe's Cabin		x
P-19-190658		x	Harry Carey Ranch - Bunkhouse		x
P-19-190659		x	Harry Carey Ranch - Upper Garage		x
P-19-190660		x	Harry Carey Ranch - Lower Garage		x
P-19-190661		x	Harry Carey Ranch - Adobe Stable		x
P-19-190662		x	Harry Carey Ranch - Wood Stable		x
P-19-190663		x	Harry Carey Ranch - Smokehouse		x
P-19-190664		x	Harry Carey Ranch - Caretaker's House		x
P-19-190750		x	Utility Pole		x
P-19-190941		x	Castaic Emergency Spillway	x	
P-56-152882		x	Santa Clara Valley District		x
P-56-152902		x	Newhall Land & Farming Co		x
P-19-100028	x		Prehistoric Artifact		x
P-19-100139	x		Prehistoric Artifact		x
P-19-100140	x		Prehistoric Artifact		x
P-19-100141	x		Prehistoric Artifact		x
P-19-100142	x		Prehistoric Artifact		x
P-19-100143	x		Prehistoric Artifact		x
P-19-100144	x		Prehistoric Artifact		x
P-19-100145	x		Prehistoric Artifact		x
P-19-100511	x		Prehistoric Artifact	x	
P-19-101216	x		Small Lithic Scatter (Prehistoric)		x
P-19-101217	x		Prehistoric Artifact		x

Native American Sacred Sites and Human Remains

A Native American sacred site is defined by the NAHC as an area that has been, and often continues to be, of religious significance to Native American peoples, such as an area where religious ceremonies are practiced or an area that is central to their origins as a people.[93] Consultation with NAHC identified no Native American cultural resources in the vicinity of the Castaic Area Multi-Use Trails Project Area.[94] On February 9, 2016, a response from the Fernandeño Tataviam Band of Mission Indians stated that the project area is of extreme risk to cultural and tribal resources and that they would like to consult with the Lead Agency regarding project mitigation. Another group, the Soboba Band of Luiseño Indians, on February 25, 2016 expressed no specific concerns with the project, but did request that the appropriate consultation to take place between tribes, project proponents and government agencies. This latter group suggested consultation with Gabrieleño tribes; however, additional discussions with NAHC revealed that consultations with the tribes listed in the initial NAHC letter would be sufficient.[95] A third group's response (on March 1, 2016), the San Manuel Band of Mission Indians, had no concerns with the project, since the project area lays outside their Tribe's ancestral territories. The NAHC requested ongoing consultation regarding the project (Appendix C, *Native American Correspondence*).

The records search did reveal two cemeteries and/or burial sites of prehistoric and historic age within the Castaic Multi-Use Trails Plan Area. The burial grounds are not located in the immediate impact area; however, they are located within the quarter-mile buffer along the trail alignment. One of the burial grounds (P-19-000324) is a prehistoric cemetery; however, it was inundated during the construction of the Castaic Reservoir. The other (P-19-001448H) is an early-twentieth-century cemetery for victims of the 1928 St. Francis Dam Disaster.

IMPACT ANALYSIS

Paleontological Resources

The geologic units that underlie the proposed project area, Chatsworth Formation, Santa Susana Formation, Llajas Formation, Sespe Formation, Topanga Formation, Monterey Formation, Towsley Formation, Pico Formation, Saugus Formation, and older Quaternary Alluvium, have a moderate to high potential for containing unique paleontological resources. Where construction of the trails requires excavation in to these geologic units, there is a potential to have significant impacts on vertebrate fossil remains that constitute unique paleontological resources pursuant to CEQA, requiring the consideration of mitigation measures.

Archaeological and Historic Resources

There are recorded archaeological and historic resources within the proposed project area. Additionally, the potential exists for the unanticipated discovery of buried significant historical and unique archaeological resources, including tribal cultural resources, during ground-disturbing

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93 Native American Heritage Commission. "Understanding Cultural Resources" Available at: http://nahc.ca.gov/resources/understanding-cultural-resources/. Accessed 3 February 2016.

94 Totton, Gayle, Native American Heritage Commission, Sacramento, CA. 20 January 2016. Email to Eugen Ruzi, Sapphos Environmental, Inc., Pasadena, CA. Subject: Letter Response.

95 Ruzi, Eugen, Sapphos Environmental, Inc., Pasadena, CA. 10 August 2015. Letter to Native American Heritage Commission, Sacramento, CA.

activities in native soils. Exposure or displacement of historical resources and unique archaeological resources is a significant impact, requiring the consideration of mitigation measures.

Native American Sacred Sites and Human Remains

There are known prehistoric burial sites within the proposed project area. Additionally, the potential exists for the unanticipated discovery of human remains interred outside of a formal cemetery and Native American sacred sites, during ground-disturbing activities in native soils. Disturbance of human remains and Native American sacred sites is a significant, requiring the consideration of mitigation measures.

MITIGATION RECOMMENDATIONS

The following mitigation measures shall be implemented, as applicable, for ground-disturbing activities associated with trail construction and/or improvements within the Castaic Area Multi-Use Trails Project. These measures, with proper implementation, will serve to avoid, minimize, or substantially reduce impacts to cultural resources.

Mitigation Measure CULTURAL-1: *Archaeological and Historic Resources – Avoidance and Monitoring*. Completion of a Worker Education and Awareness Program for all personnel who will be engaged in ground-disturbing activities shall be required prior to the start of ground-disturbing activities. This shall include training that provides an overview of cultural resources that might potentially be found and the appropriate procedures to follow if cultural resources are identified. This requirement extends to any new staff prior to engaging in ground disturbing activities.

Prior to the initiation of ground-disturbing activities, the County of Los Angeles Department of Parks and Recreation (County Parks) shall review the construction plans to ensure that any known cultural resources sites that are required to be avoided have been marked as "off-limits" areas for construction and construction staging. In addition, County Parks shall require monitoring of all ground disturbing activities by a qualified archaeologist within 100 feet of a known extant unique archaeological resources, significant historical resources, or tribal cultural resource. In addition, consultation shall be undertaken with the Most Likely Descendants designated by Native American Heritage Commission to determine if a Native American monitor shall also be present during all or a portion of the ground-disturbing activities.

In the event that previously unknown unique archaeological resources, significant historical resources, or tribal cultural resources are encountered during construction, the resources shall either be left in situ and avoided through realignment of the trail, or the resources shall be salvaged, recorded, and reposited consistent with the provisions of a Phase III data recovery program consistent with the provisions of a Cultural Resource Management Plan. Data recovery is not required by law or regulation. It is, though, the most commonly agreed-upon measure to mitigate adverse effects to archaeological sites eligible or listed under Section 106 Criterion D, as it preserves important information that will otherwise be lost.

Mitigation Measure CULTURAL-2: *Pre-Construction Surveys* At the time that any new segment of trail is proposed for development that would require ground-disturbing activities in soils that have been predominantly *in situ* during the past 50 years, records and archival information shall be reviewed to determine if there are any recorded unique archaeological resources, significant historical resources as defined in Section 15064.5 of the State CEQA Guidelines, or tribal cultural resources as defined in AB52 in the Area of Potential Effects. At a minimum, the records and

archival review will include a search of the South Central Coastal Information Center, a request for Sacred Lands File from the Native American Heritage Commission, and a request for information regarding tribal cultural resources from the Most Likely Descendants designated by Native American Heritage Commission. The appropriate course of action will be undertaken in light of the results of the records search:

(A) Where the Area of Potential Effect has been subject to a Phase I Walkover Survey within two years of the proposed activity and no unique archaeological resources, significant cultural resources, or tribal cultural resources are known from the Area of Potential Effect, work shall proceed per the provision of Mitigation Measure CULTURAL-1.

(B) Where all or a portion of the Area of Potential Effect has not been surveyed for cultural resources within two years of a proposed ground-disturbing activity, a qualified archaeologist who meets the Secretary of the Interior's professional qualification standards for archaeology and shall conduct a Phase I Walkover Survey to ascertain the presence or absence of unique archaeological and/or significant historic resources, as defined in Section 15064.5 of the State CEQA Guidelines.

a. If the survey determines no unique archaeological resources or significant historical resources, including potential tribal cultural, then the work shall proceed consistent with the provisions of Mitigation Measure CULTURAL-1.

b. If the survey determines potential unique archaeological resources or significant historical resources, including potential tribal cultural resources, then one of two courses of action shall be employed:

i. Where avoidance is feasible, the trail alignments shall be realigned to avoid the potentially significant resource, and the work shall then proceed consistent with the provisions of Mitigation Measure CULTURAL-1. The new alignment will be surveyed by a qualified archaeologist. An archaeological monitor shall be present during ground-disturbing activities. In addition, consultation shall be undertaken with the Most Likely Descendants designated by Native American Heritage Commission to determine if a Native American monitor shall also be present during all or a portion of the ground-disturbing activities.

ii. Where avoidance is not feasible, a Phase II evaluation of the cultural resources shall be undertaken to determine the significance of the cultural resource. If the Phase II investigation identifies a unique/eligible cultural resource within the area proposed for ground-disturbing work, the County shall determine whether to avoid the resource through redesign or to proceed with a Phase III data recovery program consistent with the provisions of a Cultural Resource Management Plan. The work shall then proceed consistent with the provisions of Mitigation Measure CULTURAL-1.

Mitigation Measure CULTURAL-3: *Paleontological Resources – Paleontological Monitoring*. Impacts to cultural resources related directly or indirectly to the destruction of a unique paleontological resource from the proposed project shall be reduced to below the level of significance by monitoring, salvage, and curation of unanticipated paleontological resources discovered during ground-disturbing activities in previously undisturbed native soils located five or more feet below the ground surface that would have the potential to contact geologic units with a

high to moderate potential to yield unique paleontological resources. Ground-disturbing activities include, but are not limited to, drilling, excavation, trenching, and grading. If paleontological resources are encountered during ground-disturbing activities, the County of Los Angeles Department of Parks and Recreation (County Parks) shall require and be responsible for salvage and recovery of those resources consistent with standards for such recovery established by the Society of Vertebrate Paleontology.

Paleontological Resources Sensitivity Training shall be required for all project personnel prior to the start of ground-disturbing activities in geologic units with a moderate to high potential to yield unique paleontological resources. This shall include a brief field training that provides an overview of fossils that might potentially be found, and the appropriate procedures to follow if fossils are identified. This requirement extends to any new staff that joins the project.

Construction monitoring by a qualified monitor (archaeologist cross-trained in paleontology or paleontologist) shall be implemented during all ground-disturbing activities that affect previously undisturbed geologic units 12 or more inches below the ground surface and have the potential to encounter geologic units with a moderate to high potential to yield unique paleontological resources. In the event that a paleontological resource is encountered during construction, all ground-disturbing activity within 100 feet of the find shall be halted until a qualified paleontologist can evaluate the significant of the discovery. Additional monitoring recommendations may be required. If the resource is found to be significant, the paleontologist shall determine the most appropriate treatment and method for removing and stabilizing the specimen. Curation of the any significant paleontological finds shall be required with a qualified repository, such as the Natural History Museum of Los Angeles County (LACM).

Within 90 days of the completion of any salvage operation or monitoring activities, a mitigation report shall be submitted to County Parks with an appended, itemized inventory of specimens. The report and inventory, when submitted to County Parks, shall signify the completion of the program to mitigate impacts to paleontological resources. A copy of the report/inventory shall be filed with the County of Los Angeles Planning and Development Agency.

Mitigation Measure CULTURAL-4: *Regulatory Requirements – Human Remains*. In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are encountered during excavation activities, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby areas reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains.

If the County Coroner determines that the remains are or are believed to be Native American, s/he shall notify the Native American Heritage Commission (NAHC) in Sacramento within 24 hours. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC shall immediately notify the person(s) it believes to be the most likely descendant (MLD) of the deceased Native American. The descendants shall complete their inspection and make a recommendation within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the County of Los Angeles Department of Parks and Recreation (County Parks), the disposition of the human remains. The MLD's recommendation shall be followed if feasible, and may include scientific removal and non-destructive analysis of the human remains and any items associated with Native American burials. If County Parks rejects the MLD's recommendations, the agency shall rebury the remains with appropriate dignity on the

property in a location that will not be subject to further subsurface disturbance (14 California Code of Regulations §15064.5(e)).

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of mitigation measures Cultural-1 through Cultural-4 would reduce impacts to cultural resources related to an adverse change in the significance of a paleontological resource, an archaeological resource, or human remains to below the level of significance.

Should there be any questions regarding the information contained in this MFR, please contact Mr. Eugen Ruzi at (626) 683-3547, extension 109.

APPENDIX A
PREVIOUS CULTURAL RESOURCE STUDIES

Report Number	Year	Title	Author(s)
LA-00054	1974	Archaeological Resources of the Proposed Castaic Conduit System	Leonard, Nelson N. III
LA-00088	1973	Archaeological Survey of the Proposed Castaic Development Site	Carrico, Richard L.
LA-00285	1988	Cultural Resources Archaeological Survey Hasley Canyon, California Tentative Parcel Map No. 19784.	Tartaglia, Louis J.
LA-00294		A Preliminary Archaeological Literature Search for the Community Development Plan	Adams, Andrea
LA-00504	1979	Assessment of the Impact Upon Cultural Resources by the Proposed Development of a 654 Acre Parcel Located in Seco Canyon, Saugus, California	Romani, John F.
LA-00562	1979	An Archaeological Assessment of Parcel 11490	Bowles, Larry L. and Jean A. Salpas
LA-00573	1988	Environmental Impact Evaluation: an Archaeological Assessment of the Ranch/tapia/san Fran Control Burn Areas Located in the Castaic Lake Area of Los Angeles County, California	Parr, Robert E.
LA-00678	1980	Cultural Resource Survey of Preliminary Minor Land Division No 12316 San Francisquito Canyon County of Los Angeles, California	Tartaglia, Louis J.
LA-00826	1980	Archaeological Assessment for Tentative Tract 30756	Cooley, Theodore G.
LA-00848	1977	Review of Archaeological Resource Identification and Impact Mitigation California Aqueduct Project (west Branch, Mojave Division and Coastal Branch)	Schulz, Peter D.
LA-00895	1980	A Preliminary Archaeological Resource Survey of the Garcia Ranch, Los Angeles County, California	Rechtman, Robert B.
LA-00938	1981	Cultural Resource Survey and Impact Assessment for a 20+ Acre Lot in San Francisquito Canyon (parcel Map No. 13726), Los Angeles County	Singer, Clay A.
LA-00972	1980	Cultural Resources Investigation Re: Tentative Tract Map #34032 Submitted to Andel Engineering Company	Robinson, R. W.
LA-00973	1980	Cultural Resources Investigation Re: Tentative Minor Land Division No. 13336 Submitted to Zimmerman Consulting Engineers	Robinson, R. W.
LA-00990	1981	Cultural Resource Survey, Chiquita Landfill, Newhall, California	Tartaglia, Louis J.
LA-01081	1981	An Evaluation of the Impacts to Cultural Resources by the Proposed Construction of an Oil Well and Appurtenances Newhall 1-21, San Martinez Grande Canyon Area of Los Angeles	Wlodarski, Robert J.
LA-01187	1975	Archaeological Reconnaissance Report: Dry Canyon Fire Plantation Sites (arr No. 05-ac-01-53-03)	Ryan, Thomas M.
LA-01223	1980	A Survey of Cultural Resources and Assessment of Impacts for Tentative Tract No. 34031, Hasley Canyon, Los Angeles County, California	Romani, Gwendolyn R.
LA-01233	1983	Cultural Resource Survey Storm Drain- Castaic Park P.d. No. 1707	Tartaglia, Louis J.
LA-01252	1981	Cultural Resources Investigation Parcel Map No. 12291	Robinson, R. W.
LA-01317	1983	Preliminary Archaeological Reconnaissance San Francisquito Canyon	Tartaglia, Louis J.
LA-01318	1983	Preliminary Archaeological Reconnaissance-Hasley Canyon	Tartaglia, Louis J.
LA-01341	1984	Cultural Resources Report Hasley Canyon Tentative Tract 36668	Tartaglia, Louis J.
LA-01418	1983	Cultural Resources Survey for Tentative Tract No. 34365	Romani, Gwendolyn R.
LA-01419	1984	Negative Archaeological Survey Report: Additional Ramps to I-5 Between Magic Mountain Parkway and Henry Mayo Drive Interchanges, Los Angeles County, Ca	Romani, John F.
LA-01490	1985	Report of Archaeological Reconnaissance Survey Near Castaic Lake, Los Angeles County	Raab, Mark L.
LA-01650	1987	Archaeological Reconnaissance Report of LADWP Geologic Exploration Project	McIntyre, Michael J.
LA-01660	1987	Phase I Feasibility Analysis for the Los Angeles County Airport Site Selection Study: Evaluation of Prehistoric, Historic, and Paleontological Resource Sensitivity of Three Alternate Locations	Whitney-Desautels, Nancy A.
LA-01667	1987	Archaeological Survey of Proposed New Development Areas in Castaic Lake State Recreation Area	Woodward, Jim
LA-01753	1989	Cultural Resources Archaeological Survey Hasley Canyon, California Tentative Parcel Map No. 19784	Tartaglia, Louis J.
LA-01775	1989	Cultural Resource Assessment for Three Postal Service Sites, Los Angeles County	Love, Bruce
LA-01785	1989	Cultural Resources Archaeological Survey Hasley Canyon, California Tentative Tract No. 45084	Tartaglia, Louis J.
LA-01808	1987	A Cultural Resources Investigation of a Portion of Grasshopper Canyon, Los Angeles County, California.	Robinson, R. W.
LA-01832	1989	Cultural Resource Survey of 408 Acres of Land for the Proposed Chiquita Canyon Sanitary Landfill Expansion Los Angeles County California	Cooley, Theodore G. and Toren, George A.
LA-01839	1989	Cultural Resource Investigation: Del Valle Regional Emergency Training Center Project, Los Angeles County	Romani, Gwendolyn R.
LA-01849	1989	Report of Archaeological Reconnaissance Survey Of: Wayside Project Newhall Quadrangle Los Angeles County, California	Bleitz, Dana E. and L. Mark Raab
LA-01971	1989	Report of Archaeological Evaluation Of: Site CA-LAN-1221, Castaic Lake Los Angeles County, California	Raab, Mark L.
LA-01995	1976	Assessment of the Archaeological Impact by the Proposed Zone Change for Portion Nw 1/4 of Sw 1/4 of Sec. 25, T5n. R.17w, Sb	McIntyre, Michael J.
LA-02009	1990	Report of Archaeological Reconnaissance Survey of the San Fransiquito Project, Parcels 9 and 10 Newhall Quadrangle Los Angeles County, California	Bleitz, Dana E. and L. Mark Raab
LA-02105	1990	Cultural Resources Archaeological Survey Castaic Junction, California Tentative Tract No. 45958	Tartaglia, Louis J.
LA-02106	1989	Cultural Resources Archaeological Survey Tentative Tract No. 44831	Tartaglia, Louis J.
LA-02154	1990	Cultural Resource Assessment of Tract 44471, Sloan Canyon, Map Number 21161) on Decker Road Off Encimal Canyon, Santa Monica Mountains, California	Lerch, Michael K.
LA-02209	1990	Archaeological Survey Report of a Two Acre Plot 31455 the Old Road Castaic, California	Frierman, Jay D.
LA-02259	1990	Cultural Resources Assessment Report He Pyle Ranch and Tsavangu Rancheria Site Complex Tentative Parcel Map 19784 Los Angeles County, California	Tartaglia, Louis J.
LA-02269	1991	Cultural Resources Survey and Impact Assessment for Tentative Parcel Map 22411, a 4.79 Acre Parcel at 30920 Gilmour Road in Castaic, Los Angeles County, California	Singer, Clay A. and John E. Atwood
LA-02362	1963	The Archaeology of Bowers Cave, Los Angeles County, California	Elsasser, Albert B.
LA-02388	1991	Westside Conveyance System Cultural Resources Investigation Final Technical Report.	Wells, Helen Fairman, Theresa Clewlow, Len Winter, and Robert Helman

Report Number	Year	Title	Author(s)
LA-02400	1982	Documentation Report for Historical Cultural Resources Located on a 654 Acre Parcel (tt 37539) Located in Seco Canyon, Los Angeles County, California.	Singer, Clay A. and Robert J. Wlodarski
LA-02437	1991	Phase I Archaeological Survey and Cultural Resources Assessment of an 80.4 Gross Acres Parcel, Val Verde, Los Angeles County, California	Simon, Joseph M., Tamara K. Whitley, and David S. Whitley
LA-02446	1991	Cultural Resources Archaeological Survey Seco Canyon Development III Project Tentative Tract 46564	Tartaglia, Louis J.
LA-02503	1992	Historic Property Survey Report & Archaeological Survey Report & Historic Architectural Survey Report for the Route 126 Location Study (easterly Extension) From I-5 to SR-14, Santa Claita Valley, Los Angeles County, California 07-la-126-5.8/12.7. Final	Romani, John F., Roberta S. Greenwood, Portia Lee, and Gwen Romani
LA-02639	1992	Phase 1 Archaeological Survey and Cultural Resources Assessment of a 5.5 Gross Acres Parcel, Castaic, Los Angeles County, California	W & S Consultants
LA-02718	1992	Clougherty Ranch, Los Angeles County, California Cultural Resources Investigation: Literature Search and Survey Final	Rasson, Judith A., Toni Snyder, Rene L. Vellanoweth, and Helen Wells
LA-02723	1990	Report of Archaeological Reconnaissance Survey Of: Tentative Tract 49048 Castaic, California.	Salls, Roy A.
LA-02725	1980	(also VN-1177) Proposed Highway Widening for Route Ven/la 126 P.m. 13.4/34.6; 0.0/5.0	Huey, Gene and John Romani
LA-02800	1993	Cultural Resource Monitoring Report Mobil Oil Corporation M-70 Pipeline Project	Broeker, Gale and Beth Padon
LA-02891	1993	A Cultural Resources Investigation of Tentative Tract No.47646: Eighty Acres Located Near Castaic Reservoir, Los Angeles County, California	Robinson, R. W.
LA-02933	1993	Archaeological Survey and Impact Assessment of the Rye Canyon Redevelopment Project, a 400 Acre Parcel in Valencia, Los Angeles County, California	Dillon, Brian D.
LA-02934	1993	Archaeological Survey and Impact Assessment of Tentative Parcel Map 20033, a 177 Acre Parcel Near Castaic Creek, Los Angeles County, California	Dillon, Brian D.
LA-02951	1993	Results of Archaeological Records Review for the Pacific Pipeline Project Emidio Lateral Pipeline Kern and Los Angeles Counties, Ca	Gibson, Robert O.
LA-02957	1993	Cultural Resources Survey and Impact Assessment for an 11.09 Acre Property (tentative Minor Land Division Parcel Map No. 23849) Located at 30481 Hasley Canyon Road, in the Community of Castaic, Los Angeles County, California	Singer, Clay A., John E. Atwood, and Shelley M. Gomes
LA-02980	1993	Phase I Cultural Resources Evaluation of the Chiquita Canyon Sanitary Landfill Expansion Los Angeles County, California.	Cooley, Theodore G., A.George Toren, and Loren J. Santoro
LA-02987	1987	Bicep Transmission Project Magunden to Vincent/pardee Alternative Corridor Study Archaeology, Ethnology, History and Paleontology Technical Reports (draft)	Woods, Clyde M., Andrew York, Rebecca Apple, Tirzo Gonzalez, Stephen Van Wormer, Tom Demere, and James H. Cleland
LA-03093	1993	Phase 2 Historic Resources Investigation for the Proposed Tesoro Del Valle Development, Los Angeles County, California	Wells, Helen Fairman, Leslie Heumann, Toni Snyder, Rene Vellanoweth, and Judith Rasson
LA-03226	1994	Cultural Resources Survey Report Tentative Tract Map No. 44831	Tartaglia, Louis J.
LA-03255	1994	Devil's Fire Suppression and Rehab Assessment, Los Angeles County	McIntyre, Michael J.
LA-03289	1990	Mobil M-70 Pipeline Replacement Project Cultural Resource Survey Report for Mobil Corporation	Davis, Gene
LA-03360	1996	Cultural Resources Survey Report, Tentative Parcel Map No. 20685	Tartaglia, Louis J.
LA-03396	1994	Phase 2 Test Excavations and Determinations of Significance at CA-LAN-2133,-2233,-2234,-2235,-2236,-2240,-2241,-2242, Los Angeles County, California	Whitley, David S. and Joseph M. Simon
LA-03397	1994	Intensive Phase 1 Archaeological Survey of the West Ranch Project Area, Los Angeles County, California	Whitley, David S. and Joseph M. Simon
LA-03499	1994	Metropolitan Water District West Valley Project Cultural Resources Technical Report	Eisentraut, Phyllisa
LA-03580	1972	The Archaeology of Bridgeport Flats	Singer, Clay A.
LA-03690	1997	Cultural Resources Evaluation City of Santa Clarita Circulation Element EIR	Wlodarski, Robert J.
LA-03696	1997	Negative Phase I Archaeological Survey Sheriff's Pitchess Detention Center Saugus, Los Angeles County, California	Maki, Mary K.
LA-03711	1980	Archaeological Survey Report for the Proposed Highway Widening for Route Ven/la 126 P.m. 16.6/34.9; 0.0/5.2 Hall Road to Castaic Junction	Huey, Gene and John Romani
LA-03796	1989	Technical Report of Cultural Resources Studies for the Proposed Wtg-west, Inc. Los Angeles to San Francisco and Sacramento, California Fiber Optic Cable Project	
LA-03848	1997	Cultural Resources Survey Report Lake Castaic, California	Tartaglia, Louis J.
LA-03849	1996	Archaeological Assessment of the Castaic Creek Waterway and Elderberry Reservoir Sediment and Infrastructure Management Plan	Dillon, Brian D.
LA-03897	1995	Pacific Pipeline's Proposed Geotech- Total Acres: 1 Technical Drilling, Whitaker Station, La County	Stone, David
LA-03904	1995	Phase I Archaeological Survey and Cultural Resources Basement for the Parcel Map 19091 North Rover Study Area, Los Angeles County, California	Anonymous
LA-03932	1998	Archaeological Assessment for Pacific Bell Mobile Services Telecommunications Facility La 311-01, 26730 West Tapia Canyon Road, Castaic, County of Los Angeles, California	McLean, Deborah K.
LA-04008	1996	Cultural Resources Investigation Pacific Pipeline Emidio Route	Unknown
LA-04287	1995	Environmental Impact Report Implementation of the Monterey Agreement Statement of Principles by the State Water Contractors and the State of California	Unknown
LA-04516	1999	A Phase I Cultural Resources Study for the Heights at Hidden Lakes Project, Tract 52535, Los Angeles County, California	Wlodarski, Robert J.

Report Number	Year	Title	Author(s)
LA-04546	1999	A Study in the Prehistory of the Santa Clara River Valley, Archaeological Data Recovery at CA-LAN-2233 Los Angeles County, California	Waugh, Georgie M.
LA-04547	1980	Historic Property Survey, 07 Ven/la 126 Pm 16.6-34.6/0.0-5.2 Hall Road to Route 5 07229 393131	Webb, Lois M. and Gene Huey
LA-04739	1999	Negative Phase I Archaeological Survey and Impact Assessment of 70 Acres for the Sloan Canyon Greystone Homes Project Vesting Tentative Tract No. 52475 Los Angeles County, California	Maki, Mary K.
LA-04859	2000	Negative Phase 1 Archaeological Survey of Approximately 0.12 Acre for the Val Verde Acquisition Project APN 3270-007-043, Sheridan Road Val Verde, Los Angeles County, California	Maki, Mary K.
LA-05140	1999	A Phase I Archaeological Study for Approximately 176 Acres (conceptual Lottind Study) San Francisquito Canyon, County of Los Angeles, California	Wlodarski, Robert J.
LA-05184	2000	Report of Archaeological Investigations: Castaic Project Area, I-5 Storm Damage Project, Task Order 4, Location a & B, Los Angeles County, Ca	Nixon, Joseph M.
LA-05524	2000	Negative Archaeological Survey Report: of the Proposed Cold Plane and Overlay Ac Pavement for on and Off-ramps on Route 5 From Parker Rd. to Lake Hughes Rd. in the Castaic Area of Northern Los Angeles County	Sylvia, Barbara
LA-05525	1972	Geo-science at the Castaic Site (4-LAN-324)	Ericson, Jonathon E.
LA-05552	2000	Supplemental Evaluation of the Old Ridge Route Alignment Los Angeles County, California	McKenna, Jeanette A.
LA-05616	1999	Cultural Resource Assessment for the At&t Wireless Service Facility Number C815.2 County of Los Angeles, California	Duke, Curt
LA-05768	2000	Review of Pacific Bell Wireless Facility La 312-01, County of Los Angeles, California	Duke, Curt
LA-05846	1999	Phase I Archaeological Survey of Castaic Lake Water Agency Lateral Extension Pipeline Project Area, Valencia, Los Angeles County, California	Anonymous
LA-05848	1998	Phase I Archaeological Survey of Planning Sub-area 6 in the Decoro South Project Area, Valencia, Los Angeles County, California	Anonymous
LA-05893	1998	Phase I Archaeological Survey of the Hasley Canyon Land Company Study Area, Los Angeles County, California	Anonymous
LA-06250	1974	Historic Property Survey 07-la-126 Pm 2.3/3.6 San Martinez Grande Bridge to Castaic Creek Bridge	Rosen, Martin D.
LA-06251	2002	Highway Project to Construct a Trapezoidal Channel and Concrete Ditch Along Route 126 at Chiquito Canyon Road	Sriro, Adam
LA-06585	2003	A Phase I Cultural Resources Investigation of the Proposed Sterling Gateway Project Area in the Martinez Canyon/Val Verde Area of Los Angeles County, California	McKenna, Jeanette A.
LA-06658	2002	Archaeological Survey Report of 4.078 Acres for the Castaic Senior Apartments Project APN 2865-036-034, Castaic Road, Castaic, Los Angeles County, Ca	Maki, Mary K.
LA-06660	1999	Cultural Resource Assessment for the At&t Wireless Services Facility Number C815.2, County of Los Angeles, Ca	Duke, Curt
LA-06886	2003	Phase Ii Cultural Resource Evaluation for Vesting Tentative Tract No. 53189 in San Francisquito Canyon, Northern Los Angeles County, California	Shepard, Richard S.
LA-07188	2004	Cordova/Castaic/necktie Fuelbreak Improvement Projects, Angeles National Forest, Los Angeles County, California	Bartoy, Kevin M.
LA-07832	2000	I-5/Hasley Canyon Road Interchange Project Historic Property Survey Report-negative Findings	Bingham, Jeffrey C.
LA-07861	2006	Archaeological Survey Report for the Southern California Edison Company Replacement of 30 Deteriorated Poles Private and Public Inholdings, Ventura, Los Angeles, and Santa Barbara Counties, California	Jordan, Stacey C. and Patterson, Joshua D.
LA-07890	2006	Dwo 6159-7126; A.i. #6-7102: Tips 16 Kv Overhead Line Removal Project, Commerce Center Drive, Castaic Area, Los Angeles County	Schmidt, James J.
LA-07986	2006	Cultural Resources Assessment for the Castaic Lake Water Agency Recycled Water Master Plan and the Northwest Spur Pipeline, Santa Clarita, Los Angeles County, California	Harper, Caprice D.
LA-08255	2006	Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project State of California: Volumes I and Ii	Arrington, Cindy and Nancy Sikes
LA-08317	2007	A Phase 1 Archaeological Study for Vesting Tentative Tract No. 067617 (the Highlands Project) on Park Vista Drive, North of Knoll Court Located in Castaic, County of Los Angeles, California	Wlodarski, Robert J.
LA-08783	2006	Cultural Resources Records Search Results and Site Visit for T-mobile USA Candidate Sv00922e (rancho Tesoro), Rancho Tesoro Drive at 2900 North Bernardo Way, Valencia, Los Angeles County, California	Bonner, Wayne H.
LA-08963	2007	Archaeological Survey Report for Southern California Edison Company a Line Extension on the Smith Property in Los Angeles County, California	Tsunoda, Koji
LA-08993	2007	Sce Tehachapi Renewable Transmission Project, Shoofly Corridor, Santa Clarita Area, Los Angeles County, California	Schmidt, James J.
LA-08998	2007	East Side Tower Footing Repairs Project, Los Angeles County	Schmidt, James J.
LA-09015	2005	Records Search and Field Reconnaissance Results for Sprint Site La33xc431c (Castaic Lagoon - CA-7701a) (atc Project No. 85.75013.1022 Task 1) Located at 26730 West Tapia Canyon Road, Castaic, Los Angeles County, Ca 91384	Wlodarski, Robert J.
LA-09017	2006	A Phase 1 Archaeological Study for the Mountain View Apartments Project Including a 44.16-acre Portion for Proposed Development (APN#2865-019-064) and 36-acres for Proposed Fill Material (APN 2865-019-011/tract 46798), Located in Castaic County of Los Angeles	Wlodarski, Robert J.
LA-09018	2005	A Phase 1 Archaeological Study for Tentative Tract Map Number 53933 a 47 +/- Acre Parcel of Land Located in Castaic, County of Los Angeles, California	Wlodarski, Robert J.
LA-09019	2004	Cutlural Resource Survey of 23 Work Locations for Southern California Edison Within a Segment of the Oion 16 Kv/Romanus 16kv Power Lines Along a Portion of San Francisquito Canyon Road, Los Angeles County, California	Cooley, Theodore G.
LA-09020	2004	Intensive Phase I Archaeological Survey of the Old Road Study Area, Northern Los Angeles County, California	Whitley, David S. and Joseph M. Simon
LA-09021	2004	Intensive Phase I Archaeological Survey of Tt 60319, Los Angeles County, California	Simon, Joseph M.
LA-09025	2007	Cultural Resources Reconnaissance for Two 80-acre Parcels and Evaluation of Historic Structures Within the Tapia Ranch Development Project, Castaic, Los Angeles County, California	O'Neil, Stephen, James Steely, and Patrick Maxon
LA-09026	2006	Cultural Resources Reconnaissance for the Bridge Alternatives at Tapia Canyon Road Project, Castaic, Los Angeles County, California	O'Neil, Stephen
LA-09027	2005	Cultural Resource Assessment for the Castaic Lake Water Agency Recycled Water Master Plan and the Northwest Spur Pipeline, Santa Clarita, Los Angeles County, California	Harper, Caprice D.
LA-09029	2005	Cultural Resources Reconnaissance for Two 80-acre Parcels in the Tapia Ranch Development Project, Castaic, Los Angeles County, California.	O'Neil, Stephen

Report Number	Year	Title	Author(s)
LA-09450	2008	Castaic Peak: LA-20974A	Billat, Lorna
LA-09462	2008	WO 4605-2170; 4605-2175: Santa Clara Valley Deteriorated Pole Replacement Project, Ventura and Los Angeles Counties.	Schmidt, June
LA-09471	2008	Phase Archaeological Survey of 42.6 Acres of Land (APN 3244-030-005; Tentative Parcel map 069788) Located on the West and East Sides of San Francisquito Canyon Road, Saugus, Los Angeles County, California	Romani, Gwen R.
LA-09765	2008	Supplemental Cultural Resource Assessment, Segment 1, Section 1, Tehachapi Renewable Transmission Project, Variance For Wire Stringing Location Near Construction Tower 16, Los Angeles County, California	Gust, Sherri
LA-09767	2009	Supplemental Archaeological and Paleontological Resources Assessment, Segment 1, Section 1, Tehachapi Renewable Transmission Project, Variance for Wire Stringing Work Area Near Construction Tower 16, Los Angeles County, California	Gust, Sherri
LA-09911	2009	Archaeological Letter Report: WO 6059-4800; 9-4832: Crabtree 16kV Deteriorated Pole Replacement Project, Los Angeles County, California	James Schmidt
LA-09912	2008	A Cultural Resources Assessment of 80 Acres Located in Section 28, Township 5 North, Range 17 West, of the Val Verde Quad, Los Angeles County, California	Matthew DeCarlo and L. Suzann Henrikson
LA-09920	2008	Results of the Class III Cultural Resources Investigation for the Southern California Edison Tehachapi Renewable Transmission Project (TRTP) Segment 1, Angeles National Forest and Adjacent Lands, Los Angeles County, California, ARR No. 05-01-01079	Schmidt, James J., June A. Schmidt, and Gwen R. Romani
LA-09984	2002	2002 Copper Fire Suppression and Rehabilitation Archaeological Reconnaissance Report (#05-01-00682), Angeles National Forest, Los Angeles County, California	Vance, Darrell W.
LA-10111	2003	A Phase I Cultural Resources Investigation of the Taft Corporation Property (APN 2865-022-005) in the Castaic Area of Northern Los Angeles County, California	McKenna, Jeanette A.
LA-10112	2003	A Phase I Cultural Resources Investigation of the Proposed Wshuhsd Hasley-Sloan School Sites in the Hasley Canyon Area of Northern Los Angeles County, California	McKenna, Jeanette A.
LA-10113	2004	Negative Archaeological Reconnaissance Report: 30740 Brushwood Drive (APN#3247-051-20) Castaic, Los Angeles County, California	Schmidt, James J.
LA-10114	2004	Addendum Studies: a Phase I Cultural Resources Investigation of the Proposed Sterling Gateway Project Area in the Martinez Canyon/Val Verde Area, Los Angeles County, California	McKenna, Jeanette A.
LA-10115	2005	Robert Schlattman Residential Service Installation, 31160 Romero Canyon Road, Los Angeles County.	Schmidt, James J.
LA-10116	2004	Negative Archaeological Survey Report 30801 Sloan Canyon Road, Castaic, Ca (APN 3247-042-015)	Romani, Gwendolyn R.
LA-10117	1996	Treatment Plan for CA-LAN-2233 and Prehistoric Archaeological Sites Discovered During the Construction on State Highway Ay 126 at Val Verde and Del Valle Near Santa Clarita Los Angeles County, California	Anonymous
LA-10118	2004	Intensive Phase I Archaeological Survey of Vtm 60678, Newhall Ranch, Los Angeles County, California	Whitley, David S.
LA-10119	2003	Phase I Archaeological Survey of the 325 Acres Del Valle Specific Plan Study Area, Los Angeles County, California	Whitley, David S.
LA-10122	2005	Cultural Resources Survey Report for the Hidden Paradise Ranch Property (APN 2865-018-033; 2865-018-034; 2865-023-006; 2865-023-019; and 2865-023-021) Near Castaic, Los Angeles County, California.	Mason, Roger, D. and Koral Ahmet
LA-10123	2005	Cultural Resources Survey Report for the Castaic 120 Project Property (APN 3247-026-032; 3247-026-055; and 3247-026-056) Near Castaic, Los Angeles County, California	Mason, Roger, D. and Koral Ahmet
LA-10161	2008	Castaic Lake Road/Sawtooth Warmsprings Road Maintenance Project, Santa Clara- Mojave Rivers Ranger District, Angeles National Forest, Los Angeles County, CA	Peebles, David S.
LA-10198	2002	Expansion of Earl Schmidt Filtration Plant	Foster, Karen A.
LA-10200	2000	Cultural Resource Assessment for Modifications to Pacific Bell Mobile Services Facility LA 312-01, County of Los Angeles, California	Duke, Curt
LA-10210	2006	Cultural Resources Survey Report for Antelope-Pardee 500-kV Transmission Project	Ahmet, Koral and Roger D. Mason
LA-10359	2009	Draft Program EIR for the County of Los Angeles' Proposed Santa Clarita Valley Area Plan	Tebo, Susan, Judy Charles, Joe Decruyendere, and Mark Austin
LA-10439	2010	Phase I archaeological investigation for the Proposed William S. Hart Union High School District, Romero Canyon High School Site APN 3247-068-001 and 3247-068-004 (Tentative Tract 47807) Located in the Castaic Area of Los Angeles County, California	Romani, Gwen R.
LA-10456	2009	Archaeological Survey for the Southern California Edison Company: Replacement of one deteriorated power pole on the Trumpet 16kV, Scott Brackett Program, Castaic, Los Angeles County (W 6059-4800-9-4830), and one deteriorated power pole on Crabtree 16kV	Orfila, Rebecca
LA-10481	2010	Phase I Cultural Resources Investigation for the proposed William S. Hart Union High School District, Hasley-Sloan High School Site, Located in the Castaic Area of Los Angeles County, California	Romani, Gwen R.
LA-10556	2004	2004 Los Angeles County Pole Replacement Project	Schmidt, James J.
LA-10557	2006	Commerce Center Relocation Project, Los Angeles County, California	Schmidt, James J.
LA-10578	2009	TEA21 Rural Roadside Inventory: Native American Consultation and Ethnographic Study Caltrans District 7, County of Los Angeles	Fortier, Jana
LA-10611	2009	Archaeological Survey for the Southern California Edison Company: Replacement of Two Deteriorated Power Poles on the Saugus-Haskell-Solemint 66kV line, Newhall, Los Angeles County, One deteriorated power pole on the Burro Flats-Chatworth-Thrust 66kV line	Orfila, Rebecca S.
LA-10654	2010	Archaeological letter report: Chiquito Line Extension Operations and Maintenance Project, IO#313382, TD435120, Los Angeles County, California	Schmidt, June
LA-10792	2010	Revised Draft Program EIR for the County of Los Angeles' Proposed Santa Clarita Valley Area Plan, Vol. 1	Unknown
LA-10873	2006	Section 106 Review TCNS ID 20589 Collocation of an existing 73' monopole tower 3019364; Castaic 26730 Tapia Canyon Road, Castaic, CA 91384 Los Angeles County	Martin, Thomas
LA-10995	2011	Verizon Cellular Communications Tower Site - Val Verde, Rainbow Drive, Castaic, Los Angeles County, CA 91384	Hatoff, Brian
LA-11113	2011	County of Los Angeles' Proposed Santa Clarita Valley Area Plan, Final Program Environmental Impact Report. Volumes I through III	unknown
LA-11316	2010	Research Design and Treatment Plan for Archaeological Sites CA-LAN-962H, CA-LAN-2133, and CA-LAN-2233 for the Newhall Ranch Resource Management & Development Plan, Los Angeles County, California	Unknown

Report Number	Year	Title	Author(s)
LA-11424	2011	A Class III/Section 106 and Phase I CEQA Cultural Resources Investigation for the Proposed William S. Hart Union High School District Castaic High School Access Roads in the Romero and Sloan Canyon Areas of Los Angeles County, California	McKenna, Jeanette A.
LA-11452	2011	Archaeological Survey for the Southern California Edison Company: Replacement of one deteriorated power pole near Castaic in Los Angeles County, California (59-TD518073)	Orfila, Rebecca
LA-11454	2011	Archaeological Survey for the Southern California Edison Company: Replacement of three deteriorated power poles near Newhall and Santa Clarita in Los Angeles County, California (WO6088-4800 0-4892 and WO6088-4800, RSO Consulting CWA 9)	Orfila, Rebecca
LA-11514	2011	Archaeological Letter Report: Trumpet, Crabtree, Nero, and Davenport 16kV Deteriorated Pole Replacement Projects (WO 6059-4800, I-4805 & 0-4888), Los Angeles County, California	Schmidt, James
LA-11637	2012	Alternative Road Alignments, Castaic High School, Los Angeles County, CA	McKenna, Jeanette
LA-11713	2012	Archaeological Survey Report for Southern California Edison Company's Replacement of Two Deteriorated Power Pole Structures on the Bouquet 16kV and Trumpet 16 kV Distribution Circuits, Santa Clarita, Los Angeles County, CA	Schmidt, James
LA-12526	2013	Santa Clarita Valley Sanitation District Chloride TMDL Facilities Plan Project, Phase I Cultural Resources Assessment	Ehringer, Candace, Ramirez, Katherine, and Vader, Michael
LA-12539	2012	Verizon Wireless Chiquito, 29915 Henry Mayo Drive (Hwy 126), Newhall, CA	Zalavaris-Chase, Dimitra
LA-12553	2014	Homestead South, Notice of Preparation of a Draft Environmental Impact Report and Public Scoping Meeting, Expanded Project Description Initial Study	Salazy, Kim
LA-12604	2014	Del Valle Sediment Placement Project Phase I Cultural Resources Study	Maxon, Patrick
LA-12605	2013	Claremont Homes, Inc., Sloan Canyon Residential Project, Cultural Resources Study	Haas, Hannah and Ramirez, Robert
LA-12606	2013	Claremont Homes, Inc., Hasley Canyon Residential Project, Cultural Resources Study	Haas, Hannah and Ramirez, Robert
LA-12679	2014	Los Angeles Department of Water and Power Castaic Emergency Spillway Repair Project, County of Los Angeles, California	Ehringer, Candace, Gonzalez, Matthew, and Anderson, Katherine
LA-12681	2013	Intensive Phase I Archaeological Survey of the Los Valles Study Area, Los Angeles County, California	Simon, Joseph
LA-12726	2013	Cultural Resources Records Search and Site Visit Results for AT&T Mobility, LLC Candidate NL0449 (Salmont Ridge) 30255 North Quail Trail, Santa Clarita, Los Angeles County, California CSAPR No.3551017625	Bonner, Wayne and Williams, Sarah
VN-01177	1980	(also LA-2725) Proposed Highway Widening for Route Ven/la 126 P.m.13.4/34.6; O.o/5.o_(report Missing)	Romani, John F. and Gene Huey
VN-01422	1994	Metropolitan Water District West Valley Project Cultural Resources Technical Report	Eisentraut, Phyllisa
VN-01511	1980	Archaeological Survey Report for the Proposed Highway Widening for Route Ven/la 126 P.m. 16.6/34.9; 0.0/5.2 Hall Road to Castaic Junction	Huey, Gene and John Romani
VN-01800	1980	Historic Property Survey, 07 Ven/la 126 Pm 16.6-34.6/0.0-5.2 Hall Road to Route 5 07229 393131	Webb, Lois M. and Gene Huey
VN-02872	2009	TEA-21 Rural Roadside Inventory: Native American Consultants and Ethnographic Study for Caltrans District 7, Ventura County	Fortier, Jana
VN-02886	1999	Ventura County Cultural Heritage Survey Phase VI: Santa Clara Valley	Triem, Judy
VN-03153	2013	Santa Clarita Valley Sanitation District Chloride TMDL Facilities Plan Project, Phase I Cultural Resources Assessment	Ehringer, Candace, Ramirez, Katherine, and Vader, Michael

APPENDIX B
MAP OF CULTURAL RESOURCES WITHIN THE APE

The location data for the archaeological resources will not be circulated for public review. To protect the sites from unauthorized excavation, looting, and/or vandalism, the applicant and County of Los Angeles have been notified of the need to keep confidential the location of known archaeological resources beyond what is necessary. Records in the information centers are exempt from the California Public Records Act (Government Code Section 6250 et seq.). Government Code Section 6254.19 states that "nothing in this chapter requires disclosure of records that relate to archaeological sites information maintained by the Department of Parks and Recreation, the State Historical Resources Commission, or the State Lands Commission." Government Code Section 6254 explicitly authorizes public agencies to withhold information from the public relating to "Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission." Due to the sensitive nature of cultural resources described herein, this report is confidential and meant for the exclusive use of the applicant, County of Los Angeles, and other trustee and responsible agencies related to planning, construction, operation, maintenance, and management of the project.

APPENDIX C
NATIVE AMERICAN CORRESPONDENCE

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 FAX

January 20, 2016

Eugen Ruzi
Sapphos Environmental

Sent by e-mail: eruzi@sapphosenvironmental.com
Number of pages: 3

RE: Proposed Castiac Lake Trails Master Plan Project, Los Angeles County, California

Dear Mr. Ruzi:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. Please note that the intent above reference codes is to mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects.

As of July 1, 2015, Public Resources Code Sections 21080.1, 21080.3.1 and 21080.3.2 require public agencies to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

> Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

   - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
   - If the probability is low, moderate, or high that cultural resources are located in the APE.
   - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and

- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. A search of the SFL was completed for the USGS quadrangle information provided with negative results.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand well help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton
Associate Governmental Program Analyst

Native American Heritage Commission
Tribal Consultation List
Los Angeles County
January 21, 2016

San Manuel Band of Mission Indians
Lynn Valbuena, Chairwoman
26569 Community Center Serrano
Highland , CA 92346
(909) 864-8933

Fernandeno Tataviam Band of Mission Indians
Rudy Ortega Jr., President
1019 2nd Street Fernandeno
San Fernando , CA 91340 Tataviam
(818) 837-0794 Office

Soboba Band of Luiseno Indians
Rosemary Morillo, Chairperson; Attn: Carrie Garcia
P.O. Box 487 Luiseno
San Jacinto , CA 92581 Cahuilla
carrieg@soboba-nsn.gov
(951) 654-2765

Fernandeno Tataviam Band of Mission Indians
Rudy Ortega Jr., President
1019 2nd Street Fernandeno
San Fernando , CA 91340 Tataviam
(818) 837-0794 Office

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838 Fernandeño
Newhall , CA 91322 Tataviam
tsen2u@hotmail.com Serrano
Vanyume
(760) 885-0955 Cell Kitanemuk

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 Luiseno
San Jacinto , CA 92581 Cahuilla
jontiveros@soboba-nsn.gov
(951) 663-5279
(951) 654-5544, ext 4137

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 Resources Code and Section 5097.98 of the Public Resources Code.
This list applicable only for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Castiac Lake Trails Master Plan Project, Los Angeles County, California.

Sapphos environmental inc.

January 27, 2016
Job Number: 1020-085
Proposed Castaic Lake Trails Master Plan Project

Rosemary Morillo
Chairperson
Attn: Carrie Garcia
Soboba Band of Luiseno Indians
P.O. Box 487
San Jacinto, CA 92581
carrieg@soboba-nsn.gov
(951) 654-2765

SUBJECT: Request for Information Regarding Native American Resources in the Vicinity of the Proposed Castaic Lake Trails Master Plan Project

Dear Ms. Morillo:

Sapphos Environmental, Inc. hereby requests additional information with regard to Native American cultural resources in the vicinity of the proposed Castaic Lake Trails Master Plan Project property located in Santa Clarita Valley, California.

A Native American Heritage Commission (NAHC) Sacred Lands File record search was conducted for the proposed project on January 20, 2016.[1] The NAHC response to the request stated, "A search of the SFL was completed for the USGS quadrangle information provided with negative results."[2] The NAHC response identified five Native American individuals, of whom you are one, to be contacted for further information with regard to the presence of cultural resources in the proposed project area.

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[1] Totton, Gayle, Native American Heritage Commission, Sacramento, CA. 20 January 2016. Email letter response to Eugen Ruzi, Sapphos Environmental, Inc., Pasadena, CA.

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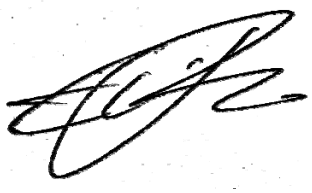
Corporate Office:
430 North Halstead Street
Pasadena, CA 91107
TEL 626.683.3547
FAX 626.683.3548

Billing Address:
P.O. Box 655
Sierra Madre, CA 91025
Web site:
www.sapphosenvironmental.com

Thank you for your assistance. Sapphos Environmental, Inc. looks forward to receiving any information or comments you may have regarding Native American cultural resources in the vicinity of the proposed project property. Should there be any questions or concerns, please contact Mr. Eugen Ruzi by phone at (626) 683-3547 ext. 109 or by e-mail at eruzi@sapphosenvironmental.com.

Respectfully submitted,

SAPPHOS ENVIRONMENTAL, INC.



Eugen Ruzi
Archaeological Resources Coordinator

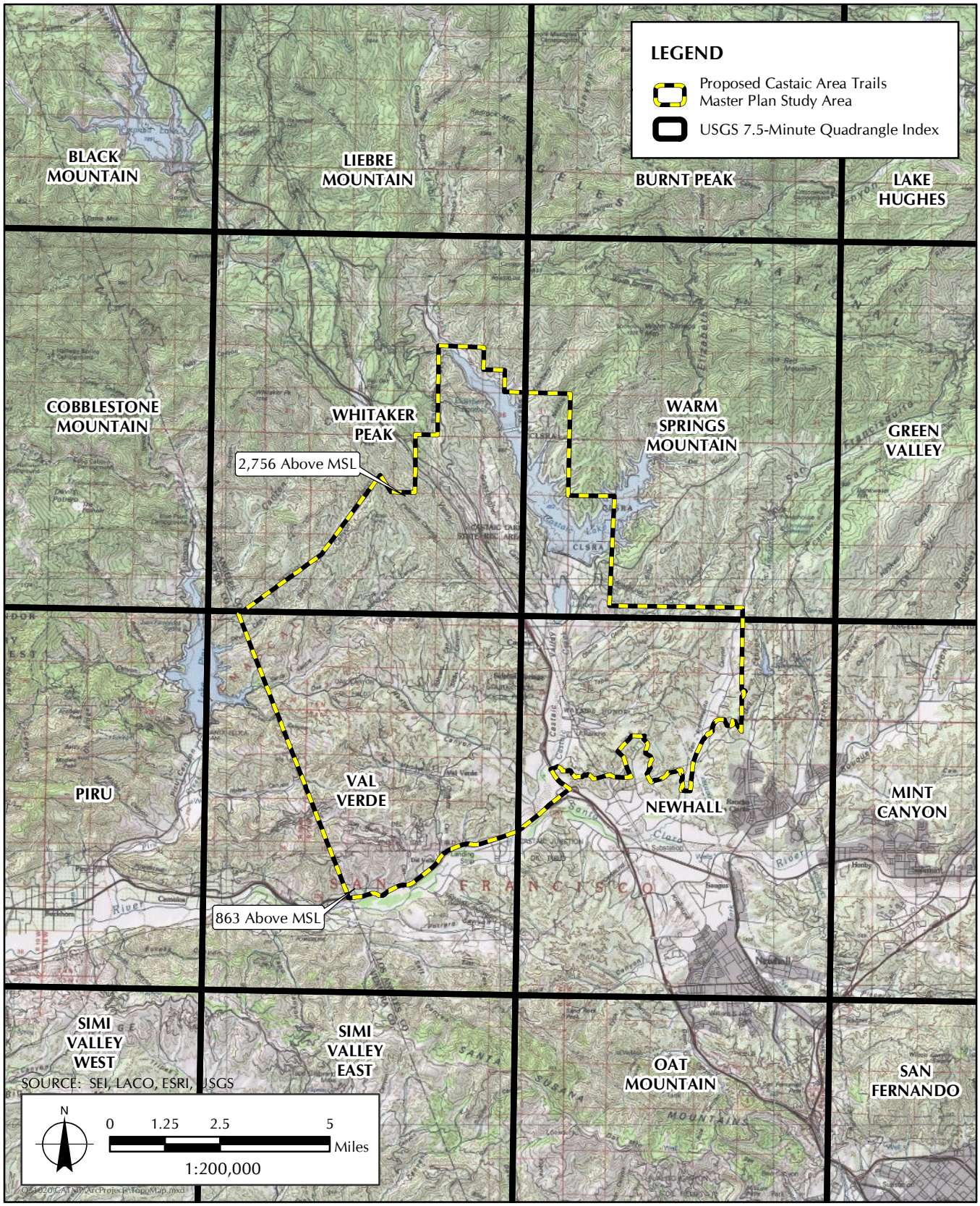


FIGURE 3

USGS 7.5-Minute Quadrangle Index

Sapphos environmental inc.

January 27, 2016
Job Number: 1020-085
Proposed Castaic Lake Trails Master Plan Project

Joseph Ontiveros
Cultural Resource Department
Soboba Band of Luiseno Indians
P.O. BOX 487
San Jacinto, CA 92581
jontiveros@soboba-nsn.gov
(951) 663-5279
(951) 654-5544, ext. 4137

SUBJECT: Request for Information Regarding Native American Resources in the Vicinity of the Proposed Castaic Lake Trails Master Plan Project

Dear Mr. Ontiveros:

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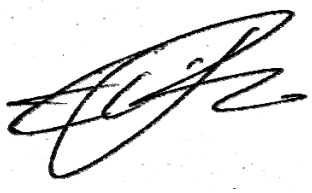
Respectfully submitted,

SAPPHOS ENVIRONMENTAL, INC.



Eugen Ruzi
Archaeological Resources Coordinator

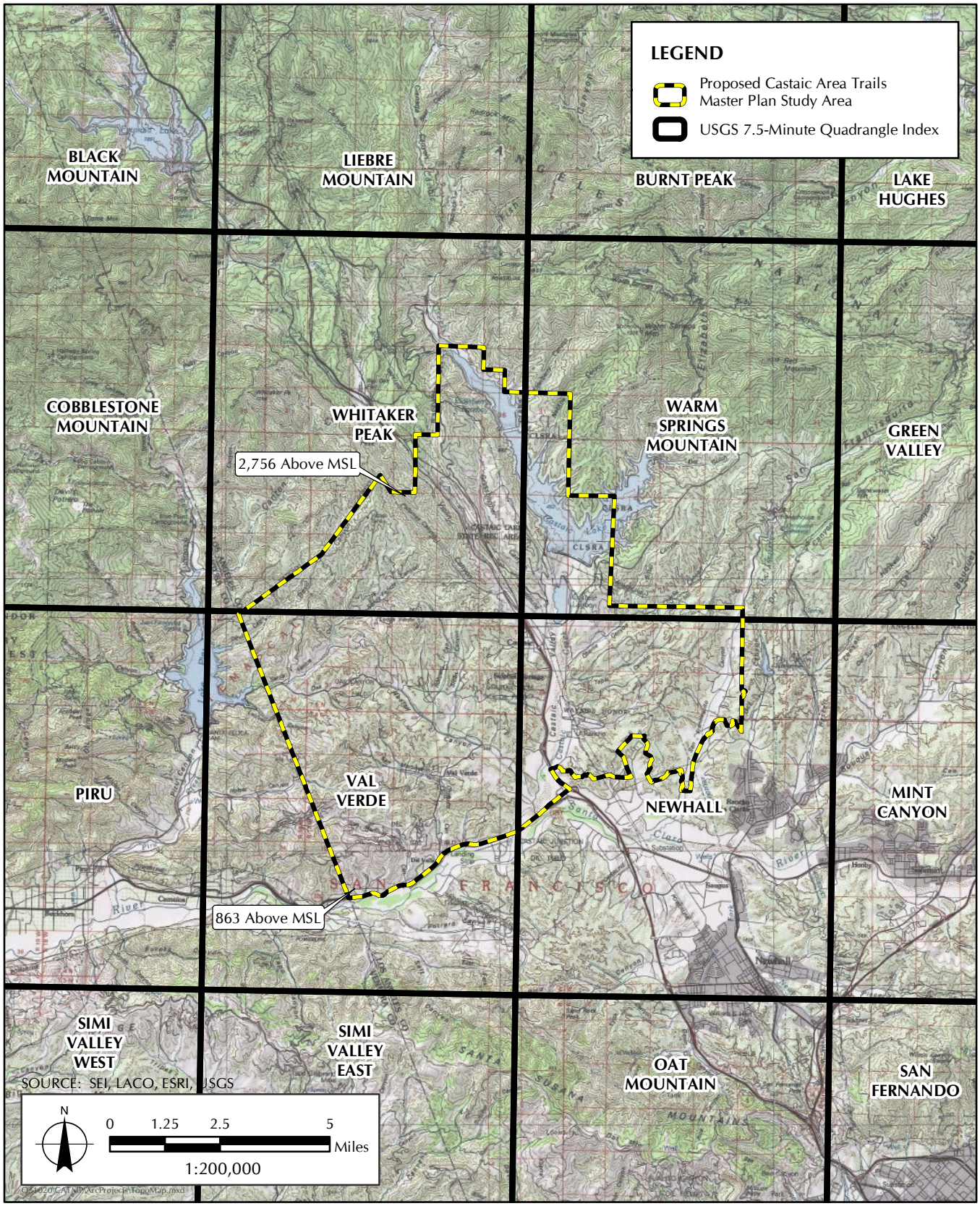


FIGURE 3

USGS 7.5-Minute Quadrangle Index

Sapphos environmental inc.

January 27, 2016
Job Number: 1020-085
Proposed Castaic Lake Trails Master Plan Project

Rudy Ortega Jr.
President
Fernandeno Tataviam Band of Mission Indians
1019 2nd Street
San Fernando, CA 91340
(818) 837-0794

SUBJECT: Request for Information Regarding Native American Resources in the Vicinity of the Proposed Castaic Lake Trails Master Plan Project

Dear Mr. Ortega:

Sapphos Environmental, Inc. hereby requests additional information with regard to Native American cultural resources in the vicinity of the proposed Castaic Lake Trails Master Plan Project property located in Santa Clarita Valley, California.

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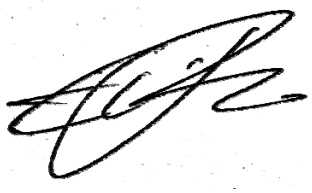
Respectfully submitted,

SAPPHOS ENVIRONMENTAL, INC.



Eugen Ruzi
Archaeological Resources Coordinator

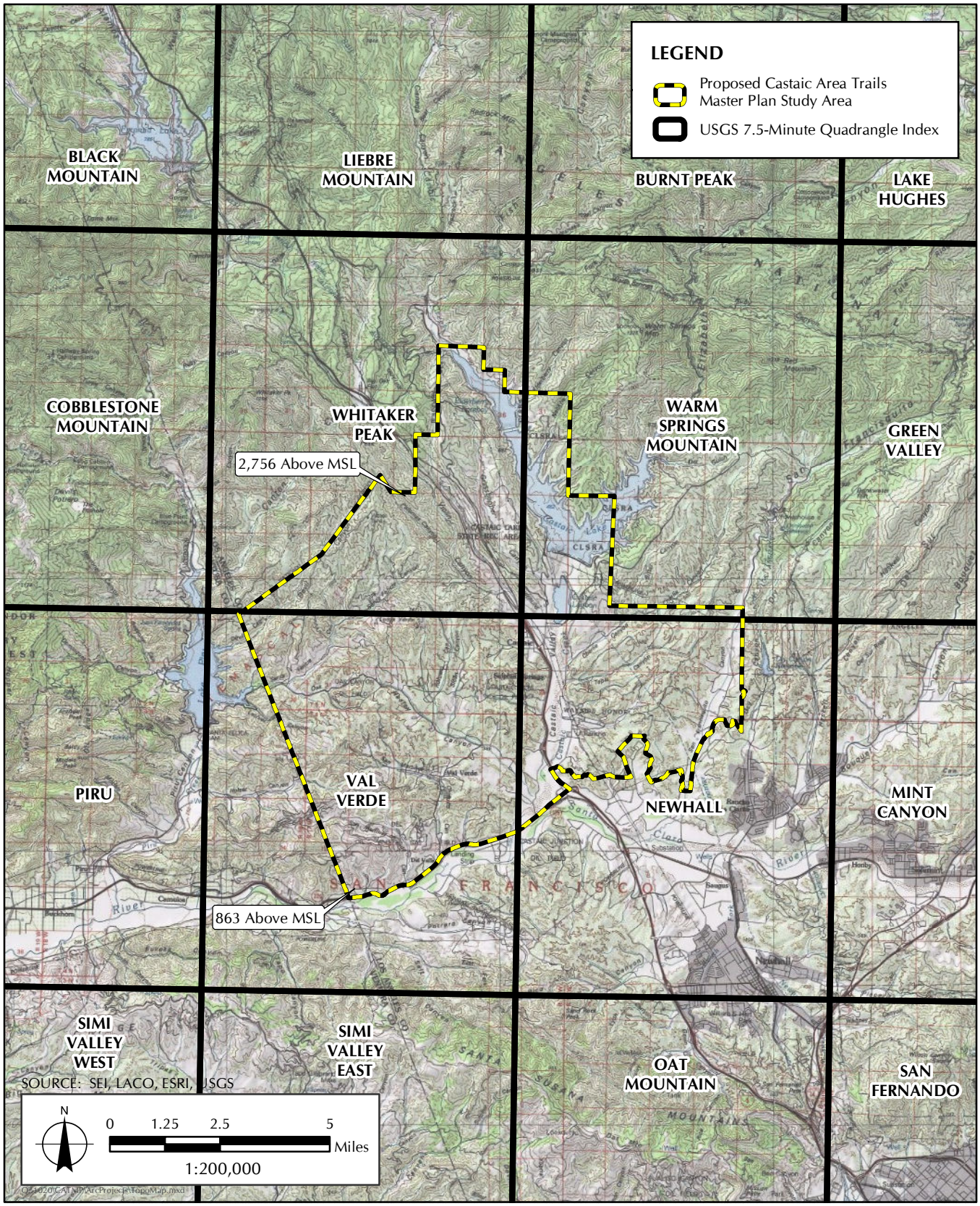


FIGURE 3

USGS 7.5-Minute Quadrangle Index

Sapphos environmental inc.

January 27, 2016
Job Number: 1020-085
Proposed Castaic Lake Trails Master Plan Project

Lynn Valbuena
Chairwoman
San Manuel Band of Mission Indians
26569 Community Center Serrano
Highland, CA 92346
(909) 864-8933

SUBJECT: Request for Information Regarding Native American Resources in the Vicinity of the Proposed Castaic Lake Trails Master Plan Project

Dear Ms. Valbuena:

Sapphos Environmental, Inc. hereby requests additional information with regard to Native American cultural resources in the vicinity of the proposed Castaic Lake Trails Master Plan Project property located in Santa Clarita Valley, California.

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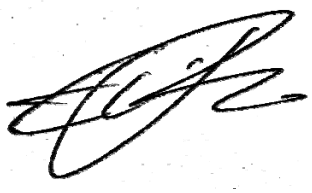
Respectfully submitted,

SAPPHOS ENVIRONMENTAL, INC.



Eugen Ruzi
Archaeological Resources Coordinator

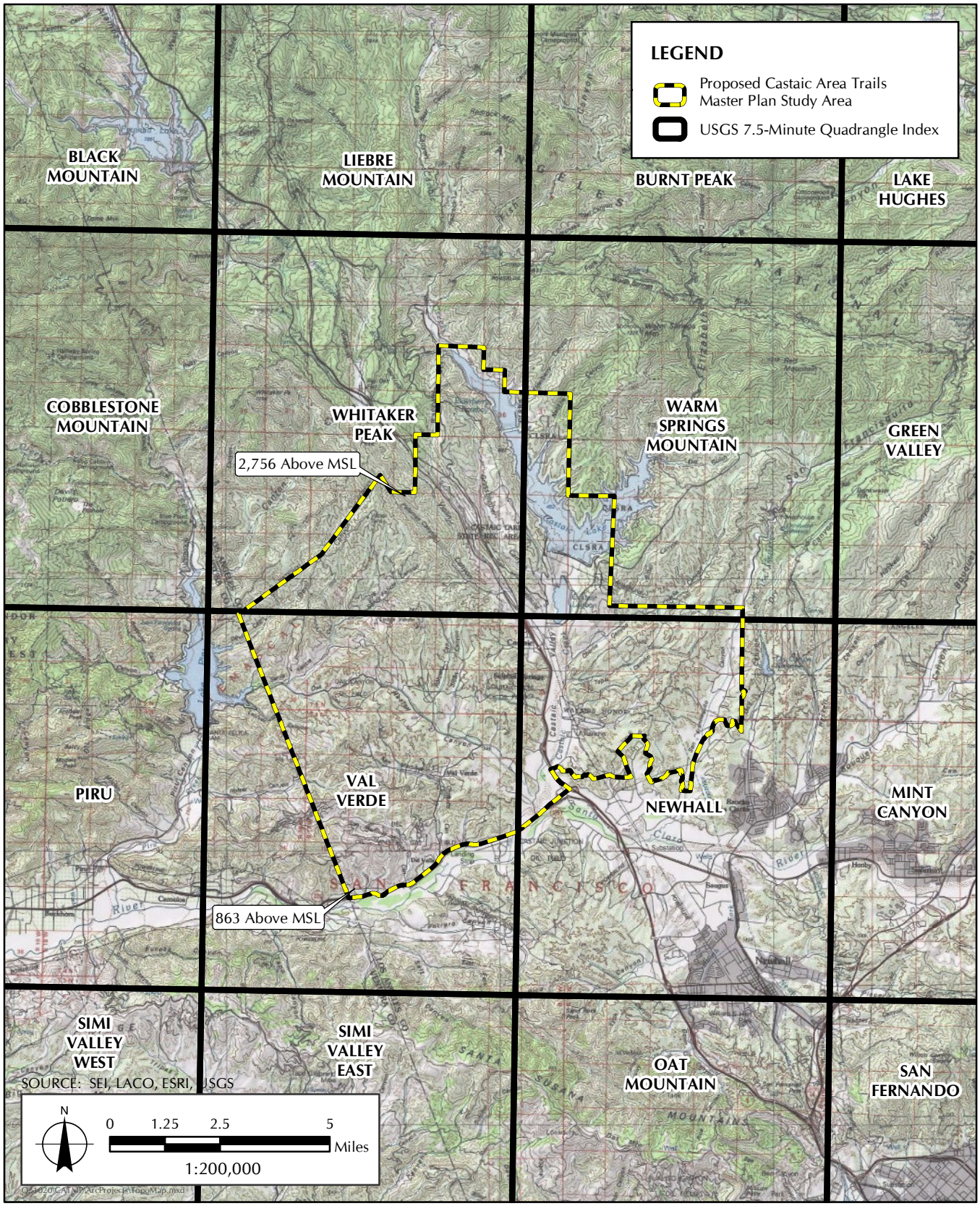


FIGURE 3

USGS 7.5-Minute Quadrangle Index

Sapphos environmental inc.

January 27, 2016
Job Number: 1020-085
Proposed Castaic Lake Trails Master Plan Project

John Valenzuela,
Chairperson
San Fernando Band of Mission Indians
P.O. Box 221838
Newhall, CA 91322
tsen2u@hotmail.com
(760) 885-0955

SUBJECT: Request for Information Regarding Native American Resources in the Vicinity of the Proposed Castaic Lake Trails Master Plan Project

Dear Mr. Valenzuela:

Sapphos Environmental, Inc. hereby requests additional information with regard to Native American cultural resources in the vicinity of the proposed Castaic Lake Trails Master Plan Project property located in Santa Clarita Valley, California.

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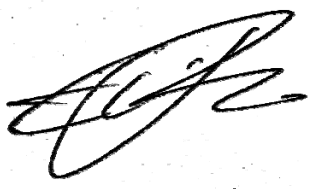
Respectfully submitted,

SAPPHOS ENVIRONMENTAL, INC.



Eugen Ruzi
Archaeological Resources Coordinator

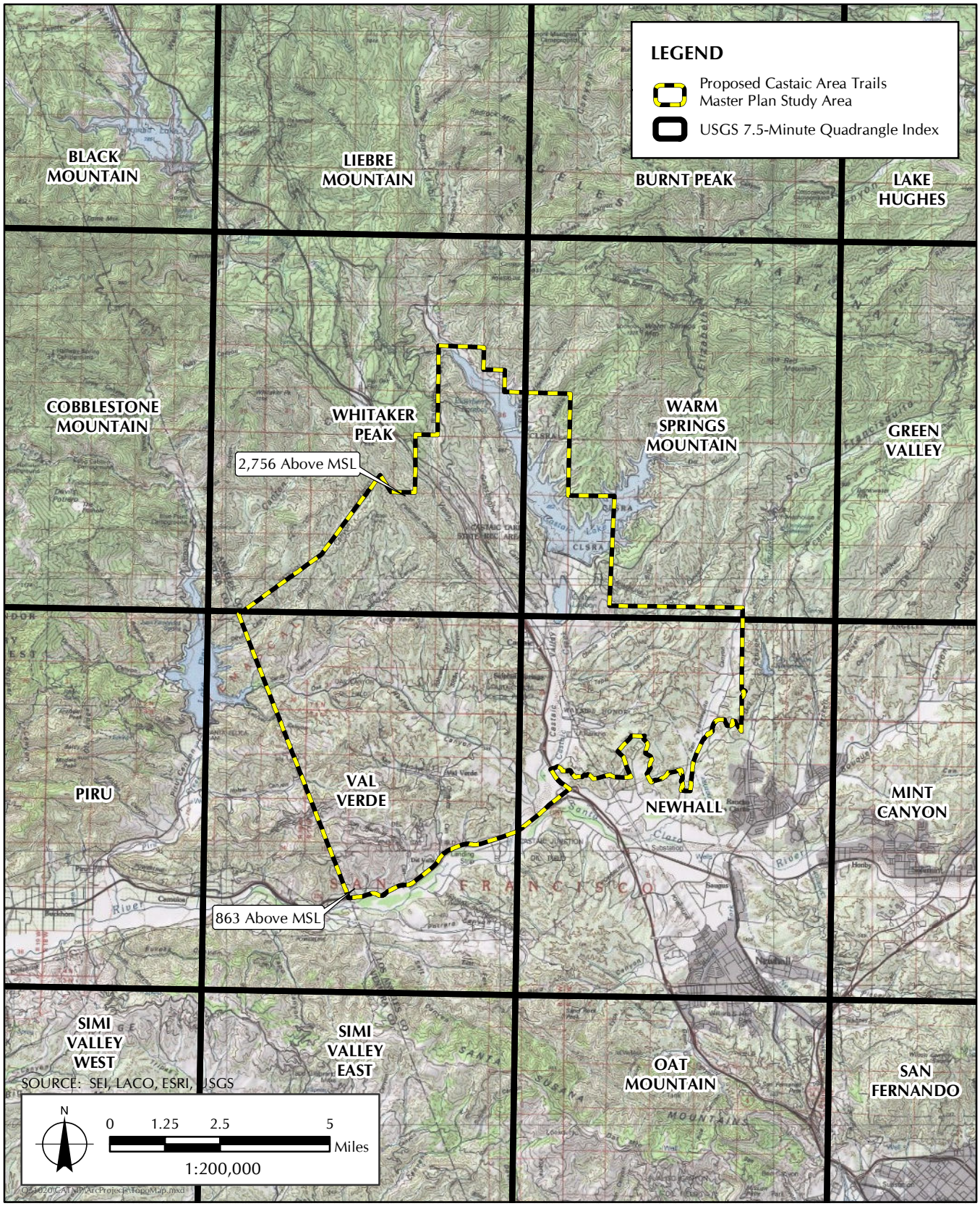


FIGURE 3

USGS 7.5-Minute Quadrangle Index

From:	Caitlin Gulley
To:	Gino Ruzi
Subject:	Fwd: Tribal Consultation: Castaic Lake Trails Master Plan Project
Date:	Tuesday, February 09, 2016 2:12:02 PM

Fernandeño Tataviam Band of Mission Indians
Tribal Historic & Cultural Preservation

February 9, 2016

Eugen Ruzi
Archaeological Resources Coordinator
Sapphos Environmental Inc.
430 North Halstead Street
Pasadena, CA 91107

RE: Castaic Lake Trails Master Plan Project

Eugin Ruzi,

Thank you for your invitation to consult on the project listed above. The Fernandeño Tataviam Band of Mission Indians (Tataviam) would like it noted in your report that (1) we find the project area to be of extreme risk to cultural and tribal resources and (2) we could like to consult with the Lead Agency regarding project mitigation.

Sincerely,

--
***Caitlin Gulley**, Director*
Tribal Historic and Cultural Preservation Department
Cell: (661) 433-0599
Office: (818) 837-0794
cgulley@tataviam-nsn.us

Fernandeño Tataviam Band of Mission Indians
1019 Second Street
San Fernando, California 91340

Phone: (818) 837-0794 Ext. 208
Website: http://www.tataviam-nsn.us

--
***Caitlin Gulley**, Director*
Tribal Historic and Cultural Preservation Department
Cell: (661) 433-0599
Office: (818) 837-0794
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Website: http://www.tataviam-nsn.us

This e-mail message is confidential, intended only for the named recipient(s) above and may contain information that is privileged, attorney work product or exempt from disclosure under applicable law. If you have received this message in error, or are not the named recipient(s), please immediately notify the sender by reply-email and delete this e-mail from your computer. Also, neither this message nor any attachments to it constitute an offer of any kind, and to the extent this communication, or any other communication in connection herewith, is in the context of negotiations regarding a possible agreement or transaction, in no event shall Fernandeno Tataviam Band of Mission Indians be bound to anything without a final, signed contract (it being understood that in all cases Fernandeno Tataviam Band of Mission Indians shall have the absolute right to terminate any discussions or negotiations at any time and for any reason without any liability whatsoever). Thank you.

February 25, 2016

Attn: Eugen Ruzi, Archaeological Resources Coordinator
Sapphos Environmental, Inc.
430 North Halstead Street
Pasadena, CA 91107

SOBOBA BAND OF LUISEÑO INDIANS
EST. JUNE 19, 1883

RE: Proposed Castaic Lake Trails Master Plan Project

The Soboba Band of Luiseño Indians appreciates your observance of Tribal Cultural Resources and their preservation in your project. The information provided to us on said project(s) has been assessed through our Cultural Resource Department, where it was concluded that although it is outside the existing reservation, the project area does fall within the bounds of our Tribal Traditional Use Areas. At this time the Soboba Band does not have any specific concerns regarding known cultural resources in the specified areas that the project encompasses, but does request that the appropriate consultation continue to take place between the tribes, project proponents, and government agencies.

Also, working in and around traditional use areas intensifies the possibility of encountering cultural resources during any future construction/excavation phases that may take place. For this reason the Soboba Band of Luiseño Indians requests that approved Native American Monitor(s) be present during any future ground disturbing proceedings, including surveys and archaeological testing, associated with this project. The Soboba Band recommends that you contact Gabrieleño Tribal Consultants, who are closer to the project area. Please feel free to contact me with any additional questions or concerns.

Sincerely,

Joseph Ontiveros
Cultural Resource Director
Soboba Band of Luiseño Indians
P.O. Box 487
San Jacinto, CA 92581
Phone (951) 654-5544 ext. 4137
Cell (951) 663-5279
jontiveros@soboba-nsn.gov

From: Daniel McCarthy
To: Gino Ruzi
Subject: FW: Castaic Lake Trails Master Plan scoping response
Date: Tuesday, March 01, 2016 4:11:10 PM

Second try

From: Daniel McCarthy
Sent: Tuesday, March 01, 2016 4:09 PM
To: 'eruzi@sapposenvironmental.com'
Subject: Castaic Lake Trails Master Plan scoping response

Eugen,

We received your scoping inquiry, dated January 27, 2016, regarding the proposed Castaic Lake Trails master Plan. Thank you for the opportunity to review and respond. The project is located outside of the Tribe's ancestral territory. Therefore, we refer you to other tribes whose ancestral territories do include the proposed project location.

Thank you,
Leslie Mouriquand MA, RPA

Sapphos environmental inc.

FILE: 2.7 1020-085

CONTACT REPORT FORM

DATE: 4/1/2016

PERSON: Rob Wood

COMPANY: Native American Heritage Commission

Phone: (916) 373-3711 **Fax:** (916) 373-5471

CONTACTED BY: Eugen Ruzi

FORM OF CONTACT: Phone Call

SUMMARY: Mr. Wood was contacted for advice related to tribal consultation efforts regarding Castaic Area Multi-Use Trails Plan. He was asked if it was necessary to include the Gabrieleno groups into the consultation efforts for this project, as it was suggested by the Soboba Band of Luiseño Indians. Mr. Wood advised we consult only with the Native American groups listed in the initial NAHC response letter.

ACTION ITEMS: List any action items here.

None

Appendix E

Geology and Soils Analysis

Sapphos environmental inc.

May 13, 2016
Job Number: 1020-085
Castaic Area Multi-Use Trails Plan

MEMORANDUM FOR THE RECORD
2.6 1020-085.M10

TO: County of Los Angeles
Department of Parks and Recreation
(Ms. Olga Ruano, Mr. Zachary Likins)

FROM: Sapphos Environmental, Inc.
(Ms. Laura Male)

Wilson Geosciences, Inc.
(Mr. Kenneth Wilson)

SUBJECT: Results of the Geology and Soils Analysis for the Castaic Area Multi-Use Trails Plan

FIGURES:

1 Regional Vicinity Map
2 Local Vicinity Map
3 Multi-Use Trails Plan Topography
4 Topographic Map with United States Geological Survey 7.5-minute Quadrangle Index
5 Multi-Use Trails Plan Area Geology
6 Landslides and Areas of Significant Grading
7 Multi-Use Trails Plan Area Hydrology Map
8 Earthquake Fault Activity
9 Earthquake-induced Landslides and Liquefaction
10 Oil Wells in the Multi-Use Trails Plan

APPENDICES

A. Soil Information for All Uses
B. Engineering Properties—Angeles National Forest Area, California
C. Engineering Properties—Antelope Valley Area, California

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FAX 626.683.3548

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Sierra Madre, CA 91025
Web site:
www.sapphosenvironmental.com

EXECUTIVE SUMMARY

This Memorandum for the Record (MFR) documents the results of the evaluation of geology and soils that was undertaken in support of the proposed Castaic Area Multi-Use Trails Plan (proposed project), in support of the County of Los Angeles serving in the capacity of a Lead Agency, pursuant to the California Environmental Quality Act (CEQA). Based on the results of the records and archival research and map review, the construction, recreational use, and maintenance activities associated with the proposed project would have the potential to result in impacts to geology and soils that would be mitigated to below the level of significance.

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known active fault trace? Refer to Division of Mines and Geology Special Publication 42.

The proposed project would result in significant impacts to geology and soils in regard to exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault. Although the Castaic project area is not located within a designated Alquist-Priolo zone, the San Gabriel and San Cayetano/Holser/Del Valle faults are fault zones of concern to the Castaic project area with regard to ground rupture. Any facilities that may be habitable for extended periods should not be built over or within 50 feet of the fault traces. Active and potentially active faults may be sources of large earthquakes that would produce severe ground shaking within the Castaic project area. Local active strike-slip, reverse and thrust faults (e.g. San Fernando, Oak Ridge, San Cayetano/Holser/Del Valle, Garlock, White Wolf, San Gabriel, and San Andreas faults) and more distant buried (blind) thrust faults (e.g., Northridge Hills, Puente Hills, and Elysian Park) have this potential as well. Severe shaking can be very destructive to narrow ridgelines and steep slopes, causing severe cracking and slope failures. Therefore, the proposed project may result in the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, requiring implementation of Mitigation Measure GEO-1.

   ii) Strong seismic ground shaking?

The proposed project would result in significant impacts to geology and soils in regard to exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking. The San Gabriel and San Cayetano/Holser/Del Valle faults are fault zones of concern to the Castaic project area with regard to strong seismic ground shaking as a result of the potential for Magnitude 6 to 7 events. Active and potentially active faults may be sources of large earthquakes that would produce severe ground shaking within the Castaic project area. Local active strike-slip, reverse and thrust faults (e.g. San Fernando, Oak Ridge, San Cayetano/Holser/Del Valle, Garlock, White Wolf, San Gabriel, and San Andreas faults) and more distant buried (blind) thrust faults (e.g., Northridge Hills, Puente Hills, and Elysian Park) have this potential as well. Severe shaking can be very destructive to narrow ridgelines and steep slopes, causing severe cracking and slope failures. Therefore, the proposed project may result in the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking, requiring implementation of Mitigation Measure GEO-1.

iii) Seismic-related ground failure, including liquefaction and lateral spreading?

The proposed project would result in significant impacts to geology and soils in regard to exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure. The expected level of ground shaking in the Castaic project area is high enough to initiate liquefaction as a result of expected high seismic shaking levels, areas of shallow groundwater, and cohesionless sands. As a result, the proposed project may result in the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction and lateral spreading, requiring implementation of Mitigation Measure GEO-1.

iv) Landslides?

The proposed project would result in significant impacts to geology and soils in regard to exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. An estimated 40 to 50 percent of the mountains and hills of the Castaic project area are potential earthquake-induced landslide areas. These areas correspond to bedrock and to a lesser extent older alluvium with steep slopes. Landslide movement may occur along bedding planes within these formations, as rocks dislodged from exposures on steep slopes, or as surficial failures of weathered rock and soil/colluvium. Such movement could cause rock masses to dislocate and damage overlying facilities and facilities nearby and downslope from these bedrock and older alluvium areas. As a result, the proposed project may result in the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismically induced landslides, requiring implementation of Mitigation Measure GEO-1.

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

The proposed project would result in significant impacts to geology and soils in regard to resulting in substantial soil erosion or the loss of topsoil. The Castaic project area has numerous primary and secondary drainages. West of Castaic Valley and the I-5 Freeway the primary drainages from north to south include: Violin, Palomas, Santa Felicia, Devil, Romero, Sloan, Hasley, Oak, Lechier, San Martinez Chiquito, Holser, and San Martinez Grande. These empty into either Castaic Valley or the Santa Clara River. East of Castaic Valley and the I-5 Freeway from north to south are: Grasshopper, Charlie, Tapia, Wayside, and San Francisquito Canyons, all of which also empty into either Castaic Valley or the Santa Clara River. Within the Castaic project area, most drainage areas form relatively narrow canyons at higher elevations and transition to the broader floodplains. With regard to drainage area size, the larger drainages in the Castaic project area are: Grasshopper, Violin, and Palomas from north to south; Romero and Hasley from west to east; San Martinez Grande/Chiquito from west to east to south; Charlie, Tapia, Wayside, and San Francisquito Canyons from east to west; and Castaic Valley from north to south. All eventually empty into the Santa Clara River. Rainfall events may result in erosion or the loss of topsoil in these drainages. As a result, the proposed project may result in substantial soil erosion or the loss of topsoil, requiring implementation of Mitigation Measure GEO-1.

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?

The proposed project would result in significant impacts to geology and soils in regard to being located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project. Oil field activity in the project area could lead to local subsidence that could manifest as cracks and areas of ground settlement. However, due to the likely limited extent of trails in these areas, to the years over which pumping has already occurred and to the relatively low level of oil extraction, this will have a minimal impact. Affected areas can be repaired to level ground and eliminate ground cracks that may form. As a result, the proposed project may result in trails or facilities that may 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, requiring implementation of Mitigation Measure GEO-1.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

The proposed project would result in significant impacts to geology and soils in regard to being located on expansive soil. The proposed project may result in the placement of trails or structures in areas of expansive soil. Surface subsidence/settlement may occur in the Castaic project area where it is found to have soil susceptible to expansion/contraction (very clay-rich soils) and possibly hydroconsolidation (fine-grained granular soils). When present, moderate to high expansion indices indicate that there is a substantial amount of clay in the soils and repeated episodes of wetting and drying will cause distress to structures in contact with such soils. As a result, requiring implementation of Mitigation Measure GEO-1.

e) Have soils incapable of adequately supporting the use of onsite wastewater treatment systems where sewers are not available for the disposal of wastewater?

The proposed project would result in significant impacts to geology and soils in regard to having soils incapable of adequately supporting the use of onsite wastewater treatment systems where sewers are not available for the disposal of wastewater. The proposed project may result in having soils incapable of adequately supporting the use of onsite wastewater treatment systems where sewers are not available for the disposal of wastewater. The proposed project plans for restroom facilities at trailheads that may require siting within soil types that would not support onsite water treatment systems, requiring implementation of Mitigation Measure GEO-1.

f) Conflict with the Hillside Management Area Ordinance (L.A. County Code, Title 22, § 22.56.215) or hillside design standards in the County General Plan Conservation and Open Space Element?

The proposed project would result in less than significant impacts to geology and soils in regard to conflicts with the Hillside Management Area Ordinance or hillside design standards in the County General Plan. The Los Angeles County Hillside Management Ordinance applies to areas greater than 25 percent slope. Of the total of approximately 48,106 acre Castaic project area, approximately 1,926 acres, or 4 percent of the total Castaic project area, consists of slopes greater than 25 percent. Portions of proposed recreational trails may cross through the areas with a greater than 25 percent slope. Trails that cross through these areas would be subject to the requirements

and design standards of the Hillside Management Ordinance and hillside design standards in the Conservation and Open Space element of the General Plan. Specifically, sensitive hillside design measures (2.1 through 2.12) would be applied to the trail and facilities (e.g., restrooms). Further, the Hillside Management Ordinance requires that all new development in areas over 25 percent obtain a conditional use permit as part of the entitlement process. Therefore, the proposed project would not result in in conflict with the Hillside Management Area Ordinance or the hillside design standards in the Conservation and Open Space Element of the County's General Plan.

Mitigation Measure GEO-1: A geotechnical and engineering geology investigation shall be conducted for the Proposed Project, based on preliminary design plans (showing trail and restroom locations), by a licensed geotechnical engineer and a licensed engineering geologist in the State of California. The resulting Geotechnical and Engineering Geology Report and Erosion Control Plan shall summarize the results of field investigations, laboratory testing, and geotechnical/geologic analysis regarding: (1) active and potentially active faults, (2) seismic ground shaking, (3) seismic related ground failure, (4) landslides, (5) soil erosion, (6) unstable geologic and soil units, (7) expansive soils, (8) wastewater disposal characteristics, and (9) the effects of hillside ground slope on trail/restroom design and construction. The technical data, analyses, conclusions, and recommendations shall be considered and adopted in the design and construction of the project facilities based on the review and approval by the County of Los Angeles Department of Public Works and County of Los Angeles Department of Parks and Recreation. Adherence to the approved design and construction recommendations shall be verified by review and approval of the final design. Construction site inspections shall be conducted by, and in coordination with, the project geotechnical engineer and engineering geologist. All activities shall be consistent with the County of Los Angeles Trails Manual, and shall adhere to the standards and requirements in the California Building Code (California Code of Regulations, Title 24), Los Angeles County Building Code, Title 26, and/or professional engineering standards appropriate for such construction within the County. The County of Los Angeles Department of Public Works, Building and Safety Division, shall enforce conformance with these design standards through plan review and approval, prior to the issuance of building permits for any facility.

INTRODUCTION

The objective of this Geology and Soils analysis is to provide a level of technical and regulatory background sufficient to allow the identification of trail planning concerns and constraints related to geologic, seismic, and soils conditions. Consideration of this background information should extend to trails and all trail related facilities within the Castaic project area. This environmental analysis was performed using existing published information. No new studies or analyses were conducted and no site- or area-specific studies (within or immediately adjacent to the proposed project) were used for this programmatic-level evaluation.

LOCATION

The Castaic project area encompasses approximately 78 square miles (approximately 49,920 acres) surrounding the Castaic Valley area north of the Santa Clarita Valley in the northwestern portion of unincorporated County of Los Angeles (Figure 1, *Regional Vicinity Map*). The Castaic Valley is surrounded by the San Gabriel Mountains to the east, the Sierra Pelona Mountains to the northeast, the Topatopa Mountains to the west, the San Emigdio Mountains and Tehachapi Mountains to the north, and the Santa Susana Mountains to the south. These mountains are within the Transverse Ranges, a group of east-west trending mountains generally separating the San Gabriel, San Fernando, and Los Angeles basins on the south from the Mojave Desert, Central Valley, and Coast Ranges on the north. The Castaic project area is composed of generally mountain, hill, and valley terrain that abuts the Angeles National Forest to the north, the City of Santa Clarita to the southeast, California State Route 126 (Henry Mayo Drive) to the south, and Ventura County to the west (Figure 2, *Local Vicinity Map*).

The Castaic project area is located in the northwestern unincorporated area of Los Angeles County, California (see Figure 1). The Castaic project area contains approximately 78 square miles (~49,920 acres or ~2,175,000,000 square feet), and the northern boundary is defined by the northern limits of Castaic Lake. The southern boundary is defined by the Santa Clara River. The western boundary is defined by the Los Angeles-Ventura County line. The eastern boundary is defined by the eastern edge of San Francisquito Canyon (Figure 3, *Multi-Use Trails Plan Topography*).

The Castaic project area is located on the U.S. Geological Survey (USGS) 7.5-minute series Val Verde (USGS, 1995a), Newhall (USGS, 1995b), Warm Springs Mountain (USGS, 1995c), and Whitaker Peak (USGS, 1995d) topographic quadrangles. The elevation of the Castaic project area ranges from 2,756 feet above mean sea level (amsl) to 863 feet amsl (Figure 4, *Topographic Map with United States Geological Survey 7.5-minute Quadrangle Index*).

The Castaic project area encompasses a distinct portion of the existing trail / unpaved road system in the hills and mountains surrounding the centrally located Castaic Valley. On the west, the Castaic project area is defined by the Ventura County line and on the east by the San Francisquito Canyon. Some trails exist formally (e.g., national, state, and county parks) or have been defined less formally by public input, past usage, and aerial photograph interpretation (Figure 5, *Multi-Use Trails Plan Area Geology*).

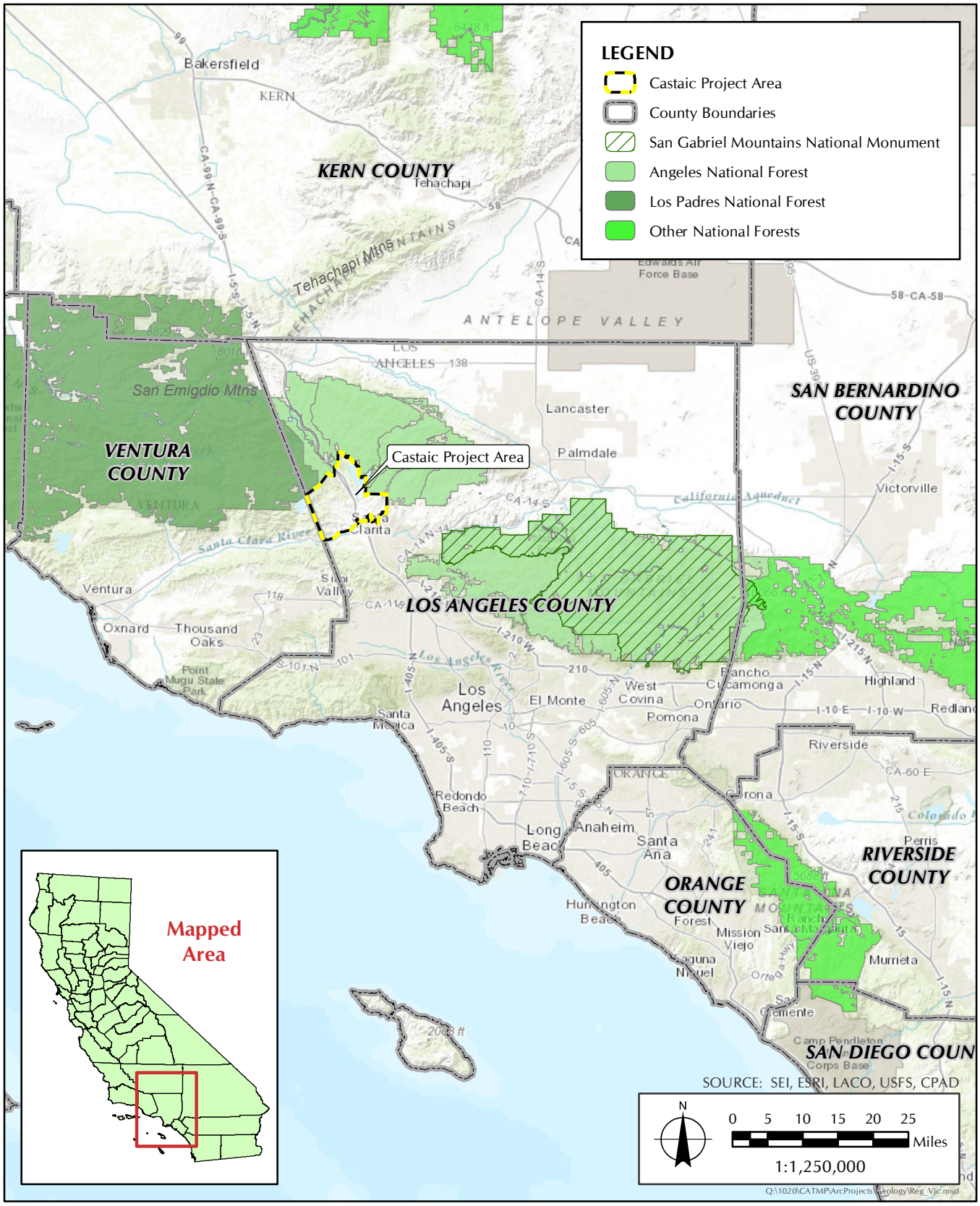

FIGURE 1

Regional Vicinity Map

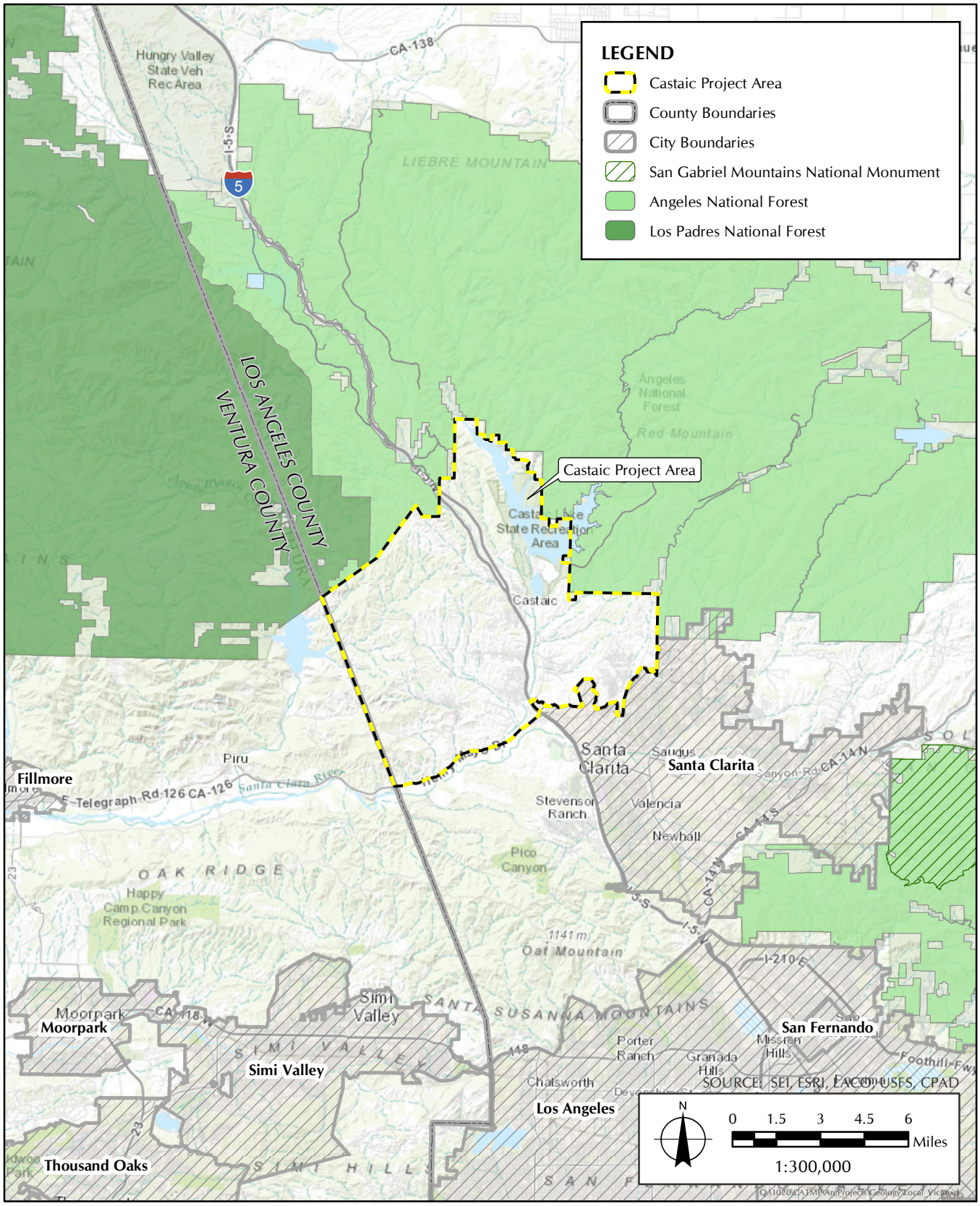

FIGURE 2

Local Vicinity Map

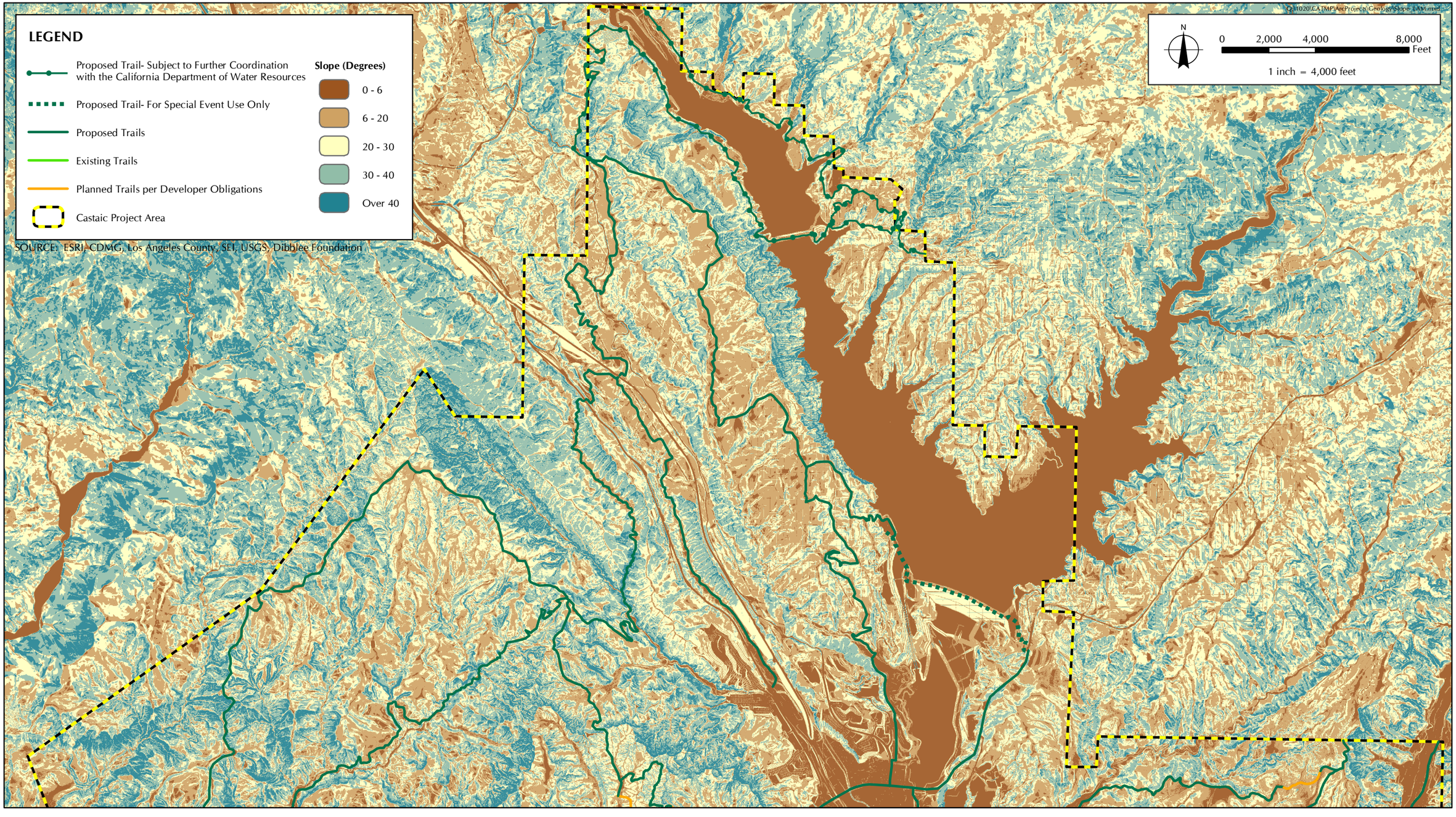

FIGURE 3A

Multi-Use Trails Plan Topography- North

FIGURE 3B

Multi-Use Trails Plan Topography- South

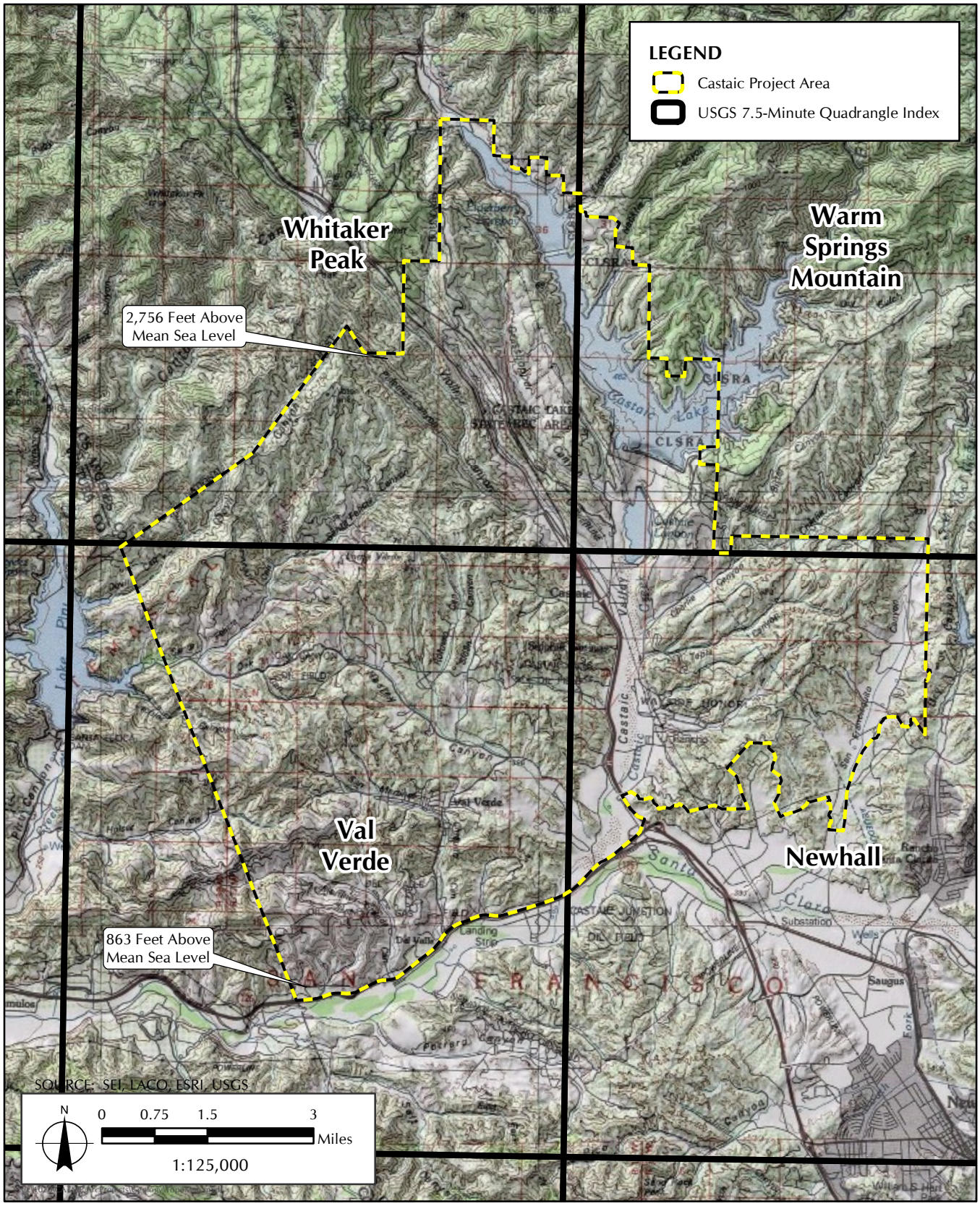

FIGURE 4A

Topographic Map with United States Geological Survey 7.5 Minute Quadrangle Index

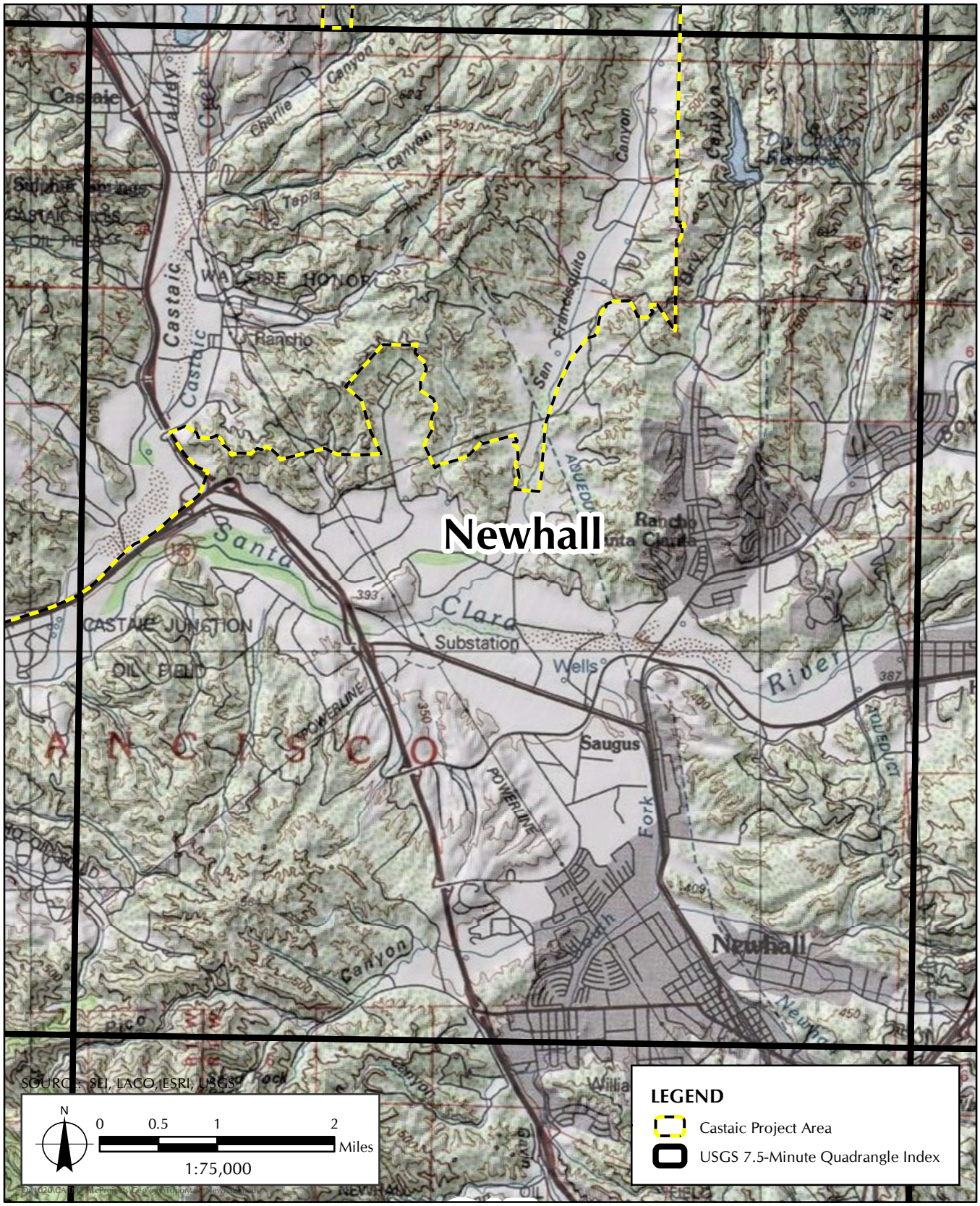

FIGURE 4B

Topographic Map with United States Geological Survey
7.5 Minute Quadrangle Index - Newhall Quadrangle

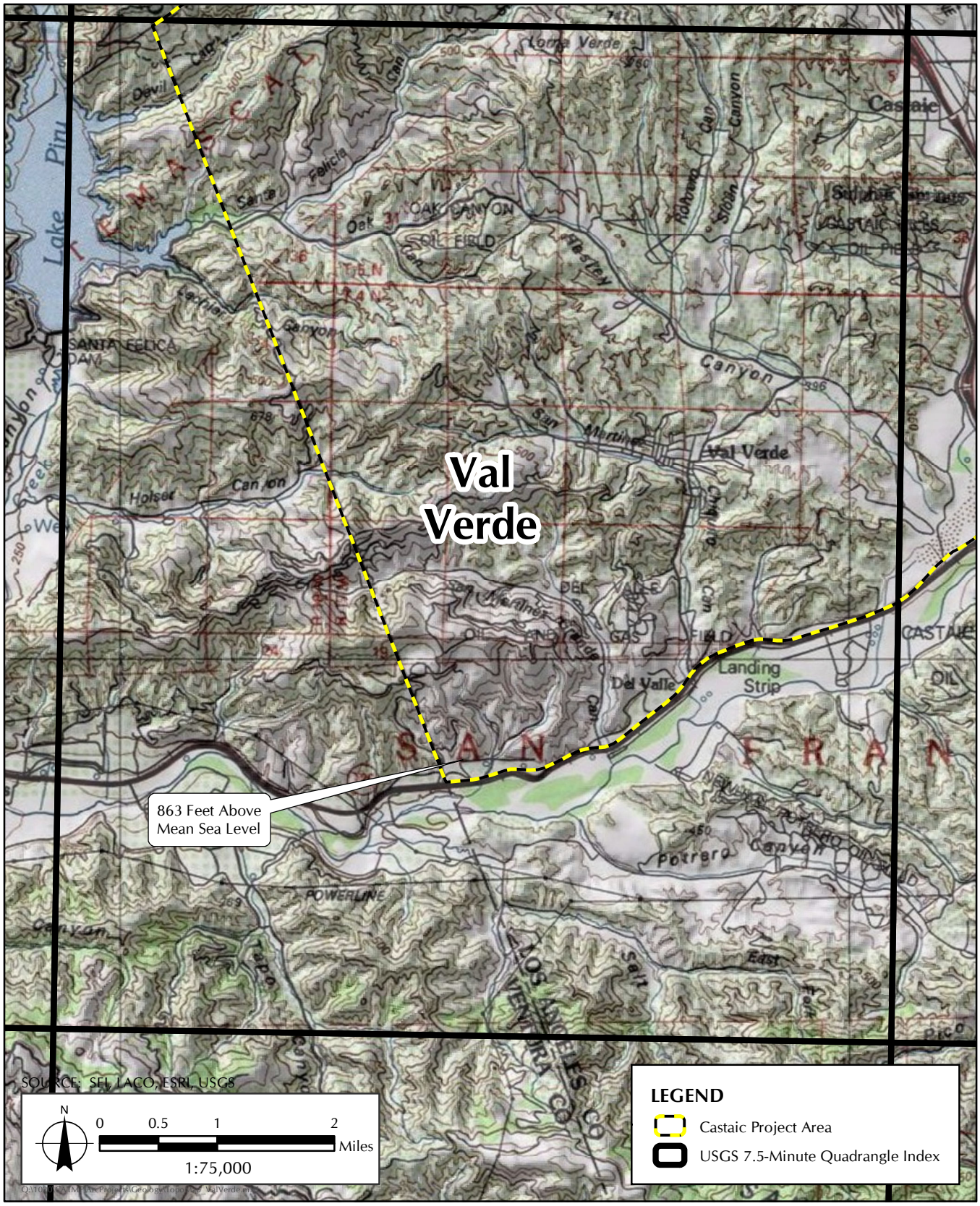

FIGURE 4C

Topographic Map with United States Geological Survey
7.5 Minute Quadrangle Index - Val Verde Quadrangle

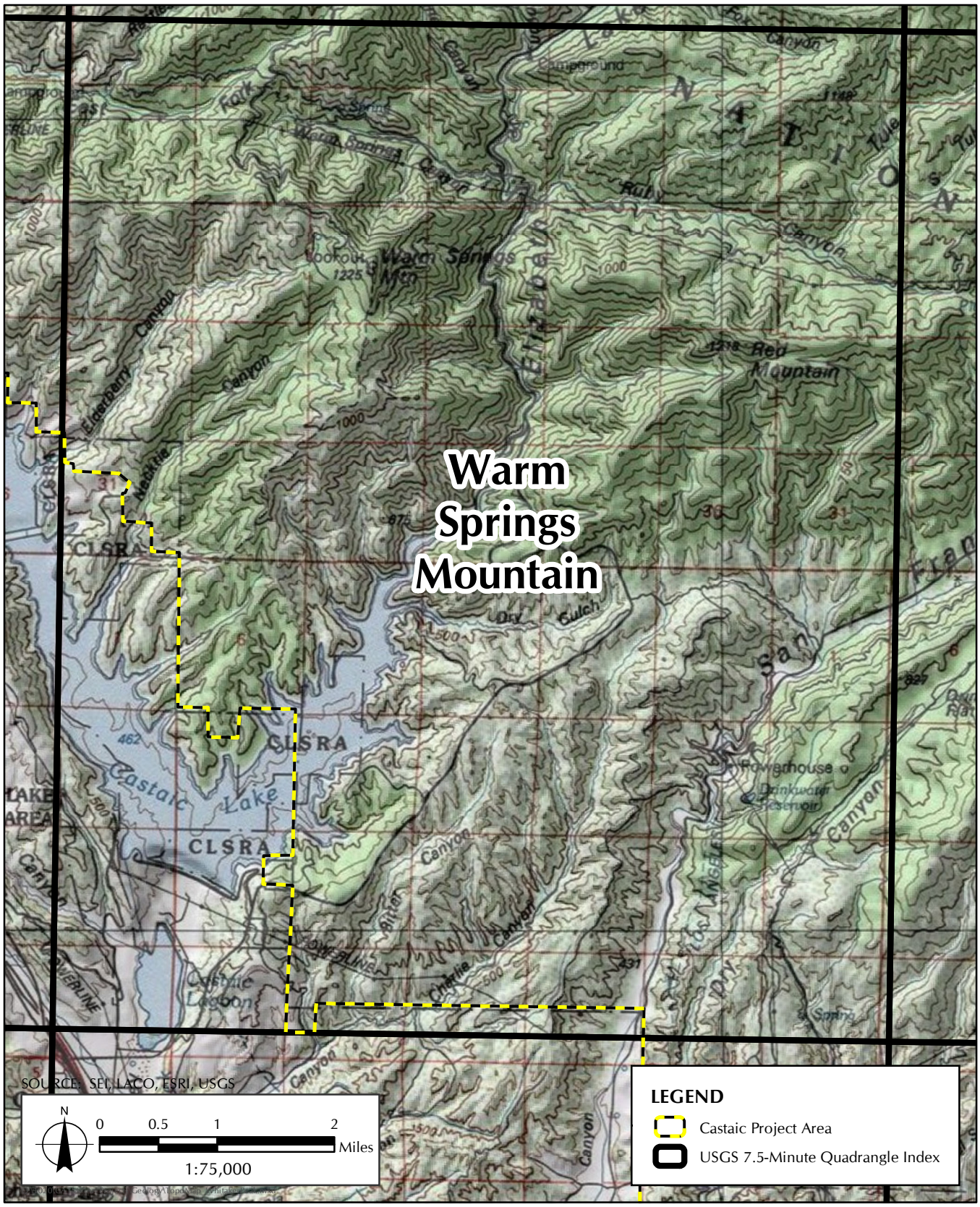

FIGURE 4D

Topographic Map with United States Geological Survey
7.5 Minute Quadrangle Index - Warm Springs Mountain Quadrangle

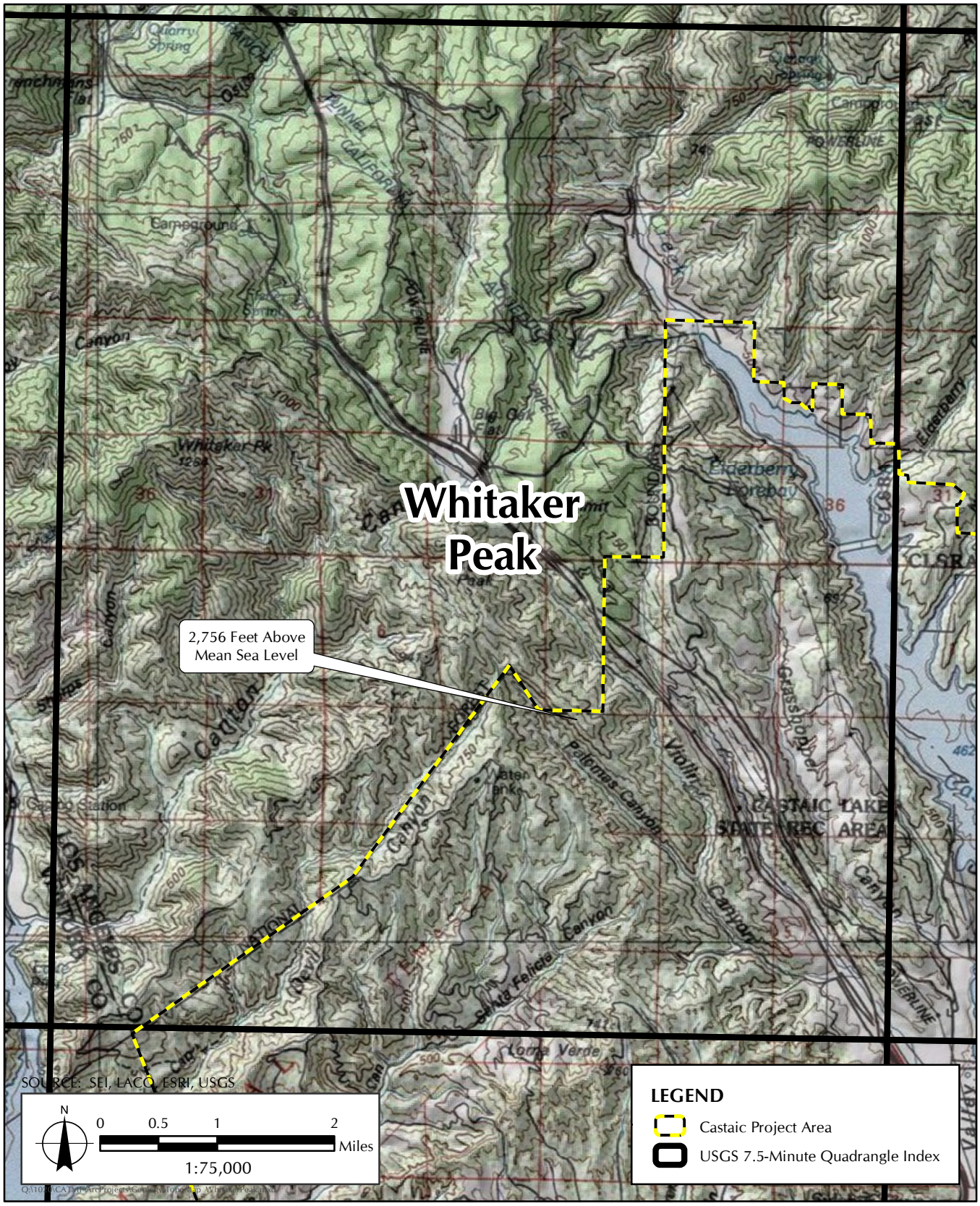

FIGURE 4D

Topographic Map with United States Geological Survey
7.5 Minute Quadrangle Index - Warm Springs Mountain Quadrangle

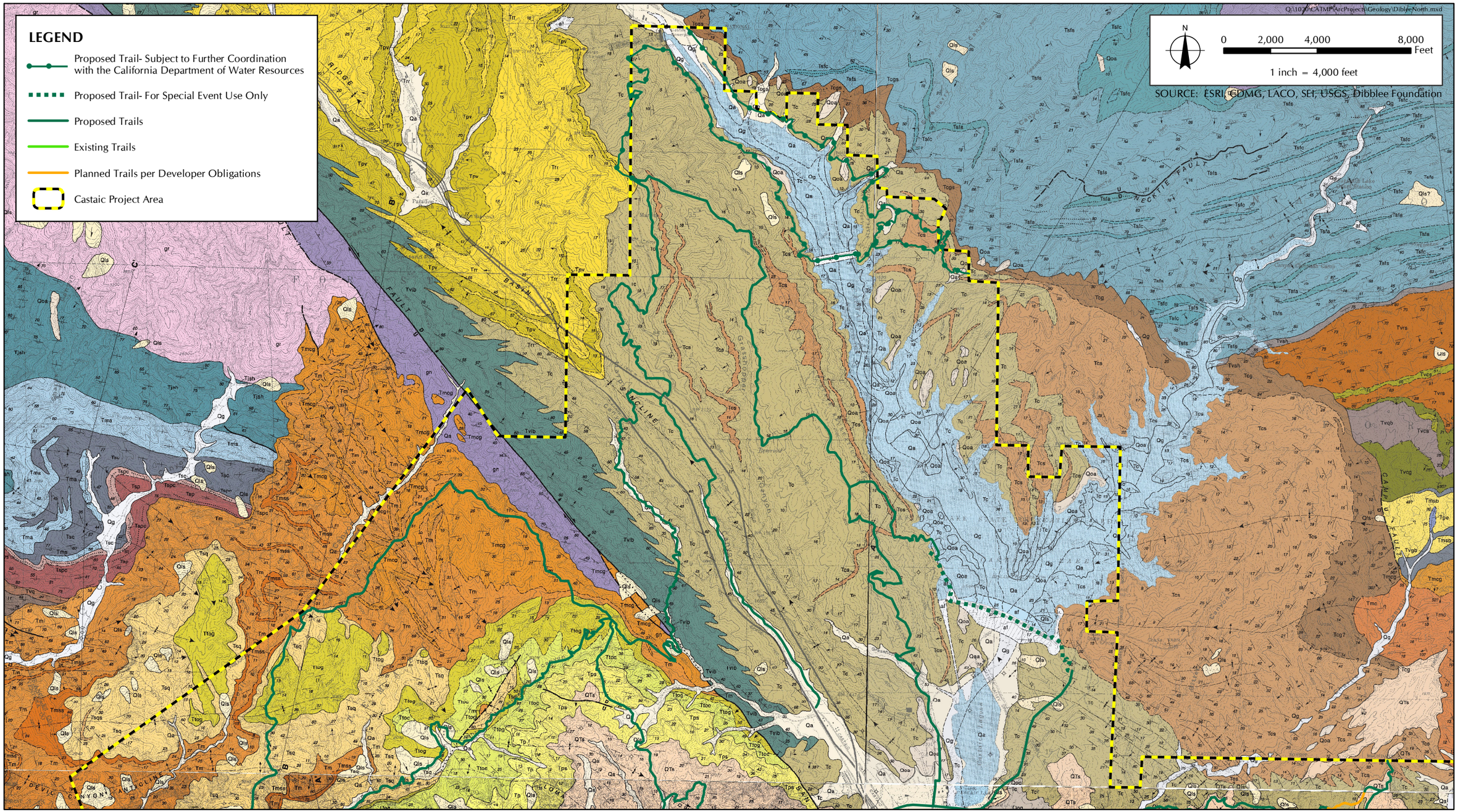

FIGURE 5A

Multi-Use Trails Area Geology - North

SOURCE: ESRI, CDMG, LACO, SEI, USGS, Dibblee Foundation

LEGEND

- Proposed Trail- Subject to Further Coordination with the California Department of Water Resources
- Proposed Trail- For Special Event Use Only
- Proposed Trails
- Existing Trails
- Planned Trails per Developer Obligations
- Castaic Project Area

N

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

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FIGURE 5B

Multi-Use Trails Area Geology - South

PROJECT DESCRIPTION

The proposed project would work to encourage and promote new multi-use trails and recommend improvements to existing trails, providing an alignment to incorporate a transition throughout the Castaic project area to additional areas, jurisdictions, and prime destinations within and adjacent to the Castaic project area. The plan would recommend conditions for improvement of unmet local recreation demands in the 5th Supervisorial District. The proposed project would develop a complete multi-use trail system connecting user groups and local populations to desired recreation destinations and experiences, with unified transition to the trails of adjacent jurisdictions, compatibility with adjacent land uses and environmental resources, and incorporate a sustainable design that is consistent with the County Trails Manual.

The proposed project includes approximately 100 miles of proposed multi-use trails and related staging areas, bike skills parks, parking areas, and other supporting trail facilities in the Castaic Area of the Santa Clarita Valley Planning Area. The proposed trails would provide connections to the Angeles National Forest, trails in the City of Santa Clarita, and trails in the Newhall Ranch Specific Plan. The trails would be multi-use and range from 3 to 12 feet wide based on site conditions, with adequate space for combined pedestrian, equestrian, and mountain biking use, in accordance with the County of Los Angeles Trails Manual guidelines (Table 1, *County Trail Types*).

TABLE 1
COUNTY TRAIL TYPES

Trail Type	Tread / Trail Width	Intensity of Use	Impact	Surface Type
Pedestrian	10–11 feet	High	High	Crusher fines / decomposed granite
Recreational Pathway	8–10 feet	High	High	Natural surface
Natural Trail 1	7–10 feet	High	Medium	Natural surface
Natural Trail 2	5–8 feet	Medium to high	Low	Natural surface
Natural Trail 3	2–3 feet	Low	Minimal	Natural surface

SOURCE: County of Los Angeles Department of Parks and Recreation. Adopted May 17, 2011. Revised June 2013. *County of Los Angeles Trails Manual*. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

The proposed project includes 18 trail routes, consisting of four existing trail segments, 10 trail segments that have been planned per developer obligations, and 57 proposed trail segments (Table 2, *Existing, Planned per Developer Obligations, and Proposed Trail Segments*). The proposed trail segments would provide connections to the Santa Felicia SEA, the Angeles National Forest, Newhall Ranch trails and the Santa Clara River Trail, City of Santa Clarita trails, under Interstate-5, and to Castaic Lake.

Consistent with Section 4.3.6, *Way-finding Signs*, of the County Trails Manual, the proposed project would include regular trail signs at trailheads, trail amenity locations, street and trail intersections, and the boundaries of trail easements on private property and National Forest lands.[1] Also consistent with the recommendations of the County Trails Manual, reassurance marker signs would be posted at eye level (62 inches above the ground surface) at every quarter (0.25) mile of trail that visually mark the trail line and identify the name of the trail and quarter milepost number in order to orient trail users and search and rescue services in the case of an emergency. As each trail segment is constructed, the County Department of Parks and Recreation would be responsible for sending the Los Angeles County Fire Department and the Los Angeles County Sheriff's Department the location of each quarter milepost along the trail for emergency response purposes.

The proposed project would involve the development of five simple trailheads at access points, up to three bike skills park amenities, four equestrian amenities, and nine staging areas and trail amenities (Table 3, *Proposed Trail Related Facilities*). The bike skills parks would occupy up to 45 acres.

[1] County of Los Angeles Department of Parks and Recreation. Revised June 2013. County of Los Angeles Trails Manual. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
Castaic Creek (CC)	CC1 (Sports Complex)	1.24	Natural	No existing trail. Dirt road, de facto trail route along Castaic Creek. De facto trail that does not cross private property. Crossing of drainage at RV park will wash out periodically unless an alternative crossing (bridge) is developed.
	CC2 (Pitchess)	2.63	Natural	No existing trail. Existing dirt road from Tapia Canyon Road along Interstate 5 and creekbed, including under the freeway bridge. Potential for trailhead at southern end of segment.
	CC3 (Commerce Center East)	0.76	SUB	No existing trail. Portion of segment parallels existing dirt road. Planned trail per developer obligations generally follows 2007 County adopted trail routes; alignment reflects subdivision plans.
	CC4 (Commerce Center Undercrossing)	0.25	Natural	No existing trail. Within Castaic creekbed and along paved utility road. Slightly modified from 2007 County adopted trail routes to meet proposed subdivision trail.
	CC5 (Commerce Center Bike Trail)	0.46	SUB	No existing trail. Along paved utility road adjacent to creekbed. Planned trail per developer obligations follows the subdivision plan indicating proposed bike trail with 10' minimum equestrian trail.
	CC6 (Commerce Center – 126)	0.48	SUB	No existing trail. Parallels Franklin Parkway and Castaic Creek. Planned trail per developer obligations follows the subdivision plan indicating proposed sidewalk and equestrian trail.
Castaic Dam (CD)	CD1 (Castaic Upper Parking)	1.39	Natural	No existing trail. Parking lot median, follows existing switchbacks (dirt path) leading to and along existing Pine Ridge Fire Road. Connection from 2007 County adopted trail routes to upper parking lot at Castaic Lake.
	CD2 (Castaic Dam Crossing)*	1.76	Natural	No existing trail. Follows paved road from upper parking lot at Castaic Lake, across Castaic Dam, to Lake Hughes Road. Dam crossing, bridging east and west sides of Castaic Lake. Subject to further coordination with State Department of Water Resources..
	CD3 (Lake Hughes East)	1.60	ROW	No existing trail. Unpaved ROW along Lake Hughes Road. On-street connection from potential lagoon trailhead to parking lot on the east side of the dam.
Cliffie Stone Extension (CE)	CE1 (San Francisquito Wash - Upper)	0.63	Natural	No existing trail. Parallels existing dirt road/path along San Francisquito Canyon wash. Passes from subdivision land into multiple private parcels. Runs adjacent to the street, but may need to enter street ROW.
	CE2 (Tesoro Del Valle – SF Wash)	0.52	Natural	No existing trail. Parallels existing dirt road / de facto route within San Francisquito Canyon wash. Realigned 2007 County adopted trail. Passes through Tesoro Del Valle but is not including in subdivision plans.
	CE3 (San Francisquito Wash - Lower)	0.55	ROW	No existing trail. Parallels existing dirt road / de facto route within San Francisquito Canyon wash. Realigned 2007 County adopted trail
	CE4 (Lady Linda)	0.55	Natural	No existing trail. Follows existing dirt road (Lady Linda Lane). Follows Lady Linda Lane to connect to proposed trailhead.
	CE5 (Cliffie Stone – From Lady Linda-Low Ridge)	0.53	ROW	No existing trail. Follows portions of existing de facto dirt path/road to the west of San Francisquito Canyon Road. Primarily follows Cliffie Stone Extension identified in subdivision alignment.
	CE6 (Cliffie Stone – From Lowridge-Tesoro)	0.26	ROW	No existing trail. Dirt ROW exists along San Francisquito Canyon Road. Crosses road ROW but original ROW does not match existing street.
	CE7 (North Park – Cliffie Stone Extension)	0.62	Natural	No existing trail or de facto route. Follows 2007 County adopted alignment through subdivision until southern end, then branches west to meet Cliffie Stone Trail. Owned by MRCA but part of Tesoro subdivision.
	CE8 (North Park Trail Connector)	0.08	Natural	No existing trail or de facto route. Connection to North Park Trail. Leaves subdivision property and enters Newhall Land parcel.
Charlie Canyon (CL)	CL1 (Charlie Canyon Road)	3.61	Natural	No existing trail. Follows existing dirt roads (Tapia Canyon Road and Charlie Canyon Road), and what appears to be a de facto ridgeline path. Realigned from 2007 County adopted trail routes to follow road on County property.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	CL2 (Charlie Canyon – Tesoro Del Valle)	0.37	Natural	No existing trail. Follows existing dirt road or de facto path. Trail enters subdivision parcels but is not on subdivision plans.
	CL3 (San Francisquito Connection)	0.16	Natural	No existing trail. Follows existing dirt road or de facto path. Connection to San Francisquito Trail.
Chiquito Canyon (CO)	CO1 (Chiquito Canyon and Creek)	3.52	Natural	No existing trail. Modified 2007 County adopted alignment to follow creek instead of Chiquito Canyon Road.
	CO2 (Jackson St)	0.21	ROW	No existing trail. Parallels two existing paved roads – Lincoln Avenue and Jackson Street. Follows existing street.
	CO3 (Chiquito Canyon and Creek – South)	1.04	Natural	No existing trail. Follows portions of Jackson Street and existing de facto dirt path or road. Requires access beyond locked gate. Realigned from 2007 County adopted alignment to minimize parcel crossings.
	CO4 (Chiquito Canyon and Creek – North)	1.05	SUB	No existing trail. Parallels portion of Del Valley Road. Planned trail per developer obligations - modified 2007 County adopted alignment to remain within subdivision parcels. Subdivision alignment not determined.
Cliffie Stone (CS)	CS1 (Cliffie Stone – San Francisquito Motorway)	0.68	Natural	No existing trail. Follows existing ridgeline Farmer John Lat dirt road and paved utility access road. Tesoro Del Valle Property. Requires access along utility road.
	CS2 (Cliffie Stone Trail [Tesoro])	1.16	Natural	Existing trail
	CS3 (Cliffie Stone Trail [San Francisquito)	1.73	Natural	Existing trail
Elderberry Forebay (EF)	EF1 (Forebay Connection)	4.76	Natural	No existing trail. Follows existing dirt road and topography. May have security issues with dam and pipes at northern edge. Only include if Elderberry Forebay Dam is useable.
	EF2 (Forebay – Limit 2)	0.81	Natural	No existing trail. Parallels portion of Elderberry Forebay road. Dam connection to northeastern corner route. Only include if Elderberry Forebay Dam is useable.
	EF3 (Forebay – Limit 1)	0.72	Natural	No existing trail. Parallels portion of Elderberry Forebay road. Dam connection to northeastern corner route. Only include if Elderberry Forebay Dam is useable.
	EF4 (Northern Limit)	4.76	Natural	No existing trail. Parallels portions of existing roads: Goodell Road and USFS Route 6N13. Northeast connection to USFS roads. Extends beyond Castaic project area.
Hasley Canyon (HC)	HC1 (Hasley – Santa Felicia)	3.48	Natural	No existing trail. Follows existing unpaved Ayala Road for a portion of proposed route. Connects Hasley Canyon to Santa Felicia SEA. Requires passage beyond locked gate at Hasley Canyon.
	HC2 (Hasley – Claremont)	0.70	Natural	No existing trail. Follows existing de facto path or dirt road. Trail falls within subdivision area but is not included in existing subdivision plans. Avoids using street ROW. Connects to 2007 County adopted trail alignment at northern end.
	HC3 (Hasley Canyon End)	0.16	Natural	No existing trail. Realigned 2007 County adopted trail alignment.
	HC4 (Hasley Road West)	0.33	ROW	No existing trail. Parallels existing paved Hasley Canyon Road. Follows 2007 County adopted trail alignment along public ROW. Ends at road.
	HC5 (Hasley Road East)	0.57	ROW	No existing trail. Parallels existing paved Hasley Canyon Road. Realigned 2007 County adopted trail to avoid private parcel conflict, avoid a creek crossing, and to more directly connect to other trail segments.
	HC6 (Hasley Creek)	0.26	Natural	Existing de facto trail along Hasley Canyon Road. Realigned 2007 County adopted trail to follow de facto trails.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	HC7 (Hasley-Los Valles)	0.56	SUB	No existing trail. Existing de facto trail along Hasley Canyon Road. Planned trail per developer obligations - realigned 2007 County adopted trail to follow de facto trails. Within subdivision area a planned subdivision trail is not indicated.
	HC8 (Hasley Canyon Trail)	1.68	Natural	Existing trail
	HC9 (Commerce Center)	0.21	ROW	No existing trail. Existing paved maintenance road along channelized creek. Line to proposed subdivision trails. Crosses under Commerce Center Drive and uses maintenance road.
	HC10 (Commerce Center NW)	0.61	SUB	No existing trail. Parallels creek bed. Planned trail per developer obligations generally follows 2007 County adopted alignment, but realigned to avoid the creek bed where possible.
Interstate Paintball (IP)	IP1 (Interstate 5 to Ridge Route)	3.30	Natural	No existing trail. Existing utility access dirt roads. Follows utility access roads. Northern end will need switchbacks to drop to Ridge Route Rd.
	IP2 (Paintball Site)	0.65	Natural	No existing trail. Existing dirt roads and paved roads. Connects through former paintball site and proposed bike skills park. Alignment to be determined by park design.
	IP3 (Santa Felicia to 5 Connection)	3.67	Natural	No existing trail. Existing dirt roads along portions of alignment. Connection from former paintball site to Santa Felicia SEA. Undercrossing at Interstate-5 will need to be evaluated for safety.
	IP4 (Between Interstate 5)	3.14	Natural	No existing trail. Existing utility access dirt roads between I-5 North and I-5 south. Picks up from the end of Castaic Road and continues to paintball site.
Lake West (LW)	LW1 (Northlake North)	3.28	Natural	No existing trail. Existing dirt roads. Follows 2007 County adopted trail route.
	LW2 (Northlake Central)	1.10	Natural	No existing trail. Existing dirt roads. Follows 2007 County adopted trail route.
	LW3 (Lagoon-Lake)	4.05	Natural	Existing dirt roads, including a portion of Cutler Canyon Fire Road and Vista Ridge Fire Road, and paved Castaic Lake State Recreation Area road. Includes a portion of Pro's Uphill Open Trail and Castaic Brick Trail of Castaic Lake State Recreation Area.[1] Follows 2007 County adopted trail route.
North Park Trail	North Park Trail	0.33	Natural	Existing trail
Romero Canyon (RC)	RC1 (Romero-Santa Felicia)	1.88	Natural	No existing trail. Follows existing dirt road/path. Portions follow narrow ridgelines.
	RC2 (North of High School)	0.13	Natural	No existing trail. Currently a construction site. Connection to Castaic High School path.
	RC3 (Castaic High School)	0.56	SUB	No existing trail. Currently a construction site leading to Romero Canyon Road. Planned trail per developer obligations – alignment needs verification from development plan.
	RC4 (Romero Canyon Rd)	1.89	Natural	No existing trail. Parallels Romero Canyon Road. Follows private road.
Santa Felicia (SA)	SA1 (Santa Felicia Upper Loop)	7.59	Natural	No existing trail. Existing dirt road. Minimal constraints.
	SA2 (Santa Felicia Lower Loop)	5.80	Natural	No existing trail. Existing dirt road. Portions follow narrow ridgelines.
San Francisquito (SF)	SF1 (San Francisquito Motorway)	0.34	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Follows San Francisquito Motorway to the edge of the Castaic project area.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	SF2 (San Francisquito Motorway Bypass)	1.09	Natural	No existing trail. De facto ridgeline dirt road/path. Two parallel alternative routes. Single alignment pending further study. Partially inside Tapia Ranch.
	SF3 (San Francisquito – Tapia)	1.15	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Passes through Tesoro Del Valle, not included in subdivision plans.
	SF4 (San Francisquito – West Creek)	0.85	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Follows utility road. Connects San Francisquito and Cliffie Stone Trails to West Creek.
Sloan Canyon (SC)	SC1 (Sloan Canyon West)	1.14	Natural	No existing trail. Existing dirt roads and construction sites. Portions follow narrow ridgelines.
	SC2 (Homestead at Sloan Canyon)	0.68	SUB	No existing trail. Existing construction site and unpaved Sloan Canyon Road. Planned trail per developer obligations follows existing dirt road.
	SC3 (Sloan Canyon Dr)	1.52	ROW	No existing trail. Parallels Sloan Canyon Road and Lake Hughes Road. On-street connection. Crosses under Interstate 5. Requires coordination with Los Angeles County Public Works.
	SC4 (Lake Hughes at Lagoon)	0.19	ROW	No existing trail. Parallels Lake Hughes Road south of Castaic Lagoon. Connects Castaic Creek to Castaic Lake.
Tapia Canyon (TC)	TC1 (Sports Complex – Tapia)	0.24	SUB	No existing trail. Parallels Tapia Canyon Road. Planned trail per developer obligations – Tapia Ranch development plans to build path to Castaic Road.
	TC2 (Tapia Bypass)	2.74	SUB	No existing trail. Parallels Tapia Canyon Road and Wayside Canyon Road in between undeveloped portions of Tapia Canyon. Planned trail per developer obligations – part of Tapia Ranch development plan. Portions follow 2007 County adopted alignment.
	TC3 (Tapia – San Francisquito)	1.11	Natural	No existing trail. Appears to be a de facto trail or dirt path between Tapia Canyon Road and San Francisquito Motorway. Partially within Tapia Ranch development.
	TC4 (Tapia – Cliffie Stone)	1.03	Natural	No existing trail. A portion of alignment route follows an existing dirt road/path. A portion parallels dirt roads/paths: Quail Haven Trail, Las Tunas Trail, and Lady Linda Lane. Trail would need to traverse a significant elevation change over the ridge at northern end.
Val Verde (VV)	VV1 (Kennsington Rd)	2.31	Natural	No existing trail. Follows a few de facto dirt roads/paths. Requires access along private roads at either end of the alignment.
	VV2 (Chiquito – Val Verde)	0.94	Natural	No existing trail. Follows edge of Val Verde Park and drainage. Follows drainage, marked as privately owned for portions but appears to all be LA County Flood Control property.
West Creek (WC)	WC1 (West Creek – Tapia)	1.49	Natural	No existing trail. Parallels two existing dirt roads: Company Road and Wayside Lateral Road. Requires connection through cul-de-dac in West Creek.
	WC2 (West Creek – Tapia – Tesoro)	1.30	Natural	No existing trail. Follows a portion of existing de facto dirt road/paths and a portion of Tapia Canyon Road. Within subdivision property, but alignment not included in subdivision. Connects West Creek development to Tapia Ranch area.
TOTAL				
Total of 18 Routes	**Total of 71 Trail Segments** • 4 Existing Segments • 10 Segments planned per developer obligations • 57 Proposed Trail Segments			**Total Of 102.94 Miles in Trail Planning Castaic project area** • 4.90 Miles Existing Trails • 8.14 Miles Planned trails per developer obligations (no existing trail) • 89.90 Miles Proposed and Under Consideration

NOTES: *Subject to negotiation with California State Department of Water Resources (DWR) - Future negotiations with DWR and pending state and county agreement renewal. SUB = Multi-Use Subdivision Trail. ROW = New Designation
SOURCE: [1] Friends of Castaic Lake. Accessed 12 April 2016. *Castaic Lake – Trail Map*. Available at: http://castaiclake.com/map_trails.html

TABLE 3
PROPOSED TRAIL RELATED FACILITIES

Trail Related Facility Type	Related Facility Name (Size)
Trail Access Only • Trailheads only	Upper Ridge Route Road
	Sloan Canyon
	Castaic Road
	West Creek
	Hasley Canyon Equestrian Center
Bike Skills Park Amenities • Restrooms • Drinking Fountains • Rest Areas/Seating • Shade Structures • Pump Tracks (no pedaling required) • Progressive Jumps (natural soil with compacted dirt jumps) • Balance Skills Features (e.g., wooden teeter-totter) • Rock/Technical Features (e.g., rock garden with narrow width trails) • Flow Trails (start at higher elevation for downhill ride) • Trails (over variety of terrain, for all ages) • Road Handling Skills Areas (hard-packed soil course) • Beginner, Intermediate, and Expert Skills Courses (for all ages) • Advanced Downhill Course (steep terrain, jumps, turns, obstacles) • Slalom Course (two adjacent trails for competition)	Castaic Sports Complex (up to 10 acres)
	Upper Lagoon (up to 5 acres)
	Ridge Route Road (up to 30 acres)
Equestrian Amenities • Trailheads • Parking • Restrooms • Drinking Fountains (for humans, equine, or pets) • Picnic Tables • Shade Structures • Horse Arenas • Gathering Areas • Horse Ties and Rails	Tapia Canyon Road
	Castaic Lake Upper Lot
	Tesoro Del Valle
	Castaic Sports Complex
Staging Areas and Trail Amenities • Trailheads • Parking • Restrooms • Drinking Fountains (for humans, equine, or pets) • Benches/Seating • Picnic Tables • Shade Structures • Wayfinding Signage • Interpretive Signage • Gathering Areas • Horse Ties and Rails • Bike Racks	Old Road
	Hasley Canyon
	Chiquito Canyon
	Santa Felicia
	Castaic Lagoon
	Lady Linda
	Ridge Route Road
	Castaic Sports Complex
	Castaic Lake State Recreation Area Upper Lot

Restrooms would be design and required to demonstrate compliance with the standards of the Santa Clarita Valley Sanitation District or the County of Los Angeles Department of Public Health for Onsite Wastewater Treatment Systems (OWTS), as applicable.

Trails and supporting facilities within a one-mile radius of officially designated and eligible State scenic highways would be designed, constructed, and maintained (where construction equipment is involved) to preserve scenic resources, including but not limited to trees, rock outcroppings, and historic buildings, within the scenic highway corridor. Where construction of trails or related supporting facilities requires cuts into the slope (which can be seen from a far distance), the visual character of the slope would be restored by planting locally native vegetation as a visual screen. Similarly, restrooms and other supporting structures would be constructed of materials that blend into the landscape, with locally native vegetative screening.

As stated in the County Trails Manual, the hours for operation for County trails are typically from dawn to dusk (County Code 17.04.330). In accordance with the guidelines in Section 4.3.18, *Lighting*, of the County Trails Manual, where lighting features are provided for safety and wayfinding reasons, lighting would installed in a manner to be non-intrusive to adjacent uses, avoid detracting from a natural outdoors experience for trail users, and directed downward to avoid light pollution or spillover in general.[2]

REGULATORY SETTING

Federal

The model building code that is predominantly adopted in the United States is the International Building Code (IBC) from the International Code Council (ICC), a nongovernmental organization. The ICC produces other model codes such as the International Residential Code (IRC). The IBC and its companion ICC documents form the basis of the building codes in most states and have been adopted by local governments within all states.

The National Earthquake Hazards Reduction Program (NEHRP) supports the development of seismic provisions in building codes. The *NEHRP Recommended Seismic Provisions for New Buildings and Other Structures* (FEMA, 2015) presents state of the art earthquake engineering research and practices in a form that is usable by the engineering community and provides a nationally applicable resource document for all model codes and standards. The 2015 NEHRP Provisions have adopted by reference the American Structural Engineers Association (ASCE) / Structural Engineering Institute (SEI) standard *ASCE/SEI 7*-10: *Minimum Design Loads for New Buildings and Other Structures* as the baseline. A 2014 series of National Seismic Hazard Maps by the USGS shows the severity of expected earthquake shaking for a particular level of probability; for example, levels of earthquake shaking that have a 2-in-100 chance of being exceeded in a 50-year period. The time period of 50 years is commonly used because it represents a typical building lifetime, while the 2 percent probability level is usually considered an acceptable hazard level for the building codes. Maps also show seismic shaking levels using a number of different measures that apply to designing earthquake-resistant buildings of different heights, which respond to different frequencies of ground motion.

[2] County of Los Angeles Department of Parks and Recreation. Adopted by the Board of Supervisors on May 17, 2011. Revised June 2013. County of Los Angeles Trails Manual. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

State

Building Codes

Development in the State of California is governed by the 2013 California Building Code (California Building Standards Commission, 2016). These regulations include provisions for site work, demolition, and construction, which include excavation and grading, as well as provisions for foundations, retaining walls, and expansive and compressible soils. The 2014 County of Los Angeles Building Code amendments are based on the 2013 CBC and the 2012 IBC. Building regulations are adopted by reference and incorporated into Title 26 of the Los Angeles County Code as Sections 119.1.2 through 119.1.14, respectively of Chapter 1 of Title 26 of the Los Angeles County Code. Standard residential, commercial, and light industrial construction is governed by the CBC, which the County may amend. The 2013 CBC (defined in CCR Part 2 of Title 24 of the California Administrative Code) includes additions to the previous building code that make it more stringent, particularly with regard to seismic and earthquake conditions for critical structures such as essential facilities, public schools, and hospitals.

The Los Angeles County Building Official may require an engineering geology and/or soils engineering report when the Building Official believes they are essential for the evaluation of the safety of the site. Either or both reports shall discuss hazard from landslide, settlement, or slippage and shall make a finding regarding the potential effects of the proposed work on stability outside the Castaic project area.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Geologic Hazards Zone Act was enacted by the State of California in 1972 to address the hazard and damage caused by surface fault rupture during an earthquake. The act has been amended 10 times and renamed the Alquist-Priolo Earthquake Fault Zoning Act, effective January 1, 1994. The act, revised in 2007, defines an active fault as one which has had surface displacements within Holocene time (about the last 11,000 years). Initially, faults were defined in the Alquist-Priolo Act as "potentially active", and were zoned if they showed evidence of surface displacement during Quaternary time (last 1.6 million years). Beginning in 1977, evidence of Quaternary surface displacement was no longer used as a criterion for zoning. Since 1975, the State of California defined the terms "sufficiently active" and "well defined" for application in zoning faults. These two terms constitute the present criteria used by the State Geologist in determining if a given fault should be zoned under the 2007 Alquist-Priolo Act (Hart, E.W., and W. A. Bryant, 2007) and are defined as follows:

> Sufficiently active - A fault is deemed sufficiently active if there is evidence of Holocene surface displacement along one or more of its segments or branches. Holocene surface displacement may be directly observable or inferred; it need not be present everywhere along a fault to qualify that fault for zoning.
>
> Well-defined - A fault is considered well-defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic evidence; Appendix C). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site specific investigations would meet with some success.

The act requires the State Geologist to establish earthquake fault zones (EFZs) along known active faults in the state. Cities and counties that include EFZs are responsible to regulate most development projects within the EFZs, as described in the act, but may enact regulations that are more stringent. Certain smaller residential developments can be exempt. The San Gabriel fault is zoned in a portion of the Castaic project area.

Seismic Hazards Mapping Act

The Seismic Hazard Mapping Act (SHMA) of 1990 was enacted, in part, to address seismic hazards not included in the Alquist-Priolo Act, including strong ground shaking, landslides, and liquefaction. Under this act, the State Geologist is assigned the responsibility of identifying and mapping seismic hazards zones.

The State of California Geologic Survey (CGS) has also adopted seismic design provisions in Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California, on March 13, 1997 (revised 2008). The CGS provides guidance with regard to seismic hazards under the Seismic Hazards Mapping Act; seismic hazard zones are to be identified and mapped to assist local governments in planning and development purposes. The intent of this publication is to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, as well as other hazards caused by earthquakes. Lead agencies with the authority to approve development projects shall ensure the following:

> The geotechnical report shall be prepared by a registered civil engineer [practicing the in field of geotechnical engineering] or certified engineering geologist, having competence in the field of seismic hazard evaluation and mitigation. The geotechnical report shall contain site-specific evaluations of the seismic hazard affecting the project, and shall identify portions of the project site containing seismic hazards. The report shall also identify any known off-site seismic hazards that could adversely affect the site in the event of an earthquake.
>
> Prior to approving the project, the lead agency shall independently review the geotechnical report to determine the adequacy of the hazard evaluation and proposed mitigation measures and to determine the requirements of Section 3724(a) above, are satisfied. Such reviews shall be conducted by a certified engineering geologist or registered civil engineer, having competence in the field of seismic hazard evaluation and mitigation.

The County and City of Los Angeles have been mapped pursuant to the SHMA and there are zones of required investigation for liquefaction and earthquake-induced landslide hazards in and adjacent to the Castaic project area (Figure 6, *Landslides and Areas of Significant Grading*).

Q:\1020\CATMP\ArcProjects\Geology\Landslides and Areas of Significant GradingNorth.mxd

N

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

LEGEND

- Proposed Trail- Subject to Further Coordination with the California Department of Water Resources
- Proposed Trail- For Special Event Use Only
- Proposed Trails
- Existing Trails
- Planned Trails per Developer Obligations
- Castaic Project Area
- No Data
- County Boundaries

SOURCE: ESRI, SEI, CGS, LACO, Alta Planning

AREA NOT EVALUATED

5

Shear test sample location

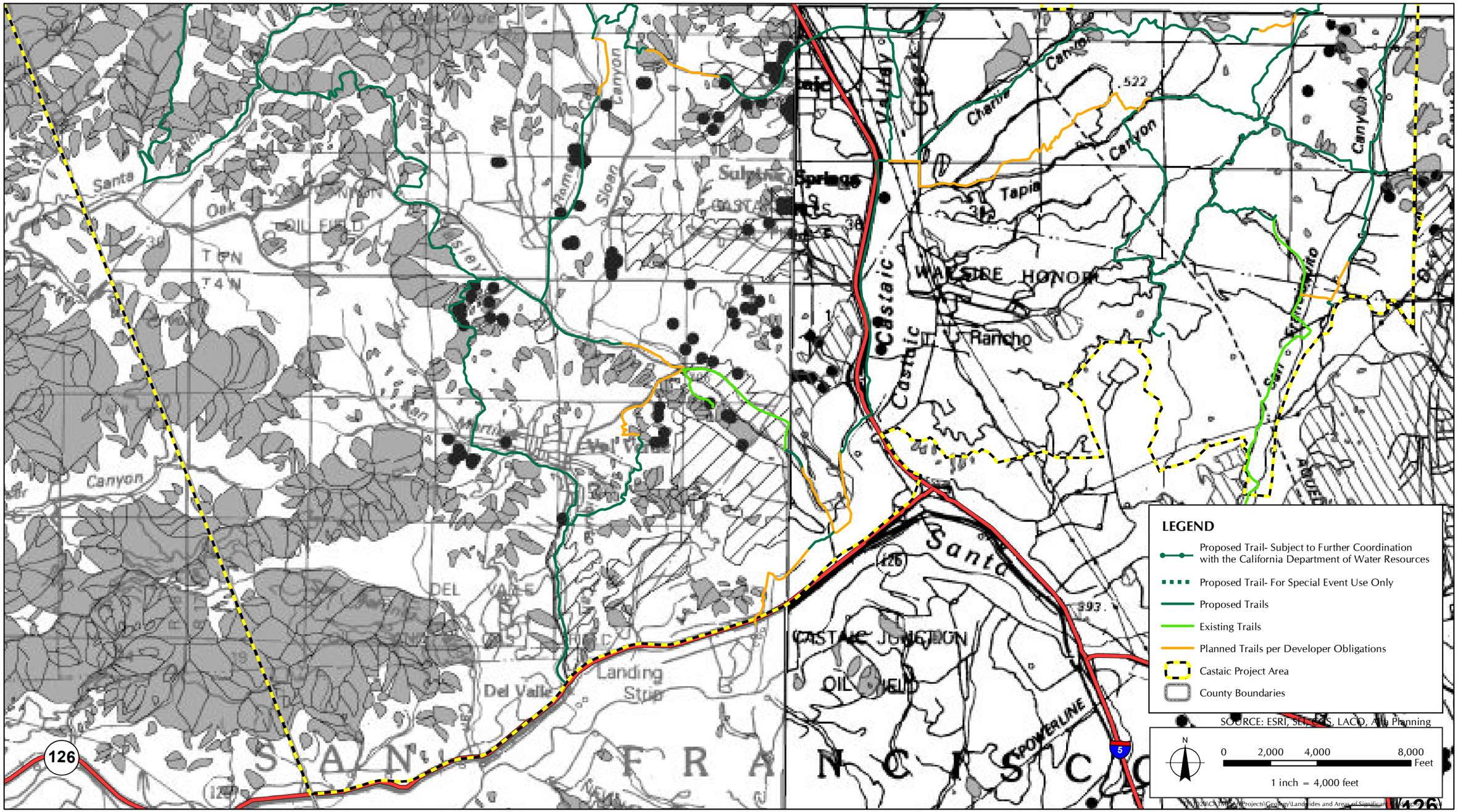
Landslide

Area of significant grading

Tract report with multiple shear tests

FIGURE 6A

Landslides and Areas of Significant Grading- North



Shear test sample location

Landslide

Area of significant grading

Tract report with multiple shear tests

FIGURE 6B

Landslides and Areas of Significant Grading- South

California Environmental Quality Act

The 1970 CEQA ensures that local agencies consider and review the environmental impacts of projects within their jurisdictions. CEQA requires that an environmental document be prepared for projects that are judged in an Initial Study to have potentially significant effects on the environment. Environmental documents must consider and analyze, as deemed appropriate, geologic, soil, and seismic hazards. If impacts are considered potentially significant, recommendations for mitigation measures are made to reduce geologic and seismic hazards to less than significant. This allows early public review of development projects and provides lead agencies the authority to regulate development projects in the early stages of planning.

Natural Hazards Disclosure Act

The Natural Hazards Disclosure Act (effective June 1, 1998), requires "that sellers of real property and their agents provide prospective buyers with a 'Natural Hazard Disclosure Statement' when the property being sold lies within one or more state-mapped hazard areas, including a Seismic Hazard Zone."

The SHMA specifies two ways in which this disclosure can be made:

In all transactions that are subject to Section 1103 of the Civil Code, the disclosure required by subdivision (a) of this section shall be provided by either of the following means:

1) The Local Option Real Estate Transfer Disclosure Statement as provided in Section 1102.6a of the Civil Code
2) The Natural Hazard Disclosure Statement as provided in Section 1103.2 of the Civil Code

The Local Option Real Estate Disclosure Statement can be substituted for the Natural Hazards Disclosure Statement if it contains substantially the same information and substantially the same warning as the Natural Hazards Disclosure Statement. Both the APEFZ Act and the SHMA require that real estate agents, or sellers of real estate acting without an agent, disclose to prospective buyers that the property is located in an APEFZ or SHMZ. There are APEFZ and SHMZ hazards within the Castaic project area.

Local

County of Los Angeles

General Plan Safety Element

California State Law (Government Code 65300) requires that each city and county prepare and adopt a comprehensive, long-term general plan for its physical development. It must contain seven mandatory elements including land use, circulation, housing, conservation, open space, noise, and safety. California Government Code Section 65302.g requires that a general plan contain a "safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mud slides and landslides; subsidence and other geologic hazards known to the legislative body; flooding; and wild land and urban fires." The October 6,

2015, General Plan updates the adopted 1990 Los Angeles County Safety Element; the safety element outlines the above issues and covers the Castaic project area. Proposed activities within the Castaic project area must consider the public health and safety, as well as the safety of County facilities developed in the context of the currently applicable Safety Element.

General Plan Hillside Management Areas and Hillside Design Guidelines

The Hillside Management Areas (HMAs) are defined in the General Plan specifically for the Castaic Community Standards District (CSD) (County of Los Angeles, 2014). Within HMAs there are designated significant primary and secondary ridgelines many of which cross proposed trails within the Castaic project area. Hillside Design Guidelines have been established that are divided into five major design categories containing a variety of sensitive hillside design measures and a corresponding checklist. One of the categories is Grading and Facilities, which has 12 items in the checklist (2.1 through 2.12). Most of these measures would apply more directly to developments with grading disturbance over a somewhat contiguous area (e.g., several acres for residential or commercial uses) and having facilities/buildings within the disturbed areas. These measures could be applied to trails.

Los Angeles County Trails Manual

The adopted May 17, 2011, Los Angeles County Trails Manual outlines various issues affecting trail feasibility (Section 2.5) including geology and soils. Factors include soil erosion, earthquake faults, geologic formation characteristics, slope stability, landslides, and slope gradient. These factors can also affect design methods, construction techniques, and trail maintenance. The stated purpose of the Trails Manual is "to provide guidance to County departments, specifically LACO-DPR, that interface with trail planning, design, development, and maintenance of hiking, equestrian, and mountain biking recreational trails, while addressing physical and social constraints and opportunities associated with the diverse topographic and social conditions that occur in the unincorporated territory of the County. LACO-DPR will use the planning process delineated in the Trails Manual in considering the development of future trails." The Trails Manual was adopted by the Los Angeles County Board of Supervisors on May 17, 2011.

EXISTING CONDITIONS

Geologic Units and Structure in the Castaic Valley and Surrounding Area

Geologic Units

The Castaic project area is located north of the Santa Susana Mountains beginning at the Santa Clara River on the south and extending northward into the foothills of the San Emigdio and Sierra Pelona Mountains. Overall, the Castaic project area is roughly 11.5 miles wide by 12.5 miles high. This portion of the mountains surrounding Castaic Valley rise locally to approximately 3,184 feet amsl (Townsend Peak) with the base of the mountains in the Castaic project area at an elevation of approximately 900 to 1,200 feet amsl along the north edge of the Santa Clara River (USGS, 1995a, 1995b, 1995c, and 1995d).

The mountains immediately surrounding Castaic Valley are underlain by a thick (several thousand feet) sequence of Quaternary, Tertiary and Mesozoic-Precambrian age bedrock, primarily sedimentary with minor igneous and metamorphic bedrock areas not within the Castaic project area. Bedrock is overlain by younger and older alluvial deposits. From oldest to youngest, these

bedrock formations include the quartz diorite-gneiss complex, and the San Francisquito, Castaic, Ridge Basin Group, Monterey/Mint Canyon, Sisquoc/Castaic, Towsley, Pico, and Saugus Formations that are underlain by crystalline basement (Dibblee, 1993, 1996, 1997a, and 1997b). Each bedrock formation is comprised of rock layers alternating between sandstone, claystone, siltstone, shale, and conglomerate. Table 4, *Approximate Trail Lengths within Each Geologic Unit*, represents a very rough estimate of both the area represented by each formation within the Castaic project area (right column), and the miles and percentage of total trail overlying each formation (second and third columns, respectively).

Quaternary (Holocene through early Pleistocene) landslide, stream channel, and older surficial deposits cover the Tertiary bedrock formations. Holocene stream channel deposits cover nearly one-quarter of the Castaic project area at the edges of the hills and mountains, in the bottom of canyons, and on some slopes, and underlie approximately one-quarter of the proposed trails. Older surficial deposits cover very small areas along the edges of Castaic Valley between the valley floor and the hills. These alluvial deposits consist predominantly of sand, silt, and gravel/boulders, along with smaller amounts of clay-rich materials. Landslide deposits are scattered throughout the area and form a very small portion of the overall deposits. They consist of bedrock and surficial deposits that have moved downslope by gravity and are inherently unstable.

Geologic Structure

Geologic structure includes folding, tilting, and faulting of the geologic units. The low hills and mountains surrounding the Castaic Valley are tectonically active and have been subject to these structural effects for millions of years. Previous geologic mapping (Dibblee, 1993, 1996, 1997a, and 1997b) indicates numerous generally east-west trending named and unnamed fold structures (anticlines [up-folds] and synclines [down-folds]) within the Castaic project area. From north to south these are: Ridge Basin Syncline, Town Syncline, Loma Verde Anticline, North Hasley Canyon Syncline, Oak Canyon Anticline, Santa Felicia Syncline, and Ramona Anticline. Therefore, the geologic structure is very complex with numerous faults (discussed below), fractures, and disturbed bedrock layers. Bedrock formation bedding (dip) angles are generally to the north and south, and range from very shallow, less than 20 degrees into and out of slopes, to vertical (90 degrees). Due to the relatively recent nature of tectonic activity, even the older alluvium units may be folded and faulted. Often fault zones form highly fractured zones in bedrock that are weaker than adjacent unfaulted materials. The orientation of these fractures cannot be easily predicted and can affect local slope stability.

TABLE 4
APPROXIMATE TRAIL LENGTHS WITHIN EACH GEOLOGIC UNIT (DIBBLEE AND OTHERS)

Formation Name (Map Symbol) (Age)	Estimated Trail in Each Formation		Formation Description (Very Rough Percentage of Aerial Coverage of Each Formation within the Multi-Use Trails Area)
	Length in Miles (+/−10%)	Percent of Total Trail	
Alluvium (Qa/Qg) and Artificial fill (af) (Holocene)	22	28	Gravel and sand, generally loose to medium dense; af is a very small portion of the overall length for this formation (≤25%)
Landslide Deposits (Qls) (Holocene)	1	1.5	Variable depending upon the underlying bedrock formation, generally siltstone, sandstone, and claystone/shale (≤1% based on Dibble and others; CDMG maps show ≤15%)
Older Dissected Surficial Sediments (Qoa) (Pleistocene)	0	0	Gravel with sand (≤1%)
Saugus Formation (QTs) (Pliocene)	24	31	Light gray pebble conglomerate, sandstone, and minor siltstone (includes a small percentage of claystone) (≤35%)
Pico Formation (Tp) (Pliocene)	4	5	Gray siltstone and claystone, crumbly and light gray to tan sandstone, fine to medium grained and thickly bedded (≤25%)
Towsley Formation (Tto) (Pliocene-Miocene)	4	5	Gray claystone and siltstone, vaguely bedded, crumbly and a basal gray conglomerate with rounded cobbles (≤10%)
Castaic and Sisquoc Formations (Tc/Ts) (Pliocene-Miocene)	18	23	Gray clay shale with thin sandstone beds, and gray-brown bedded clay shale, crumbly where weathered with white fine grained sandstone (≤10%)
Monterey and Mint Canyon Formations (Tm/Tmc) (Miocene)	4	5	Gray conglomerate, crudely bedded, with rounded to subrounded pebbles, cobbles, and some boulders, and white shale, thinly bedded and calcareous (≤15%)
Castaic Formation (Tc) (Miocene)	1	1.5	Gray clay shale or claystone, thinly bedded, crumbly, with white sandstone, and interbedded gray breccia, crudely bedded with gneiss and granite rocks to 5-feet (≤5%)
Ridge Basin Group (Tvb) (Miocene)	0	0	Gray clay shale, claystone, and siltstone with gray breccia (see Tc above) (≤1%)
San Francisquito Formation (Tsf) (Paleocene-Cretaceous)	0	0	Sandstone, clay shale, siltstone, and conglomerate (≤1%)
Quartz Diorite - Gneiss Complex (qd/gn) (Late Mesozoic-Precambrian)	0	0	Light to medium gray quartz diorite and gneiss, medium grained, fractured, weathered, moderately hard to very hard (≤5%)
	78	100	

Geologic Conditions

The review of available documents describing the geology of the Castaic project area indicates the Castaic project area is underlain by (1) younger Quaternary-age (Holocene) alluvium/surficial sediments (map symbols Qa and Qg-Holocene), (2) landslide deposits (Qls-Holocene), (3) older Quaternary-age (Holocene-Pleistocene) alluvium/surficial sediments (Qoa and Qos), (4) Quaternary-age (Pleistocene) soft bedrock formations (QTs), (5) Tertiary-age hard to very hard sedimentary bedrock formations, and (6) an older (Cretaceous to Precambriam) hard to very hard sedimentary, plutonic, and metamorphic bedrock formations (Dibblee, 1993, 1996, 1997a, and 1997b; Table 4). The young alluvium and landslide deposits are estimated to make up less than 25 percent (Qa <25 and Qls <1) of the Castaic project area, while older alluvium is estimated to make up less than 1 percent and soft bedrock less than 70 percent of the deposits, with the Cretaceous to Precambrian harder bedrock formation making up the remaining less than 5 percent of the Castaic project area. These are very rough approximations.

Most geologic formations are covered by some thickness of soil and colluvium that can range from several inches to several feet. Some soils within the Castaic project area have been modified and disturbed by grading and earthmoving associated with development; however, most soils are undisturbed in the Castaic project area. Available soil maps and reports suggest that most soil materials in the Castaic project area are rich in sand, clay, and silt, with much smaller amounts of gravel- and cobble-rich deposits. A very small percentage of artificial fill is found in the Castaic project area associated with man-made structures (e.g., the Interstate-5 [I-5] and the Castaic Dam) and few, if any, large deposits are present in the hillside and mountainous areas. Areas of active or former drilling operations associated with the oil fields would have local areas of artificial fill.

The geologic units are described briefly below from youngest through oldest formations. This analysis uses unit names and symbols from Dibblee (1993, 1996, 1997a, 1997b). The California Division of Mines and Geology (CDMG, currently CGS) seismic hazard maps (1997a, 1997b, 1998, 2002a, 2002b, 2003a, 2003b) have detail in their subdivision of the surficial/alluvial formations and used different symbols for these same units.

Quaternary Formations

af – Artificial Fill. Artificial fill is found along the I-5, and SR-126, around small business or residential areas, at three crossings of the I-5, likely in some canyon bottoms, and along roads and trails where grading was necessary for construction. These fills may be engineered and compacted to modern standards where associated with engineered facilities or may be undocumented with unknown properties in other areas. In general, it can be expected that the engineered fill materials will be predominantly sand, silt, and fine gravel due to the ease of compaction and resulting stability. Locally present undocumented fills may contain larger materials (cobble, boulders) and trash (organic matter, metal, concrete, wood, etc.). These materials would not be suitable for use in future trail development projects.

Qls – Landslide Deposits. Landslide deposits are present within the Castaic project area bedrock formations and are considered unstable masses. These deposits result from mass movements of bedrock materials downslope due to some or all of (1) out-of-slope bedding planes, (2) weak material properties, and (3) steep slopes. Existing maps (Dibblee, 1993, 1996, 1997a, and 1997b; CDMG, 1997a, 1997b, 1998, 2002a, 2002b, 2003a, 2003b; Wilson and others, 1997; Table 4) show numerous landslides within the Pico, Sisquoc, Towsley, Castaic, Monterey/Mint Canyon, and Saugus Formations described below. Many of these landslide masses have their upper areas

located immediately below prominent ridgelines with some crossing existing roads or trails. The CDMG seismic hazard maps referenced above show landslides from various sources and indicate a far greater number of landslides than Dibblee. Since the sources vary, there is not complete agreement between the two maps.

Qa and Qg – Young Alluvial Deposits (Holocene). The Qa and Qg deposits exist within the Castaic project area along major and minor canyons (e.g., Castaic Valley, Charlie, Tapia, Villa, Violin, Sloan, San Francisquito, Palomas, Martinez, Hasley, Wayside, San Martinez Grande Canyons, and the Santa Clara River). The map view of these deposits typically exhibits irregular linear ribbons of varying width, many of which are crossed or followed by proposed trails. Qa and Qg deposits generally consist of unconsolidated bouldery, cobbley, gravelly, sandy, or silty alluvial deposits on inactive and recently active alluvial fans.

Qoa and Qos – Older Alluvial Deposits (Late-Middle Pleistocene). Qoa is the undifferentiated older alluvial fan deposits and Qos is the older sandy alluvium derived from the Saugus Formation. These deposits occur from Castaic Dam south along both sides of the I-5 associated with and overlying the Saugus Formation within the Castaic project area (e.g., near the mouths of Charlie, Tapia, Villa, and Hasley Canyons). The map view of these deposits typically shows relatively small, irregular masses, some of which are crossed by trails near these canyons in the central portion of the Castaic project area (Dibblee, 1993, 1996, 1997a, and 1997b). Qoa consists largely of calcite (caliche) cemented angular fragments of bedrock from the Castaic and Saugus Formations, as well as silt and sand deposits on incised alluvial fans; surfaces can show moderately to well-developed pedogenic soils.

Tertiary Bedrock Formations

QTs – Saugus Formation (Pliocene). QTs (Saugus Formation) is the most abundant single geologic unit and is found over most of the Castaic project area south of Castaic Dam and east of approximately Martinez and Hasley Canyons. The formation consists of slightly consolidated, poorly sorted, coarse-grained, cross-bedded sandstone and pebble conglomerate with lesser amounts of soft siltstone and claystone overlying Pico Formation.

Tp/Tps – Pico Formation (Pliocene). Pico Formation consists of white to light gray poorly cemented fine- to very fine-grained sandstone (Tps) and claystone-siltstone (Tp). It is found in the western and northwestern portions of the Castaic project area associated with Sisquoc and Monterey Formations as described below. The main distribution of Pico is in Santa Felicia, Oak, Hosler, Martinez, and Santa Martinez Canyons, and in the upper portions of Romero and Hasley Canyons.

Ttog/Ttoc – Towsley Formation (Early Pliocene – Late Miocene). The Towsley Formation (Ttog/Ttoc) is found in mainly north and just south of Santa Felicia and Canton Canyons, and just south of Violin Canyon in the northwest and central portions of the Castaic project area. Ttoc consists of predominantly gray to brown thin-bedded claystone and siltstone, contains interbeds of very fine-grained to coarse-grained sandstone. Ttog gray conglomerate, poorly to moderately cemented with pebbles and cobbles.

Tsq/Tc – Sisquoc and Castaic Formations (Miocene). The Sisquoc (Tsq) and Castaic (Tc) Formations are found in extensive exposures around Castaic Lake, between Castaic Lake and I-5, and in the west-central area adjacent to Devil and Santa Felicia Canyons. Overall this represents the northern and western portions of the Castaic project area. Sisquoc Formation consists of a dark

gray to brownish gray clay-rich shale that weathers to gravel- and cobble-size rock fragments. This portion of the Castaic Formation consists of gray clay shale with thin sandstone beds.

Tm/Tmc – Monterey and Mint Canyon Formations (Late to Middle Miocene). The Monterey (Tm) and Mint Canyon (Tmc) Formations consist of dark gray brown siliceous shale that is hard, brittle, fractured and contains chert. Tm is exposed just east of the National Forest boundary along Devil and Palomas Canyons in the northwestern Castaic project area.

Tpv/Trr/Tc – Ridge Basin Group and Castaic Formation (Late Miocene). The Ridge Basin Group (Tpv/Trr) and Castaic Formation (Tc/Tcs/Tcgs) are composed of clay shale, claystone, sandstone, some conglomerate, and areas of the Violin Breccia (Tvib) with quartz diorite and gneiss rock fragments up to 6 feet in diameter. Exposures of Tvib are limited to the area southwest of the I-5 freeway and Tc is found in isolated exposures southeast of Castaic Lake to the east boundary of the Castaic project area.

Tsf – San Francisquito Formation (Late Cretaceous to Paleocene). The San Francisquito Formation (Tsf/Tsfa/Tsfc) is found in limited exposures in the far northern/northwestern edges of the Castaic project area. Tsf is a claystone, sandstone, and conglomerate in a gray sandstone matrix.

qd/gn – Quartz Diorite – Gneiss Compex (Precambrian to late Mesozoic). The Quartz Diorite – Gneiss Complex (qd/gn) consists of a light to dark gray banded gneissthat extends into the northwestern portion of the Castaic project area from the National Forest boundary along the southwest side of Palomas Canyon.

USDA Soil Classifications

There are nearly 60 U.S. Department of Agriculture (USDA) soil classification types within the Castaic project area (USDA, 2016). Considering only those soils comprising more than one percent of the Castaic project area (representing over 90 percent of the area) reduces the number of soils to 18. Further considering only those soils above 4% reduces the number of soil units to eight (representing 78 percent of the area). The eight (by soil symbol, name, and approximate portions of the 78 percent area) that comprise most of the area are:

- CmE Castaic-Balcom silty clay loams, 15 to 30 percent slopes (4.2 percent)
- CmF Castaic-Balcom silty clay loams, 30 to 50 percent slopes (11.9 percent)
- CmF2 Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded (14.5 percent)
- CmG2 Castaic-Balcom silty clay loams, 50 to 65 percent slopes, eroded (4.7 percent)
- CnG3 Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded (8.4 percent)
- HcC Hanford sandy loam, 2 to 9 percent slopes (4.9 percent)
- MhF2 Millsholm rocky loam, 30 to 50 percent slopes, eroded (5.2 percent)
- ScF2 Saugus loam, 30 to 50 percent slopes, eroded (24.2 percent)

The USDA website can provide general ratings (limitations and no limitations) for trail suitability that are based on the properties of each soil type that affect trafficability and erodibility. The properties are "stoniness", depth to a water table, ponding, flooding, slope, and the texture of the surface layer. An erosion factor K is provided to indicate the susceptibility of a soil to sheet and rill

erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. The estimates are modified by the presence of rock fragments. In general, the Castaic project area soils indicate substantial trail related limitations due to slope and the soil texture.

An attempt at a rough correlation between soil type and geologic unit indicates that while the soil units do cross geologic contact lines in a significant way, the following correlation should be valuable in determining the most common relationships.

- Tps and Tc correlate most to CmE (4.2 percent)
- Tps and Tp correlate most to CmF (11.9 percent)
- QTs correlates most to CmF2 (14.5 percent)
- Tps correlates most to CmG2 (4.7 percent)
- Tps and Tc correlate most to CnG3 (8.4 percent)
- Qa correlates most to HcC (4.9 percent)
- Tps and Tc correlate most to Mh (5.2 percent)
- QTs correlates most to ScF2 (24.2 percent)

Since Tp/Tps (Pico) and Tc (Castaic) occupy higher ground than QTs (Saugus) and Qa (young alluvium). It appears weathering products, past alluvial fan/wash formation, and subsequent erosion/down-cutting have led to the formation of rather homogeneous older, finer grained soils over Tp/Tps/Tc and the other older formations. In contrast, younger coarser grained soils former over QTs and Qa. The soil units making up the >1 percent and <4 percent coverage are nearly all in the shallower (0 to 9 percent) sloping areas.

Surface Subsidence and Settlement

Surface subsidence/settlement may occur in the Castaic project area where it is found to have soil susceptible to expansion/contraction (very clay-rich soils) and possibly hydroconsolidation (fine-grained granular soils). When present, moderate to high expansion indices indicate that there is a substantial amount of clay in the soils and repeated episodes of wetting and drying will cause distress to structures in contact with such soils. Consolidation (and long-term settlement) is most prominent in clay-rich and silt-rich soils, resulting from loading pressure created by overlying structures, including buildings or artificial fill. This added weight could collapse internal void spaces within the soils, squeeze out the water, and reduce the soil volume causing overlying structures to settle and possibly become damaged. This consolidation and settlement can be much more dramatic under severe seismic shaking (dynamic settlement). Hydroconsolidation will also lead to settlement, but includes the addition of water into the soil structure causing more rapid and more substantial settlements. Based on the generally clayey nature of the surface soils, it is concluded that expansion indices should be moderate to high. Non-engineered artificial fill and younger alluvial deposits are likely poorly consolidated and could be subject to hydroconsolidation.

Topography, Slopes, and Major Drainage Courses

The Castaic project area is covered by four USGS 15-minute quadrangle maps; clockwise from the northeast these are the Val Verde (1995a), Newhall (1995b), Warm Springs Mountain (1995c), and Whitaker Peak (1995d) maps. Surface elevations in the Castaic project area range from approximately 2,756 feet above mean sea level (amsl) at Townsend Peak, to approximately 863

feet amsl at the Ventura County line and the Santa Clara River at the south edge of the Castaic project area. The Castaic project area drains to the south, west, and east. These drainages are shown on Figure 7, *Multi-Use Trails Plan Area Hydrology Map*.

The Castaic project area has numerous primary and secondary drainages. West of Castaic Valley and the I-5 Freeway the primary drainages from north to south include: Violin, Palomas, Santa Felicia, Devil, Romero, Sloan, Hasley, Oak, Lechier, San Martinez Chiquito, Holser, and San Martinez Grande. These empty into either Castaic Valley or the Santa Clara River. East of Castaic Valley and the I-5 Freeway from north to south are: Grasshopper, Charlie, Tapia, Wayside, and San Francisquito Canyons all of which also empty into either Castaic Valley or the Santa Clara River.

Each of these canyons has corresponding ridgelines separating the adjacent canyons. Many of these ridgelines have been classified as significant primary or secondary ridgeline within the Hillside Management Area defined for the Castaic CSD. Ground surface slopes in the Castaic project area are relatively steep with most greater than 20 percent in the upper elevation hills and mountains, reaching greater than 40 percent adjacent to ridges. Slopes in the lowest foothills immediately adjacent to the mountains, in canyons, valley and active drainages designated above are generally less than 20 percent and predominantly less than 6 percent (e.g., Castaic Valley and Violin, Hasley, San Martinez Grande, and San Francisquito Canyons). Sensitive hillside design measures (2.1 through 2.12) would be applied to the trail and facilities (e.g., restrooms) designs to minimize the impact on the ridgelines.

Within the Castaic project area, most drainage areas form relatively narrow canyons at higher elevations and transition to the broader floodplains. With regard to drainage area size (USGS, 1995a, 1995b, 1995c, and 1995d), the larger drainages in the Castaic project area are: Grasshopper, Violin, and Palomas from north to south; Romero and Hasley from west to east; San Martinez Grande/Chiquito from west to east to south; Charlie, Tapia, Wayside, and San Francisquito Canyons from east to west; and Castaic Valley from north to south. All eventually empty into the Santa Clara River.

Faulting, Earthquakes, and Ground Shaking Potential

Plate tectonics and the forces that cause these plates to move within the earth's crust affect all of southern California geology and seismicity. Faults are formed at the plate boundaries and other stress points within tectonic plates. Faults adjacent to, within, and beneath the County and City of Los Angeles and San Fernando Valley areas may be classified as inactive, potentially active, or active (CGS, 2010). Faults classified as inactive (black lines with no demonstrated movement in the past 2 million years) are of no present concern as earthquake sources and are not discussed further. Potentially active faults (green) show evidence of Quaternary movement and may be possible sources of large earthquakes (magnitude [M] 6.0 to 7.0), but no data are known to conclusively demonstrate Holocene (within the past 10,000 to 1,200 years) fault movement. Active faults (orange and red [historically active]) are of most concern for earthquake generation and fault rupture potential since they have documented Holocene fault movement or are clearly associated with historic seismicity. APEFZ maps delineate active faults and potentially active faults considered by the state to be "sufficiently active" and "well-defined." Fault Rupture Study Areas (FRSA) are defined by the City of Los Angeles in addition to the APEFZs where fault rupture potential is a concern, but less well known than required for the APEFZ designation process.

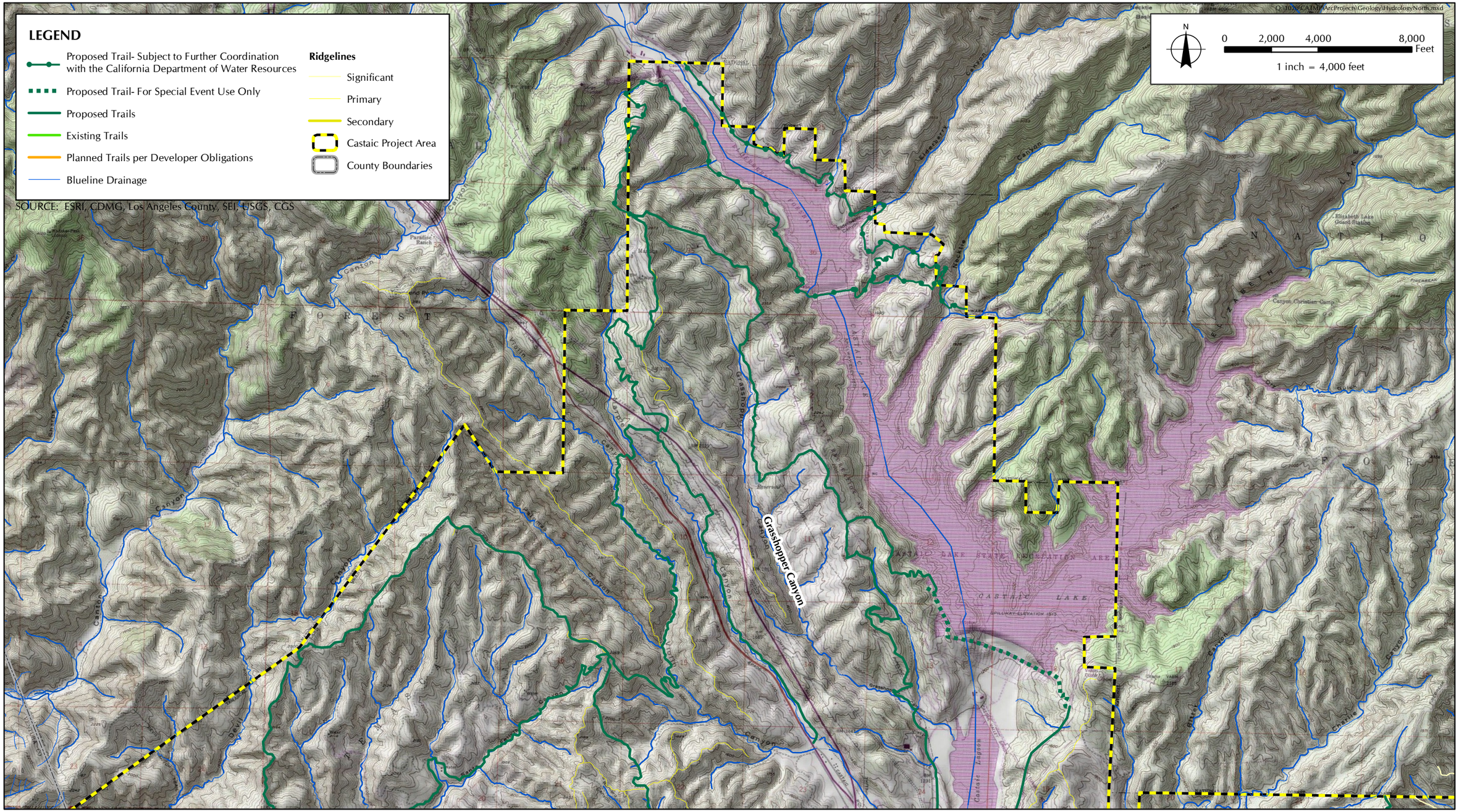


FIGURE 7A

Multi-Use Trails Plan Area Hydrology Map- North

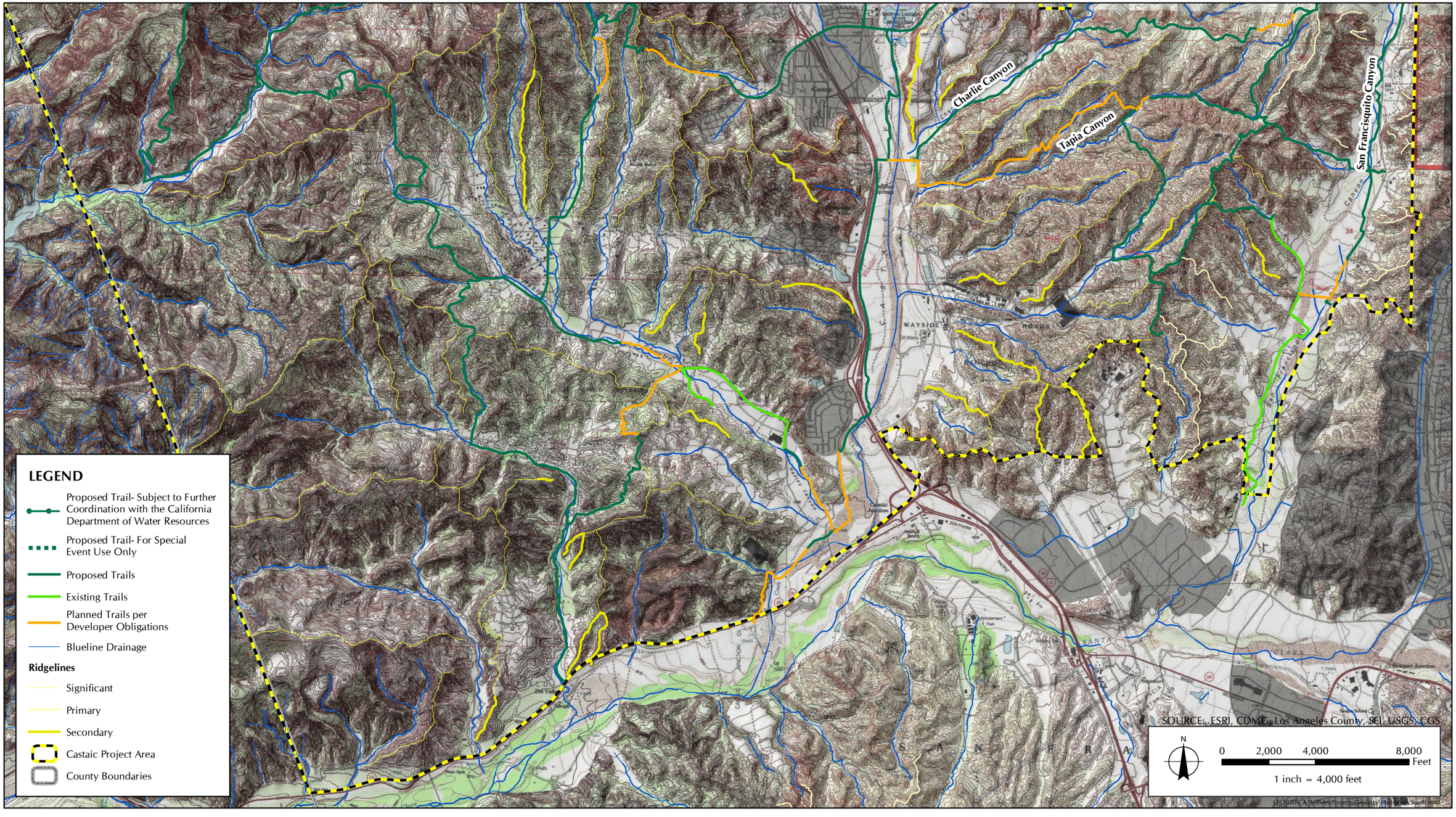


FIGURE 7B

Multi-Use Trails Plan Area Hydrology Map- South

Numerous regional and local faults contribute to the earthquake ground shaking potential for the Castaic project area. Faults along rocks that slip horizontally past one another are strike slip faults (e.g., San Andreas, San Jacinto, Elsinore, Newport-Inglewood), while mainly vertical movement is found along normal, as well as reverse and thrust faults (e.g., Santa Susana, Sierra Madre-San Fernando, Santa Monica-Hollywood, Palos Verdes, Raymond, Verdugo). Abrupt movements along faults cause earthquakes deep in the crust and may result in subsurface fault rupture or surface deformation (folding) along buried (blind) thrust faults (e.g., Northridge Hills, Puente Hills, and Elysian Park). Mountains built by these processes include the Transverse Ranges (e.g., Santa Susana, San Emigdio, Topatopa, San Gabriel, San Bernardino) and the Peninsular Ranges (e.g., Santa Ana, San Joaquin Hills, Palos Verdes Hills, Signal Hill). This seismo-tectonic setting has been a part of the evolution of the Los Angeles County landscape for the past 5 million years or so.

Surface faults of most concern for the Castaic project area with respect to strong ground shaking are the San Fernando, Oak Ridge, San Cayetano/Holser/Del Valle, Garlock, White Wolf, San Gabriel, and San Andreas faults. Other smaller faults, such as the Pine Mountain, Big Pine, Santa Ynez, and Clearwater, are of lesser concern due to their lower likelihood of independently generating moderate to large earthquakes. Because they are buried, there remains more uncertainty with regard to the earthquake characteristics of blind thrust faults (e.g., Puente Hills and Northridge Hills). Since the San Fernando, Garlock, White Wolf, San Gabriel, and San Andreas faults are within or very near the Castaic project area, they are considered the most significant for potential ground rupture and differential uplift. The San Gabriel and San Cayetano/Holser/Del Valle faults pass through the Castaic project area. The potential for earthquake activity and ground rupture, though possible, are not likely for the San Gabriel and San Cayetano/Holser faults (see Figure 8, *Earthquake Fault Activity*).

The San Gabriel and San Cayetano/Holser faults, as delineated by the CGS (2010)), are the only fault zones of concern to Castaic project area with regard to ground rupture. The fault zones within or very near the Castaic project area, which are considered as potential ground rupture or earthquake ground shaking hazards, are discussed briefly below.

San Gabriel Fault

The San Gabriel fault zone is a right-lateral strike slip fault that traces a long arcuate path through the Transverse ranges. It is at least 72 kilometers long. Several echelon strands, in zones up to 0.5 kilometer wide, comprise this fault zone, which crosses the Castaic project area. Both Late Quaternary (between Newhall and Big Tujunga Canyon) and Holocene (near Castaic) fault offsets have been documented along various segments (Ziony and Yerkes, 1985). The A-P fault zone portion of the San Gabriel fault passes through the Castaic project area located within the southeastern-most portion between Castaic Valley and San Francisquito Canyon (CGS, 1995). An average slip rate of 1 to 5 millimeters (mm) per year is estimated by the Southern California Earthquake Center (2016), and the fault is capable of an M7.2 earthquake.

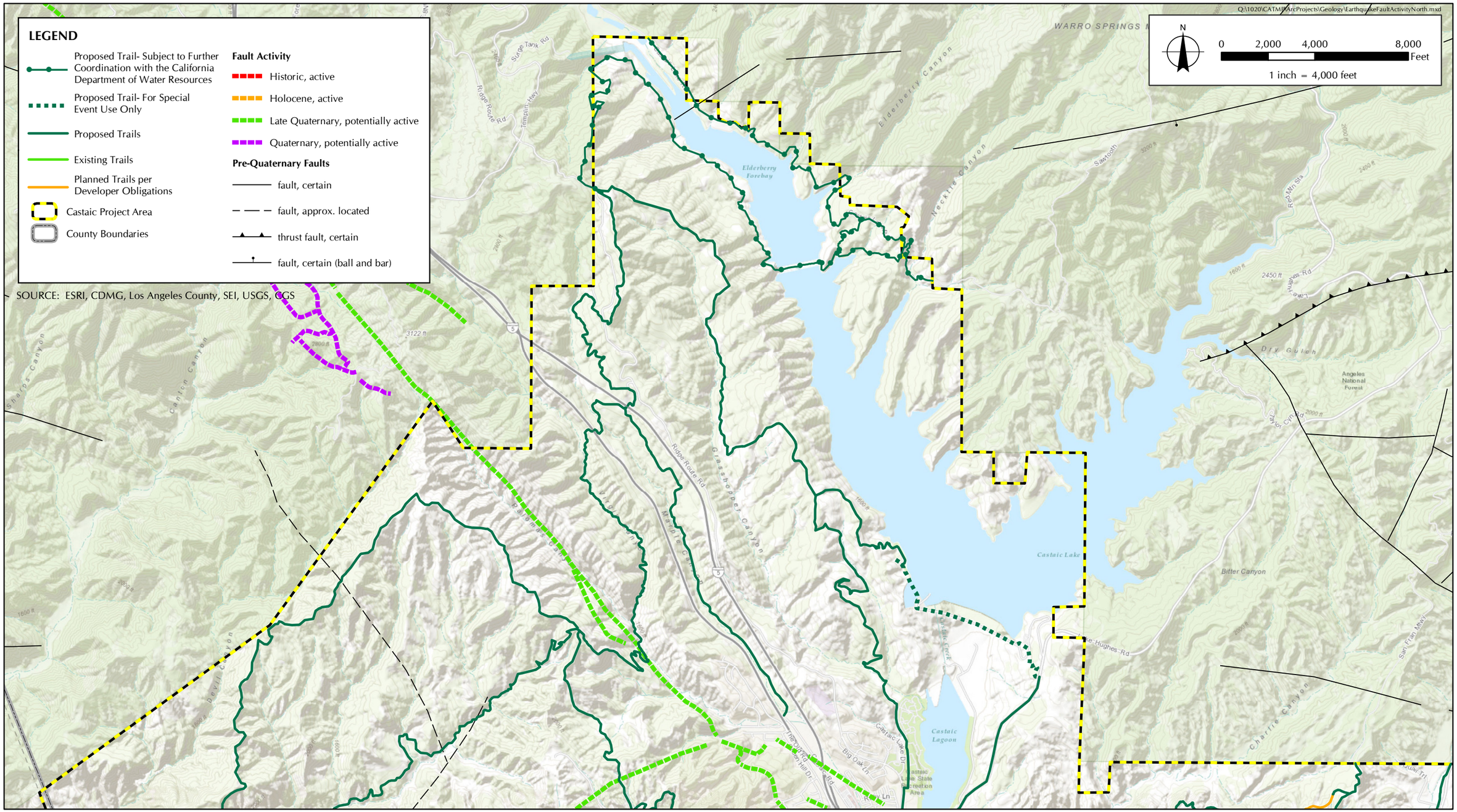


FIGURE 8A

Earthquake Fault Activity- North

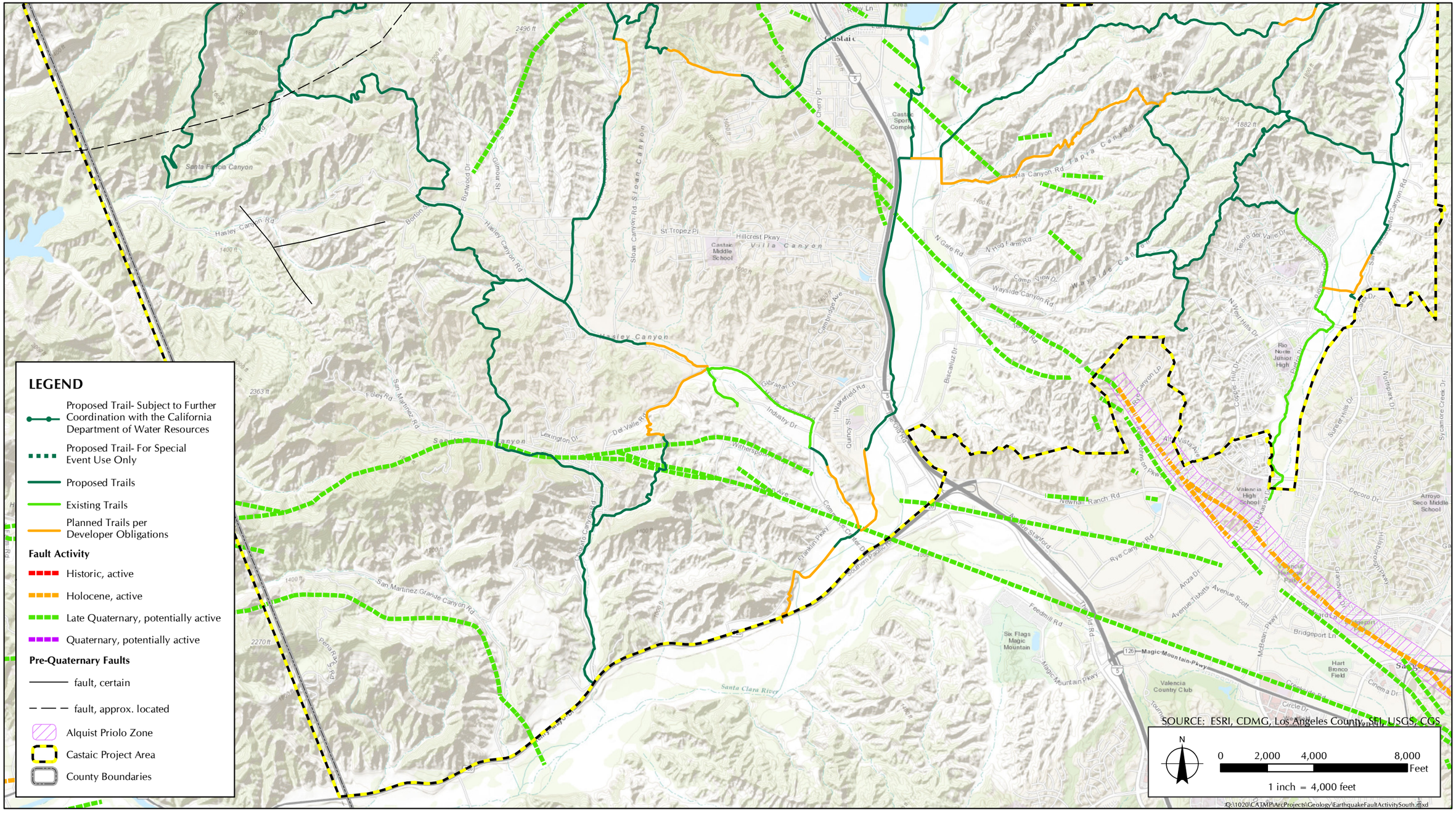


FIGURE 8B

Earthquake Fault Activity- South

Sierra Madre-San Fernando Fault

The Sierra Madre-San Fernando fault zone trends nearly east-west through the southern Transverse Ranges. The San Fernando segment is about 18 kilometers long and is one of five major strands comprising the overall Sierra Madre fault zone. The site is approximately 12 miles northwest of this fault zone. This segment of the fault zone is the source of the 1971 M6.6 San Fernando earthquake. An average slip rate of 1 to 3 mm per year and a future earthquake magnitude range of 6.7 for the San Fernando segment of the Sierra Madre fault zone are estimated by the CGS (2004b) for this A-P fault zone.

San Andreas Fault Zone (Mojave and 1857 Rupture Segments)

The San Andreas fault zone is considered the boundary between two major crustal plates (Pacific and North American). Historic earthquakes along the San Andreas fault zone have caused extensive surface rupture and major damage to structures and engineered facilities. The San Andreas fault zone (Mojave and 1857 Rupture segments) is located about 13 miles northeast of the site. The overall fault zone trends generally northwest for almost the entire length of California, from Cape Mendocino south to beyond the Mexican border. These two segments of the fault are approximately 103 and 345 kilometers long, respectively, extending north from Cajon Pass. Past work estimated the recurrence interval for an M8.0 earthquake along the entire fault zone is between 50 and 200 years, and a 140- to 200-year recurrence interval for major (M7.0 to 7.9) to great (M8.0 or larger) earthquakes along the southern fault zone segment. The 1857 M8.0 Fort Tejon earthquake was the last "great" earthquake along the San Andreas fault zone near Southern California. An average slip rate of about 30 mm per year (+/– 7 mm) and a future earthquake magnitude range of 7.4 and 7.8 for the Mojave and 1857 Rupture segments of the San Andreas fault are estimated by the CGS (2004b).

San Cayetano/Holser/Del Valle Fault Zone

The San Cayetano is a north-dipping reverse/thrust fault, is approximately 45 kilometers long, has a seismic slip rate of between 1.3 and 9 mm/year, ruptured less than 5,000 years ago, and is capable of producing an M6.5 to 7.3 earthquake. The fault lies west of the project area and appears to merge with the Holser and DelValle faults that are within the Castaic project area.

The Del Valle and Holser faults appear to be eastward extensions of the San Cayetano fault. The Del Valle fault trends eastward from the Los Angeles-Ventura County line and turns southward before crossing San Martinez Grande Canyon. The eastward-trending part of the fault trace is a southward dipping reverse fault and the southward-trending part is thought to be a tear fault. To the north of the Del Valle the Holser fault is a southward dipping that can be traced to Castaic Valley and is inferred to intersect the San Gabriel fault. The Holser fault is also a north dipping reverse fault and is approximately 20 kilometers long. An average slip rate Holser fault is 0.4 mm per year (+/–0.4 mm), and future earthquake of 6.5 are estimated for this fault zone (CGS, 2004b).

Surface Faulting / Ground Rupture Hazard

The anticipated (average) amount of surface fault rupture on any given fault trace for the maximum earthquake can be inferred from measurements of offsets caused by past earthquakes. In general, these estimates range from 0 to about 1 foot for magnitudes under 6.0 and from 1 foot to 10 feet or more for magnitudes between 6.0 and 7.5. Many variables affect the amount of surface rupture, including the depth of the earthquake hypocenter where the strain energy is released. Site-specific

study is normally conducted to refine such estimates for a fault segment at a given project site.

The estimated earthquakes for Holser and Del Valle faults suggest a potential for 3 to 6 feet of vertical and lesser horizontal surface displacements. An estimate of the range of displacements for the San Gabriel fault would be larger, potentially as much as 10 to 20 feet. Lacking specific analysis, these offsets are considered representative of similar active reverse faults and strike slip faults in the vicinity of the Castaic project area. In addition, smaller disruptions from co-seismic uplift, ground tilting, and ground disturbance could result.

Earthquakes and Potential Ground Shaking

Violent shaking occurs not only next to the earthquake's epicenter, but for many miles in all directions. The Modified Mercalli Intensity (MMI) Scale is a qualitative scale of how earthquakes are felt by people and how they affect buildings. It is a 12-point scale ranging from Intensity I, which is rarely felt by people, to Intensity XII, where damage to structures is total and objects are thrown into the air. An acceleration of 0.35 to 0.65g corresponds roughly to an intensity of VIII on the MMI Scale (Wald and others, 1999). Several earthquakes in the region within the last 200 years are estimated to have caused Intensity VIII ground shaking on the site. In an Intensity VIII earthquake damage is slight in specially designed structures; ordinary substantial buildings are damaged considerably and partially collapse; and damage is great in poorly built structures. Historic earthquakes in the region estimated to have caused significant ground shaking on the site include the M7.5 1952 Kern County/Tehachapi Earthquake, the M6.6 1971 Sylmar Earthquake, and the M6.7 1994 Northridge Earthquake.

Based on the fault discussed above and a review of estimates from seismic hazard mapping for California (CGS, 2016) the Castaic project area peak ground acceleration (PGA; what is experienced by a particle on the ground) with a 10 percent chance that this acceleration may be exceeded within a 50-year period for the central portion of the Castaic project area, is approximately 0.52g (g = the force of gravity) considering typical soft bedrock ground conditions of the area.

Groundwater

The vast majority of the Castaic project area is underlain by bedrock formations that store and transmit groundwater in permeable sedimentary beds such as sandstone, conglomerate, and siltstone, and through fractures caused by faulting, uplift, and folding of these older units. The saturated bedrock layers usually produce springs and seeps in the hillsides and higher canyon areas or discharge into the larger canyon alluvial materials. In the larger drainages alluvial sand, gravel, and silt store and transmit water laterally down gradient toward the centrally located Castaic Valley and the Santa Clara River on the south.

Historically highest groundwater depths are summarized by the CDMG (1997a, 1997b, 1998, 2002a, 2002b, 2003, and 2003b) in studies to evaluate the liquefaction potential in the Castaic project area; these data do not continue into the bedrock or narrower canyon alluvial areas. Water levels in the Castaic project area vary generally between zero and 25 feet, but predominantly are around 10 feet deep. These data do not preclude the possibility that some localized shallow "perched" groundwater could be encountered in areas immediately adjacent to the San Gabriel, Holser, and Del Valle faults. It is most likely that "perched" water zones would be associated with springs or seeps, and occurrences of water in these areas would be seasonal. Such occurrences would not likely be significant on ridgelines.

It is understood that trail-related facilities would include restrooms that would rely on natural soil seepage and infiltration potential. The alluvial/existing drainage areas will nearly all have groundwater in the 10- to 20-foot depth range suggesting that local contamination of seepage could reach the groundwater surface. Bedrock and older alluvial deposits are elevated above the existing drainages with groundwater correspondingly deeper or not present at all due to the low material permeabilities. Restroom facilities should be planned in locations away from the existing drainages and at elevations several tens of feet above these drainage elevations.

Liquefaction, Earthquake Induced Landslides, and Mudflow

Liquefaction

Liquefaction occurs when saturated, cohesionless (low relative density) materials (usually sand or silty sand) are transformed from a solid to a near liquid state. This phenomenon occurs when moderate to severe seismic ground shaking causes pore-water pressure to increase. The expected level of ground shaking in the Castaic project area is high enough to initiate liquefaction. Liquefaction can cause overlying structures (e.g., bridges, buildings, storage tanks) to settle non-uniformly, and buried structures (e.g., fuel tanks, pipelines) to float. In either situation, severe damage to the structure is highly likely.

In addition to sufficiently high seismic shaking levels, the two other key conditions conducive to liquefaction, shallow groundwater and cohesionless sands, are potentially present within several portions of the Castaic project area. It is generally considered that there is a low potential (although there may be some) for liquefaction where water is greater than about 40 feet below the ground surface; there is a very high potential where less than 10 feet.

There are three maps showing potential liquefaction areas in the Castaic project area (CDMG, 1998, 2002a, and 2003a), with no coverage of the Warm Springs quadrangle covering the northeast area. The representation of liquefaction potential presented on Figure 9, *Earthquake-Induced Landslides and Liquefaction* (CDMG, 1997a, 1997b), considers the maps prepared by the CDMG (green shading); the line designating liquefaction areas corresponds to the 40-foot groundwater depth contour, although groundwater is not shown to be less than 25-feet deep as historic highs. Figure 9 shows the more extensive areas in and adjacent to the Castaic Valley and the Santa Clara River Valley, as well as the more limited areas of liquefaction potential in the primary canyons Hasley, Romero, Santa Felicia, San Martinez Chiquito and Grande, and San Francisquito discussed earlier.

Earthquake-Induced Landslides and Mudflow

Much (an estimated 40 to 50 percent) of the mountains and hills of the Castaic project area have the potential earthquake-induced landslide areas. These areas correspond to bedrock and to a lesser extent older alluvium with steep slopes (Figure 9). Landslide movement may occur along bedding planes within these formations, as rocks dislodged from exposures on steep slopes, or as surficial failures of weathered rock and soil/colluvium. Such movement could cause rock masses to dislocate and damage overlying facilities and facilities nearby and downslope from these bedrock and older alluvium areas.

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N

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

LEGEND

- Proposed Trail- Subject to Further Coordination with the California Department of Water Resources
- Proposed Trail- For Special Event Use Only
- Proposed Trails
- Existing Trails
- Planned Trails per Developer Obligations

Fault Activity

- Historic, active
- Holocene, active
- Late Quaternary, potentially active
- Quaternary, potentially active
- Castaic Project Area
- County Boundaries
- No Data
- Earthquake-Induced Landslide Zone
- Liquefaction Zone

SOURCE: ESRI, CDMG, LACO, SEI, USGS, CGS

FIGURE 9A

Earthquake-induced Landslides and Liquefaction (CDMG, 1997, etc.) - North

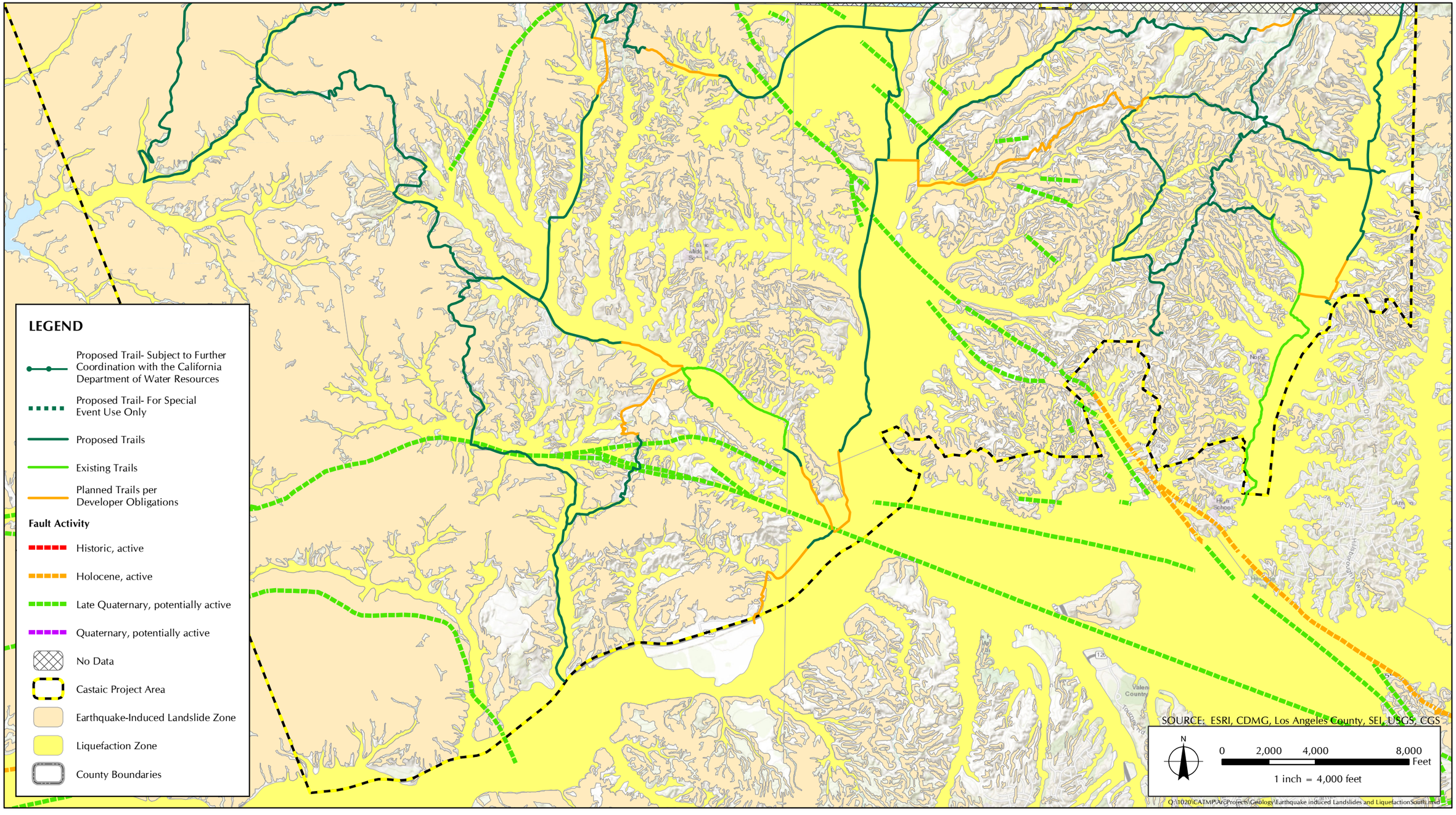

FIGURE 9B

Earthquake-induced Landslides and Liquefaction South (CDMG, 1997, etc.)

Oil Fields

This area around Castaic Valley has a long history of oil and gas exploration and some subsequent development. The first wells in the area were drilled in the early 1900s. Many attempts to find commercial crude oil reserves were unsuccessful and wells that were not economical were plugged and abandoned. Unsuccessful exploratory holes were abandoned as "dry holes." It is possible that not all wells and dry holes within the Castaic project area were documented during the early development history and that not all have been properly abandoned.

Portions of the Castaic project area overlie state designated oil fields, many of which are associated with the synclinal and anticlinal geologic structure discussed above. In the Castaic project area area, there are the Ramona/Ramona North, the De Valle, the Castaic Junction, the Oak Canyon, the Hasley Canyon, the Castaic Hills, the Tapia, the Wayside Canyon, and the Honor Rancho Oil Fields (Figure 10, *Oil Wells in the Multi-Use Trails Plan Area*). The designated oil field boundaries, the areas of production and major drilling, specifically underlie the Castaic project area, as depicted by the State Division of Oil, Gas, and Geothermal Resources (California Department of Conservation, Division of Oil, Gas, and Geothermal Resources [DOGGR] website, 2016). Each of these oil fields is associated with structural features (e.g., anticlines or elongated domes) that trap petroleum and related compounds (crude oil and natural gas). Honor Rancho, in addition to oil production, also serves as an underground natural gas storage facility (28 billion cubic feet) for Southern California Gas Company and has approximately 40 active gas wells in the lower one-third of the field.

Figure 10 shows the approximate outline of the designated administrative oil field boundaries and the classifications of wells associated with each oil field (DOGGR website, 2016). Most wells are within the Del Valle and Honor Rancho Oil Fields, with substantial wells in the Ramona, Oak Canyon, and Castaic Hills. There are fewer in the Ramona North, Hasley Canyon, Tapia, Wayside, and Castaic Junction. Although some minor surface subsidence and ground settlement may have occurred related to oil extraction, its distribution across a broad area is likely to have limited its potential effects and no substantial effects are known to have occurred. Similarly, the potential for future surface subsidence effects from oil extraction is considered very low.

Wells are classified as active, buried, inactive, new, plugged, and unknown. Most of the wells are plugged, and the second most common are inactive. There are a few unknown, buried, and new wells. Abandoned wells and dry holes (inactive and plugged) can represent potential hazards for areas with nearby buildings and occupants. Prior to regulations, many early wells and dry holes were plugged with telephone poles, railroad ties, or other debris before being buried. These holes represent potential vertical migration pathways for crude oil, methane, H_2S, and other compounds. In undeveloped areas, these holes may be an attractive nuisance that could pose a risk from these contaminants for nearby areas. DOGGR regulates drilling and abandonment of wells and dry holes. DOGGR regulations evolved over time to address problems and hazards identified in older wells. As a result, there are fewer problems associated with recently plugged wells and dry holes. Nevertheless, even when a well is plugged in accordance with DOGGR regulations, leaks can occur later.

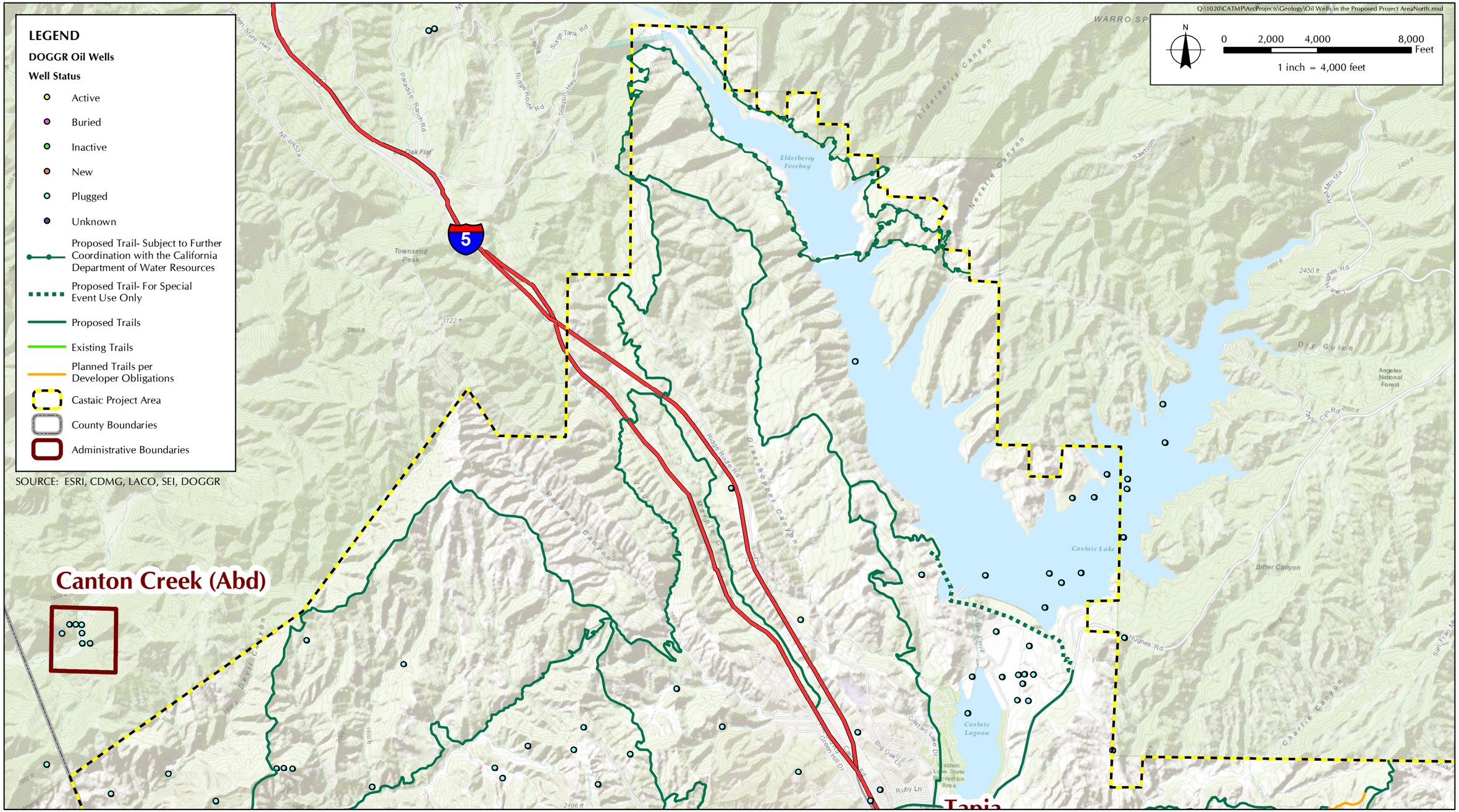

FIGURE 10A

Oil Wells in the Multi-Use Trails Plan Area- North

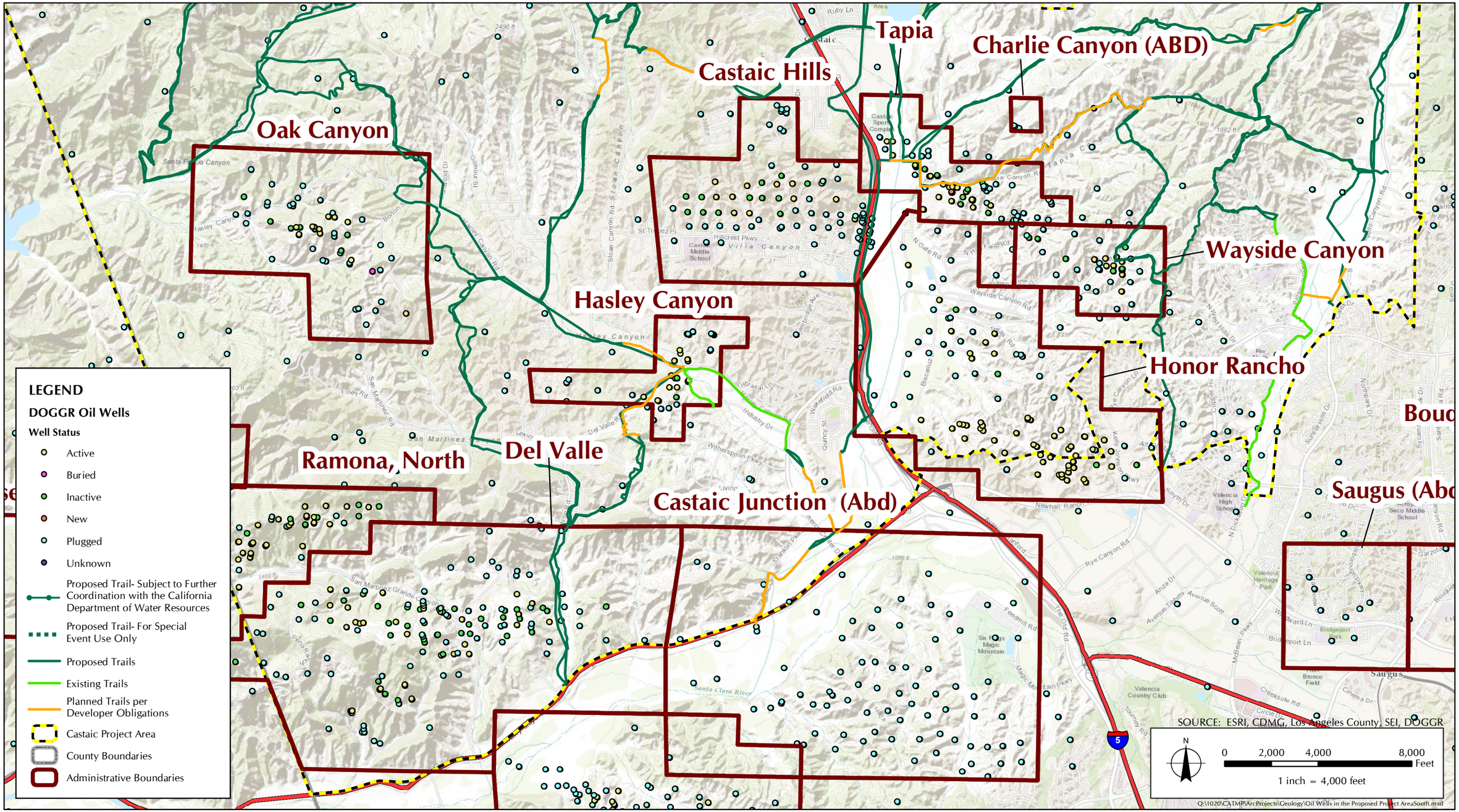

FIGURE 10B

Oil Wells in the Multi-Use Trails Plan Area- South

CONCLUSIONS, RECOMMENDATIONS, AND CONSIDERATIONS FOR TRAIL PLANNING

Faulting and Earthquakes, Seismic Ground Shaking, Seismic-Related Ground Failure, and Landslides

The proposed project would result in significant impacts to geology and soils in regard to exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, and landslides. Although the Castaic project area is not located within a designated Alquist-Priolo zone, the San Gabriel and San Cayetano/Holser/Del Valle faults are fault zones of concern to the Castaic project area with regard to ground rupture. It is possible that fault movement of a few inches to several feet could occur with potential M6 to 7 events. This should be less of a suitability and design issue with regard to trails and more of a post-earthquake maintenance issue. Any facilities that may be habitable for extended periods should not be built over or within 50 feet of the fault traces.

Active and potentially active faults (red, orange, and green) may be sources of large earthquakes (M6.0 to 7.0) that would produce severe ground shaking within the Castaic project area. Local active strike-slip, reverse and thrust faults (e.g. San Fernando, Oak Ridge, San Cayetano/Holser/Del Valle, Garlock, White Wolf, San Gabriel, and San Andreas faults) and more distant buried (blind) thrust faults (e.g., Northridge Hills, Puente Hills, and Elysian Park) have this potential. Severe shaking can be very destructive to narrow ridgelines and steep slopes, causing severe cracking and slope failures. Trail designs can accommodate such shaking to some degree, but as with fault rupture this should be less of a suitability and design issue with regard to trails and more of a post-earthquake maintenance issue. The expected level of ground shaking in the Castaic project area is high enough to initiate liquefaction as a result of there being expected high seismic shaking levels, areas of shallow groundwater, and cohesionless sands. As a result, the proposed project may result in the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction and lateral spreading. An estimated 40 to 50 percent of the mountains and hills of the Castaic project area are potential earthquake-induced landslide areas. These areas correspond to bedrock and to a lesser extent older alluvium with steep slopes. Landslide movement may occur along bedding planes within these formations, as rocks dislodged from exposures on steep slopes, or as surficial failures of weathered rock and soil/colluvium. Such movement could cause rock masses to dislocate and damage overlying facilities and facilities nearby and downslope from these bedrock and older alluvium areas. As a result, the proposed project may result in the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismically induced landslides. Therefore, the proposed project may result in the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, and landslides, thus requiring mitigation measures.

Soil Erosion

The proposed project would result in significant impacts to geology and soils in regard to resulting in substantial soil erosion or the loss of topsoil. The Castaic project area has numerous primary and secondary drainages. West of Castaic Valley and the I-5 Freeway the primary drainages from north to south include: Violin, Palomas, Santa Felicia, Devil, Romero, Sloan, Hasley, Oak, Lechier, San Martinez Chiquito, Holser, and San Martinez Grande. These empty into either Castaic Valley or the Santa Clara River. East of Castaic Valley and the I-5 Freeway from north to south are: Grasshopper,

Charlie, Tapia, Wayside, and San Francisquito Canyons all of which also empty into either Castaic Valley or the Santa Clara River. Within the Castaic project area, most drainage areas form relatively narrow canyons at higher elevations and transition to the broader floodplains. With regard to drainage area size, the larger drainages in the Castaic project area are: Grasshopper, Violin, and Palomas from north to south; Romero and Hasley from west to east; San Martinez Grande/Chiquito from west to east to south; Charlie, Tapia, Wayside, and San Francisquito Canyons from east to west; and Castaic Valley from north to south. All eventually empty into the Santa Clara River. Rainfall events may result in erosion or the loss of topsoil in these drainages. As a result, the proposed project may result in substantial soil erosion or the loss of topsoil and mitigation will be required.

Geologic Units

The proposed project would result in significant impacts to geology and soils in regard to being located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project. Based on a review of available documents describing the geology of the Castaic project area, it is underlain by (1) younger Quaternary-age (Holocene) artificial fill/alluvium/surficial sediments (map symbols af, Qa and Qg-Holocene), (2) landslide deposits (Qls-Holocene), (3) older Quaternary-age (Holocene-Pleistocene) alluvium/surficial sediments (Qoa and Qos), (4) Quaternary-age (Pleistocene) soft bedrock formations (QTs), (5) Tertiary-age hard to very hard sedimentary bedrock formations, (6) an older (Paleocene-Cretaceous) hard to very hard sedimentary bedrock formation, and (7) quartz diorite-gneiss complex (Dibblee, 1993, 1996, 1997a, and 1997b). Artificial fill may be present in selected areas not yet mapped. With this large variation in geologic units, the relative difficulty of excavation, the suitability for safe trail or roadway surfaces, the stability of construction slopes, and the suitability of excavated materials for use as backfill will also vary. It is believed that all units except artificial fill and young alluvium should meet minimum requirements for the items listed.

Geologic Structure

Geologic structure includes folding, tilting, and faulting of the geologic units. The geologic structure is very complex with numerous faults, folds, fractures and disturbed bedrock layers with bedding (dip) angles range from very shallow (less than 20 degrees), into and out of slope, to vertical (90 degrees). This indicates that the orientation and height of natural slopes will control in many cases the preferred trail path and gradient, that is, certain orientations and heights may exposed unfavorable bedding, fault features, and fracture planes that may render a slope unstable and, therefore, unsafe. It is expected that most proposed graded slopes will not be extensive in height or width so that this project-induced slope stability concern should be limited. However, where these unfavorable conditions cannot be avoided it will be necessary to design and construct stabilization features (e.g., reduced slope angle, retaining structure, slope reorientation) to overcome these potential instabilities.

Surface Subsidence and Settlement

Oil field activity in the Castaic project area could lead to local subsidence that could manifest as cracks and areas of ground settlement. Due to the likely limited extent of trails in these areas, to the years over which pumping has already occurred and to the relatively low level of oil extraction, this will have a minimum impact. Affected areas can be repaired to level ground and eliminate ground cracks that may form.

As a result, the proposed project may result trails or facilities that may 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.

Expansive Soil

The proposed project would result in significant impacts to geology and soils in regard to being located on expansive soil. The proposed project may result in the placement of trails or structures in areas of expansive soil. Surface subsidence/settlement may occur in the Castaic project area where it is found to have soil susceptible to expansion/contraction (very clay-rich soils) and possibly hydroconsolidation (fine-grained granular soils). When present, moderate to high expansion indices indicate that there is a substantial amount of clay in the soils and repeated episodes of wetting and drying will cause distress to structures in contact with such soils.

Groundwater, Wastewater, Liquefaction, and Landslides/Mudflows

The proposed project would result in significant impacts to geology and soils in regard to having soils incapable of adequately supporting the use of onsite wastewater treatment systems where sewers are not available for the disposal of wastewater. The vast majority of the Castaic project area is underlain by bedrock formations that store and transmit groundwater in permeable sedimentary beds such as sandstone, conglomerate, and siltstone and through fractures caused by faulting, uplift, and folding of these older units. This flow can produce springs and seeps in the hillsides and higher canyon areas or discharge into the larger canyon alluvial materials. The larger canyon alluvial deposits are subject to liquefaction. Mapped landslides are common throughout the Castaic project area and the steeper slopes are subject to mudflows and earthquake-induced slope failures. Areas where landslides are mapped provide the most concern for suitability and the most difficulty for design and construction. To fully protect trails and roadways and prevent failures, extensive stabilization can be required; this suggests that avoidance is the most prudent option. Mudflow areas are more difficult to predict and mitigation would be through avoidance or upslope structure to capture or deflect the debris. Liquefaction is only an issue for larger or habitable structures. Design and location of restroom facilities must consider groundwater depth and proximity to potentially shallow groundwater in existing drainages. The proposed project may result in having soils incapable of adequately supporting the use of onsite wastewater treatment systems where sewers are not available for the disposal of wastewater. The proposed project plans for restroom facilities at trailheads that may require siting within soil types that would not support onsite water treatment systems.

Oil Fields and Wells

Portions of the Castaic project area overlie state-designated oil fields, specifically the Ramona/Ramona North, De Valle, Castaic Junction, Oak Canyon, Hasley Canyon, Castaic Hills, Tapia, Wayside Canyon, and Honor Rancho Oil Fields, that have abandoned wells and dry holes, plus in Honor Rancho gas injection and extraction wells. Prior to regulations, many early wells and dry holes were plugged with telephone poles, railroad ties, or other debris before being buried. These holes represent potential vertical migration pathways for crude oil, methane, H_2S, and other compounds. It is likely, due to the open space nature of the proposed project, that there would be limited opportunity for exposure to the named hazards. In undeveloped areas, these holes may be an attractive nuisance that could pose a risk from these contaminants for nearby areas. However, it would be advisable to avoid these oil field areas and to provide signage warning of the dangers.

Hillside Management Area Ordinance (L.A. County Code, Title 22, § 22.56.215) Or Hillside Design Standards

The proposed project would result in less than significant impacts to geology and soils in regard to conflicts with the Hillside Management Area Ordinance or hillside design standards in the County General Plan. The Los Angeles County Hillside Management Ordinance applies to areas greater than 25 percent slope. Of the total of approximately 48,106 acre Castaic project area, approximately 1,926 acres, or 4 percent of the total Castaic project area consists of slopes greater than 25 percent. Ground surface slopes in the Castaic project area are relatively steep with most greater than 20 percent in the upper elevation hills and mountains, reaching greater than 40 percent adjacent to ridges. Slopes in the lowest foothills immediately adjacent to the mountains, in canyons, valley and active drainages designated above are generally less than 20 percent and predominantly less than 6 percent (e.g., Castaic Valley and Violin, Hasley, San Martinez Grande, and San Francisquito Canyons). Portions of proposed recreational trails may cross through the areas with a greater than 25 percent slope. As a result, trails that cross through these areas would be subject to the requirements and design standards of the Hillside Management Ordinance and hillside design standards in the Conservation and Open Space element of the General Plan. Specifically, sensitive hillside design measures (2.1 through 2.12) would be applied to the trail and facilities (e.g., restrooms). Further, the Hillside Management Ordinance requires that all new development in areas over 25 percent obtain a conditional use permit as part of the entitlement process. Therefore the proposed project would not result in in conflict with the Hillside Management Area Ordinance or the hillside design standards in the Conservation and Open Space Element of the County's General Plan.

Topography, Slopes, Significant Ridgelines, and Major Drainage Courses

Surface elevations in the Castaic project area range from approximately 2,756 feet amsl at Townsend Peak to approximately 863 feet amsl adjacent to the Santa Clara River at the south edge of the Castaic project area. The Castaic project area consists mainly of narrow ridges and moderate- to steep-walled canyons. The Castaic project area drains to the south, east, and west. Locally, topographic relief can vary from near vertical slopes to just gentle slopes of just a few degrees. The area has numerous blue line streams, but surface drainage flow is predominantly during rain events with few areas having continuous flow from springs. The combination of high relief, locally steep slopes, and erosion from rain events will contribute to inherently unstable areas particularly on narrow ridges and steep side slopes below these ridges. As with the geologic structure and structural features, where these slope conditions cannot be avoided it will be necessary to design and construct stabilization features (e.g., combined cut/fill slopes in difficult areas with retaining structures) to overcome these potential instabilities. Consideration of significant ridgelines should be made when designing cuts, fills, retaining structures, bridges or boardwalks, and where trails cut through a continuous ridgeline.

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The soils information below was extracted from a full report for all soils within the Castaic Multi-Use Trails Area. Only those predominant soils with greater than 4 percent areal coverage (~80% of all soils present) were selected for presentation here.

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Physical Properties

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting,

and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates

determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

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Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx? content=17757.wba).

Map Unit Symbol and Soil Name (Approximate % of Trails Area)	% of Map Unit	Hydrologic Group	Depth	USDA Texture	Classification		Fragments		Percentage Passing Sieve Number				Liquid Limit	Plasticity Index
					Unified	AASHTO	>10 Inches	3–10 Inches	4	10	40	200		
CmE—Castaic-Balcom silty clay loams, 15 to 30 percent slopes (4.2%)														
Castaic	50	C	0-9	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			9-26	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			26-30	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
Balcom	40	C	0-10	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-85-95	65-75-85	40-45-50	10-15-20
			10-28	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-85-95	65-75-85	40-45-50	10-15-20
			28-32	Weathered bedrock	—	—	—	—	—	—	—	—	—	—

Map Unit Symbol and Soil Name (Approximate % of Trails Area)	% of Map Unit	Hydrologic Group	Depth	USDA Texture	Classification		Fragments		Percentage Passing Sieve Number				Liquid Limit	Plasticity Index
					Unified	AASHTO	> 10 Inches	3–10 Inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
CmF—Castaic-Balcom silty clay loams, 30 to 50 percent slopes (11.9%)														
Castaic	50	C	0-11	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			11-28	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			28-32	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
Balcom	40	C	0-10	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-85-95	65-75-85	40-45-50	10-15-20
			10-28	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-85-95	65-75-85	40-45-50	10-15-20
			28-32	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
CmF2—Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded (14.5%)														
Castaic	50	C	0-9	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			9-26	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			26-30	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
Balcom	40	C	0-7	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-85-95	65-75-85	40-45-50	10-15-20
			7-25	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-85-95	65-75-85	40-45-50	10-15-20
			25-29	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
			In				*Pct*	*Pct*					*Pct*	
CmG2—Castaic- Balcom silty clay loams, 50 to 65 percent slopes, eroded (4.7%)														

Map Unit Symbol and Soil Name (Approximate % of Trails Area)	% of Map Unit	Hydrologic Group	Depth	USDA Texture	Classification		Fragments		Percentage Passing Sieve Number				Liquid Limit	Plasticity Index
					Unified	AASHTO	> 10 Inches	3–10 Inches	4	10	40	200		
Castaic	50	C	0-9	Silty clay loam	ML	A-7	0-0-0	0-0-0	95-98-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			9-26	Silty clay loam	ML	A-7	0-0-0	0-0-0	95-98-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			26-30	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
Balcom	40	C	0-7	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-85-95	65-75-85	40-45-50	10-15-20
			7-25	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-85-95	65-75-85	40-45-50	10-15-20
			25-29	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
CnG3—Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded (8.4%)														
Castaic	45	C	0-9	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			9-26	Silty clay loam	ML	A-7	0-0-0	0-0-0	90-95-100	85-90-95	70-83-95	65-75-85	40-45-50	10-15-20
			26-30	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
Saugus	35	B	0-8	Loam	SM	A-2	0-0-0	0-0-0	80-90-100	75-80-85	45-55-65	20-28-35	0-0 -0	NP
			8-40	Loam, sandy loam	SM	A-2	0-0-0	0-0-0	80-90-100	75-80-85	45-55-65	20-28-35	0-0 -0	NP
			40-44	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
			In				*Pct*	*Pct*					*Pct*	
HcC—Hanford sandy loam, 2 to 9 percent slopes (4.9%)														
Hanford	85	A	0-8	Sandy loam	SM	A-2, A-4	0-0-0	0-0-0	85-93-100	75-88-100	50-63-75	25-38-50	20-25-30	NP-3 -5
			8-70	Fine sandy loam, sandy loam	SM	A-2, A-4	0-0-0	0-0-0	85-93-100	75-88-100	50-63-75	25-38-50	20-25-30	NP-3 -5
MhF2—Millsholm rocky loam, 30 to 50 percent slopes, eroded (5.2%)														
Millsholm	85	D	0-16	Loam	CL-ML, ML	A-4	0-0-0	0-0-0	80-90-100	75-88-100	70-83-95	50-63-75	25-30-35	5-8 -10

Map Unit Symbol and Soil Name (Approximate % of Trails Area)	% of Map Unit	Hydrologic Group	Depth	USDA Texture	Classification		Fragments		Percentage Passing Sieve Number				Liquid Limit	Plasticity Index
					Unified	AASHTO	> 10 Inches	3–10 Inches	4	10	40	200		
			16-20	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
ScF2—Saugus loam, 30 to 50 percent slopes, eroded (24.2%)														
Saugus	85	B	0-15	Loam	SM	A-2, A-4	0-0-0	0-0-0	90-95-100	85-90-95	45-55-65	25-38-50	0-0-0	NP
			15-42	Loam, sandy loam	SM	A-2, A-4	0-0-0	0-0-0	90-95-100	85-90-95	45-55-65	25-38-50	0-0-0	NP
			42-46	Weathered bedrock	—	—	—	—	—	—	—	—	—	—

Appendix F

Hydrology and Water Quality Assessment

Sapphos environmental inc.

May 13, 2016
Job Number: 1020-085
Castaic Area Multi-Use Trails Plan Project

MEMORANDUM FOR THE RECORD
2.6 1020-085.07

TO: County of Los Angeles
Department of Parks and Recreation
(Ms. Olga Ruano, Mr. Zachary Likins, and Mr. Frank Moreno)

FROM: Sapphos Environmental, Inc.
(Ms. Laura Male and Mr. Jeffrey Rex)

SUBJECT: Castaic Area Multi-Use Trails Plan Hydrology and Water Quality Assessment

FIGURES:
1. Regional Vicinity Map
2. Local Vicinity Map
3. Topographic Map with USGS 7.5-minute Quadrangle Index
4. Castaic Area Multi-Use Trails Plan
5. Study Area Hydrology
6. Groundwater Basins
7. 100-Year Flood Plain
8. Santa Clarita Valley Sanitation District

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EXECUTIVE SUMMARY

This Memorandum for the Record (MFR) documents the results of the programmatic evaluation of the potential for the proposed Castaic Area Multi-Use Trails Plan (proposed project) to result in significant impacts to hydrology and water quality in accordance with Appendix G of the State California Environmental Quality Act (CEQA) Guidelines[1] in support of the County of Los Angeles serving in the capacity of a Lead Agency, pursuant to the California Environmental Quality Act. Based on the results of the records and archival research and map review conducted by Sapphos Environmental, Inc., the construction, recreational use, and maintenance activities associated with the proposed project, would have the potential to result in impacts to hydrology and water quality that would be mitigated to below the level of significance with mitigation measures. The scope of evaluation of hydrology and water quality includes water quality standards and discharge requirements, groundwater recharge areas; natural drainages in relation to erosion and flood conveyance; stormwater drainage systems; water quality; 100-year floodplain; and potential for seiche, tsunami, or mudflows.

Water Quality Standards and Discharge Requirements

Construction or maintenance of trails that require grading in excess of 1 acre have the potential to violate water quality standards, particularly in relation to total dissolved sediments and be subject to General Construction Permit. Impacts would be reduced to below the level of significance through preparation and implementation, of a Stormwater Pollution Prevention Plan (SWPPP). In addition, construction or maintenance of trails that require grading in a Significant Ecological Area (SEA) have the potential to violate water quality standards in a manner that would be deleterious for native fish and wildlife. Impacts would be reduced to below the level of significance through compliance with the County's LID ordinance, requiring the use of two Best Management Practices (BMP). Implementation of BMPs, required pursuant to the County's LID Ordinance, would be expected to reduce impacts to below the level of significance.

Recreation is an allowable use pursuant to the Basin Plan; therefore, the proposed project would be consistent with the Basin Plan.

Groundwater Recharge Areas

There would be no significant impacts to groundwater recharge or groundwater quality. The depth to groundwater within the Santa Clara River Valley Groundwater Basin has been reported at 10 to 100 feet below the ground surface in the Castaic project area. There would be no anticipated impact on groundwater recharge or quality from the near surface grading required to accommodate new trails and improvements to existing trails.[2]

Natural Drainages in Relation to Erosion and Flood Conveyance

The discharge of dredged or fill materials into wetlands and "waters of the United States" or the alteration of a natural drainage subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act and/or subject to the jurisdiction of the California Department of Fish and Wildlife pursuant to Section 1600 of the State Fish and Game

[1] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

[2] California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

Code would have the potential to result in or erosion of compromise the natural flood conveyance functions, constituting a significant impact. Conformance with the mitigation measures required to use a Nationwide Permit, or obtain an individual permit under Section 404 of the Clean Water Act, or a Lake and Streambed Alteration Agreement under Section 1600 of the State Fish and Game Code would reduce impacts to below the level of significance. Impacts would be further reduced to below the level of significance through compliance with the County's LID ordinance, requiring the use of two Best Management Practices. Implementation of BMPs, required pursuant to the County's LID Ordinance, would be expected to reduce impacts to below the level of significance.

Increase Habitat for Mosquitoes and Other Vectors that Transmit Diseases

There would be no anticipated impact related to increasing habitat for mosquitoes or other vectors that transmit diseases. The proposed project would not add water features or create conditions in which standing water would accumulate or that would increase habitat for mosquitoes and other vectors that transmit diseases such as the West Nile virus and result in increased pesticide use. Additionally Los Angeles County has a "pack it in…pack it out" policy that would further deter increased habitat for mosquitoes and other vectors that transmit diseases. This common saying is a simple yet effective way to get hikers to take their trash home with them. Hikers are encouraged to carry out the extra food and packaging materials that they carried in with them.

Stormwater Drainage Systems

There would be no anticipated impact to existing stormwater drainage systems. The proposed project would be required to be designed in accordance with the recommendations of the County Trails Plan. The plan requires the use of erosion control devices. The proposed project would consist of primarily natural pervious surfaces and would not be expected to increase stormwater runoff.

Generate Construction or Post-Construction Runoff that would Violate Applicable Stormwater NPDES Permits or Otherwise Significantly affect Surface Water or Groundwater Quality

The proposed project would not be expected to generate construction or post-construction runoff that would violated existing NPDES permits or otherwise significant affect surface water or groundwater quality. The proposed project would be required to be designed in accordance with the recommendations of the County Trails Plan. The plan requires the use of erosion control devices Construction or maintenance of trails that require grading in excess of 1 acre have the potential to violate water quality standards, particularly in relation to total dissolved sediments and be subject to General Construction Permit. Impacts would be reduced to below the level of significance through preparation, and implementation, of a Stormwater Pollution Prevention Plan (SWPPP). Impacts would be reduced to below the level of significance through compliance with the County's LID ordinance, requiring the use of two Best Management Practices. Implementation of BMPs, required pursuant to the County's LID Ordinance, would be expected to reduce impacts to below the level of significance.

Water Quality

Construction or maintenance of trails that require grading in excess of 1 acre have the potential to violate water quality standards, particularly in relation to total dissolved sediments and be subject to General Construction Permit. Impacts would be reduced to below the level of significance

through preparation, and implementation, of a Stormwater Pollution Prevention Plan (SWPPP). There are no impaired water bodies within the proposed project boundary.

Recreation is an allowable use pursuant to the Basin Plan; therefore, the proposed project would be consistent with the Basin Plan.

Use Onsite Wastewater Treatment Systems in Areas with Known Geological Limitations

There would be no impact related to the use of onsite wastewater treatment systems in areas of known geological systems. The proposed project would not use onsite wastewater treatment systems in areas with known geological limitations or in close proximity to surface water.

Place Housing within a 100-Year Flood Hazard Area

The proposed project would have no impacts related to placing housing with a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary of Flood Insurance Rate Map or other flood hazard delineation map, or within a floodway or floodplain, because the proposed project does not include the construction of new or relocation of existing housing.

Seiche, Tsunami, or Mudflows

The proposed project is not expected to increase the risk and hazard to individuals within areas that lie within the vicinity of coastal waters of being subject to a seiche or tsunami. Therefore, implementation of the proposed project would not be expected to result in significant impacts to hydrology and water quality in relation to seiche, tsunamis, and mudflows.

INTRODUCTION

This Memorandum for the Record (MFR) provides the County of Los Angeles Department of Parks and Recreation (County) with the requisite information to understand the level of impact on hydrology and water quality anticipated for designation, construction, operation and maintenance of trails proposed in the proposed project at a programmatic level of detail. The proposed designation, improvement, operation, and maintenance of the trail segment constitute a project pursuant to the California Environmental Quality Act (CEQA). This MFR provides the requisite information related to hydrology and water quality to support the County's decision-making process in relation to the proposed project: regulatory framework, existing conditions, thresholds of significance, and the consideration of the potential for direct, indirect, and cumulative impacts in accordance with Appendix G of the State CEQA Guidelines.[3] The scope of analysis considered the potential for impacts on hydrology and water quality.

PURPOSE

The purpose of this MFR is to support the County in the development of a multi-use trail plan that would minimize the impacts on the surrounding community, Native Americans most likely descendants identified by the Native American Heritage Commission. It is understood that the County expects to move forward with the proposed project and seeks funding for construction, operation, and maintenance of the proposed project. This MFR provides the requisite information related to impacts on cultural resources to support the County's decision-making process in relation to the proposed project. The evaluation of the potential for the proposed project to result in significant impacts to noise cultural resources was undertaken in accordance with Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines and the Los Angeles County General Plan. This MFR presents the results of these efforts and provides impact analyses for the designation, construction, use and maintenance, of the multi-use trail segments.

LOCATION

The Castaic project area encompasses approximately 75 square miles (approximately 48,107 acres) in the Castaic area of the Santa Clarita Valley in the northwestern portion of unincorporated County of Los Angeles (Figure 1, *Regional Vicinity Map*). The Santa Clarita Valley is centrally located between the San Gabriel Mountains to the east, the Sierra Pelona Mountains to the northeast, the Topatopa Mountains to the west, the San Emigdio Mountains and Tehachapi Mountains to the north, and the Santa Susana Mountains and Santa Monica Mountains to the south within the Transverse Ranges, a group of east-west trending mountains paralleling the Pacific Ocean between Santa Barbara and San Diego Counties.[4] The Castaic project area is composed of generally mountainous and valley terrain that abuts the Angeles National Forest to the north, the City of Santa Clarita to the southeast, California State Route 126 (Henry Mayo Drive) to the south, and Ventura County to the west (Figure 2, *Local Vicinity Map*). The Castaic project area, which is located in the Fifth Supervisorial District, includes a portion of the County-managed Castaic Lake State Recreation Area.

[3] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

[4] U.S. Geological Survey. Accessed 4 January 2016. TopoView. Available at: http://ngmdb.usgs.gov/maps/TopoView/viewer/#11/34.5626/-118.5353

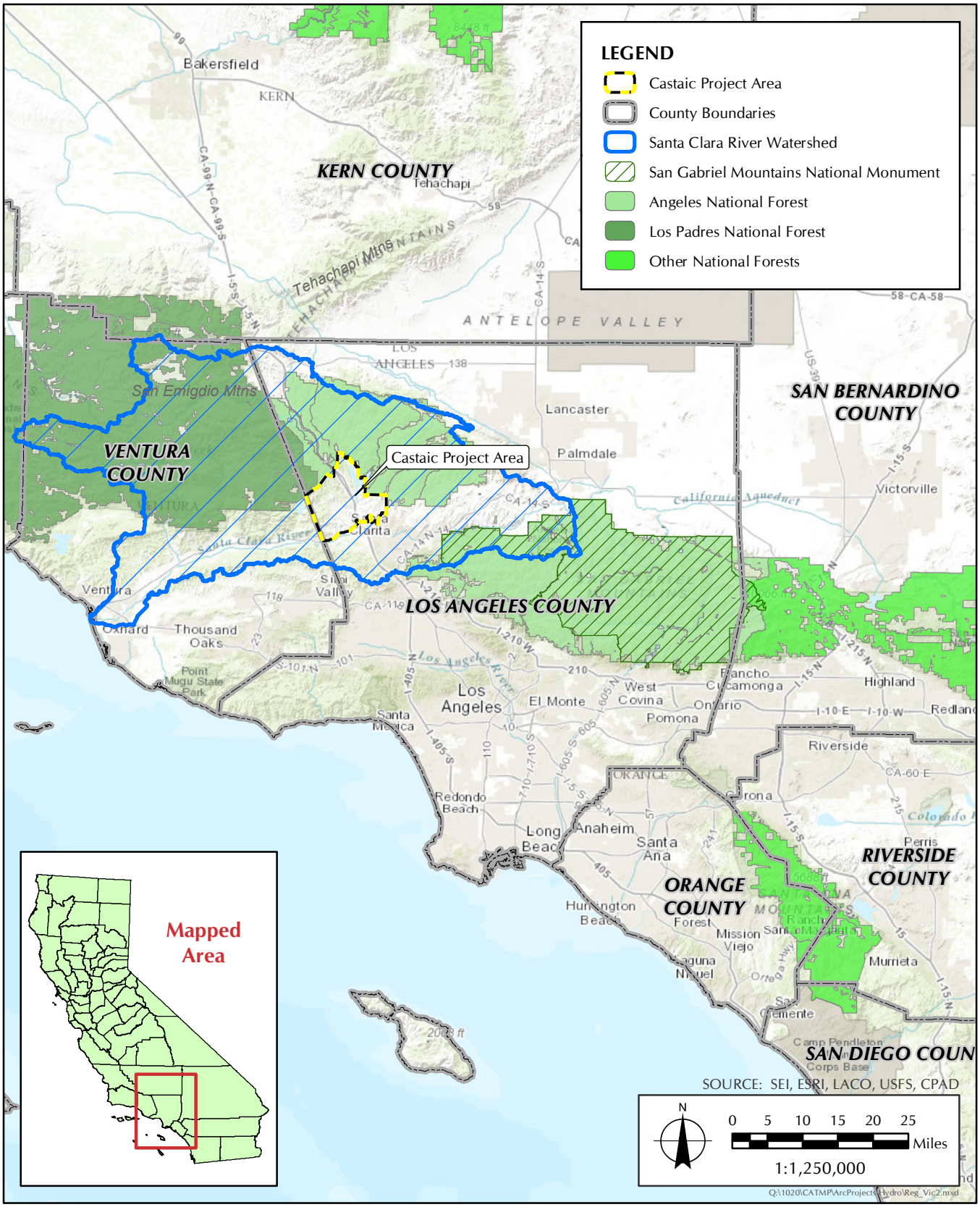

FIGURE 1

Regional Vicinity Map

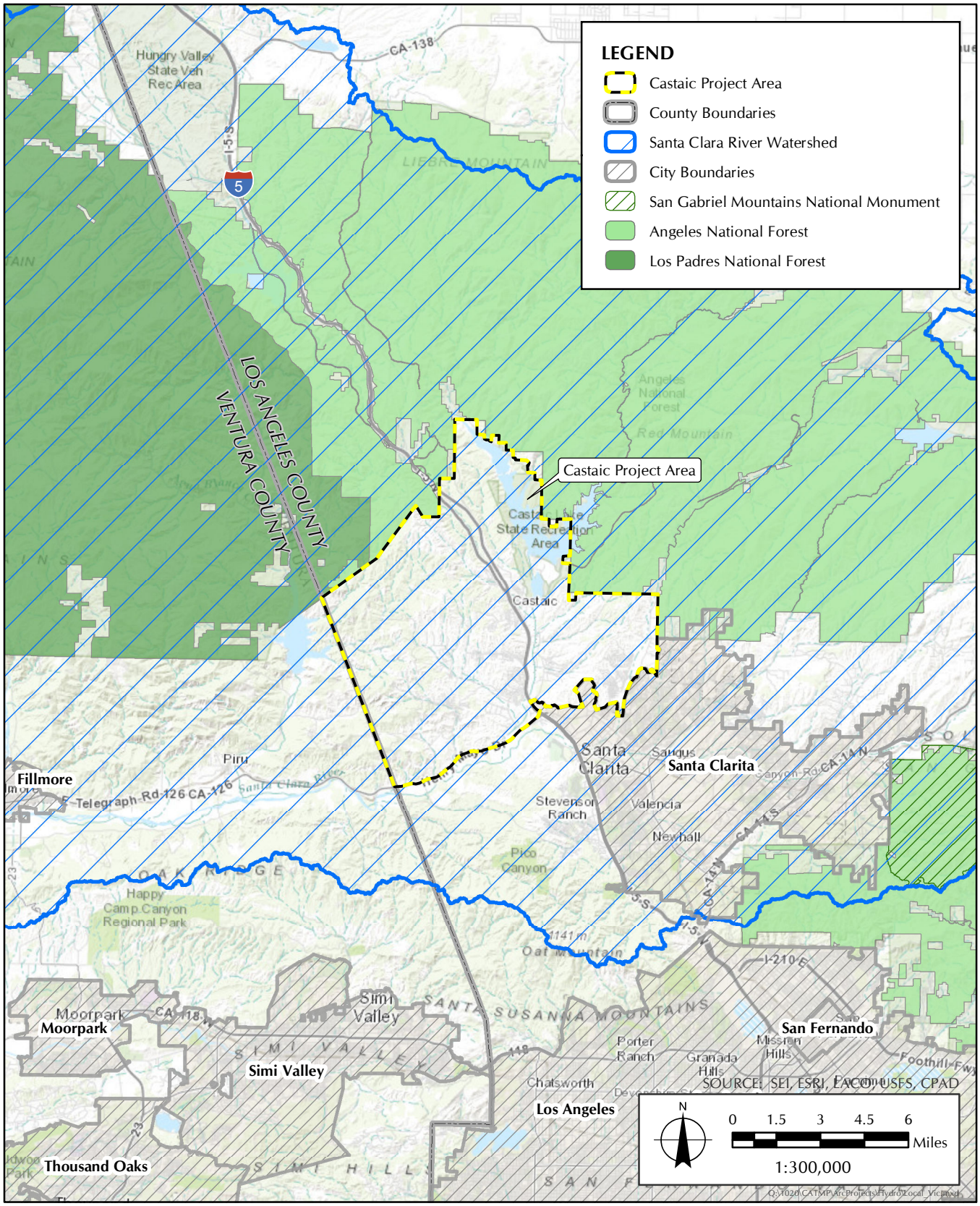

FIGURE 2

Local Vicinity Map

The Castaic project area appears on the U.S. Geological Survey (USGS) 7.5-minute series Whitaker Peak, Warm Springs Mountain, Newhall, and Val Verde topographic quadrangles (Figure 3, *Topographic Map with USGS 7.5-Minute Quadrangle Index*).[5,6,7,8] The elevation of the Castaic project area ranges from 2,756 feet above mean sea level (MSL) near the northern edge of the Castaic project area between Violin Canyon and Palomas Canyon, to 863 feet above MSL near the Santa Clara River at the southwestern corner of the Castaic project area. Loma Linda Peak, at an elevation of approximately 2,494 feet above MSL, is located between Santa Felicia Canyon and Romero Canyon, approximately 0.2 mile south of the northern edge of the Val Verde topographic quadrangle.

PROJECT DESCRIPTION

The proposed project would work to encourage and promote new multi-use trails and recommend improvements to existing trails, providing an alignment to incorporate a transition throughout the Castaic project area to additional areas, jurisdictions, and prime destinations within and adjacent to the Castaic project area. The plan would recommend conditions for improvement of unmet local recreation demands in the 5th Supervisorial District. The proposed project would develop a complete multi-use trail system connecting user groups and local populations to desired recreation destinations and experiences, with unified transition to the trails of adjacent jurisdictions, compatibility with adjacent land uses and environmental resources, and incorporate a sustainable design that is consistent with the County Trails Manual.

The proposed project includes approximately 100 miles of proposed multi-use trails and related staging areas, bike skills parks, parking areas, and other supporting trail facilities in the Castaic Area of the Santa Clarita Valley Planning Area (Figure 4, *Castaic Area Multi-Use Trails Plan*). The proposed trails would provide connections to the Angeles National Forest, trails in the City of Santa Clarita, and trails in the Newhall Ranch Specific Plan. The trails would be multi-use and range from 3 to 12 feet wide based on site conditions, with adequate space for combined pedestrian, equestrian, and mountain biking use, in accordance with the County of Los Angeles Trails Manual guidelines (Table 1, *County Trail Types*).

[5] U.S. Geological Survey. 4 January 2016. 7.5-Minute Series, Whitaker Peak, California, Topographic Quadrangle. Reston, VA.

[6] U.S. Geological Survey. 4 January 2016. 7.5-Minute Series, Warm Springs Mountain, California, Topographic Quadrangle. Reston, VA.

[7] U.S. Geological Survey. 4 January 2016. 7.5-Minute Series, Newhall, California, Topographic Quadrangle. Reston, VA.

[8] U.S. Geological Survey. 4 January 2016. 7.5-Minute Series, Val Verde, California, Topographic Quadrangle. Reston, VA.

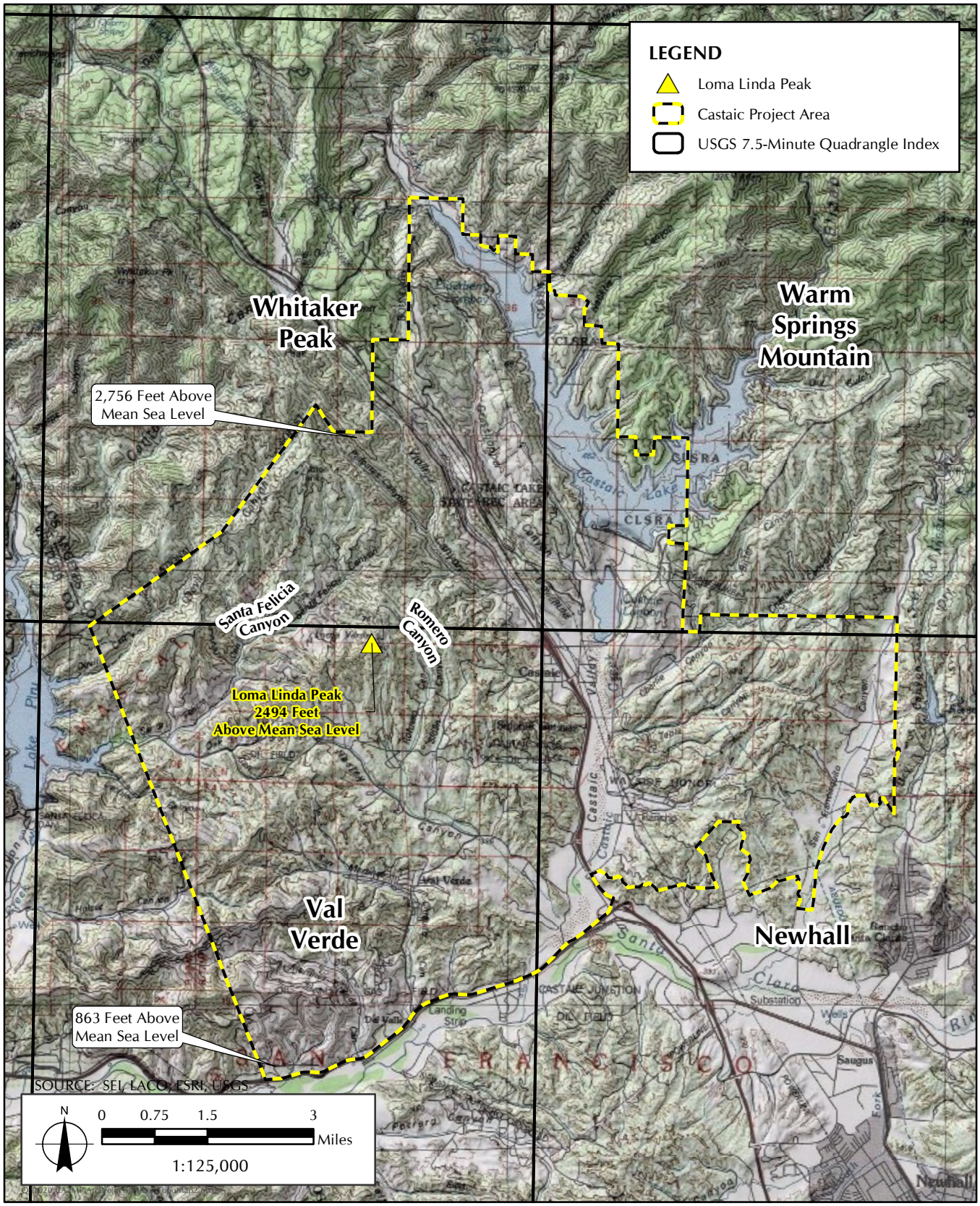

FIGURE 3

Topographic Map with United States Geological Survey 7.5 Minute Quadrangle Index

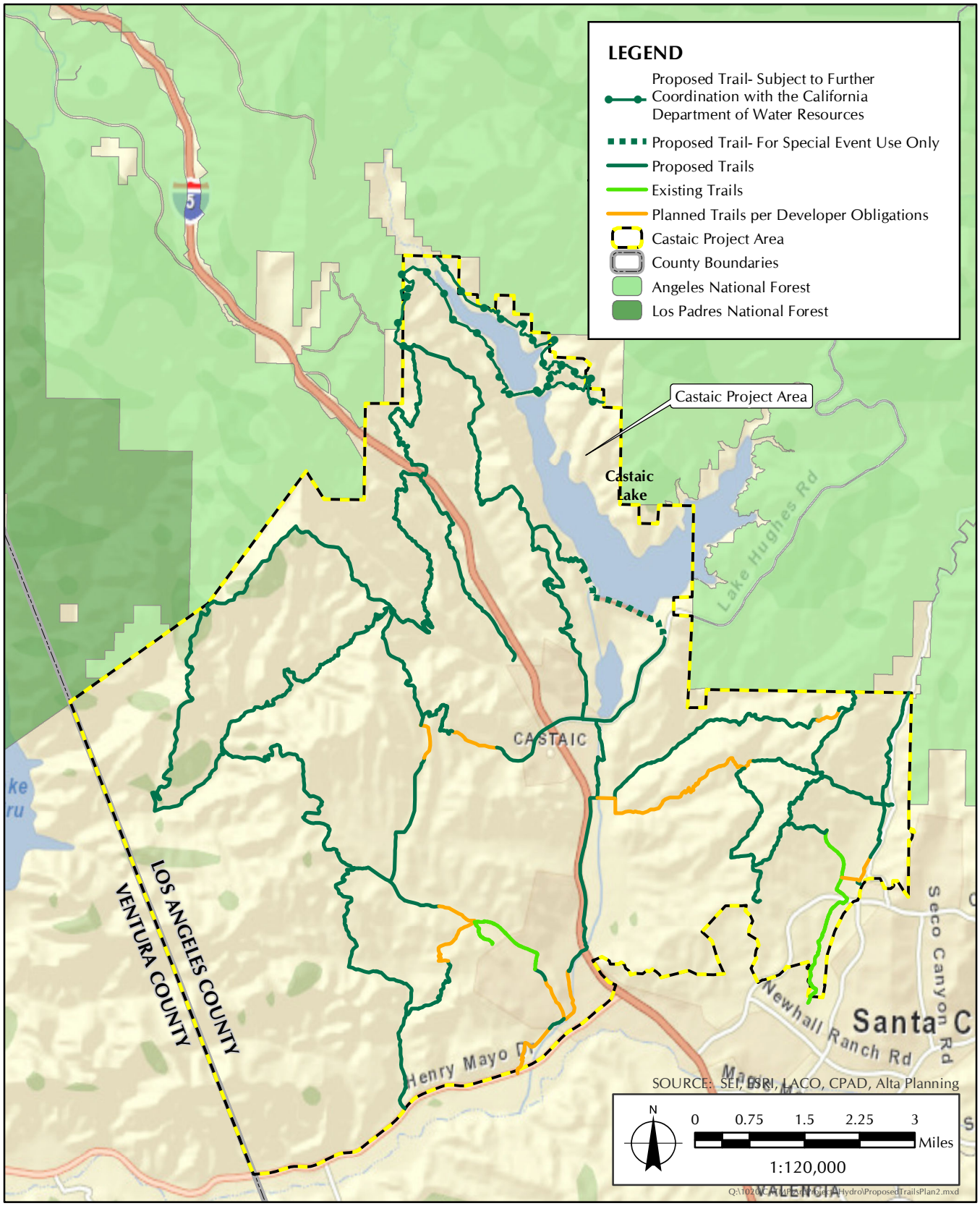

FIGURE 4

Castaic Area Multi-Use Trails Plan

TABLE 1
COUNTY TRAIL TYPES

Trail Type	Tread / Trail Width	Intensity of Use	Impact	Surface Type
Pedestrian	10–11 feet	High	High	Crusher fines / decomposed granite
Recreational Pathway	8–10 feet	High	High	Natural surface
Natural Trail 1	7–10 feet	High	Medium	Natural surface
Natural Trail 2	5–8 feet	Medium to high	Low	Natural surface
Natural Trail 3	2–3 feet	Low	Minimal	Natural surface

SOURCE: County of Los Angeles Department of Parks and Recreation. Adopted May 17, 2011. Revised June 2013. *County of Los Angeles Trails Manual*. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

The proposed project includes 18 trail routes, consisting of four existing trail segments, 10 trail segments that have been planned per developer obligations, and 57 proposed trail segments (Table 2, *Existing, Planned per Developer Obligations, and Proposed Trail Segments*). The proposed trail segments would provide connections to the Santa Felicia SEA, the Angeles National Forest, Newhall Ranch trails and the Santa Clara River Trail, City of Santa Clarita trails, under Interstate-5, and to Castaic Lake.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
Castaic Creek (CC)	CC1 (Sports Complex)	1.24	Natural	No existing trail. Dirt road, de facto trail route along Castaic Creek. De facto trail that does not cross private property. Crossing of drainage at RV park will wash out periodically unless an alternative crossing (bridge) is developed.
	CC2 (Pitchess)	2.63	Natural	No existing trail. Existing dirt road from Tapia Canyon Road along Interstate 5 and creekbed, including under the freeway bridge. Potential for trailhead at southern end of segment.
	CC3 (Commerce Center East)	0.76	SUB	No existing trail. Portion of segment parallels existing dirt road. Planned trail per developer obligations generally follows 2007 County adopted trail routes; alignment reflects subdivision plans.
	CC4 (Commerce Center Undercrossing)	0.25	Natural	No existing trail. Within Castaic creekbed and along paved utility road. Slightly modified from 2007 County adopted trail routes to meet proposed subdivision trail.
	CC5 (Commerce Center Bike Trail)	0.46	SUB	No existing trail. Along paved utility road adjacent to creekbed. Planned trail per developer obligations follows the subdivision plan indicating proposed bike trail with 10' minimum equestrian trail.
	CC6 (Commerce Center – 126)	0.48	SUB	No existing trail. Parallels Franklin Parkway and Castaic Creek. Planned trail per developer obligations follows the subdivision plan indicating proposed sidewalk and equestrian trail.
Castaic Dam (CD)	CD1 (Castaic Upper Parking)	1.39	Natural	No existing trail. Parking lot median, follows existing switchbacks (dirt path) leading to and along existing Pine Ridge Fire Road. Connection from 2007 County adopted trail routes to upper parking lot at Castaic Lake.
	CD2 (Castaic Dam Crossing)*	1.76	Natural	No existing trail. Follows paved road from upper parking lot at Castaic Lake, across Castaic Dam, to Lake Hughes Road. Dam crossing, bridging east and west sides of Castaic Lake. Subject to further coordination with State Department of Water Resources..
	CD3 (Lake Hughes East)	1.60	ROW	No existing trail. Unpaved ROW along Lake Hughes Road. On-street connection from potential lagoon trailhead to parking lot on the east side of the dam.
Cliffie Stone Extension (CE)	CE1 (San Francisquito Wash - Upper)	0.63	Natural	No existing trail. Parallels existing dirt road/path along San Francisquito Canyon wash. Passes from subdivision land into multiple private parcels. Runs adjacent to the street, but may need to enter street ROW.
	CE2 (Tesoro Del Valle – SF Wash)	0.52	Natural	No existing trail. Parallels existing dirt road / de facto route within San Francisquito Canyon wash. Realigned 2007 County adopted trail. Passes through Tesoro Del Valle but is not including in subdivision plans.
	CE3 (San Francisquito Wash - Lower)	0.55	ROW	No existing trail. Parallels existing dirt road / de facto route within San Francisquito Canyon wash. Realigned 2007 County adopted trail
	CE4 (Lady Linda)	0.55	Natural	No existing trail. Follows existing dirt road (Lady Linda Lane). Follows Lady Linda Lane to connect to proposed trailhead.
	CE5 (Cliffie Stone – From Lady Linda-Low Ridge)	0.53	ROW	No existing trail. Follows portions of existing de facto dirt path/road to the west of San Francisquito Canyon Road. Primarily follows Cliffie Stone Extension identified in subdivision alignment.
	CE6 (Cliffie Stone – From Lowridge-Tesoro)	0.26	ROW	No existing trail. Dirt ROW exists along San Francisquito Canyon Road. Crosses road ROW but original ROW does not match existing street.
	CE7 (North Park – Cliffie Stone Extension)	0.62	Natural	No existing trail or de facto route. Follows 2007 County adopted alignment through subdivision until southern end, then branches west to meet Cliffie Stone Trail. Owned by MRCA but part of Tesoro subdivision.
	CE8 (North Park Trail Connector)	0.08	Natural	No existing trail or de facto route. Connection to North Park Trail. Leaves subdivision property and enters Newhall Land parcel.
Charlie Canyon (CL)	CL1 (Charlie Canyon Road)	3.61	Natural	No existing trail. Follows existing dirt roads (Tapia Canyon Road and Charlie Canyon Road), and what appears to be a de facto ridgeline path. Realigned from 2007 County adopted trail routes to follow road on County property.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	CL2 (Charlie Canyon – Tesoro Del Valle)	0.37	Natural	No existing trail. Follows existing dirt road or de facto path. Trail enters subdivision parcels but is not on subdivision plans.
	CL3 (San Francisquito Connection)	0.16	Natural	No existing trail. Follows existing dirt road or de facto path. Connection to San Francisquito Trail.
Chiquito Canyon (CO)	CO1 (Chiquito Canyon and Creek)	3.52	Natural	No existing trail. Modified 2007 County adopted alignment to follow creek instead of Chiquito Canyon Road.
	CO2 (Jackson St)	0.21	ROW	No existing trail. Parallels two existing paved roads – Lincoln Avenue and Jackson Street. Follows existing street.
	CO3 (Chiquito Canyon and Creek – South)	1.04	Natural	No existing trail. Follows portions of Jackson Street and existing de facto dirt path or road. Requires access beyond locked gate. Realigned from 2007 County adopted alignment to minimize parcel crossings.
	CO4 (Chiquito Canyon and Creek – North)	1.05	SUB	No existing trail. Parallels portion of Del Valley Road. Planned trail per developer obligations - modified 2007 County adopted alignment to remain within subdivision parcels. Subdivision alignment not determined.
Cliffie Stone (CS)	CS1 (Cliffie Stone – San Francisquito Motorway)	0.68	Natural	No existing trail. Follows existing ridgeline Farmer John Lat dirt road and paved utility access road. Tesoro Del Valle Property. Requires access along utility road.
	CS2 (Cliffie Stone Trail [Tesoro])	1.16	Natural	Existing trail
	CS3 (Cliffie Stone Trail [San Francisquito)	1.73	Natural	Existing trail
Elderberry Forebay (EF)	EF1 (Forebay Connection)	4.76	Natural	No existing trail. Follows existing dirt road and topography. May have security issues with dam and pipes at northern edge. Only include if Elderberry Forebay Dam is useable.
	EF2 (Forebay – Limit 2)	0.81	Natural	No existing trail. Parallels portion of Elderberry Forebay road. Dam connection to northeastern corner route. Only include if Elderberry Forebay Dam is useable.
	EF3 (Forebay – Limit 1)	0.72	Natural	No existing trail. Parallels portion of Elderberry Forebay road. Dam connection to northeastern corner route. Only include if Elderberry Forebay Dam is useable.
	EF4 (Northern Limit)	4.76	Natural	No existing trail. Parallels portions of existing roads: Goodell Road and USFS Route 6N13. Northeast connection to USFS roads. Extends beyond Castaic project area.
Hasley Canyon (HC)	HC1 (Hasley – Santa Felicia)	3.48	Natural	No existing trail. Follows existing unpaved Ayala Road for a portion of proposed route. Connects Hasley Canyon to Santa Felicia SEA. Requires passage beyond locked gate at Hasley Canyon.
	HC2 (Hasley – Claremont)	0.70	Natural	No existing trail. Follows existing de facto path or dirt road. Trail falls within subdivision area but is not included in existing subdivision plans. Avoids using street ROW. Connects to 2007 County adopted trail alignment at northern end.
	HC3 (Hasley Canyon End)	0.16	Natural	No existing trail. Realigned 2007 County adopted trail alignment.
	HC4 (Hasley Road West)	0.33	ROW	No existing trail. Parallels existing paved Hasley Canyon Road. Follows 2007 County adopted trail alignment along public ROW. Ends at road.
	HC5 (Hasley Road East)	0.57	ROW	No existing trail. Parallels existing paved Hasley Canyon Road. Realigned 2007 County adopted trail to avoid private parcel conflict, avoid a creek crossing, and to more directly connect to other trail segments.
	HC6 (Hasley Creek)	0.26	Natural	Existing de facto trail along Hasley Canyon Road. Realigned 2007 County adopted trail to follow de facto trails.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	HC7 (Hasley-Los Valles)	0.56	SUB	No existing trail. Existing de facto trail along Hasley Canyon Road. Planned trail per developer obligations - realigned 2007 County adopted trail to follow de facto trails. Within subdivision area a planned subdivision trail is not indicated.
	HC8 (Hasley Canyon Trail)	1.68	Natural	Existing trail
	HC9 (Commerce Center)	0.21	ROW	No existing trail. Existing paved maintenance road along channelized creek. Line to proposed subdivision trails. Crosses under Commerce Center Drive and uses maintenance road.
	HC10 (Commerce Center NW)	0.61	SUB	No existing trail. Parallels creek bed. Planned trail per developer obligations generally follows 2007 County adopted alignment, but realigned to avoid the creek bed where possible.
Interstate Paintball (IP)	IP1 (Interstate 5 to Ridge Route)	3.30	Natural	No existing trail. Existing utility access dirt roads. Follows utility access roads. Northern end will need switchbacks to drop to Ridge Route Rd.
	IP2 (Paintball Site)	0.65	Natural	No existing trail. Existing dirt roads and paved roads. Connects through former paintball site and proposed bike skills park. Alignment to be determined by park design.
	IP3 (Santa Felicia to 5 Connection)	3.67	Natural	No existing trail. Existing dirt roads along portions of alignment. Connection from former paintball site to Santa Felicia SEA. Undercrossing at Interstate-5 will need to be evaluated for safety.
	IP4 (Between Interstate 5)	3.14	Natural	No existing trail. Existing utility access dirt roads between I-5 North and I-5 south. Picks up from the end of Castaic Road and continues to paintball site.
Lake West (LW)	LW1 (Northlake North)	3.28	Natural	No existing trail. Existing dirt roads. Follows 2007 County adopted trail route.
	LW2 (Northlake Central)	1.10	Natural	No existing trail. Existing dirt roads. Follows 2007 County adopted trail route.
	LW3 (Lagoon-Lake)	4.05	Natural	Existing dirt roads, including a portion of Cutler Canyon Fire Road and Vista Ridge Fire Road, and paved Castaic Lake State Recreation Area road. Includes a portion of Pro's Uphill Open Trail and Castaic Brick Trail of Castaic Lake State Recreation Area.[1] Follows 2007 County adopted trail route.
North Park Trail	North Park Trail	0.33	Natural	Existing trail
Romero Canyon (RC)	RC1 (Romero-Santa Felicia)	1.88	Natural	No existing trail. Follows existing dirt road/path. Portions follow narrow ridgelines.
	RC2 (North of High School)	0.13	Natural	No existing trail. Currently a construction site. Connection to Castaic High School path.
	RC3 (Castaic High School)	0.56	SUB	No existing trail. Currently a construction site leading to Romero Canyon Road. Planned trail per developer obligations – alignment needs verification from development plan.
	RC4 (Romero Canyon Rd)	1.89	Natural	No existing trail. Parallels Romero Canyon Road. Follows private road.
Santa Felicia (SA)	SA1 (Santa Felicia Upper Loop)	7.59	Natural	No existing trail. Existing dirt road. Minimal constraints.
	SA2 (Santa Felicia Lower Loop)	5.80	Natural	No existing trail. Existing dirt road. Portions follow narrow ridgelines.
San Francisquito (SF)	SF1 (San Francisquito Motorway)	0.34	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Follows San Francisquito Motorway to the edge of the Castaic project area.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	SF2 (San Francisquito Motorway Bypass)	1.09	Natural	No existing trail. De facto ridgeline dirt road/path. Two parallel alternative routes. Single alignment pending further study. Partially inside Tapia Ranch.
	SF3 (San Francisquito – Tapia)	1.15	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Passes through Tesoro Del Valle, not included in subdivision plans.
	SF4 (San Francisquito – West Creek)	0.85	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Follows utility road. Connects San Francisquito and Cliffie Stone Trails to West Creek.
Sloan Canyon (SC)	SC1 (Sloan Canyon West)	1.14	Natural	No existing trail. Existing dirt roads and construction sites. Portions follow narrow ridgelines.
	SC2 (Homestead at Sloan Canyon)	0.68	SUB	No existing trail. Existing construction site and unpaved Sloan Canyon Road. Planned trail per developer obligations follows existing dirt road.
	SC3 (Sloan Canyon Dr)	1.52	ROW	No existing trail. Parallels Sloan Canyon Road and Lake Hughes Road. On-street connection. Crosses under Interstate 5. Requires coordination with Los Angeles County Public Works.
	SC4 (Lake Hughes at Lagoon)	0.19	ROW	No existing trail. Parallels Lake Hughes Road south of Castaic Lagoon. Connects Castaic Creek to Castaic Lake.
Tapia Canyon (TC)	TC1 (Sports Complex – Tapia)	0.24	SUB	No existing trail. Parallels Tapia Canyon Road. Planned trail per developer obligations – Tapia Ranch development plans to build path to Castaic Road.
	TC2 (Tapia Bypass)	2.74	SUB	No existing trail. Parallels Tapia Canyon Road and Wayside Canyon Road in between undeveloped portions of Tapia Canyon. Planned trail per developer obligations – part of Tapia Ranch development plan. Portions follow 2007 County adopted alignment.
	TC3 (Tapia – San Francisquito)	1.11	Natural	No existing trail. Appears to be a de facto trail or dirt path between Tapia Canyon Road and San Francisquito Motorway. Partially within Tapia Ranch development.
	TC4 (Tapia – Cliffie Stone)	1.03	Natural	No existing trail. A portion of alignment route follows an existing dirt road/path. A portion parallels dirt roads/paths: Quail Haven Trail, Las Tunas Trail, and Lady Linda Lane. Trail would need to traverse a significant elevation change over the ridge at northern end.
Val Verde (VV)	VV1 (Kennsington Rd)	2.31	Natural	No existing trail. Follows a few de facto dirt roads/paths. Requires access along private roads at either end of the alignment.
	VV2 (Chiquito – Val Verde)	0.94	Natural	No existing trail. Follows edge of Val Verde Park and drainage. Follows drainage, marked as privately owned for portions but appears to all be LA County Flood Control property.
West Creek (WC)	WC1 (West Creek – Tapia)	1.49	Natural	No existing trail. Parallels two existing dirt roads: Company Road and Wayside Lateral Road. Requires connection through cul-de-dac in West Creek.
	WC2 (West Creek – Tapia – Tesoro)	1.30	Natural	No existing trail. Follows a portion of existing de facto dirt road/paths and a portion of Tapia Canyon Road. Within subdivision property, but alignment not included in subdivision. Connects West Creek development to Tapia Ranch area.
TOTAL				
Total of 18 Routes	**Total of 71 Trail Segments** • 4 Existing Segments • 10 Segments planned per developer obligations • 57 Proposed Trail Segments			**Total Of 102.94 Miles in Trail Planning Castaic project area** • 4.90 Miles Existing Trails • 8.14 Miles Planned trails per developer obligations (no existing trail) • 89.90 Miles Proposed and Under Consideration

NOTES: *Subject to negotiation with California State Department of Water Resources (DWR) - Future negotiations with DWR and pending state and county agreement renewal. SUB = Multi-Use Subdivision Trail. ROW = New Designation
SOURCE: [1] Friends of Castaic Lake. Accessed 12 April 2016. *Castaic Lake – Trail Map*. Available at: http://castaiclake.com/map_trails.html

Consistent with Section 4.3.6, *Way-finding Signs*, of the County Trails Manual, the proposed project would include regular trail signs at trailheads, trail amenity locations, street and trail intersections, and the boundaries of trail easements on private property and National Forest lands.[9] Also consistent with the recommendations of the County Trails Manual, reassurance marker signs would be posted at eye level (62 inches above the ground surface) at every quarter (0.25) mile of trail that visually mark the trail line and identify the name of the trail and quarter milepost number in order to orient trail users and search and rescue services in the case of an emergency. As each trail segment is constructed, the County Department of Parks and Recreation would be responsible for sending the Los Angeles County Fire Department and the Los Angeles County Sheriff's Department the location of each quarter milepost along the trail for emergency response purposes.

The proposed project would involve the development of five simple trailheads at access points, up to three bike skills park amenities, four equestrian amenities, and nine staging areas and trail amenities (Table 3, *Proposed Trail Related Facilities*). The bike skills parks would occupy up to 45 acres.

TABLE 3
PROPOSED TRAIL RELATED FACILITIES

Trail Related Facility Type	Related Facility Name (Size)
Trail Access Only • Trailheads only	Upper Ridge Route Road
	Sloan Canyon
	Castaic Road
	West Creek
	Hasley Canyon Equestrian Center
Bike Skills Park Amenities • Restrooms • Drinking Fountains • Rest Areas/Seating • Shade Structures • Pump Tracks (no pedaling required) • Progressive Jumps (natural soil with compacted dirt jumps) • Balance Skills Features (e.g., wooden teeter-totter) • Rock/Technical Features (e.g., rock garden with narrow width trails) • Flow Trails (start at higher elevation for downhill ride) • Trails (over variety of terrain, for all ages) • Road Handling Skills Areas (hard-packed soil course) • Beginner, Intermediate, and Expert Skills Courses (for all ages) • Advanced Downhill Course (steep terrain, jumps, turns, obstacles) • Slalom Course (two adjacent trails for competition)	Castaic Sports Complex (up to 10 acres) Upper Lagoon (up to 5 acres) Ridge Route Road (up to 30 acres)

[9] County of Los Angeles Department of Parks and Recreation. Revised June 2013. County of Los Angeles Trails Manual. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

TABLE 3
PROPOSED TRAIL RELATED FACILITIES

Trail Related Facility Type	Related Facility Name (Size)
Equestrian Amenities • Trailheads • Parking • Restrooms • Drinking Fountains (for humans, equine, or pets) • Picnic Tables • Shade Structures • Horse Arenas • Gathering Areas • Horse Ties and Rails	Tapia Canyon Road
	Castaic Lake Upper Lot
	Tesoro Del Valle
	Castaic Sports Complex
Staging Areas and Trail Amenities • Trailheads • Parking • Restrooms • Drinking Fountains (for humans, equine, or pets) • Benches/Seating • Picnic Tables • Shade Structures • Wayfinding Signage • Interpretive Signage • Gathering Areas • Horse Ties and Rails • Bike Racks	Old Road
	Hasley Canyon
	Chiquito Canyon
	Santa Felicia
	Castaic Lagoon
	Lady Linda
	Ridge Route Road
	Castaic Sports Complex
	Castaic Lake State Recreation Area Upper Lot

Restrooms would be design and required to demonstrate compliance with the standards of the Santa Clarita Valley Sanitation District or the County of Los Angeles Department of Public Health for Onsite Wastewater Treatment Systems (OWTS), as applicable.

Trails and supporting facilities within a one-mile radius of officially designated and eligible State scenic highways would be designed, constructed, and maintained (where construction equipment is involved) to preserve scenic resources, including but not limited to trees, rock outcroppings, and historic buildings, within the scenic highway corridor. Where construction of trails or related supporting facilities requires cuts into the slope (which can be seen from a far distance), the visual character of the slope would be restored by planting locally native vegetation as a visual screen. Similarly, restrooms and other supporting structures would be constructed of materials that blend into the landscape, with locally native vegetative screening.

As stated in the County Trails Manual, the hours for operation for County trails are typically from dawn to dusk (County Code 17.04.330). In accordance with the guidelines in Section 4.3.18, *Lighting*, of the County Trails Manual, where lighting features are provided for safety and wayfinding reasons, lighting would installed in a manner to be non-intrusive to adjacent uses, avoid detracting from a natural outdoors experience for trail users, and directed downward to avoid light pollution or spillover in general.[10]

[10] County of Los Angeles Department of Parks and Recreation. Adopted by the Board of Supervisors on May 17, 2011. Revised June 2013. County of Los Angeles Trails Manual. Available at:

REGULATORY FRAMEWORK

Federal

Clean Water Act, Sections 401 and 404

Section 401 of the Clean Water Act of 1972 (CWA) established the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under the CWA, the U.S. Environmental Protection Agency (EPA) has implemented pollution control programs such as setting wastewater standards for surface waters. The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit is obtained. The EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. Point sources are discrete conveyances such as pipes or manmade ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit. In California, Section 401 of the federal CWA is administered and enforced by the SWRCB, which develops regulations to implement water-quality control programs mandated at the federal and state levels. To implement these programs, California has nine RWQCBs. The Trail Planning Study Area is located within the jurisdiction of the Los Angeles RWQCB.

Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. The U.S. Army Corps of Engineers (USACE) administers the day-to-day program, including individual permit decisions and jurisdictional determinations; develops policy and guidance; and enforces Section 404 provisions.

Clean Water Act

This law was enacted to restore and maintain the chemical, physical, and biological integrity of the nation's waters by regulating point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. This includes the creation of the National Pollutant Discharge Elimination System (NPDES), a program that requires states to establish discharge standards specific to water bodies.

Section 303(d) of the CWA requires states to identify and establish a list of water bodies for which technology-based NPDES effluent limitations required by the CWA are not stringent enough to attain and maintain applicable water quality standards. Those water bodies on the 303(d) list are termed "impaired water bodies." For each impaired water body, states are required to develop a total maximum daily load (TMDL), which is the pollutant limit a water body can receive and still attain water quality standards. Any pollution above the maximum TMDL has to be "budgeted," meaning that the residual pollution is allocated for reduction among the various sources of the pollutant in order to regain the beneficial uses of the water body.

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https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

State

Section 1602 of the State Fish and Game Code

The California Department of Fish and Wildlife (CDFW) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify CDFW of any proposed activity that may substantially modify a river, stream, or lake. Notification is required by any person, business, state, or local government agency, or public utility that proposes an activity that will:

- Substantially divert or obstruct the natural flow of any river, stream or lake;
- Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water. If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. The Agreement includes reasonable conditions necessary to protect those resources and must comply with the California Environmental Quality Act (CEQA). The entity may proceed with the activity in accordance with the final Agreement.

California Porter-Cologne Water Quality Act

This California state law provides a comprehensive water quality management system for the protection of California waters. Porter-Cologne designated the State Water Resources Control Board (SWRCB) as the ultimate authority over state water rights and water quality policy and also established nine Regional Water Quality Control Boards (RWQCBs) to oversee water quality on a day-to-day basis at the local/regional level, including preparation and implementation of the Water Quality Control Plan (Basin Plan).

The Basin Plans contain water quality standards that are the basis for each RWQCBs' regulatory programs. The water quality standards consist of up to 24 designated beneficial uses (e.g., municipal and domestic supply, wildlife habitat, recreation, and groundwater recharge) for individual surface water bodies and groundwater, as well as the water quality objectives to be maintained or attained to protect those beneficial uses. The Basin Plans also contain waste discharge prohibitions and other implementation measures to achieve water quality objectives. Water quality control measures include TMDLs required by the federal CWA.

Water Code Section 8100

This code provides that each county board of supervisors may appropriate and expend money from the general fund of a county for any of the following purposes in connection with streams or rivers:

- The construction of works, improvements, levees, or check dams to prevent overflow and flooding
- The protection and reforestation of watersheds

- The conservation of the floodwaters
- The making of all surveys, maps, and plans necessary to carry out any work, construction, or improvement authorized by this article
- The carrying out of any work, construction, or improvement authorized by this article outside the county if the rivers or stream affect flow in or through more than one county

Regional

Water Quality Control Plan for the Los Angeles Region

The Los Angeles RWQCB has prepared a Water Quality Control Plan for the Los Angeles Region (Basin Plan), which includes the Coastal Watersheds of Los Angeles and Ventura Counties. The first essentially complete Basin Plan, which was established under the requirements of California's 1969 Porter-Cologne Water Quality Control Act (Section 13000 [Water Quality] et seq. of the California Water Code), was adopted in 1975 and revised in 1984. The latest version was adopted in 1994.

The Los Angeles RWQCB is involved is the regulation of a number of activities that are relevant to the Multi-Use Trails Plan:

- Prepares, monitors compliance with, and enforces Waste Discharge Requirements, including NPDES Permits;
- Implements and enforces local storm water control efforts;
- Enforces water quality laws, regulations, and waste discharge requirements;
- General Construction Activity Storm Water Discharges

Storm water discharges that are composed entirely of runoff from qualifying construction activities may require regulation under the General Construction Activity Storm Water Permit issued by the SWRCB. Construction activities that qualify include clearing, grading, excavation, reconstruction, and dredge-and-fill activities that result in the disturbance of at least 1 acre and less than 5 acres of total land area.

Local

Los Angeles County General Plan 2035

The Trail Planning Study Area is located within unincorporated Los Angeles County and is subject to the County of Los Angeles General Plan 2035.

Goal C/NR 5: Protected and useable local surface water resources.

- **Policy C/NR 5.1:** Support the LID philosophy, which seeks to plan and design public and private development with hydrologic sensitivity, including limits to straightening and channelizing natural flow paths, removal of vegetative cover, compaction of soils, and distribution of naturalistic BMPs at regional, neighborhood, and parcel-level scales.

- **Policy C/NR 5.2:** Require compliance by all County departments with adopted Municipal Separate Storm Sewer System (MS4), General Construction, and point source NPDES permits.
- **Policy C/NR 5.3:** Actively engage with stakeholders in the formulation and implementation of surface water preservation and restoration plans, including plans to improve impaired surface water bodies by retrofitting tributary watersheds with LID types of BMPs.
- **Policy C/NR 5.4:** Actively engage in implementing all approved Enhanced Watershed Management Programs/Watershed Management Programs and Coordinated Integrated Monitoring Programs/Integrated Monitoring Programs or other County-involved TMDL implementation and monitoring plans.
- **Policy C/NR 5.5:** Manage the placement and use of septic systems in order to protect nearby surface water bodies.
- **Policy C/NR 5.6:** Minimize point and non-point source water pollution.
- **Policy C/NR 5.7:** Actively support the design of new and retrofit of existing infrastructure to accommodate watershed protection goals, such as roadway, railway, bridge, and other—particularly—tributary street and greenway interface points with channelized waterways.

Goal C/NR 6: Protected and usable local groundwater resources.

- **Policy C/NR 6.1:** Support the LID philosophy, which incorporates distributed, post-construction parcel-level stormwater infiltration as part of new development.
- **Policy C/NR 6.2**: Protect natural groundwater recharge areas and regional spreading grounds.
- **Policy C/NR 6.3:** Actively engage in stakeholder efforts to disperse rainwater and stormwater infiltration BMPs at regional, neighborhood, infrastructure, and parcel-level scales.
- **Policy C/NR 6.4:** Manage the placement and use of septic systems in order to protect high groundwater.
- **Policy C/NR 6.5:** Prevent stormwater infiltration where inappropriate and unsafe, such as in areas with high seasonal groundwater, on hazardous slopes, within 100 feet of drinking water wells, and in contaminated soils.

Goal C/NR 7: Protected and healthy watersheds.

- **Policy C/NR 7.1:** Support the LID philosophy, which mimics the natural hydrologic cycle using undeveloped conditions as a base, in public and private land use planning and development design.
- **Policy C/NR 7.2:** Support the preservation, restoration and strategic acquisition of available land for open space to preserve watershed uplands, natural streams, drainage paths, wetlands, and rivers, which are necessary for the healthy function of watersheds.
- **Policy C/NR 7.3:** Actively engage with stakeholders to incorporate the LID philosophy in the preparation and implementation of watershed and river master plans, ecosystem restoration projects, and other related natural resource conservation aims, and support the implementation of existing efforts, including Watershed Management Programs and Enhanced Watershed Management Programs.

- **Policy C/NR 7.4:** Promote the development of multi-use regional facilities for stormwater quality improvement, groundwater recharge, detention/attenuation, flood management, retaining non-stormwater runoff, and other compatible uses.

Goal S 2: An effective regulatory system that prevents or minimizes personal injury, loss of life, and property.

- **Policy S 2.1:** Discourage development in the County's Flood Hazard Zones.
- **Policy S 2.2:** Discourage development from locating downslope from aqueducts.
- **Policy S 2.3:** Consider climate change adaptation strategies in flood and inundation hazard planning.
- **Policy S 2.4:** Ensure that developments located within the County's Flood Hazard Zones are sited and designed to avoid isolation from essential services and facilities in the event of flooding.
- **Policy S 2.5:** Ensure that the mitigation of flood related property damage and loss limits impacts to biological and other resources.
- **Policy S 2.6:** Work cooperatively with public agencies with responsibility for flood protection, and with stakeholders in planning for flood and inundation hazards.
- **Policy S 2.7:** Locate essential public facilities, such as hospitals and fire stations, outside of Flood Hazard Zones, where feasible.

Los Angeles County Flood Control Act

This act was adopted by the state legislature in 1915. The act established the Los Angeles County Flood Control District (LACFCD) and empowered it to provide flood protection, water conservation, recreation, and aesthetic enhancement within its boundaries. The LACFCD is governed, as a separate entity, by the County of Los Angeles Board of Supervisors. In 1985, the responsibilities and authority vested in the LACFCD were transferred to the County of Los Angeles Department of Public Works (DPW).

Los Angeles County Trails Manual

The Trails Manual outlines various issues affecting trail feasibility (Section 2.5), including hydrology and water quality. Factors include soil erosion, surface runoff, flooding, slope gradient, and water quality. These factors can also affect design methods, construction techniques, and trail maintenance. The stated purpose of the Trails Manual is "to provide guidance to County departments, specifically Los Angeles County Department of Parks and Recreation (LACO-DPR), that interface with trail planning, design, development, and maintenance of hiking, equestrian, and mountain biking recreational trails, while addressing physical and social constraints and opportunities associated with the diverse topographic and social conditions that occur in the unincorporated territory of the County. LACO-DPR will use the planning process delineated in the Trails Manual in considering the development of future trails."

Santa Clarita Valley Area Plan

The Trail Planning Study Area is located within the unincorporated portion of the Santa Clarita Valley and is subject to the 2012 Santa Clarita Valley Area Plan. Relevant guiding principles stated in the Santa Clarita Valley Area Plan include:

Environmental Resources.

- **11.** New development shall be designed to improve energy efficiency, reducing energy and natural resource consumption by such techniques as … capture of storm runoff on-site, … native and drought-tolerant landscape.

Objective LU-7.3: Protect surface and ground water quality through design of development sites and drainage improvements.

- **Policy LU-7.3.1:** Promote the use of permeable paving materials to allow infiltration of surface water into the water table.
- **Policy LU-7.3.2:** Maintain stormwater runoff onsite by directing drainage into rain gardens, natural landscaped swales, rain barrels, permeable areas and use of drainage areas as design elements, where feasible and reasonable.
- **Policy LU-7.3.3:** Seek methods to decrease impermeable site area where reasonable and feasible, in order to reduce stormwater runoff and increase groundwater infiltration, including use of shared parking and other means as appropriate.
- **Policy LU-7.3.4:** Implement best management practices for erosion control throughout the construction and development process
- **Policy LU-7.3.5:** Limit development within flood-prone areas to minimize down-stream impacts.
- **Policy LU-7.3.6:** Support emerging methods and technologies for the on-site capture, treatment, and infiltration of stormwater and greywater, and amend the County Code to allow these methods and technologies when they are proven to be safe and feasible.

Los Angeles County Low Impact Development Ordinance (L.A. County Code, Title 12, Ch. 12.84)

The project is in Los Angeles County and is subject to Low Impact Development standards outlined in L.A. County Code, Title 12, Chapter 12.84. The purpose of the standards is:

- To lessen the adverse impacts of stormwater runoff from development and urban runoff on natural drainage systems, receiving waters and other water bodies
- Minimize pollutant loadings from impervious surfaces by requiring development projects to incorporate proper designed, technically appropriate BMPs and other LID strategies.
- Minimize erosion and other hydrologic impacts on natural drainage systems by requiring development projects to incorporate properly designed, technically appropriated hydromodification control development principles and technologies.

The LID standards of this chapter include:

- Mimic undeveloped stormwater runoff rates and volumes in any storm event up to and including the Capital Flood;
- Prevent pollutants of concern from leaving the development site in stormwater as the result of storms, up to and including a Water Quality Design Storm Event; and
- Minimize hydromodification impacts to natural drainage systems.

Newhall Ranch Specific Plan

A portion of the Trail Planning Study Area is located within the Newhall Ranch area and is subject to the Newhall Ranch Specific Plan. There are two Resource Conservation Objectives within the Newhall Ranch Specific Plan that relate to hydrology and water quality:

- **Resource Conservation Objective 1:** Protect wetland and endangered species in the Santa Clara River.
- **Resource Conservation Objective 2:** Preserve the Santa Clara River Corridor and adjacent uplands containing significant natural resources for their resource value, Open Area, and recreational use.

Northlake Specific Plan

A portion of the Trail Planning Study Area is located within the Northlake Specific Plan area. However, there are no goals or policies within this specific plan that pertain to hydrology and water quality. Therefore, this plan is not applicable to the Proposed project.

EXISTING CONDITIONS

The information is organized consistent with the Hydrology and Water Quality Section of Appendix G to the State California Environmental Quality Act (CEQA) Guidelines.

Surface Water

Rainfall in the Proposed project study area drains to the Santa Clara River watershed (Figure 1 and Figure 5, *Study Area Hydrology*). The Proposed project study area is within the South Coast Hydrological Region and under the jurisdiction of the Los Angeles RWQCB. The Proposed project study area is primarily mountainous with surfaces formed by erosion from wind, water, and structural features of the rock.

Castaic Creek is a major tributary of the Santa Clara River and falls within the East Subbasin of the Santa Clara Watershed. Castaic Creek is a south-trending creek originating near Liebre Mountain that confluences with the Santa Clara River downstream of the City of Santa Clarita. The Castaic Lake Reservoir is located on Castaic Creek.[11]

The East Subbasin has a surface area of 66,200 acres (103 square miles). The surface is drained by the Santa Clara River, Bouquet Creek, and Castaic Creek. Discharge from the subbasin is through pumping for municipal and irrigation uses, uptake by plants, and outflow to the Santa Clara River in the western part of the subbasin. Groundwater flow in the subbasin is southward and westward and follows the course of the Santa Clara River. The subbasin is comprised of two aquifer systems, the Alluvium and the Saugus Formation. The Alluvium generally underlies the Santa Clara River and its several tributaries, and the Saugus Formation underlies virtually the entire Upper Santa Clara River area (*Black & Veatch*, 2005). Groundwater in the alluvial aquifer varies from calcium bicarbonate character in the east to calcium sulfate character in the western part of the subbasin. Nitrate content decreases to the west and TDS content increases from about 550 to 600 mg/l in the

[11] California Public Utilities Commission. December 2004. *Antelope Transmission Project – Segment 1 Proponent's Environmental Assessment*. Available at: http://www.cpuc.ca.gov/Environment/info/aspen/antelopepardee/pea/pea04-09.pdf

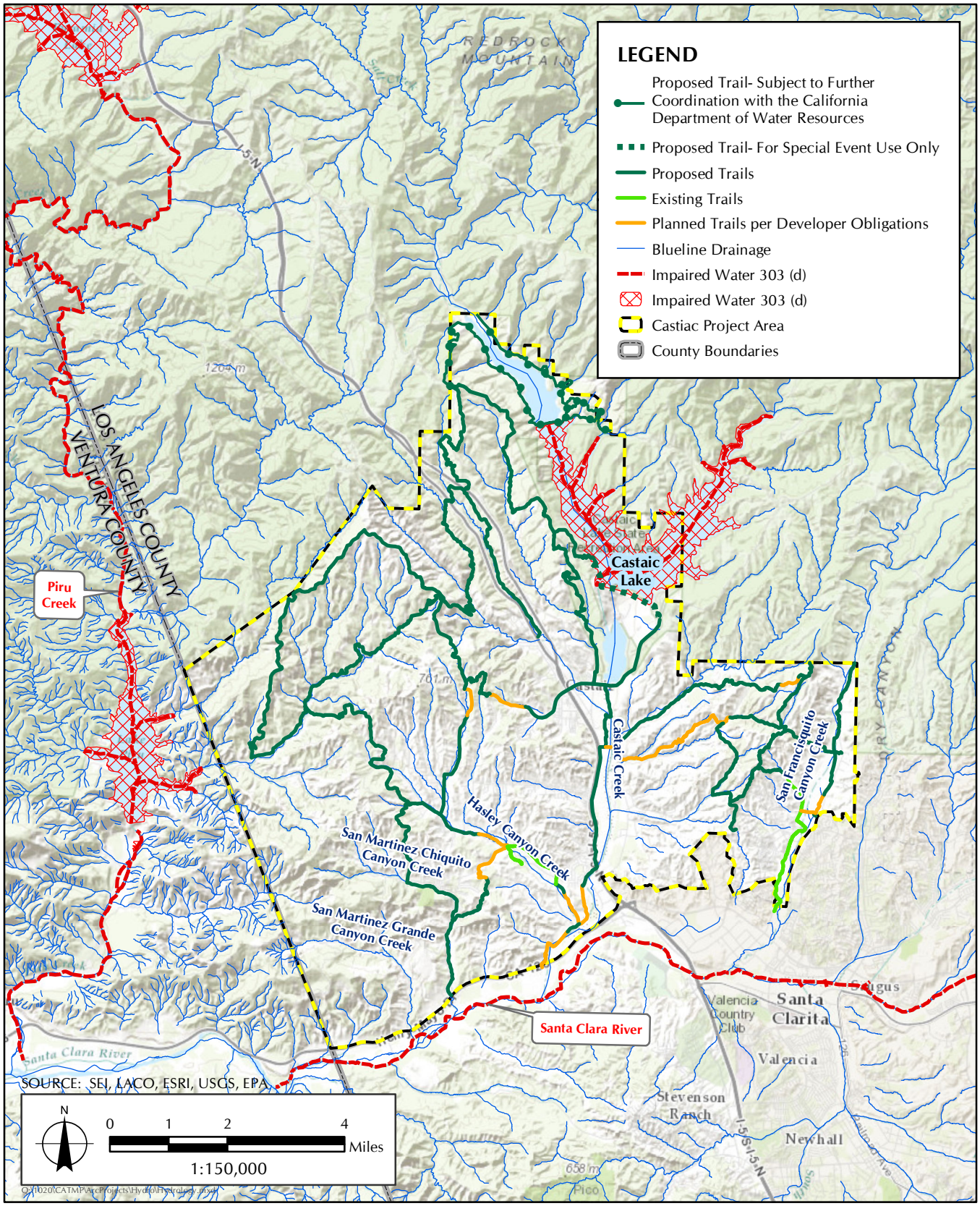

FIGURE 5

Study Area Hydrology

east to about 1,000 mg/l in the west. Groundwater in the Saugus Formation aquifer is of calcium bicarbonate character in the southeast, calcium sulfate in the central, and sodium bicarbonate in the western parts of the subbasin. TDS content in the Saugus Formation aquifer ranges from about 500 to 900 mg/l (CDWR website). Most local wells draw water from the Alluvial Aquifer. A smaller portion of the Valley's water supply is drawn from the Saugus Formation, a much deeper aquifer than the Alluvial Aquifer.[12]

The Castaic Lake Reservoir was completed in 1973 as part of the California State Water Project and stores water transported from northern California for use by state water contractors in southern California. It has a storage capacity of approximately 323,700 acre-feet.[13]

Surface Water Quality

The Proposed project study area is located within the Basin Plan for the Los Angeles RWQCB. The development and implementation of the Basin Plan is a requirement under the federal CWA and is a resource for the use of water and/or discharge of wastewater within the Los Angeles RWQCB boundaries, as well as providing valuable information to the public about local water quality issues. The Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan (1) designates beneficial uses for surface and ground waters, (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's anti-degradation policy, and (3) describes implementation programs to protect all waters in the region. In addition, the Basin Plan incorporates (by reference) all applicable state and regional board plans and policies and other pertinent water quality policies and regulations.

Groundwater

The Castaic project area is underlain by the Santa Clara River Valley Groundwater Basin, (Figure 6, *Groundwater Basins*). The Santa Clara River Valley East subbasin is bordered on the north by the Piru Mountains, on the west by impervious rocks of the Modelo and Saugus Formations and a constriction in the alluvium[14] on the south by the Santa Susana Mountains, and on the south and east by the Gabriel Mountains. The surface is drained by the Santa Clara River, Bouquet Creek, and Castaic Creek. Average annual precipitation ranges from 14 to 16 inches.

Groundwater is found in alluvium, terrace deposits, and Saugus Formation. Groundwater in the subbasin is generally unconfined in the alluvium, but may be confined, semi-confined, or unconfined in the Saugus Formation.[15]

Groundwater levels in the alluvium has been relatively stable during about 1970 through 2000.[16] During this period, depth to groundwater varied from about 13 to 37 feet in the western 10 to 50

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[12] California Public Utilities Commission. December 2004. *Antelope Transmission Project – Segment 1 Proponent's Environmental Assessment*. Available at: http://www.cpuc.ca.gov/Environment/info/aspen/antelopepardee/pea/pea04-09.pdf

[13] California Public Utilities Commission. December 2004. *Antelope Transmission Project – Segment 1 Proponent's Environmental Assessment*. Available at: http://www.cpuc.ca.gov/Environment/info/aspen/antelopepardee/pea/pea04-09.pdf

[14] California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

[15] California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

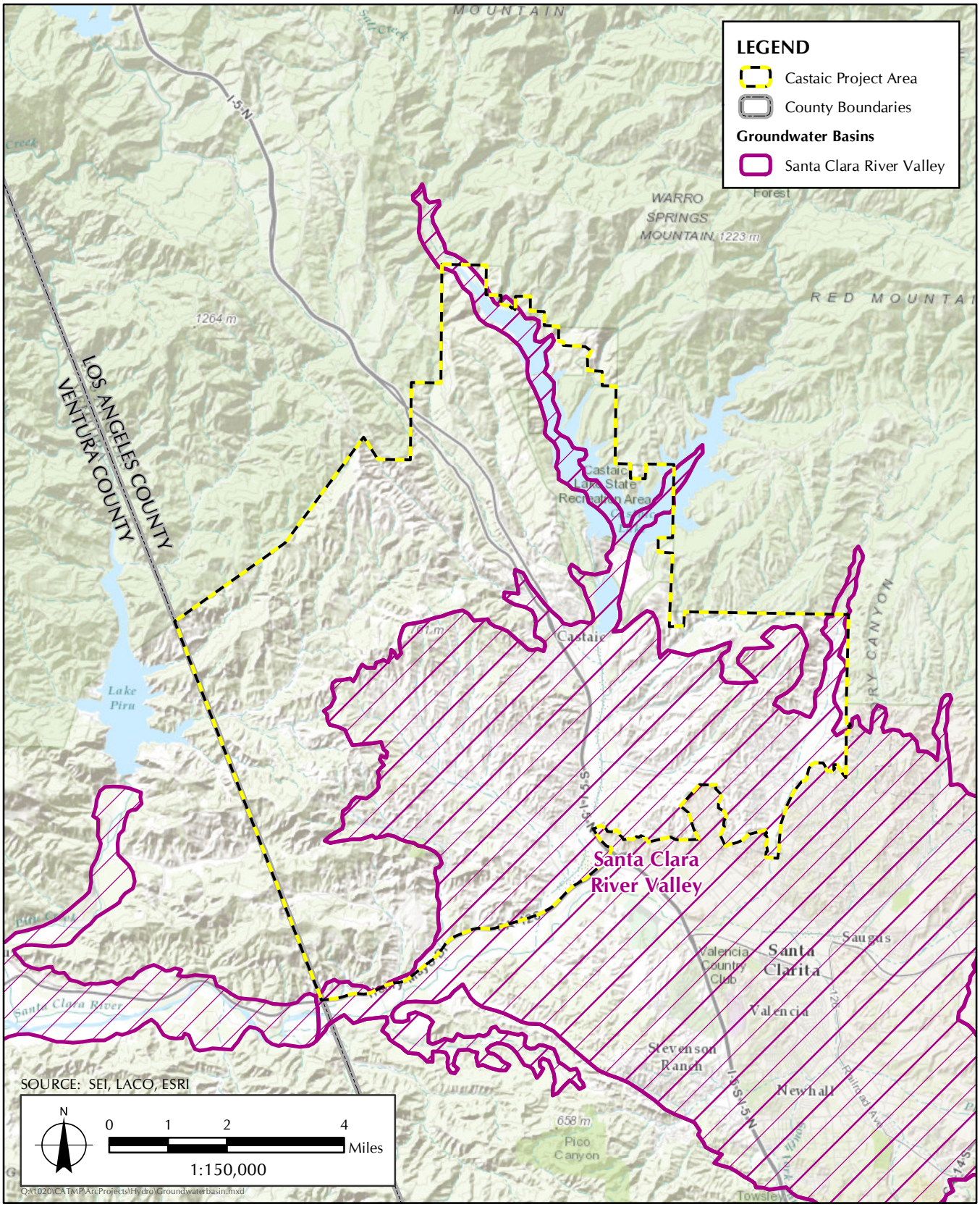

FIGURE 6

Groundwater Basins

feet in the central, and 15 to 100 feet in the eastern parts of the subbasin.[17] Water levels tend to follow long-term precipitation patterns by dropping during periods of low rainfall and recovering during periods of high rainfall. Groundwater levels in the Saugus Formation have been essentially constant during 1970 through 2000 (Upper Santa Clara Valley Water Committee 2002). Groundwater flow in the subbasin is southward and westward and follows the course of the Santa Clara.[18]

The groundwater storage capacity of the alluvial aquifer is about 240,000 af and the Saugus Formations aquifer is at least 1,650,000 af.[19]

Groundwater in storage in the alluvial aquifer during the historical high in 1945 is estimated to have been about 201,000 af and during Spring 2000 was about 161,000 af (*Slade*, 2002). Groundwater in storage in the Saugus Formation during Spring 2000 is estimated to be about 1,650,000 af.[20]

Recent study has determined a normal year operational yield of 30,000 to 40,000 af/yr for the alluvial aquifer and 7,500 to 15,000 af/yr for the Saugus Formation.[21] Pumping from the alluvial aquifer has ranged from 20,000 to 44,000 af/yr, with an average of about 35,000 af/yr for 1990 through 2000 (*Slade*, 2002). During 1991 through 2000, annual pumping from the Saugus Formation ranged from 3,850 to 15,000 af and averaged about 8,500 af/yr. About 92 percent of the Saugus pumping is used for municipal purposes.[22] During 2001, 25,322 af of groundwater was used for municipal and industrial purposes, 16,091 for agricultural and other uses; 37,300 af was produced from the alluvial aquifer and 4,100 af was from the Saugus Formation.[23]

Groundwater in the alluvial aquifer varies from calcium bicarbonate character in the east to calcium sulfate character in the western part of the subbasin.[24] Nitrate content decreases to the west and TDS content increases from about 550 to 600 mg/L in the east to about 1,000 mg/L in the west.[25] Groundwater in the Saugus Formation aquifer is of calcium bicarbonate character in the southeast, calcium sulfate in the central, and sodium bicarbonate in the western parts of the

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16 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

17 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

18 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

19 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

20 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

21 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

22 California's Groundwater Bulletin 118; Sanat Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

23 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

24 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

25 California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

subbasin.[26] TDS content in the Saugus Formation aquifer ranges from about 500 to 900 mg/L.[27] Water sampled from 59 public supply wells show an average TDS content of 695 mg/L in the subbasin and a range from 300 to 1,662 mg/L.

Nitrate content has exceeded 45 mg/L in some parts of the subbasin with a well in the central part of the subbasin reaching 68 mg/L.[28] TDS content may also be elevated, particularly in the western part of the subbasin to become unsuitable for domestic use (DWR, 1968; 1979). Trichloroethylene and ammonium perchlorate have been detected in four wells in the eastern part of the subbasin (*Slade*, 2002).

Existing Drainage Pattern

The Castaic Ranges cover 404,000 acres and include Liebre Mountain, Sawmill Mountain, and the Sierra Pelona. They lie northwest of the San Gabriel Mountains, between Soledad Canyon and Piru Creek in Los Angeles County. Geologically, they are considered part of the Transverse Ranges. The area has rugged topography but is relatively low in elevation, climbing above 5,000 feet only on Liebre and Sawmill mountains. The mountains and foothills north of Castaic are dominated by chaparral-covered hills, but they also contain several low elevation streams that have high-quality riparian and aquatic habitats. In addition, the upper elevations of Liebre and Sawmill mountains contain unique and important montane habitats. The geographic position of this region, which lies between the San Gabriel Mountains to the east, the Tehachapi Mountains to the north, and the Los Padres ranges to the west, makes it a key wildland linkage.[29] The study area crosses Castaic Creek and many other unnamed blueline drainages. These crossings and ephemeral drainages would be subject to the jurisdiction of USACE and CDFW.

Precipitation and Floods

Rainfall in the Castaic project area primarily occurs during late fall through early spring (official season is October 15 through May 15). The average annual rainfall in the area of the Castaic project area is 17.7 inches. The San Fernando Valley received 25.2 inches of precipitation in the measuring year 2010–2011, approximately 42 percent more than its normal seasonal average. In the Santa Clara region, the average annual rainfall is slightly less at 17.1 inches (County of Los Angeles, 2012).

Flooding hazards are directly related to precipitation (rainfall) intensity and duration. Other contributing factors to flooding include the regional topography, type and extent of vegetation coverage, amount of impermeable surfaces, local slope characteristics, and available drainage facilities. Discharge during rainfall events in the Proposed project study area tends to be rapid due to the steep terrain. High intensity rainfalls, in combination with alluvial soils, sparse vegetation, erosion, and steep gradients, can result in significant debris-laden flash floods (County of Los Angeles, 2012).

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[26] California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

[27] California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

[28] California's Groundwater Bulletin 118; Santa Clara River Valley Groundwater Basin, Santa Clara River Valley East Subbasin. 2006.

[29] Stephenson R., John. 1999. Southern California Mountains and Foothills Assessment.

Stormwater Drainage Systems

The proposed project would increase runoff, but adherence to the County's required BMPs would mitigate against any impacts to the existing area's stormwater drainage systems.

100-Year Floodplain

The Federal Emergency Management Agency (FEMA) maps flood risk areas within the United States as part of the National Flood Insurance Program (NFIP). The NFIP is a federal program that allows property owners in areas of participating communities to purchase insurance against possible loss due to flooding. The majority of the Castaic project area falls within Flood Hazard Zone D; areas where there are possible but undetermined flood hazards (Figure 7, *100-Year Floodplain*). Castaic Lake falls within Flood Hazard Zone A; No base flood elevation determined.[30]

Levees or Dams

Castaic Dam is an embankment dam in northern Los Angeles County, California, near the city of Castaic. Although located on Castaic Creek, a major tributary of the Santa Clara River, Castaic Creek provides little of its water. The lake is the terminus of the West Branch of the California Aqueduct, part of the State Water Project. The dam was built by the California Department of Water Resources and construction was completed in 1973. The lake has a capacity of 325,000 af (401,000,000 m^3) and stores drinking water for the western portion of the Greater Los Angeles Area (Figure 5).

Seiche, Tsunami, or Mudflows

Seiche and tsunamis are the result of tectonic activity, such as an earthquake. A seiche is an oscillation of the surface of a landlocked body of water that can create a hazard to persons and structures on and in the vicinity of the water. A tsunami is a long-period, high-velocity tidal surge that can result in a series of very low (trough) and high (peak) sea levels, with the potential to inundate areas up to several miles from the coast, creating hazards to people or structures from loss, injury, or death. Most of the hazards created by a tsunami come when a trough follows the peak, resulting in a rush of sea water back into the ocean. A mudflow is a moving mass of soil-made fluid by a loss of shear strength, generally as a result of saturation from rain or melting snow. As such, the proposed initiative is not expected to increase the risk and hazard to individuals residing within unincorporated areas that lie within the vicinity of coastal waters of being subject to a seiche or tsunami. Therefore, the Castaic Area Multi Use Trails Plan Area would not be expected to result in significant impacts to hydrology and water quality in relation to seiche, tsunamis, and mudflow.

A tsunami is a series of water waves caused by the displacement of a large volume of water in the ocean that have the potential to cause damage at shorelines. Earthquakes, volcanic eruptions, landslides, glacier carvings, meteorite impacts and other disturbances above or below water all have the potential to generate a tsunami. Due to the distance and rise in elevation from the Pacific Ocean to the Proposed project study area, the area is unlikely to be affected by tsunami.

[30] FEMA Flood Insurance Rate Map Panel 600.

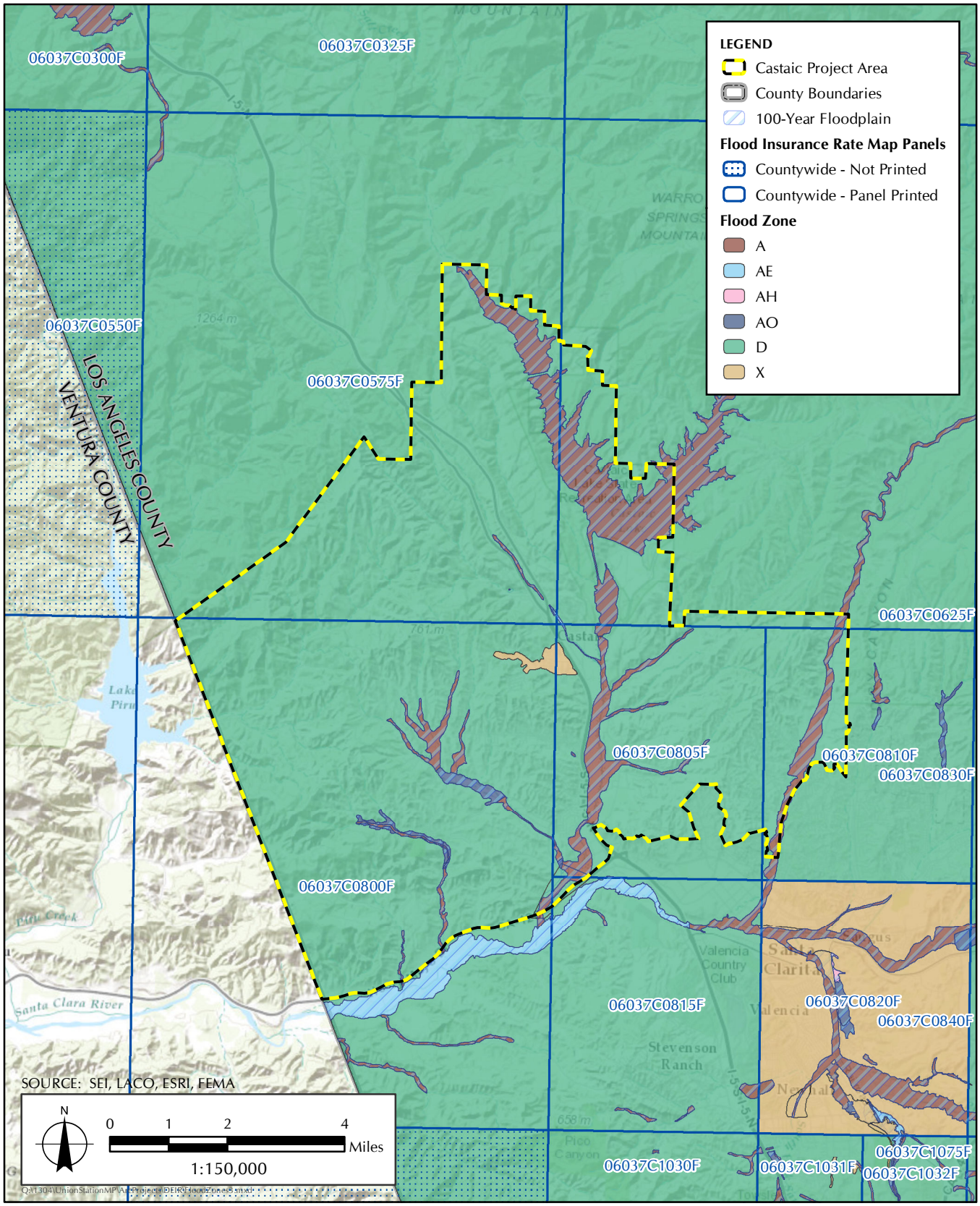

FIGURE 7

100-Year Floodplain

SIGNIFICANCE THRESHOLDS

The potential for trails constructed within the proposed project study area, to result in impacts related to hydrology and water quality was analyzed in relation to the questions in Appendix G of the State CEQA Guidelines.[31] Trails constructed within the study area would be considered to have a significant impact to hydrology and water quality when the potential for any one of the following four thresholds occurs:

- Violate any water quality standards or waste discharge requirements?
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?
- Add water features or create conditions in which standing water can accumulate that could increase habitat for mosquitoes and other vectors that transmit diseases such as the West Nile virus and result in increased pesticide use?
- 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?
- Generate construction or post-construction runoff that would violate applicable stormwater NPDES permits or otherwise significantly affect surface water or groundwater quality?
- Conflict with the Los Angeles County Low Impact Development_Ordinance (L.A. County Code, Title 12, Ch. 12.84)?
- Result in point or nonpoint source pollutant discharges into State Water Resources Control Board-designated Areas of Special Biological Significance?
- Use onsite wastewater treatment systems in areas with known geological limitations (e.g. high groundwater) or in close proximity to surface water (including, but not limited to, streams, lakes, and drainage course)?
- Otherwise substantially degrade water quality?
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, or within a floodway or floodplain?
- Place structures, which would impede or redirect flood flows, within a 100-year flood hazard area, floodway, or floodplain?
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?
- Place structures in areas subject to inundation by seiche, tsunami, or mudflow?

[31] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

RESULTS

Violate any water quality standards or waste discharge requirements?

There are no impaired water bodies within the proposed project boundary (Figure 5). Where grading is required to construct the trail improvements is in excess of 1 acre, it would be subject to General Construction Permit and require preparation of a Stormwater Pollution Prevention Plan (SWPPP). Additionally, grading that occurs in the vicinity of a Significant Ecological Area (SEA) may be subject to storm water controls at the discretion of the County Building Department when disturbance is less than an acre.

Most of the main drainages are classified on USGS topographic maps as blue-line streams, indicating that under certain conditions the streams convey water flows. A blue-line stream would be classified as either a positive or negative control point for planning the path of a new trail. In some instances, blue-line streams can be identified as negative control points because the stream can pose a hazard to users or cause excessive damage to natural resources. However, blue-line streams can also provide access to water bodies where the Basin Plan identifies the water body as being suitable for body contact recreation or the water body provides an important visual or aesthetic experience and the blue-line stream would then be considered a positive control point.

Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Depth to groundwater has reported at 10 to 100 feet below the ground surface from the limited investigations that have been undertaken in the study area and should not be an issue for near surface grading required to accommodate new trails and improvements to existing trails.

Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

The discharge of dredged or fill materials in to wetlands and "waters of the United States" would be subject to the jurisdiction of the U.S. Army Corps of Engineers pursuant to Section 404 of the CWA and would require a Water Quality Certification or Waiver of Water Quality Certification from the Los Angeles RWQCB. It is possible that the work could be authorized pursuant to one of the pre-authorized Nationwide Permits.

The alteration of any water of the state would be subject to the jurisdiction of the California Department of Fish and Wildlife pursuant to Section 1600 of the State Fish and Game Code.

Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The discharge of dredged or fill materials in to wetlands and "waters of the United States" would be subject to the jurisdiction of the U.S. Army Corps of Engineers pursuant to Section 404 of the CWA and would require a Water Quality Certification or Waiver of Water Quality Certification

from the Los Angeles RWQCB. It is possible that the work could be authorized pursuant to one of the pre-authorized Nationwide Permits.

The alteration of any water of the state would be subject to the jurisdiction of the California Department of Fish and Wildlife pursuant to Section 1600 of the State Fish and Game Code.

Add water features or create conditions in which standing water can accumulate that could increase habitat for mosquitoes and other vectors that transmit diseases such as the West Nile virus and result in increased pesticide use?

The proposed project would not add water features or create conditions in which standing water can accumulate that could increase habitat for mosquitoes and other vectors that transmit diseases such as the West Nile virus and result in increased pesticide use.

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?

The are no planned stormwater drainage systems to be added and thus the project would not 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.

Generate construction or post-construction runoff that would violate applicable stormwater NPDES permits or otherwise significantly affect surface water or groundwater quality?

Procedures from the County's LID Standards Manual will be followed to determine the difference in the proposed initiative's pre- and post-development runoff volumes and potential pollutant loads.

Conflict with the Los Angeles County Low Impact Development Ordinance (L.A. County Code, Title 12, Ch. 12.84)?

LA County's Low Impact Development (LID) Standards Manual requires developments manage stormwater runoff. Developments are categorized as Designated or Non-Designated. The proposed project is considered new development located in or directly adjacent to or discharging directly to a Significant Ecological Area (SEA), as defined in Section 22.08.190 of Title 22 of the LID Development Standards, which will discharge stormwater runoff that is likely to impact a sensitive biological species or habitat and create two thousand five hundred (2,500) square feet or more of impervious surface area. The County's LID ordinance does not require a specific reduction in pollutant discharges, but it does have requirements on the size of the BMPs in the manual. BMPs listed for Non-Designated Projects are not required to meet a specific pollutant load reduction or to retain a specified amount of runoff. They are only intended to reduce a development's pollutant load, but not necessarily to reduce all pollutant loads to a pre-development condition; therefore, Project development will result in an increase of pollutant discharges. Procedures from the County's LID Standards Manual will be followed to determine the difference in the proposed initiative's pre- and post-development runoff volumes and potential pollutant loads.

Result in point or nonpoint source pollutant discharges into State Water Resources Control Board-designated Areas of Special Biological Significance?

The proposed project would not result in a point or nonpoint pollutant discharge into State Water Resources Control Board-designated Areas of Special Biological Significance.

Use onsite wastewater treatment systems in areas with known geological limitations (e.g. high groundwater) or in close proximity to surface water (including, but not limited to, streams, lakes, and drainage course)?

The proposed project would not use onsite wastewater treatment systems in areas with known geological limitations or in close proximity to surface water. (Figure 8, *Santa Clarita Valley Sanitation District*).

Otherwise substantially degrade water quality?

There are no impaired water bodies within the proposed project boundary (Figure 5). Where grading is required to construct the trail improvements is in excess of 1 acre, it would be subject to General Construction Permit and require preparation of a Stormwater Pollution Prevention Plan (SWPPP). Additionally, grading that occurs in the vicinity of a Significant Ecological Area (SEA) may be subject to storm water controls at the discretion of the County Building Department when disturbance is less than an acre.

Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, or within a floodway or floodplain?

The proposed would have no impacts related to placing housing with a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary of Flood Insurance Rate Map or other flood hazard delineation map, or within a floodway or floodplain, because the proposed project does not include the construction of new or relocation of existing housing.

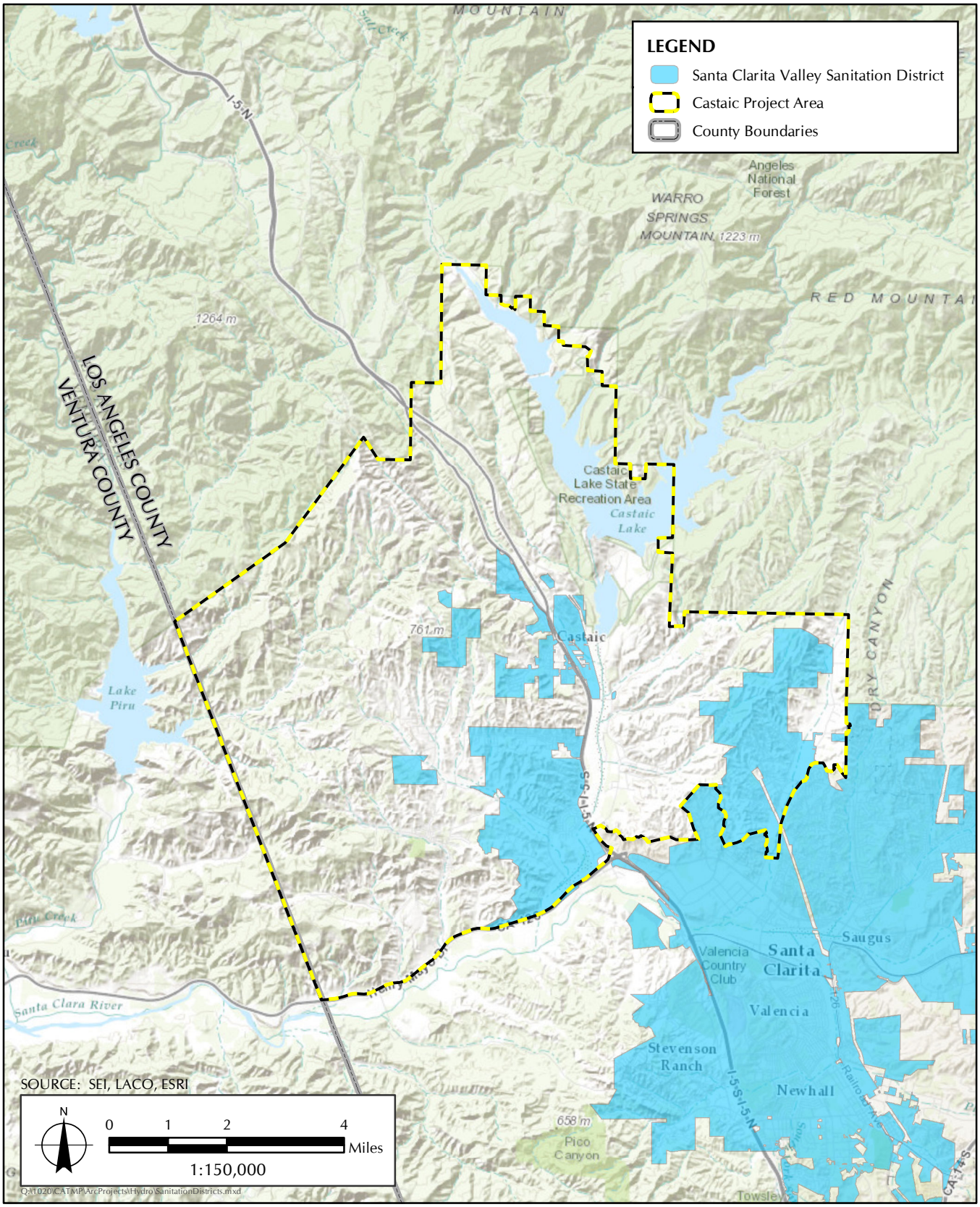

FIGURE 8

Santa Clarita Valley Sanitation District

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Appendix G

Noise Assessment

Sapphos environmental inc.

May 13, 2016
Job Number: 1020-085
Castaic Area Multi-Use Trails Plan Project

MEMORANDUM FOR THE RECORD
2.6 1020-085 M.08

TO: County of Los Angeles Department of Parks and Recreation (Mr. Frank Moreno, Ms. Olga Ruano, and Mr. Zachary Likins)

FROM: Sapphos Environmental, Inc.
(Ms. Aimee Frappied)

SUBJECT: Castaic Area Multi-Use Trails Plan Noise Assessment

FIGURES:
1. Regional Vicinity Map
2. Local Vicinity Map
3. Castaic Area Multi-Use Trails Plan
4. Topographic Map with United States Geological Survey 7.5-Minute Quadrangle Index
5. Noise Monitoring Sites
6. Sensitive Receptors
7. Public and Private Airports

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www.sapphosenvironmental.com

EXECUTIVE SUMMARY

This Memorandum for the Record (MFR) documents the results of the noise evaluation that was undertaken in support of the proposed Castaic Area Multi-Use Trails Plan (proposed project). Based on the results of the noise monitoring and modelling conducted by Sapphos Environmental, Inc. in January 2016, the location of sensitive receptors, and construction and operation activities associated with the proposed project, there would be no anticipated significant impacts related to the construction, operation, or maintenance of the proposed trail elements related to exceeding the standard for ambient noise established by the County of Los Angeles Noise Ordinance[1] or as a result of the exposure of sensitive receptors to excessive noise or ground-borne vibration, a substantial permanent increase in ambient noise levels, a substantial temporary increase in noise levels, or exposure to excessive noise from public or private airports for people residing or working in new structures. All impacts related to noise and vibration from construction, operation, and maintenance of trails would be avoided by complying with the County Noise Ordinance by limiting construction and maintenance activities to 7:00 a.m. to 7:00 p.m. on weekdays and Saturdays, and prohibiting work on federal holidays and Sundays, along with limiting noise levels to below 75 dBA for mobile equipment and 60 dBA for stationary equipment at sensitive receptor locations through the use of noise-attenuating barriers, baffles, or blankets.

The evaluation identified 1,260 parcels with potentially sensitive receptors (primarily residential land uses) within 251 feet of the proposed trail alignments in the southern portion of the Castaic project area, south of Castaic, California and adjacent to the Castaic Junction and in the southwestern portion of the Castaic project area in Val Verde, California. The results of the noise monitoring and modeling demonstrated that, when compared to trail operations and maintenance, trail construction activities generate the greatest increases in ambient noise levels and that a separation of a minimum of 251 feet between construction and the nearest sensitive receptor is sufficient to avoid significant impacts to ambient noise levels and sensitive receptors. Impacts to sensitive receptors within 251 feet would be avoided through the use of noise-attenuating barriers, baffles, or blankets

The proposed project would not result in noise impacts in relation to exposure to persons residing or working near airports to excessive noise levels. The Castaic project area is not located within 2 miles of an airport land use area. The distance to the nearest public and private airports is 12.7 miles for the Agua Dulce Airpark, 13.0 miles for the Quail Lake Sky Park, and 15.1 miles for the Whiteman Airport. The Castaic project area is sufficiently removed from public and private airports to protect workers engaged in construction or maintenance of the trails from exposure to excessive noise levels. Similarly, recreational users would not be exposed to excessive noise levels from an airport.

[1] County of Los Angeles. *Municipal Codes*. Title 12, Chapter 8, Part 4, Section 440.

INTRODUCTION

This MFR provides the County of Los Angeles (County) with the substantial evidence used to make a determination that there would be no anticipated significant impacts related to the construction, operation, or maintenance of the proposed trail elements related to exceeding the standard for ambient noise established by the County of Los Angeles Noise Ordinance[2] or as a result of the exposure of sensitive receptors to excessive noise or ground-borne vibration, a substantial permanent increase in ambient noise levels, a substantial temporary increase in noise levels, or exposure to excessive noise from public or private airports for people residing or working in new structures. All impacts related to noise and vibration from construction, operation, and maintenance of trails would be avoided by complying with the County Noise Ordinance by limiting construction and maintenance activities to 7:00 a.m. to 7:00 p.m. on weekdays and Saturdays, and prohibiting work on federal holidays and Sundays, along with limiting noise levels to below 75 dBA for mobile equipment and 60 dBA for stationary equipment at sensitive receptor locations.

PURPOSE

The purpose of this MFR is to support the County in the development of a multi-use trail plan that would minimize the impacts on the surrounding community. It is understood that the County expects to move forward with the proposed project and seeks funding for construction, operation, and maintenance of the proposed project. This MFR provides the requisite information related to noise impacts to support the County's decision-making process in relation to the proposed project. The evaluation of the proposed project to result in significant impacts to noise was undertaken in accordance with Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines and the Los Angeles County General Plan. The analysis contained herein can be extrapolated to assess the potential for the proposed project to result in significant impacts from noise as currently conceived by the County. This MFR presents the results of these efforts and provides impact analyses for the designation and construction of the multi-use trail segments.

LOCATION

The Castaic project area, which encompasses approximately 75 square miles (approximately 48,107 acres) in the Castaic area of the Santa Clarita Valley, is located in the northwestern portion of the unincorporated area of the County of Los Angeles (Figure 1, *Regional Vicinity Map*). The Santa Clarita Valley is centrally located between the San Gabriel Mountains to the east, the Sierra Pelona Mountains to the northeast, the Topatopa Mountains to the west, the San Emigdio Mountains and Tehachapi Mountains to the north, and the Santa Susana Mountains and Santa Monica Mountains to the south within the Transverse Ranges, a group of east-west trending mountains paralleling the Pacific Ocean between Santa Barbara and San Diego Counties. The Castaic project area is composed of generally mountainous and valley terrain that abuts the Angeles National Forest to the north, the City of Santa Clarita to the southeast, California State Route 126 (Henry Mayo Drive) to the south, and Ventura County to the west (Figure 2, *Local Vicinity Map*). The Castaic project area, which is located in the Fifth Supervisorial District, includes a portion of the County-managed Castaic Lake State Recreation Area. The Castaic project area includes three existing County trails (approximately 4.9 miles) and approximately 74.7 miles of adopted County Trail System proposed trails (Figure 3, *Castaic Area Multi-Use Trails Plan*).

[2] County of Los Angeles. *Municipal Codes*. Title 12, Chapter 8, Part 4, Section 440.

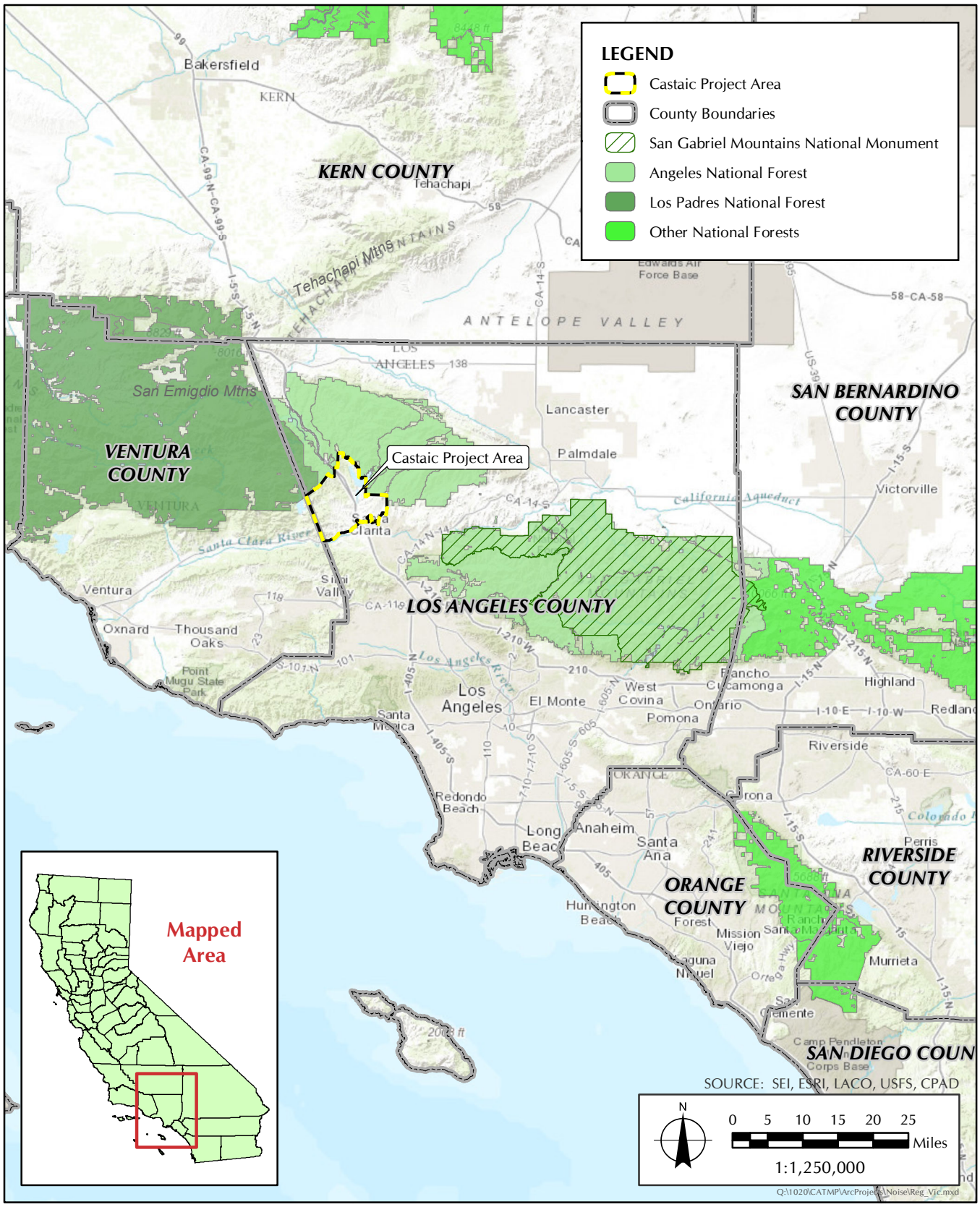


FIGURE 1

Regional Vicinity Map

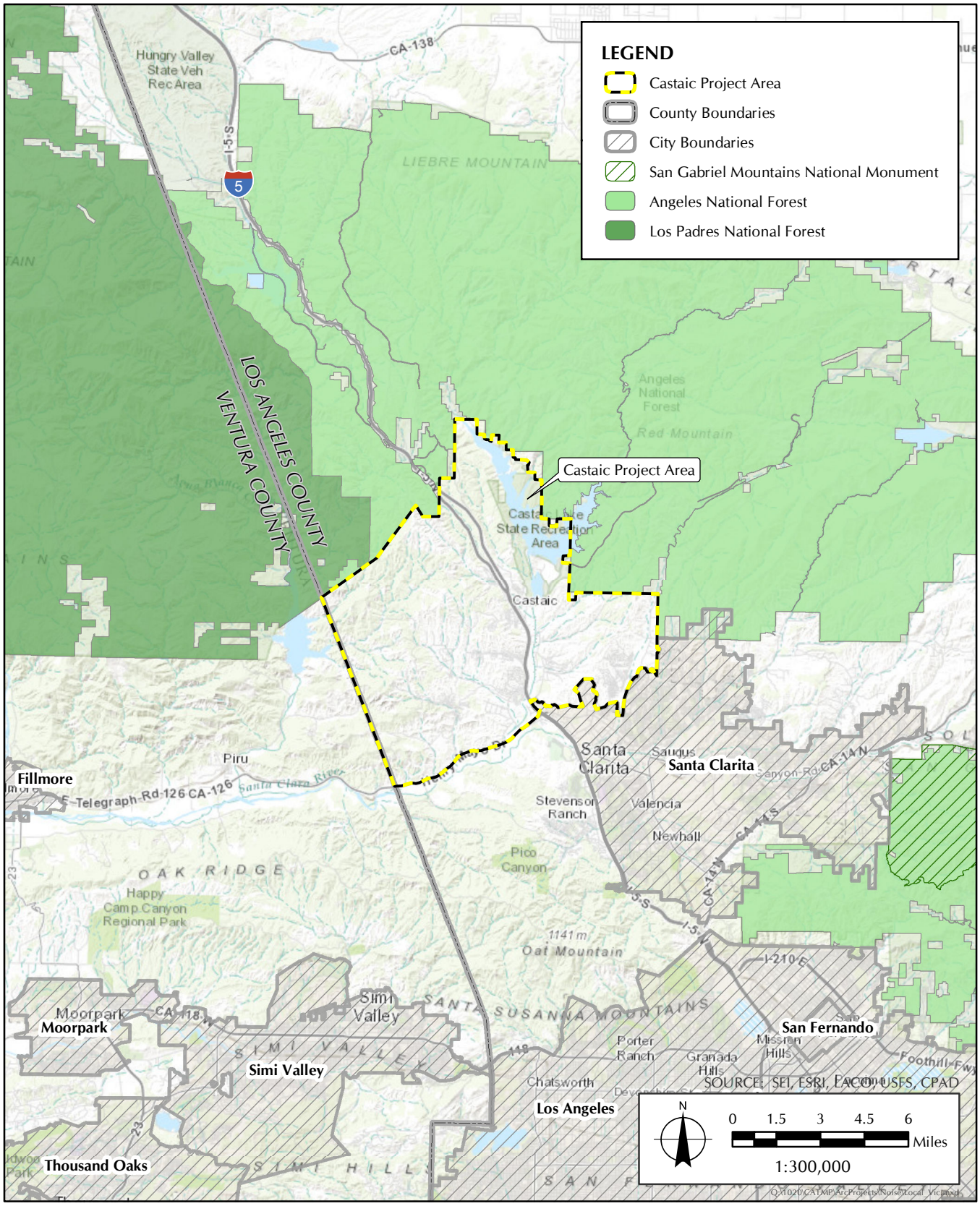


FIGURE 2

Local Vicinity Map

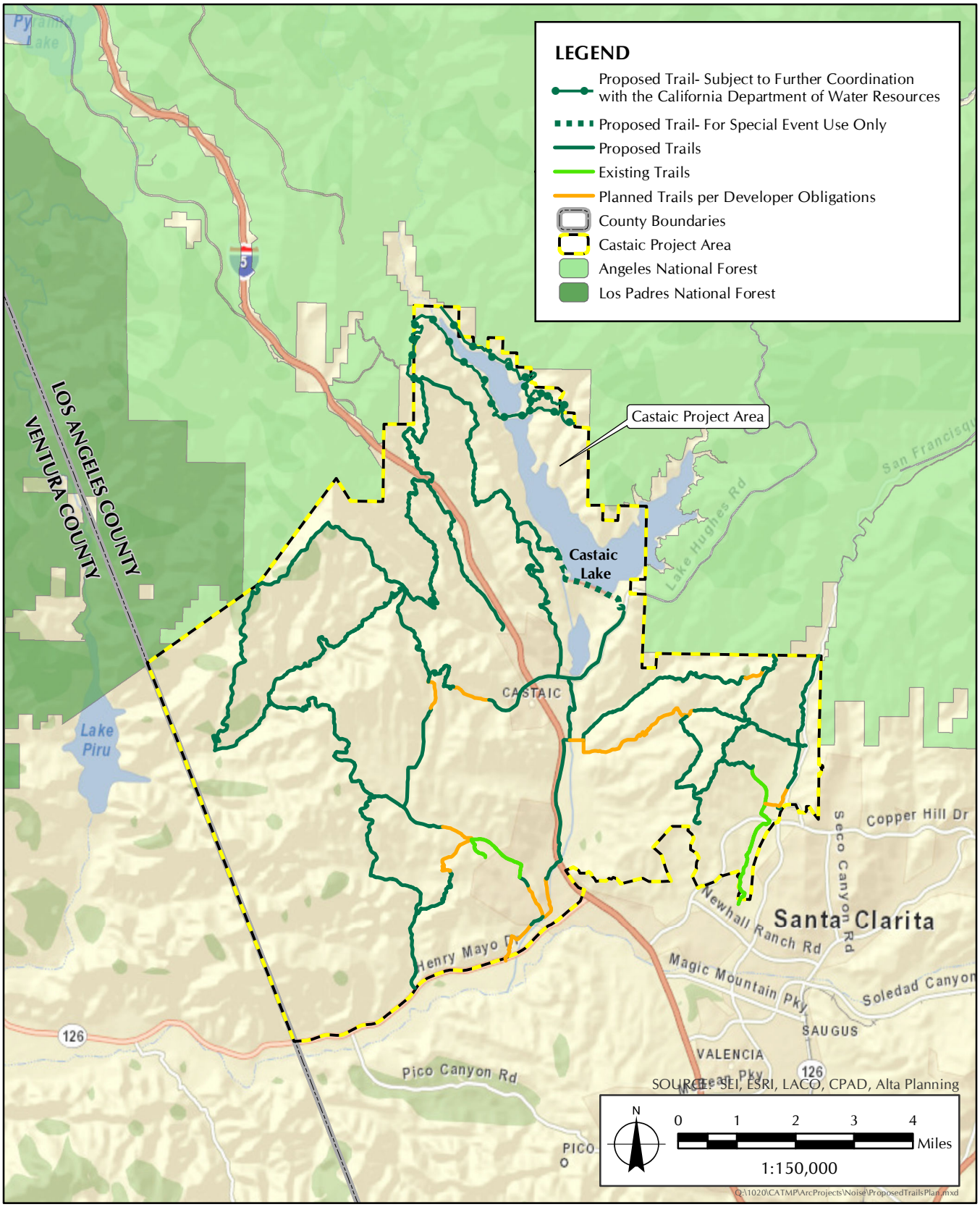


FIGURE 3

Castaic Area Multi-Use Trails Plan

The Castaic project area appears on the U.S. Geological Survey (USGS) 7.5-minute series Whitaker Peak, Warm Springs Mountain, Val Verde, and Newhall topographic quadrangles (Figure 4, *Topographic Map with United States Geological Survey 7.5-Minute Quadrangle Index*). The elevation of the Castaic project area ranges from 2,756 feet above mean sea level (MSL) near the northern edge of the Castaic project area between Violin Canyon and Palomas Canyon, to 863 feet above MSL near the Santa Clara River at the southwestern corner of the Castaic project area. Loma Linda Peak, at an elevation of approximately 2,494 feet above MSL, is located between Santa Felicia Canyon and Romero Canyon, approximately 0.2 mile south of the northern edge of the Val Verde topographic quadrangle.

PROJECT DESCRIPTION

The proposed project would work to encourage and promote new multi-use trails and recommend improvements to existing trails, providing an alignment to incorporate a transition throughout the Castaic project area to additional areas, jurisdictions, and prime destinations within and adjacent to the Castaic project area. The plan would recommend conditions for improvement of unmet local recreation demands in the 5th Supervisorial District. The proposed project would develop a complete multi-use trail system connecting user groups and local populations to desired recreation destinations and experiences, with unified transition to the trails of adjacent jurisdictions, compatibility with adjacent land uses and environmental resources, and incorporate a sustainable design that is consistent with the County Trails Manual.

The proposed project includes approximately 100 miles of proposed multi-use trails and related staging areas, bike skills parks, parking areas, and other supporting trail facilities in the Castaic Area of the Santa Clarita Valley Planning Area. The proposed trails would provide connections to the Angeles National Forest, trails in the City of Santa Clarita, and trails in the Newhall Ranch Specific Plan. The trails would be multi-use and range from 3 to 12 feet wide based on site conditions, with adequate space for combined pedestrian, equestrian, and mountain biking use, in accordance with the County of Los Angeles Trails Manual guidelines (Table 1, *County Trail Types*).

TABLE 1
COUNTY TRAIL TYPES

Trail Type	Tread / Trail Width	Intensity of Use	Impact	Surface Type
Pedestrian	10–11 feet	High	High	Crusher fines / decomposed granite
Recreational Pathway	8–10 feet	High	High	Natural surface
Natural Trail 1	7–10 feet	High	Medium	Natural surface
Natural Trail 2	5–8 feet	Medium to high	Low	Natural surface
Natural Trail 3	2–3 feet	Low	Minimal	Natural surface

SOURCE: County of Los Angeles Department of Parks and Recreation. Adopted May 17, 2011. Revised June 2013. *County of Los Angeles Trails Manual*. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

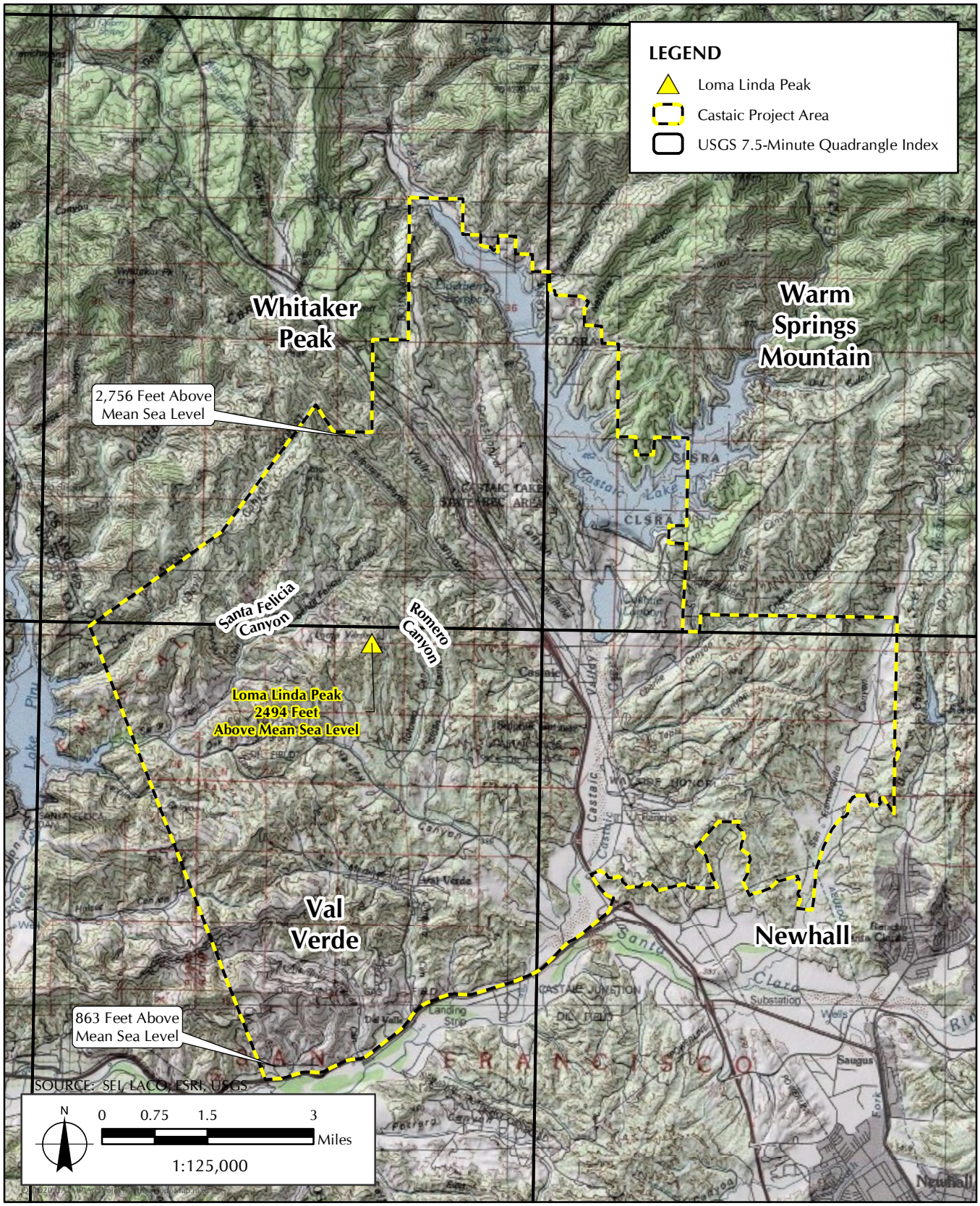


FIGURE 4

Topographic Map with United States Geological Survey 7.5 Minute Quadrangle Index

The proposed project includes 18 trail routes, consisting of four existing trail segments, 10 trail segments that have been planned per developer obligations, and 57 proposed trail segments (Table 2, *Existing, Planned per Developer Obligations, and Proposed Trail Segments*). The proposed trail segments would provide connections to the Santa Felicia SEA, the Angeles National Forest, Newhall Ranch trails and the Santa Clara River Trail, City of Santa Clarita trails, under Interstate-5, and to Castaic Lake.

Consistent with Section 4.3.6, *Way-finding Signs*, of the County Trails Manual, the proposed project would include regular trail signs at trailheads, trail amenity locations, street and trail intersections, and the boundaries of trail easements on private property and National Forest lands.[3] Also consistent with the recommendations of the County Trails Manual, reassurance marker signs would be posted at eye level (62 inches above the ground surface) at every quarter (0.25) mile of trail that visually mark the trail line and identify the name of the trail and quarter milepost number in order to orient trail users and search and rescue services in the case of an emergency. As each trail segment is constructed, the County Department of Parks and Recreation would be responsible for sending the Los Angeles County Fire Department and the Los Angeles County Sheriff's Department the location of each quarter milepost along the trail for emergency response purposes.

The proposed project would involve the development of five simple trailheads at access points, up to three bike skills park amenities, four equestrian amenities, and nine staging areas and trail amenities (Table 3, *Proposed Trail Related Facilities*). The bike skills parks would occupy up to 45 acres.

[3] County of Los Angeles Department of Parks and Recreation. Revised June 2013. County of Los Angeles Trails Manual. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
Castaic Creek (CC)	CC1 (Sports Complex)	1.24	Natural	No existing trail. Dirt road, de facto trail route along Castaic Creek. De facto trail that does not cross private property. Crossing of drainage at RV park will wash out periodically unless an alternative crossing (bridge) is developed.
	CC2 (Pitchess)	2.63	Natural	No existing trail. Existing dirt road from Tapia Canyon Road along Interstate 5 and creekbed, including under the freeway bridge. Potential for trailhead at southern end of segment.
	CC3 (Commerce Center East)	0.76	SUB	No existing trail. Portion of segment parallels existing dirt road. Planned trail per developer obligations generally follows 2007 County adopted trail routes; alignment reflects subdivision plans.
	CC4 (Commerce Center Undercrossing)	0.25	Natural	No existing trail. Within Castaic creekbed and along paved utility road. Slightly modified from 2007 County adopted trail routes to meet proposed subdivision trail.
	CC5 (Commerce Center Bike Trail)	0.46	SUB	No existing trail. Along paved utility road adjacent to creekbed. Planned trail per developer obligations follows the subdivision plan indicating proposed bike trail with 10' minimum equestrian trail.
	CC6 (Commerce Center – 126)	0.48	SUB	No existing trail. Parallels Franklin Parkway and Castaic Creek. Planned trail per developer obligations follows the subdivision plan indicating proposed sidewalk and equestrian trail.
Castaic Dam (CD)	CD1 (Castaic Upper Parking)	1.39	Natural	No existing trail. Parking lot median, follows existing switchbacks (dirt path) leading to and along existing Pine Ridge Fire Road. Connection from 2007 County adopted trail routes to upper parking lot at Castaic Lake.
	CD2 (Castaic Dam Crossing)*	1.76	Natural	No existing trail. Follows paved road from upper parking lot at Castaic Lake, across Castaic Dam, to Lake Hughes Road. Dam crossing, bridging east and west sides of Castaic Lake. Subject to further coordination with State Department of Water Resources..
	CD3 (Lake Hughes East)	1.60	ROW	No existing trail. Unpaved ROW along Lake Hughes Road. On-street connection from potential lagoon trailhead to parking lot on the east side of the dam.
Cliffie Stone Extension (CE)	CE1 (San Francisquito Wash - Upper)	0.63	Natural	No existing trail. Parallels existing dirt road/path along San Francisquito Canyon wash. Passes from subdivision land into multiple private parcels. Runs adjacent to the street, but may need to enter street ROW.
	CE2 (Tesoro Del Valle – SF Wash)	0.52	Natural	No existing trail. Parallels existing dirt road / de facto route within San Francisquito Canyon wash. Realigned 2007 County adopted trail. Passes through Tesoro Del Valle but is not including in subdivision plans.
	CE3 (San Francisquito Wash - Lower)	0.55	ROW	No existing trail. Parallels existing dirt road / de facto route within San Francisquito Canyon wash. Realigned 2007 County adopted trail
	CE4 (Lady Linda)	0.55	Natural	No existing trail. Follows existing dirt road (Lady Linda Lane). Follows Lady Linda Lane to connect to proposed trailhead.
	CE5 (Cliffie Stone – From Lady Linda-Low Ridge)	0.53	ROW	No existing trail. Follows portions of existing de facto dirt path/road to the west of San Francisquito Canyon Road. Primarily follows Cliffie Stone Extension identified in subdivision alignment.
	CE6 (Cliffie Stone – From Lowridge-Tesoro)	0.26	ROW	No existing trail. Dirt ROW exists along San Francisquito Canyon Road. Crosses road ROW but original ROW does not match existing street.
	CE7 (North Park – Cliffie Stone Extension)	0.62	Natural	No existing trail or de facto route. Follows 2007 County adopted alignment through subdivision until southern end, then branches west to meet Cliffie Stone Trail. Owned by MRCA but part of Tesoro subdivision.
	CE8 (North Park Trail Connector)	0.08	Natural	No existing trail or de facto route. Connection to North Park Trail. Leaves subdivision property and enters Newhall Land parcel.
Charlie Canyon (CL)	CL1 (Charlie Canyon Road)	3.61	Natural	No existing trail. Follows existing dirt roads (Tapia Canyon Road and Charlie Canyon Road), and what appears to be a de facto ridgeline path. Realigned from 2007 County adopted trail routes to follow road on County property.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	CL2 (Charlie Canyon – Tesoro Del Valle)	0.37	Natural	No existing trail. Follows existing dirt road or de facto path. Trail enters subdivision parcels but is not on subdivision plans.
	CL3 (San Francisquito Connection)	0.16	Natural	No existing trail. Follows existing dirt road or de facto path. Connection to San Francisquito Trail.
Chiquito Canyon (CO)	CO1 (Chiquito Canyon and Creek)	3.52	Natural	No existing trail. Modified 2007 County adopted alignment to follow creek instead of Chiquito Canyon Road.
	CO2 (Jackson St)	0.21	ROW	No existing trail. Parallels two existing paved roads – Lincoln Avenue and Jackson Street. Follows existing street.
	CO3 (Chiquito Canyon and Creek – South)	1.04	Natural	No existing trail. Follows portions of Jackson Street and existing de facto dirt path or road. Requires access beyond locked gate. Realigned from 2007 County adopted alignment to minimize parcel crossings.
	CO4 (Chiquito Canyon and Creek – North)	1.05	SUB	No existing trail. Parallels portion of Del Valley Road. Planned trail per developer obligations - modified 2007 County adopted alignment to remain within subdivision parcels. Subdivision alignment not determined.
Cliffie Stone (CS)	CS1 (Cliffie Stone – San Francisquito Motorway)	0.68	Natural	No existing trail. Follows existing ridgeline Farmer John Lat dirt road and paved utility access road. Tesoro Del Valle Property. Requires access along utility road.
	CS2 (Cliffie Stone Trail [Tesoro])	1.16	Natural	Existing trail
	CS3 (Cliffie Stone Trail [San Francisquito)	1.73	Natural	Existing trail
Elderberry Forebay (EF)	EF1 (Forebay Connection)	4.76	Natural	No existing trail. Follows existing dirt road and topography. May have security issues with dam and pipes at northern edge. Only include if Elderberry Forebay Dam is useable.
	EF2 (Forebay – Limit 2)	0.81	Natural	No existing trail. Parallels portion of Elderberry Forebay road. Dam connection to northeastern corner route. Only include if Elderberry Forebay Dam is useable.
	EF3 (Forebay – Limit 1)	0.72	Natural	No existing trail. Parallels portion of Elderberry Forebay road. Dam connection to northeastern corner route. Only include if Elderberry Forebay Dam is useable.
	EF4 (Northern Limit)	4.76	Natural	No existing trail. Parallels portions of existing roads: Goodell Road and USFS Route 6N13. Northeast connection to USFS roads. Extends beyond Castaic project area.
Hasley Canyon (HC)	HC1 (Hasley – Santa Felicia)	3.48	Natural	No existing trail. Follows existing unpaved Ayala Road for a portion of proposed route. Connects Hasley Canyon to Santa Felicia SEA. Requires passage beyond locked gate at Hasley Canyon.
	HC2 (Hasley – Claremont)	0.70	Natural	No existing trail. Follows existing de facto path or dirt road. Trail falls within subdivision area but is not included in existing subdivision plans. Avoids using street ROW. Connects to 2007 County adopted trail alignment at northern end.
	HC3 (Hasley Canyon End)	0.16	Natural	No existing trail. Realigned 2007 County adopted trail alignment.
	HC4 (Hasley Road West)	0.33	ROW	No existing trail. Parallels existing paved Hasley Canyon Road. Follows 2007 County adopted trail alignment along public ROW. Ends at road.
	HC5 (Hasley Road East)	0.57	ROW	No existing trail. Parallels existing paved Hasley Canyon Road. Realigned 2007 County adopted trail to avoid private parcel conflict, avoid a creek crossing, and to more directly connect to other trail segments.
	HC6 (Hasley Creek)	0.26	Natural	Existing de facto trail along Hasley Canyon Road. Realigned 2007 County adopted trail to follow de facto trails.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	HC7 (Hasley-Los Valles)	0.56	SUB	No existing trail. Existing de facto trail along Hasley Canyon Road. Planned trail per developer obligations - realigned 2007 County adopted trail to follow de facto trails. Within subdivision area a planned subdivision trail is not indicated.
	HC8 (Hasley Canyon Trail)	1.68	Natural	Existing trail
	HC9 (Commerce Center)	0.21	ROW	No existing trail. Existing paved maintenance road along channelized creek. Line to proposed subdivision trails. Crosses under Commerce Center Drive and uses maintenance road.
	HC10 (Commerce Center NW)	0.61	SUB	No existing trail. Parallels creek bed. Planned trail per developer obligations generally follows 2007 County adopted alignment, but realigned to avoid the creek bed where possible.
Interstate Paintball (IP)	IP1 (Interstate 5 to Ridge Route)	3.30	Natural	No existing trail. Existing utility access dirt roads. Follows utility access roads. Northern end will need switchbacks to drop to Ridge Route Rd.
	IP2 (Paintball Site)	0.65	Natural	No existing trail. Existing dirt roads and paved roads. Connects through former paintball site and proposed bike skills park. Alignment to be determined by park design.
	IP3 (Santa Felicia to 5 Connection)	3.67	Natural	No existing trail. Existing dirt roads along portions of alignment. Connection from former paintball site to Santa Felicia SEA. Undercrossing at Interstate-5 will need to be evaluated for safety.
	IP4 (Between Interstate 5)	3.14	Natural	No existing trail. Existing utility access dirt roads between I-5 North and I-5 south. Picks up from the end of Castaic Road and continues to paintball site.
Lake West (LW)	LW1 (Northlake North)	3.28	Natural	No existing trail. Existing dirt roads. Follows 2007 County adopted trail route.
	LW2 (Northlake Central)	1.10	Natural	No existing trail. Existing dirt roads. Follows 2007 County adopted trail route.
	LW3 (Lagoon-Lake)	4.05	Natural	Existing dirt roads, including a portion of Cutler Canyon Fire Road and Vista Ridge Fire Road, and paved Castaic Lake State Recreation Area road. Includes a portion of Pro's Uphill Open Trail and Castaic Brick Trail of Castaic Lake State Recreation Area.[1] Follows 2007 County adopted trail route.
North Park Trail	North Park Trail	0.33	Natural	Existing trail
Romero Canyon (RC)	RC1 (Romero-Santa Felicia)	1.88	Natural	No existing trail. Follows existing dirt road/path. Portions follow narrow ridgelines.
	RC2 (North of High School)	0.13	Natural	No existing trail. Currently a construction site. Connection to Castaic High School path.
	RC3 (Castaic High School)	0.56	SUB	No existing trail. Currently a construction site leading to Romero Canyon Road. Planned trail per developer obligations – alignment needs verification from development plan.
	RC4 (Romero Canyon Rd)	1.89	Natural	No existing trail. Parallels Romero Canyon Road. Follows private road.
Santa Felicia (SA)	SA1 (Santa Felicia Upper Loop)	7.59	Natural	No existing trail. Existing dirt road. Minimal constraints.
	SA2 (Santa Felicia Lower Loop)	5.80	Natural	No existing trail. Existing dirt road. Portions follow narrow ridgelines.
San Francisquito (SF)	SF1 (San Francisquito Motorway)	0.34	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Follows San Francisquito Motorway to the edge of the Castaic project area.

TABLE 2
EXISTING, PLANNED PER DEVELOPER OBLIGATIONS, AND PROPOSED TRAIL SEGMENTS

Route Name	Trail Segment	Length (Miles)	Trail Type	Existing Conditions of Trail Segment and Trail Design Considerations
	SF2 (San Francisquito Motorway Bypass)	1.09	Natural	No existing trail. De facto ridgeline dirt road/path. Two parallel alternative routes. Single alignment pending further study. Partially inside Tapia Ranch.
	SF3 (San Francisquito – Tapia)	1.15	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Passes through Tesoro Del Valle, not included in subdivision plans.
	SF4 (San Francisquito – West Creek)	0.85	Natural	No existing trail. Existing dirt road: San Francisquito Motorway. Follows utility road. Connects San Francisquito and Cliffie Stone Trails to West Creek.
Sloan Canyon (SC)	SC1 (Sloan Canyon West)	1.14	Natural	No existing trail. Existing dirt roads and construction sites. Portions follow narrow ridgelines.
	SC2 (Homestead at Sloan Canyon)	0.68	SUB	No existing trail. Existing construction site and unpaved Sloan Canyon Road. Planned trail per developer obligations follows existing dirt road.
	SC3 (Sloan Canyon Dr)	1.52	ROW	No existing trail. Parallels Sloan Canyon Road and Lake Hughes Road. On-street connection. Crosses under Interstate 5. Requires coordination with Los Angeles County Public Works.
	SC4 (Lake Hughes at Lagoon)	0.19	ROW	No existing trail. Parallels Lake Hughes Road south of Castaic Lagoon. Connects Castaic Creek to Castaic Lake.
Tapia Canyon (TC)	TC1 (Sports Complex – Tapia)	0.24	SUB	No existing trail. Parallels Tapia Canyon Road. Planned trail per developer obligations – Tapia Ranch development plans to build path to Castaic Road.
	TC2 (Tapia Bypass)	2.74	SUB	No existing trail. Parallels Tapia Canyon Road and Wayside Canyon Road in between undeveloped portions of Tapia Canyon. Planned trail per developer obligations – part of Tapia Ranch development plan. Portions follow 2007 County adopted alignment.
	TC3 (Tapia – San Francisquito)	1.11	Natural	No existing trail. Appears to be a de facto trail or dirt path between Tapia Canyon Road and San Francisquito Motorway. Partially within Tapia Ranch development.
	TC4 (Tapia – Cliffie Stone)	1.03	Natural	No existing trail. A portion of alignment route follows an existing dirt road/path. A portion parallels dirt roads/paths: Quail Haven Trail, Las Tunas Trail, and Lady Linda Lane. Trail would need to traverse a significant elevation change over the ridge at northern end.
Val Verde (VV)	VV1 (Kennsington Rd)	2.31	Natural	No existing trail. Follows a few de facto dirt roads/paths. Requires access along private roads at either end of the alignment.
	VV2 (Chiquito – Val Verde)	0.94	Natural	No existing trail. Follows edge of Val Verde Park and drainage. Follows drainage, marked as privately owned for portions but appears to all be LA County Flood Control property.
West Creek (WC)	WC1 (West Creek – Tapia)	1.49	Natural	No existing trail. Parallels two existing dirt roads: Company Road and Wayside Lateral Road. Requires connection through cul-de-dac in West Creek.
	WC2 (West Creek – Tapia – Tesoro)	1.30	Natural	No existing trail. Follows a portion of existing de facto dirt road/paths and a portion of Tapia Canyon Road. Within subdivision property, but alignment not included in subdivision. Connects West Creek development to Tapia Ranch area.
TOTAL				
Total of 18 Routes	**Total of 71 Trail Segments** • 4 Existing Segments • 10 Segments planned per developer obligations • 57 Proposed Trail Segments			**Total Of 102.94 Miles in Trail Planning Castaic project area** • 4.90 Miles Existing Trails • 8.14 Miles Planned trails per developer obligations (no existing trail) • 89.90 Miles Proposed and Under Consideration

NOTES: *Subject to negotiation with California State Department of Water Resources (DWR) - Future negotiations with DWR and pending state and county agreement renewal. SUB = Multi-Use Subdivision Trail. ROW = New Designation
SOURCE: [1] Friends of Castaic Lake. Accessed 12 April 2016. *Castaic Lake – Trail Map*. Available at: http://castaiclake.com/map_trails.html

TABLE 3
PROPOSED TRAIL RELATED FACILITIES

Trail Related Facility Type	Related Facility Name (Size)
Trail Access Only • Trailheads only	Upper Ridge Route Road
	Sloan Canyon
	Castaic Road
	West Creek
	Hasley Canyon Equestrian Center
Bike Skills Park Amenities • Restrooms • Drinking Fountains • Rest Areas/Seating • Shade Structures • Pump Tracks (no pedaling required) • Progressive Jumps (natural soil with compacted dirt jumps) • Balance Skills Features (e.g., wooden teeter-totter) • Rock/Technical Features (e.g., rock garden with narrow width trails) • Flow Trails (start at higher elevation for downhill ride) • Trails (over variety of terrain, for all ages) • Road Handling Skills Areas (hard-packed soil course) • Beginner, Intermediate, and Expert Skills Courses (for all ages) • Advanced Downhill Course (steep terrain, jumps, turns, obstacles) • Slalom Course (two adjacent trails for competition)	Castaic Sports Complex (up to 10 acres)
	Upper Lagoon (up to 5 acres)
	Ridge Route Road (up to 30 acres)
Equestrian Amenities • Trailheads • Parking • Restrooms • Drinking Fountains (for humans, equine, or pets) • Picnic Tables • Shade Structures • Horse Arenas • Gathering Areas • Horse Ties and Rails	Tapia Canyon Road
	Castaic Lake Upper Lot
	Tesoro Del Valle
	Castaic Sports Complex
Staging Areas and Trail Amenities • Trailheads • Parking • Restrooms • Drinking Fountains (for humans, equine, or pets) • Benches/Seating • Picnic Tables • Shade Structures • Wayfinding Signage • Interpretive Signage • Gathering Areas • Horse Ties and Rails • Bike Racks	Old Road
	Hasley Canyon
	Chiquito Canyon
	Santa Felicia
	Castaic Lagoon
	Lady Linda
	Ridge Route Road
	Castaic Sports Complex
	Castaic Lake State Recreation Area Upper Lot

Restrooms would be design and required to demonstrate compliance with the standards of the Santa Clarita Valley Sanitation District or the County of Los Angeles Department of Public Health for Onsite Wastewater Treatment Systems (OWTS), as applicable.

Trails and supporting facilities within a one-mile radius of officially designated and eligible State scenic highways would be designed, constructed, and maintained (where construction equipment is involved) to preserve scenic resources, including but not limited to trees, rock outcroppings, and historic buildings, within the scenic highway corridor. Where construction of trails or related supporting facilities requires cuts into the slope (which can be seen from a far distance), the visual character of the slope would be restored by planting locally native vegetation as a visual screen. Similarly, restrooms and other supporting structures would be constructed of materials that blend into the landscape, with locally native vegetative screening.

As stated in the County Trails Manual, the hours for operation for County trails are typically from dawn to dusk (County Code 17.04.330). In accordance with the guidelines in Section 4.3.18, *Lighting*, of the County Trails Manual, where lighting features are provided for safety and wayfinding reasons, lighting would installed in a manner to be non-intrusive to adjacent uses, avoid detracting from a natural outdoors experience for trail users, and directed downward to avoid light pollution or spillover in general.[4]

TECHNICAL TERMINOLOGY

Sensitive Receptors

Areas with noise-sensitive receptors are locations in which the presence of unwanted sound could adversely affect or disrupt activities associated with the land use at the specified location. Land uses such as residences, schools, libraries, churches, and hospitals are generally more sensitive to noise than industrial and commercial land uses. These particular locations are considered to be noise-sensitive receptors. Baseline data are collected at the locations of existing noise-sensitive receptors to determine the ambient noise levels and if noise from the implementation of the proposed plan would result in significant increases to these levels.

Noise Characteristics

Noise is defined as unwanted sound (Table 4, *Definitions*). The human response to environmental noise is subjective and varies considerably from individual to individual. The effects of noise can range from interference with sleep, concentration, and communication, to the causation of physiological and psychological stress, and, at the highest intensity levels, hearing loss.

[4] County of Los Angeles Department of Parks and Recreation. Adopted by the Board of Supervisors on May 17, 2011. Revised June 2013. County of Los Angeles Trails Manual. Available at: https://trails.lacounty.gov/Files/Documents/69/LA%20County%20Trails%20Manual%20%28Revised%2006-20-13%29.compressed.pdf

TABLE 4
DEFINITIONS

dBA	A-weighted decibels (dBA) are an expression of the relative loudness of sounds in air as perceived by the human ear. In the A-weighted system, the decibel values of sounds at low frequencies are reduced compared with unweighted decibels, in which no correction is made for audio frequency.
L_{eq}	The equivalent-continuous sound (L_{eq}) is the level of a constant sound, expressed in decibels (dB), which in a given time period ($T = T_2 - T_1$) has the same energy as a time varying sound.
CNEL	The Community Noise Equivalent Level (CNEL) is the average sound level over a 24-hour period, with a penalty of 5 dB added between the hours of 7:00 p.m. and 10:00 p.m., and a penalty of 10 dB added for the nighttime hours between 10:00 p.m. and 7:00 a.m. These increases account for reduced ambient noise levels during these time periods and increased human sensitivity to noise during the quieter periods of the day.
Ambient noise	The level of the total noise in an area.
Point source	A single identifiable, localized source of noise.
Sensitive receptors	Sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, playgrounds, long-term health care facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to noise impacts.

Noise Attenuation

Noise is attenuated as it propagates from the source to the receiver. Attenuation is logarithmic, rather than linear, which means:

- For line sources, such as streets, noise levels decrease by 3 to 5 dBA for every doubling of distance from the source.
- For point sources, noise levels decrease quicker, about 6 dBA, for every doubling of distance from the source
- Topography and the type of surface (paved or vegetated) also play a role in noise attenuation characteristics.

One way of estimating a person's subjective reaction to a new noise is to compare the new noise with the existing noise environment to which the person has become adapted, that is, the increase over the so-called "ambient" noise level. Research in the area of perceived impacts of various degrees of increase in dBA indicates the following:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A change in noise level of at least 5 dBA is required before any noticeable change in community response would be expected. A 5-dBA increase is often considered a significant impact.
- A 10-dBA increase is subjectively heard as approximately a doubling in loudness and almost always causes an adverse community response.

In assessing the impact of noise upon the environment, the nature and level of activities that generate the noise, the pathway through which the noise travels, the sensitivity of the receptor, the period of exposure, and the increase over the ambient noise levels are all considered. For the purposes of this analysis, sensitive receptors are defined to include single-family residences, convalescent homes, schools, auditoriums, and other similar land uses that may be affected to a greater degree by increased noise levels than industrial, manufacturing, or commercial land uses.

The noise evaluation identified sensitive noise receptors in the southern portion of the Castaic project area, south of Castaic, California and adjacent to the Castaic Junction and in the southwestern portion of the Castaic project area in Val Verde. Although the proposed Master Plan is a programmatic planning document, it would facilitate the development of the identified conceptual trails. Therefore, an evaluation was undertaken to determine if such development would likely result in significant impacts, necessitating the consideration of mitigation measures. The noise evaluation not only informs the proposed project planning process, it provides the County of Los Angeles Department of Parks and Recreation with the information that would serve as the basis for assessment of noise in the Initial Study, pursuant to CEQA. The evaluation of noise was undertaken in accordance with Appendix G of the State CEQA Guidelines. This assessment focuses on the potential for the proposed project to exceed the standards for noise established for the County or result in the exposure of sensitive receptors to excessive ground-borne vibration, a substantial permanent increase in noise levels, or exposure to excessive noise from public or private airports for people residing or working in new structures.

Ground-Borne Vibration

Vibration is an oscillatory motion, which can be described in terms of the displacement, velocity, or acceleration. Because motion is oscillatory, there is no net movement of the vibrating element and the average of any of the motion descriptors is zero. Displacement is the easiest descriptor to understand. For a vibrating floor, the displacement is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the movement and the acceleration the rate of change of speed.

Although displacement is easier to understand than velocity and acceleration, it is rarely used for describing ground-borne vibration. This is because most transducers used for ground-borne vibration use either velocity or acceleration, and even more important, the response of humans, buildings, and equipment to vibration is more accurately described using velocity or acceleration.

The effects of ground-borne vibration include fellable movements of the building floors, rattling of windows, shaking of items on shelves or hangings on walls. The rumble is the noise radiated from the motion of the room surfaces. In essence, the room surfaces act like a loudspeaker. This is called ground-borne noise. In extreme cases, vibrations can cause damage to buildings.

Ground-borne vibration is almost never annoying to people who are outdoors, although the motion of the ground may be perceived.

Propagation of vibration from source to the receiver is dependent on soil conditions and on the receiving building. Vibration propagation is more efficient in stiff clay soils and shallow rocks seem to concentrate the vibration energy close to the surface and can result in ground-borne vibration problem at large distances. Factors such as layering of the soil and depth to water table can have significant effects on the propagation of ground-borne vibration. The vibration levels inside a building depend on the energy that reaches the building foundation, the coupling of the building

foundation to the soil, and the propagation of vibration through the building. The general guideline is that the heavier the building is the lower the response would be to the incident vibration.

REGULATORY FRAMEWORK

Federal

Noise Control Act of 1972

The adverse impacts of noise were officially recognized by the federal government in the Noise Control Act of 1972,[5] which serves three purposes:

- Promulgating noise emission standards for interstate commerce;
- Assisting state and local abatement efforts; and,
- Promoting noise education and research.

The Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) prohibits exposure of workers to excessive sound levels. The U.S. Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies, such as the Federal Aviation Administration (FAA), which regulates noise generated by aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA), which requires that all rail systems receiving federal funding be constructed and operated in accordance with its regulations and specifications. The Federal Railroad Administration (FRA) sets forth and enforces safety standards, including noise emissions within railroad locomotive cabs. Transit noise is regulated by the FTA, while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). The FHWA has adopted and promulgated noise abatement criteria for highway construction projects. The federal government encourages local jurisdictions to use their land use regulatory authority to site new development to minimize potential noise impacts.

Title 14 Code of Federal Regulations, Part 150

Part 150 applies to airport noise compatibility planning and provides the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs. It provides guidance for measuring noise at airports and surrounding areas and for determining exposure of individuals to noise from the operations of an airport. Part 150 also identifies land uses that are normally compatible with various levels of exposure to noise by individuals. It provides guidance on the preparation and execution of noise compatibility planning and implementation programs.

[5] 42 U.S.C., *Noise Control Act of 1972*, § 4901–4918.

Noise Abatement and Control, Title 24 Code of Federal Regulations, Part 51, Subpart B

The mission of Department of Housing and Urban Development (HUD) includes fostering "a decent, safe, and sanitary home and suitable living environment for every American." Accounting for acoustics is intrinsic to this mission, as an environment's safety and comfort can be compromised by excessive noise. In order to facilitate the creation of suitable living environments, HUD has developed a standard for noise criteria. The basic foundation of the HUD noise program is set out in the noise regulation 24 CFR Part 51 Subpart B, Noise Abatement and Control.

HUD's noise policy clearly requires noise attenuation measures be provided when proposed projects are to be located in high noise areas. Within the HUD Noise Assessment Guidelines, potential noise sources are examined for projects located within 15 miles of a military or civilian airport, 1,000 feet from a road, or 3,000 feet from a railroad.

HUD exterior noise regulations state that 65 dBA DNL noise levels or less are acceptable for residential land uses and noise levels exceeding 75 dBA DNL are unacceptable. HUD's regulations do not contain standards for interior noise levels. Rather, a goal of 45 dBA is set forth, and the attenuation requirements are geared toward achieving that goal. It is assumed that, with standard construction, any building will provide sufficient attenuation so that if the exterior level is 65 dBA DNL or less, the interior level will be 45 dBA DNL or less.

State

California Government Code Section 65302

Section 65302 of California Government Code provides a framework for general plans and their content. It requires that the noise element include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards. The noise element shall also identify and appraise noise problems in the community, analyze and quantify current and projected noise levels for (a) highways and freeways; (b) primary arterials and major local streets; (c) passenger and freight online railroad operations and ground rapid transit systems; (d) commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation; (e) local industrial plants, including, but not limited to, railroad classification yards; and (f) other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.

Section 65302 also specifies that noise contours be shown for all of the above listed sources and be stated in terms of community noise equivalent level (CNEL) or day-night average level (L_{dn}). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified above. The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.

California Noise Control Act of 1973

The California Noise Control Act (California Health and Safety Code, Division 28, § 46000 et seq), as found in the California Health and Safety Code, Division 28, § 46000 et seq., declares that excessive noise is a serious hazard to public health and welfare, and establishes the Office of Noise

Control with responsibility to set standards for noise exposure in cooperation with local governments or the state legislature.

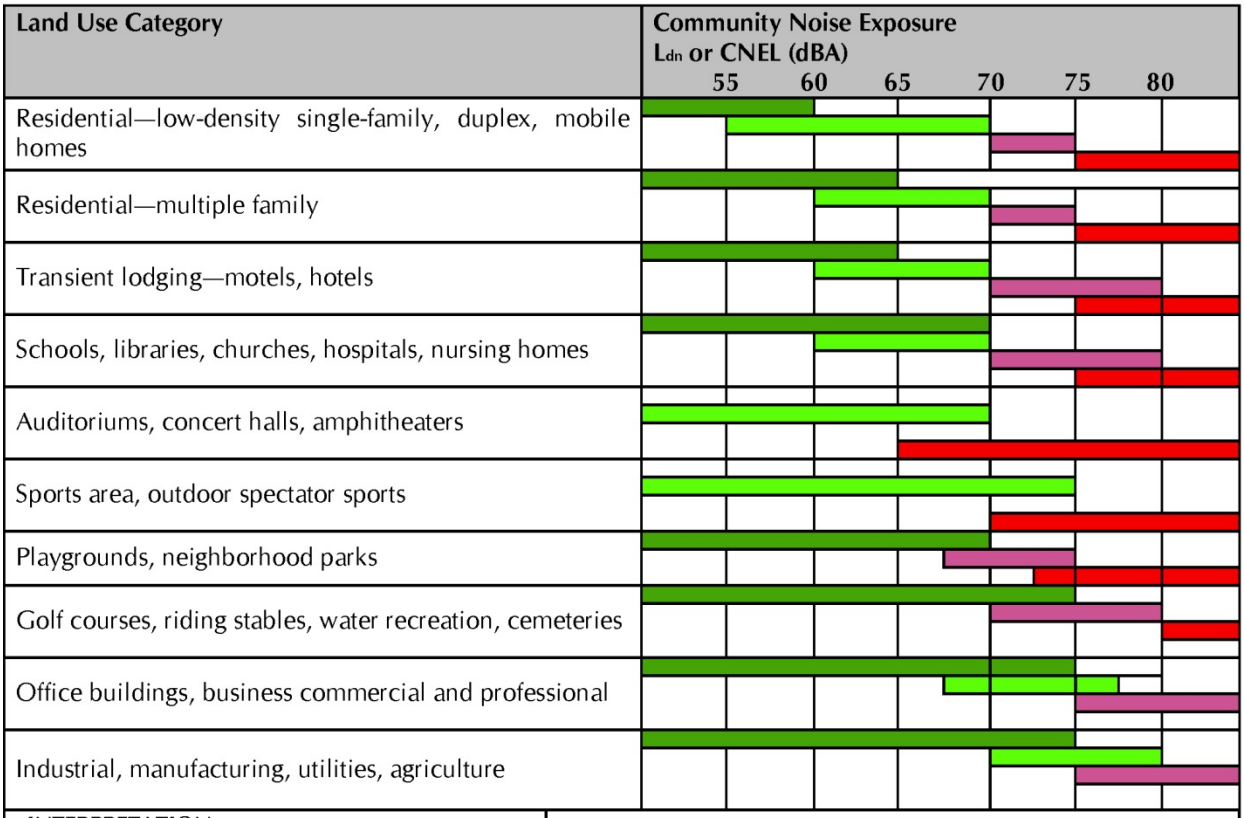
Title 24, California Code of Regulations, Part 2

The State of California has developed a Land Use Compatibility Matrix for community noise environments that further defines the four categories of acceptance and assigns CNEL values to them. In addition, the State Building Code (Title 24, California Code of Regulations [CCR], Part 2) establishes uniform minimum noise insulation performance standards to protect persons within new hotels, motels, dormitories, long-term care facilities, apartment houses, and residential units other than detached single-family residences from the effects of excessive noise, including, but not limited to, hearing loss or impairment and interference with speech and sleep. Residential structures to be located where the CNEL or L_{dn} is 60 dBA or greater are required to provide sound insulation to limit the interior CNEL to a maximum of 45 dBA. An acoustic, or noise, analysis report prepared by an experienced acoustic engineer is required for the issuance of a building permit for these structures. Conversely, land use changes that result in increased noise levels at residences of 60 dBA or greater must be considered in the evaluation of impacts to ambient noise levels. Table 5, *Normally Acceptable Noise Levels for Residential Land Use*, and Table 6, *Land Use Compatibility for Community Noise Environments*, depict noise levels for a variety of uses.

TABLE 5
NORMALLY ACCEPTABLE NOISE LEVELS FOR RESIDENTIAL LAND USE

Land Use	Acceptable Range (dBA)
Residential – low-density single-family, duplex, mobile homes	50–60
Residential – multiple family	50–65

TABLE 6
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS



INTERPRETATION:

Normally acceptable
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Normally unacceptable
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Conditionally acceptable
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction with closed windows and fresh air supply systems or air conditioning will normally suffice.

Clearly unacceptable
New construction of development should not be undertaken.

NOTES:
L_{dn} = Day-Night Level
CNEL = Community Noise Equivalent Level
dBA = decibels in A-weighted sound levels

SOURCE:
California Department of Health Services, Office of Noise Control. February 1976. *Guidelines for the Preparation and Content of Noise Elements of the General Plan*. Sacramento, CA.

County

Los Angeles County Municipal Code

The County maintains the health and welfare of its residents with respect to noise through nuisance abatement ordinances and land use planning. The County Noise Control Ordinance, Title 12 of the County Code, was adopted by the Los Angeles County Board of Supervisors in 1977 "to control unnecessary, excessive, and annoying noise and vibration." It declares that the purpose of the County policy is to "maintain quiet in those areas which exhibit low noise levels and to implement programs aimed at reducing noise in those areas within the county where noise levels are above acceptable values."[6]

On August 14, 2001, the Los Angeles County Board of Supervisors approved an ordinance amending Title 12 of the County Code to prohibit loud, unnecessary, and unusual noise that disturbs the peace and/or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area. Regulations can include requirements for sound barriers, mitigation measures to reduce excessive noise, or the placement and orientation of buildings, and can specify the compatibility of different uses with varying noise levels, as shown in Table 7, *Los Angeles County Community Noise Criteria*.

TABLE 7
LOS ANGELES COUNTY COMMUNITY NOISE CRITERIA

Noise Zone	Land Use of Receptor Property	Time	Noise Levels (dBA)				
			Std 1 L50 30 min/hr	Std 2 L25 15 min/hr	Std 3 L8.3 5 min/hr	Std 4 L1.7 1 min/hr	Std 5 L0 At No Time
I	Noise Sensitive	Anytime	45	50	55	60	65
II	Residential	10 p.m. – 7 a.m.	45	50	55	60	65
		7 a.m. – 10 p.m.	50	55	60	65	70
III	Commercial	10 p.m. – 7 a.m.	55	60	65	70	75
		7 a.m. – 10 p.m.	60	65	70	75	80
IV	Industrial	Anytime	70	75	80	85	90

SOURCE: County of Los Angeles. *Municipal Codes*. Title 12, Chapter 8, *Noise Control*. Section 12.08.390.

In addition to the community noise criteria, the Los Angeles County Municipal Code establishes interior noise standards for multifamily residential dwellings. According to the Section 12.08.400 of the Los Angeles County Municipal Code, no person shall operate or cause to be operated within a dwelling unit, any source of sound, or allow the creation of any noise, which causes the noise level when measures inside a neighboring receiving dwelling to exceed the following standards:[7]

- Standard No. 1: The applicable interior noise level for cumulative period of more than five minutes in any hour; or

[6] County of Los Angeles. *Municipal Codes*. Title 12, Chapter 8, *Noise Control*.

[7] County of Los Angeles. *Municipal Codes*. Title 12, Chapter 8, *Noise Control*.

- Standard No. 2: The applicable interior noise level plus 5 dB for a cumulative period or more than one minute in any hour; or
- Standard No. 3: The applicable interior noise level plus 10 dB or the maximum measured ambient noise level for any period of time.

Furthermore, the following interior noise levels for multifamily residential dwellings shall apply, unless otherwise specifically indicated, within all such dwellings with windows in their noise seasonal configuration (Table 8, *Los Angeles County Interior Noise Standards*).

TABLE 8
LOS ANGELES COUNTY INTERIOR NOISE STANDARDS

Noise Zone	Designated Land Use	Time Interval	Allowable Interior Noise Level (dB)
All	Multifamily	10 p.m.–7 a.m.	40
	Residential	7 a.m.–10 p.m.	45

SOURCE: County of Los Angeles. *Municipal Codes*. Title 12, Chapter 8, *Noise Control*.

Section 12.08.440 of the Los Angeles County Municipal Code states that operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the health office is prohibited. If noise disturbance crosses a residential or commercial property line, the County has established maximum noise levels for both mobile and stationary equipment (Table 9, *County of Los Angeles Construction Noise Restrictions*).

TABLE 9
COUNTY OF LOS ANGELES CONSTRUCTION NOISE RESTRICTIONS

Time Frame	Single-Family Residential	Multifamily Residential	Semiresidential/ Commercial
Mobile equipment*			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m. (daytime)	75 dBA	80 dBA	85 dBA
Daily, 8:00 p.m. to 7:00 a.m. (nighttime) and all day Sunday and legal holidays	60 dBA	64 dBA	70 dBA
Stationary equipment**			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m. (daytime)	60 dBA	65 dBA	70 dBA
Daily, 8:00 p.m. to 7:00 a.m. (nighttime) and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

SOURCE: County of Los Angeles. *Municipal Codes*. Title 12, Chapter 8, *Noise Control*.
NOTES:
* = Maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment
** = Maximum noise levels for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment

Los Angeles County General Plan

The Noise Element of the Los Angeles County General Plan summarizes noise issues and outlines goals and policies that seek to reduce noise impacts when making land use planning decisions. Of the 11 policies outlined in the Noise Element of the Los Angeles County General Plan, the following are applicable to the proposed project:[8]

Goal N-1: The reduction of excessive noise impacts.

- Policy N 1.1: Utilize land uses to buffer noise-sensitive uses from adverse noise impacts.
- Policy N 1.2: Reduce exposure to noise impacts by promoting land use compatibility.
- Policy N 1.3: Minimize impacts to noise-sensitive land uses by ensuring adequate site design, acoustical construction, and use of barriers, berms, or additional engineering controls through Best Available Technologies (BAT).
- Policy N 1.4: Enhance and promote noise abatement programs in an effort to maintain acceptable levels of noise as defined by the Los Angeles County Exterior Noise Standards and other applicable noise standards.
- Policy N 1.6: Ensure cumulative impacts related to noise do not exceed health-based safety margins.
- Policy N 1.9: Require construction of noise attenuation barriers on noise sensitive uses that would be exposed to exterior noise levels of 65 dBA CNEL and above, when unavoidable impacts are identified.

Local

Santa Clarita Valley Plan

The Santa Clarita Valley Area Plan, which comprises the entire Santa Clarita Valley including the Castaic project area, provides goals, policies, and maps to establish zoning regulations and guide new development proposals. Section 11.40.040 of the Santa Clarita City Municipal Code states, "It shall be unlawful for any person within the City to produce or cause or allow to be produced noise which is received on property occupied by another person within the designated region, in excess of the following levels, except as expressly provided otherwise herein" (Table 10, *Santa Clarita Noise Levels Criteria*).

[8] County of Los Angeles Department of Regional Planning. Adopted 6 October 2015. *Los Angeles County General Plan 2035*. Chapter 11, Noise Element. Available at: http://planning.lacounty.gov/assets/upl/project/gp_final-general-plan-ch11.pdf

TABLE 10
SANTA CLARITA NOISE LEVELS CRITERIA

Region/Zone	Timeframe	Allowable Noise Level dBA
Residential zone	Day	65
Residential zone	Night	55
Commercial and manufacturing	Day	80
Commercial and manufacturing	Night	70

SOURCE: City of Santa Clarita Municipal Code. Available at: http://www.codepublishing.com/CA/SantaClarita/

The following objectives and policies are applicable to the proposed project:

Section 11.44.080

Section 11.44.080, as amended, represents an exception for construction work to the noise limits in Section 11.44.040 and 11.44.070 of the City's Noise Ordinance. As set forth by the City of Santa Clarita Municipal Code, construction work that falls between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between 8:00 a.m. and 6:00 p.m. on Saturday is allowed within 300 feet of a residentially zoned property and is exempt from the noise limits in Section 11.44.040 and 11.44.070 of the City's Noise Ordinance. Construction work is prohibited on Sundays, New Year's Day, Independence Day, Thanksgiving Day, Christmas Day, Memorial Day, and Labor Day. Implementation of design measure DM 5.5-1, described below, would require construction work to occur within the hours specified above. Compliance with design measure DM 5.5-1 would reduce construction noise impacts to a less than significant level. The following objectives and policies of the Santa Clarita Valley Area Plan are applicable to the proposed project:

Objective N-1.1: Protect the health and safety of the residents of the Santa Clarita Valley by the elimination, mitigation, and prevention of significant existing and future noise levels.

- Policy N-1.1.1: Use the Noise and Land Use Compatibility Guidelines consistent with State guidelines, as a policy basis for decisions on land use and development proposals related to noise.
- Policy N-1.1.2: Continue to implement the adopted Noise Ordinance and other applicable code provisions, consistent with state and federal standards, which establish noise impact thresholds for noise abatement and attenuation, in order to reduce potential health hazards associated with high noise levels.
- Policy N-1.1.3: Include consideration of potential noise impacts in land use planning and development review decisions.
- Policy N-1.1.4: Control noise sources adjacent to residential, recreational, and community facilities, and those land uses classified as noise sensitive.
- Policy N-1.1.5: Monitor and update data and information regarding current and projected noise levels in the planning area.

Objective N-3.1: Prevent and mitigate significant noise levels in residential neighborhoods.

- Policy N-3.1.3: Through enforcement of the applicable Noise Ordinance, protect residential neighborhoods from noise generated by machinery or activities that

produce significant discernable noise exceeding recommended levels for residential uses.

- Policy N-3.1.4: Require that those responsible for construction activities develop techniques to mitigate or minimize the noise impacts on residences, and adopt standards that regulate noise from construction activities that occur in or near residential neighborhoods.[9]

Newhall Ranch Specific Plan

The Newhall Ranch Specific Plan is a comprehensive document to help guide the future development of the Newhall Ranch property, which is located in the southernmost portion of the Castaic project area. The document contains a comprehensive set of plans, development regulations, design guidelines, and implementation programs designed to produce a project consistent with the goals, objectives, and policies of the Los Angeles County General Plan and Santa Clarita Valley Area Plan, as proposed for amendment according to General Plan Amendment No. 94-087. The Newhall Ranch Specific Plan is subject to the Los Angeles Noise Ordinance as it exists on the date of adoption of the Specific Plan and provides mitigation measures to reduce potential impacts to levels that would not exceed Los Angeles County standards. The following policies and goals of the Specific Plan are applicable to the proposed project:[10]

Section 8: Noise

- Goal: Reduce transportation noise to a level that does not jeopardize health and welfare.
- Goal: Minimize noise levels of future transportation facilities.

Policy 8.8: Determine and evaluate the future noise levels associated with all major transportation facilities in the county.

- Goal: Establish compatible land use adjacent to transportation facilities.

Policy 8.11: Reduce the present and future impact of excessive noise from transportation sources through judicious use of technology, planning and regulatory measures.

- Goal: Allocate noise mitigation costs among those who produce the noise.
- Goal: Alert the public regarding the potential impact of transportation.
- Goal: Protect areas that are presently quiet from future noise impact.

[9] County of Los Angeles Department of Regional Planning. 2012. *Santa Clarita Valley Plan: One Valley One Vision*. Chapter 6, Noise. Available at: http://planning.lacounty.gov/assets/upl/project/ovov_2012-ch_06_noise.pdf

[10] County of Los Angeles Department of Regional Planning. 21 January 2016. *Newhall Ranch Specific Plan*. Available at: http://planning.lacounty.gov/view/newhall_ranch_specific_plan/

Northlake Specific Plan

The Northlake Specific Plan is a comprehensive document to help guide the future development of the Northlake Specific Plan Area, which is located southwest of Castaic Lake State Recreation Area, within the Castaic project area.[11] The following goals and policies of the Specific Plan are applicable to the proposed project:

> Goal i: To maintain consistency with the County's Noise Element by establishing compatible land use adjacent to transportation facilities and other significant sources of noise and by properly mitigating noise-generating uses that cause exceedance of maximum suggested noise levels.
>
> - Policy i: To avoid locating noise sensitive facilities, including schools, parks and the library site within areas designated in excess of 65 dBA (dBA is an "A-weighted" system of measuring decibels that is adjusted to match frequencies audible to humans).
> - Policy iv: To provide adequate noise mitigation measures for those uses located within areas designated in excess of 65 dBA on the County's Noise Level Map.

STUDY METHODS

The method commonly used to quantify environmental noise involves evaluation of all frequencies of sound with an adjustment to reflect the constraints of human hearing. Since the human ear is less sensitive to low and high frequencies than to midrange frequencies, noise measurements are weighted more heavily within those frequencies of maximum human sensitivity in a process called "A-weighting," written as dBA. In practice, environmental noise is measured using a sound level meter that includes an electronic filter corresponding to the A-weighted (Table 11, *A-Weighted Noise Levels*).

TABLE 11
A-WEIGHTED NOISE LEVELS

Noise Source	A-Weighted Sound Level (in dBA)	Subjective Loudness	Effect of Noise
Near jet engine	130	Intolerable or deafening	Hearing loss
Loud auto horn	100	Very noisy	Hearing loss
Normal conversation at 5–10 feet	60	Loud	Speech interference
Bird calls	40	Moderate	Sleep disturbance
Whisper	30	Faint	No effect
Rustling leaves	10	Very faint	No effect

KEY: dBA = decibels in A-weighted sound levels.

For the purpose of establishing the ambient noise levels over a given period of time, the equivalent-continuous sound (L_{eq}) is the preferred measurement to describe noise levels that vary over time. The L_{eq} is the level of a constant sound, expressed in decibels (dB), which in a given time period ($T = T_2 - T_1$) has the same energy as a time varying sound. This analysis considers dBA

[11] County of Los Angeles Department of Regional Planning. June 1992. *Northlake Specific Plan*. Available at: http://planning.lacounty.gov/assets/upl/data/pd_sp_northlake.pdf

to reflect the relative loudness of sounds in air as perceived by the human ear since the human ear does not have a linear response to sounds at different frequencies. In the A-weighted system, the decibel values of sounds at low frequencies are reduced compared with unweighted decibels, in which no correction is made for audio frequency.

In order to establish existing conditions for ambient noise levels in the Castaic project area, Sapphos Environmental, Inc. conducted noise monitoring at four locations near potential sensitive receptors within the Castaic project area (Figure 5, *Noise Monitoring Sites*).

Ambient noise levels were established by continuously recording noise measurements in 15-minute intervals with a Larson Davis Spark 706 Noise Dosimeters from 10:40 am through 1:35 p.m. on January 20, 2015. The dosimeter was calibrated prior to recording measurements. Measurements were taken to establish ambient noise levels representative of the Castaic project area. The average, maximum, and minimum L_{eq} for each monitoring site are the measurements used to describe ambient noise levels.

EXISTING CONDITIONS

Ambient Noise Levels

The average of the A-weighted ambient noise level for all four monitoring sites at the Castaic project area is 62.7 dBA (Table 12, *Ambient Noise Levels*). Ambient noise was characterized using ambient noise measurements recorded on January 20, 2016. The highest L_{eq} recorded was 79.4 dBA at Site C. Field observations at Site A (located adjacent to a school in a residential area) indicated the primary sources of noise can be attributed to sounds of birds chirping, barking dogs, sounds of children in the nearby school playing during recess, and traffic sounds heard from the nearby Interstate 5 freeway. The primary sources of noise at Site B (located in a relatively quiet rural/suburban residential area) included dogs barking, cars driving by, birds chirping, planes crossing overhead, and traffic sounds heard from the nearby Interstate 5 and State Route 126 freeways. The primary sources of noise at Site C (located in relatively open space at Charlie Canyon, in front of the California Paintball Park entrance) were only traffic sounds heard from the Interstate 5 freeway, along with environmental factors such as wind (no sources of noise can be attributed from the paintball park). Site D (a relatively open space located at the Lake Hughes Road scenic overlook) included primarily noise sources of cars driving on Lake Hughes Road and traffic sounds heard from the Interstate 5 freeway, as well as environmental factors such as wind. The freeways are a primary source of ambient noise in the Santa Clarita Valley, and at all four ambient noise measurement sites. L_{eq} data can be used as representatives of the minimum threshold because "if the ambient L50 exceeds the foregoing level, then the ambient L50 becomes the exterior noise level for Standard No. 1" pursuant to the noise control ordinance of the County of Los Angeles, Section 12.08.390, exterior noise standards (Table 13, *Ambient Noise Level L Statistics*).

TABLE 12
AMBIENT NOISE LEVELS

Monitoring Site (Sensitive Receptor)	Average L_{eq} (dBA)	Maximum L_{eq} (dBA)	Minimum L_{eq} (dBA)
A	63.3	79.1	58.8
B	64.0	74.9	60.5
C	61.1	79.4	56.7
D	62.3	67.0	59.8

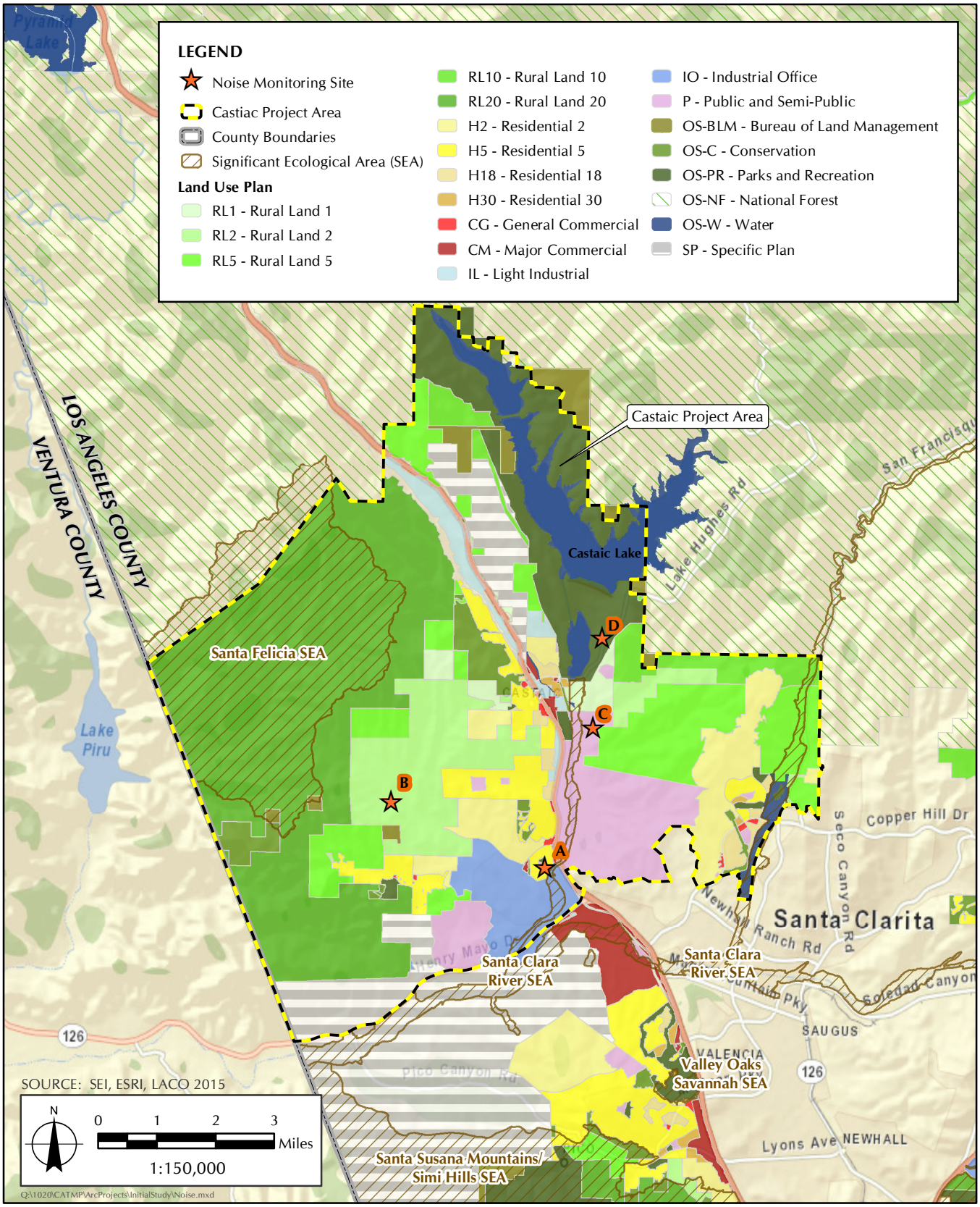


FIGURE 5

Noise Monitoring Sites

TABLE 13
AMBIENT NOISE LEVELS L STATISTICS

Monitoring Site (Sensitive Receptor Site)	L10	L30	L50	L70	L90
A	64	63.5	63	62.5	62
B	64.5	64	64	63	62
C	61	60	59.5	59.5	59.5
D	63	62.5	62	61.5	60.5

KEY:

L_{eq}: The equivalent-continuous sound (L_{eq}) is the level of a constant sound, expressed in decibels (dB), which in a given time period ($T = T_2 - T_1$) has the same energy as a time varying sound. For the Spark dosimeters, a L_{eq} value is recorded for 2 different time intervals. First, a L_{eq} is recorded for the entire record's run time. Second, a L_{eq} is recorded for each individual time history sample.

dBA: A-weighted decibels (dBA) are an expression of the relative loudness of sounds in air as perceived by the human ear. In the A-weighted system, the decibel values of sounds at low frequencies are reduced compared with unweighted decibels, in which no correction is made for audio frequency.

Sensitive Receptors

The evaluation identified 1,260 parcels with potentially sensitive receptors (>99 percent were residential land uses) within 251 feet mile of the proposed trail alignments in the southern portion of the Castaic project area, south of Castaic, California and adjacent to the Castaic Junction and in the southwestern portion of the Castaic project area in Val Verde, California. The nearest sensitive receptors to the Castaic project area, including any existing or proposed residences inside the Castaic project area, are located within surrounding communities in the vicinity of the Castaic project area (Figure 6, *Sensitive Receptors*). These sensitive land uses include residences, 3 churches, 3 schools, and 1 medical center. The Castaic project area is located within Castaic, California. Nearby communities include Santa Clarita, California and Newhall Ranch, California. There are known sensitive receptors within the Castaic project area located in the southern portion of the Castaic project area, south of Castaic, California and adjacent to the Castaic Junction and in the southwestern portion of the Castaic project area in Val Verde, California.

Ground-Borne Vibration

Existing conditions for ground-borne vibration in the vicinity of the Castaic project area are limited to recreational uses of current trails including, but not limited to, motorized dirt bikes and all-terrain vehicles (ATVs). Furthermore, there are no current construction projects, oil fields, mining operations, blasting, or other activities resulting in ground-borne vibrations in the vicinity of the Castaic project area.

Public and Private Airports

The nearest airports to the Castaic project area include the public Agua Dulce Airpark located approximately 12.7 miles to the east at 33638 Agua Dulce Canyon Road, in Santa Clarita; the private Quail Lake Sky Park located approximately 13.0 miles to the north at West Lancaster Road (Highway 138) at Quail Lake, in Lancaster; and the public Whiteman Airport located approximately 15.1 miles to the southeast at 12653 Osborne Street, in Pacoima (Figure 7, *Public and Private Airports*).

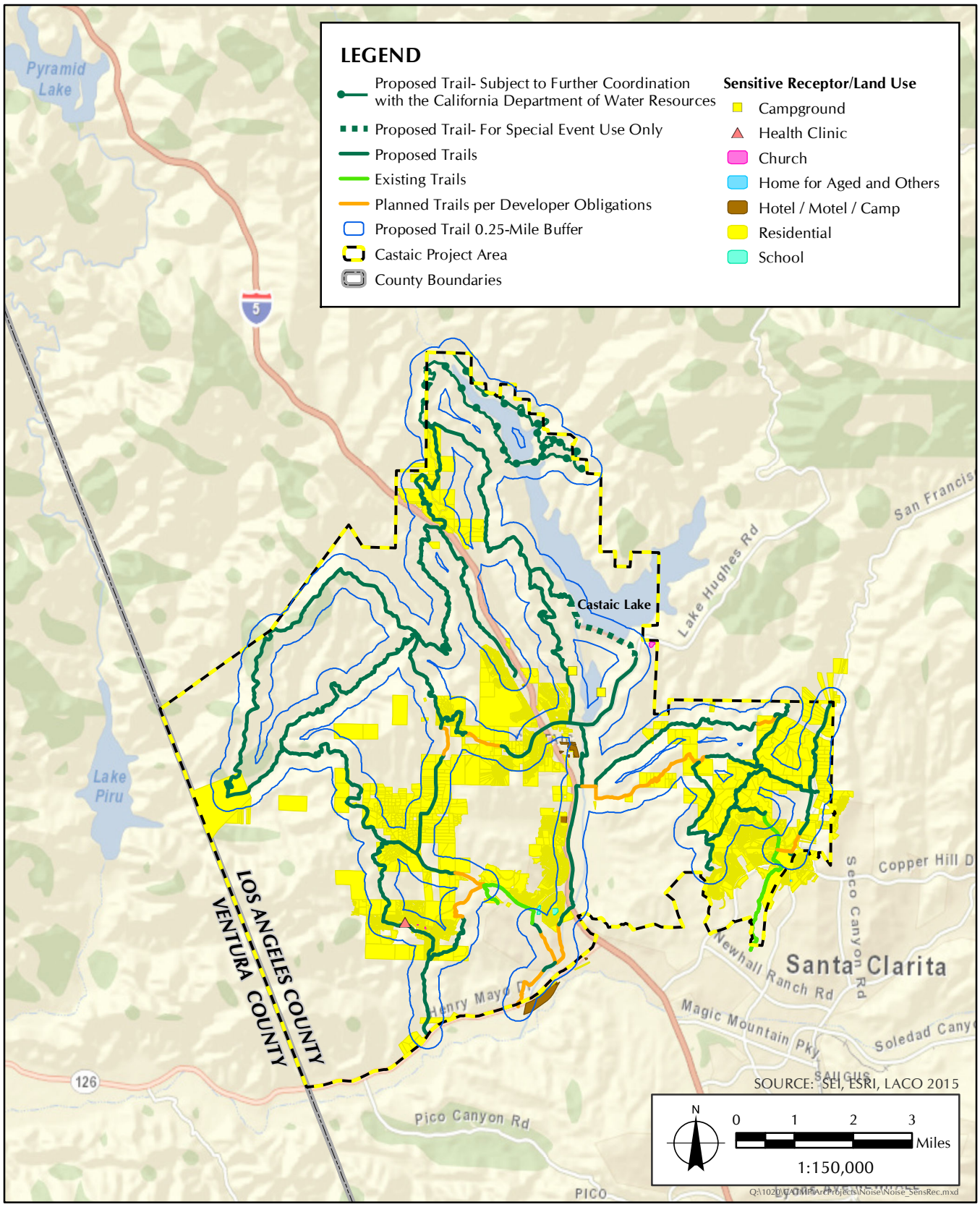


FIGURE 6

Sensitive Receptors

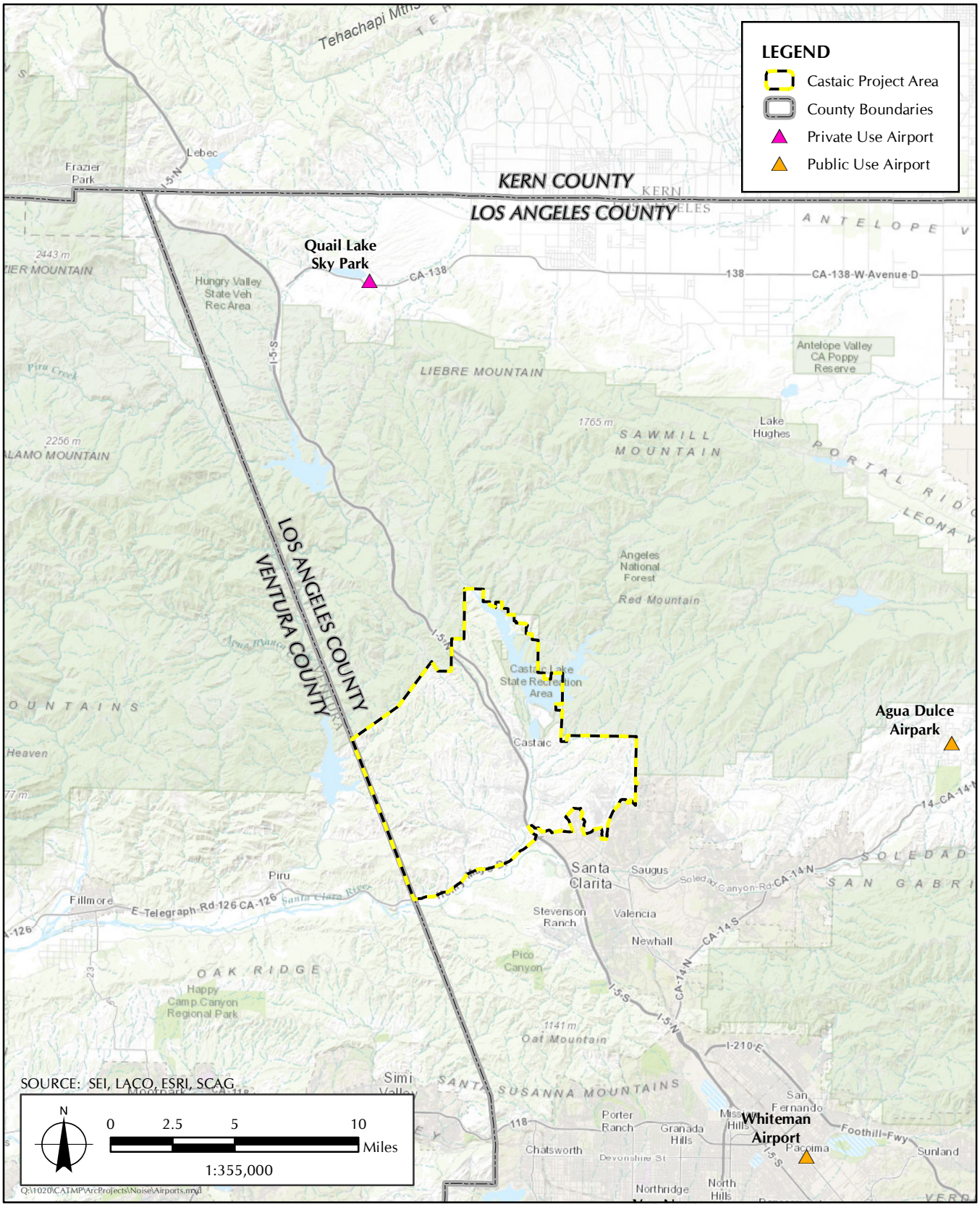


FIGURE 7

Public and Private Airports

IMPACT ANALYSIS

Construction Impacts

Noise impacts associated with the construction of the proposed project are expected to occur in three phases: ground clearing, excavations, and erections of poles and amenities. The average noise levels associated with these construction phases where all pertinent equipment is present and operating at a reference distance of 50 feet are presented in Table 14, *Construction Activity Noise Levels at 50 Feet*.

TABLE 14
CONSTRUCTION ACTIVITY NOISE LEVELS AT 50 FEET

Activity	Noise Level at 50 Feet (dBA)
Ground Clearing	84 ± 6 dBA
Excavations	89 ± 6 dBA
Erection of Structures	85 ± 5 dBA

SOURCE: VSA & Associates. 7 January 2008. *Altadena Crest Trail Improvement Noise Impact Analysis*. Whittier, CA.

Based on these noise levels, and the fact that noise attenuates at a rate of approximately 6.0 dBA per doubling of distance from a point source, the noise impacts on sensitive receptors can be determined by Equation 1 for noise attenuation over distance:

(1) $$L_2 = L_1 - 20\,log_{10}\left(\frac{d_1}{d_2}\right)$$

where

L_1 = known sound level at d_1
L_2 = desired sound level at d_2
d_1 = distance of known sound level from the noise source
d_2 = distance of the sensitive receptor from the noise source

By assigning the highest potential noise level during construction at 89 dBA during excavations (L_1) at a distance of 50 feet (d_1), the distance at which construction activities would reach a maximum of 75 dBA (L_2) and still be in compliance with Title 12, Chapter 8 of the Los Angeles County Municipal Codes for construction noise restrictions is approximately 251 feet (d_2). This distance, along with the other predicted distances at which the noise impacts would be below 75 dBA according to Equation 1 for each construction phase, are presented in Table 15, *Predicted Distance at which Noise Impact Would Be Below Level of Significance*.

TABLE 15
PREDICTED DISTANCE AT WHICH NOISE IMPACT WOULD BE BELOW LEVEL OF SIGNIFICANCE

Construction Phase	Distance at Which Noise Impact Would Be below 75 dBA*	Number of Sensitive Receptors within this Distance
Ground Clearing	141 feet	896
Excavations	251 feet	1,260
Erection of Structures	158 feet	972

NOTE: * According to Title 12, Chapter 8 of the Los Angeles County Municipal Codes, construction activities for mobile equipment may not exceed 75 dBA during weekly daytime hours from 7:00 a.m. to 8:00 p.m. for single-family residential. Construction activities are not expected to occur during nighttime hours from 8 p.m. to 7:00 a.m.

The distance at which noise impacts would be below the threshold of significance for the different construction phases ranges from 141 to 251 feet. As Table 15 indicates, up to 1,260 sensitive receptors are expected to be within 251 feet. However, construction activities associated with the proposed project are not expected to expose sensitive receptors to noise levels in excess of the standards established by the Los Angeles County Municipal Codes since impacts would be avoided by limiting construction and maintenance activities to 7:00 a.m. to 7:00 p.m. on weekdays and Saturdays, and prohibiting work on federal holidays and Sundays, along with limiting noise levels to below 75 dBA for mobile equipment and 60 dBA for stationary equipment at sensitive receptor locations through the use of noise-attenuating barriers, baffles, or blankets.

Furthermore, exposure to potential noise impacts would vary from day to day, depending on the amount of work being conducted, the weather conditions, the location of receptors, and the length of time that receptors would be exposed. Due to the short-term nature of project construction, sensitive receptors would not be expected to be significantly affected by the proposed project.

Ground-Borne Vibration

Construction activities for the proposed project are not expected to include blasting, drilling, or other activities that would result in excessive ground-borne vibrations at the Castaic project area. Furthermore, there are no current construction projects, oil fields, mining operations, blasting, or other activities resulting in ground-borne vibrations in the vicinity of the Castaic project area. Therefore, the proposed project is not expected to result in exposure of sensitive receptors or generation of excessive ground-borne vibration or ground-borne noise levels.

Operational Impacts

The primary sources of noise can be attributed to conversational noise from recreational uses such as hiking, bike riding, and equestrian riding. Noise from typical conversations at the trail would be negligible at sensitive receptor locations, when compared with the average A-weighted ambient noise level (62.7 dBA) for all four monitoring sites. Therefore, operation of the proposed project would not be expected to result in substantial permanent or temporary increases in ambient noise levels in the vicinity above levels existing without the proposed project.

Public and Private Airports

The proposed project would not result in noise impacts in relation to exposure to persons residing or working near airports to excessive noise levels. The Castaic project area is not located within 2 miles of an Airport Land Use Area. The distance to the nearest public and private airports is 12.7 miles for the Agua Dulce Airpark, 13.0 miles for the Quail Lake Sky Park, and 15.1 miles for the Whiteman Airport. The Castaic project area is sufficiently removed from public and private airports to protect workers engaged in construction or maintenance of the trails from exposure to excessive noise levels. Similarly, recreational users would not be exposed to excessive noise levels from an airport.

CONCLUSIONS, RECOMMENDATIONS, AND CONSIDERATIONS FOR TRAIL PLANNING

Noise Standards

According to the County of Los Angeles Municipal Codes, mobile equipment shall not generate noise levels above 75 dBA for single-family residences and stationary equipment shall not generate noise levels above 60 dBA for single-family residences during weekdays from 7:00 a.m. to 8:00 p.m. Furthermore, daily construction activities would be subject to County noise regulations, which state that construction equipment may not operate between the hours of 7:00 p.m. and 7:00 a.m., Monday through Saturday, or at any time on Sunday or holidays. Construction activities are not expected to occur outside of the time frame from 7:00 a.m. to 7:00 p.m. The analysis contained herein regarding the predicted distance at which noise impacts would be below the level of significance for the four construction phases (ground clearing, excavations, erection of structures) indicates that construction impacts would be below the level of significance when activities occur at a minimum of 251 feet away from a sensitive receptor. Impacts to potential sensitive receptors located within 251 feet would be avoided through the use of noise-attenuating barriers, baffles, or blankets. Therefore, if construction activities occur between the hours of 7:00 am and 7:00 p.m. during weekdays, and noise-attenuating barriers, baffles, or blankets are installed to reduce noise levels to a maximum of 75 dBA for mobile equipment and 60 dBA for stationary equipment for potential sensitive receptors within 251 feet, then the proposed project would not be expected to expose persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance.

Ground-Borne Vibrations

Construction activities for the proposed project are not expected to include blasting, drilling, or other activities that would result in excessive ground-borne vibrations at the Castaic project area. Furthermore, there are no current construction projects, oil fields, mining operations, blasting, or other activities resulting in ground-borne vibrations in the vicinity of the Castaic project area. Therefore, the proposed project is not expected to result in exposure of sensitive receptors or generation of excessive ground-borne vibration or ground-borne noise levels.

Ambient Noise Levels

Construction activities may result in temporary or periodic increases in ambient noise levels; however, all construction activities shall be in accordance with the Los Angeles County Noise Regulation to ensure that all noise impacts are below the level of significance. Furthermore, field observations at the Study Plan Area revealed that the primary sources of existing noise can be attributed to conversational noise from recreational uses such as hiking, bike riding, and horse

riding, along with other environmental factors such as wind. The operations of the trails built as a result of the proposed plans would typically result in conversation noise, which would not exceed the measured average of the existing noise levels (62.7 dBA).

Airports

The proposed trail improvements are located more than 2 miles away from a public or private airport. The nearest airport is located 12.7 miles away from the Study Plan Area; therefore, recreational users are not expected to be exposed to excessive noise levels as a result of airport operations.

Should there be any questions regarding the information contained in this MFR, please contact Ms. Aimee Frappied at (626) 683-3547.

REFERENCES

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Appendix H

Traffic Assessment

Sapphos environmental inc.

May 13, 2016
Job Number: 1020-085
Castaic Area Multi-Use Trails Plan Project

MEMORANDUM FOR THE RECORD

TO: County of Los Angeles
Department of Parks and Recreation
(Ms. Olga Ruano, Mr. Zachary Likins, and Mr. Frank Moreno)

FROM: Sapphos Environmental, Inc. and Alta Planning + Design, Inc.
(Ms. Laura Male, Bryan Jones, PE, AICP, LCI, and Emily Duchon)

SUBJECT: Castaic Area Multi-Use Trails Plan Traffic Assessment

FIGURES:
1. Castaic Regional Vicinity Map
2. Castaic Local Vicinity Map
3. Castaic Proposed Trailheads, Trails and Traffic Count Locations
4. Parking Tickets Sold at Castaic Lake State Recreation Area

APPENDIX
A. Traffic Counts

EXECUTIVE SUMMARY

This Memorandum for the Record (MFR) documents the results of the traffic and parking assessment that was undertaken in support of the proposed Castaic Area Multi-Use Trails Plan (proposed project), in support of the County of Los Angeles serving in the capacity of a Lead Agency, pursuant to the California Environmental Quality Act. Based on an analysis of existing traffic volumes, planned road capacities the future trips associated with the construction, recreational use, and maintenance activities associated with the proposed project should not experience an impact to Transportation/Traffic.

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INTRODUCTION

This MFR has been prepared to summarize the traffic and parking assessment prepared for the proposed project located in the Castaic Area of the Santa Clarita Valley, in the northwestern portion of the unincorporated area of the County of Los Angeles. A traffic and parking assessment is needed to document the existing and forecasted parking demand and vehicle volumes associated with the proposed project. Locations for potential staging areas, bike skills park amenities, and equestrian amenities were identified and analyzed for the purpose of developing vehicle trip generation forecasts for trail projects. Based on these locations, 24-hour traffic counts at key roads were conducted on Saturday, February 6, and Tuesday, February 9, 2016. Traffic counts demonstrate that substantial roadway capacity is available on these access roads, with each segment scoring in the LOS A/B range. Trips associated with the proposed project elements would not have a impact level because projected ADT is below the LOS C range per the Los Angeles County Traffic Impact Analysis Report Guidelines.[1]

This traffic and parking assessment memorandum provides the following data:

- Description of the existing conditions;
- Overview of the existing trailhead locations analyzed;
- Summary of the vehicle volume counts conducted for the traffic assessment;
- Assumptions to derive the parking trip generation rate associated with trail use;
- Summary of the existing parking supply and forecasted parking demand at the existing recreational areas and proposed trailhead locations; and
- Conclusion regarding the future traffic and parking demand associated with potential future trail connections as part of the proposed project.

LOCATION

The Castaic project area, which encompasses approximately 75 square miles (approximately 48,107 acres) in the Castaic area of the Santa Clarita Valley, is located in the northwestern portion of the unincorporated area of the County of Los Angeles (Figure 1, *Castaic Regional Vicinity Map*). The Castaic project area is bound by the Angeles National Forest to the north, the City of Santa Clarita to the southeast, Highway 126 to the south, and Ventura County to the west (Figure 2, *Castaic Local Vicinity Map*). The Castaic project area includes three existing County trails (approximately 4.9 miles) and approximately 100 miles of County Trail System proposed trails (Figure 3, *Castaic Proposed Trailheads, Trails and Traffic Count Locations*).

The Santa Clarita Valley is centrally located between the San Gabriel Mountains to the east, Sierra Pelona Mountains to the northeast, the Topatopa Mountains to the west, the San Emigdio Mountains and Tehachapi Mountains to the north, and the Santa Susana Mountains and Santa Monica Mountains to the south within the Transverse Ranges, a group of east-west trending mountains paralleling the Pacific Ocean between Santa Barbara and San Diego Counties.[2] The Castaic project area is located on the U.S. Geological Survey (USGS) 7.5-minute series Whitaker Peak, Warm Springs Mountain, Val Verde, and Newhall topographic quadrangles. The elevation of the Castaic project area ranges from approximately 863 feet above mean sea level (MSL) in the

[1] LA County Traffic Impact Analysis Report Guidelines.

[2] United States Geological Survey (USGS). Accessed 10 August 2015. *TopoView*. Available at: http://ngmdb.usgs.gov/maps/TopoView/viewer/#11/34.5626/-118.5353

Santa Clara River bed at the southern edge of the Castaic project area to approximately 2,756 feet above MSL along the northern edge of the Castaic project area, approximately 0.7 mile southwest of Interstate-5. Loma Linda Peak, at an elevation of approximately 2,494 feet above MSL, is located between Santa Felicia Canyon and Romero Canyon, approximately 0.2 mile south of the northern edge of the Val Verde topographic quadrangle.

PROJECT DESCRIPTION

Existing trails: 4.9 miles

Proposed trails: Approximately 100 miles

The purpose of the proposed project is to provide an analysis of existing and potential connectors between prime destination points for enhanced recreational opportunities for users. The trail systems are planned to be designed such that it provides an equal and safe experience for various trail users including pedestrians, bicyclists, and equestrians. The County of Los Angeles Department of Parks of Recreation identified the following seven objectives for the project:

1. Accommodate a wide range of trail user types and abilities
2. Connect to desirable destinations, features, and settings
3. Provide safe and sustainable trails
4. Avoid or minimize environmental impacts
5. Identify the means to implement and maintain trails as feasible within the scope and budget of the Multi-Use Trails Plan
6. Develop plan consistent with the County's multi-use (equestrians, hikers, and mountain bikers) trail policy
7. Develop plan consistent with Parks and Recreation Element of County General Plan

The County of Los Angeles existing and proposed trails within the Castaic Area trail system are illustrated in Figure 3.

Figure 1: Castaic Regional Vicinity Map

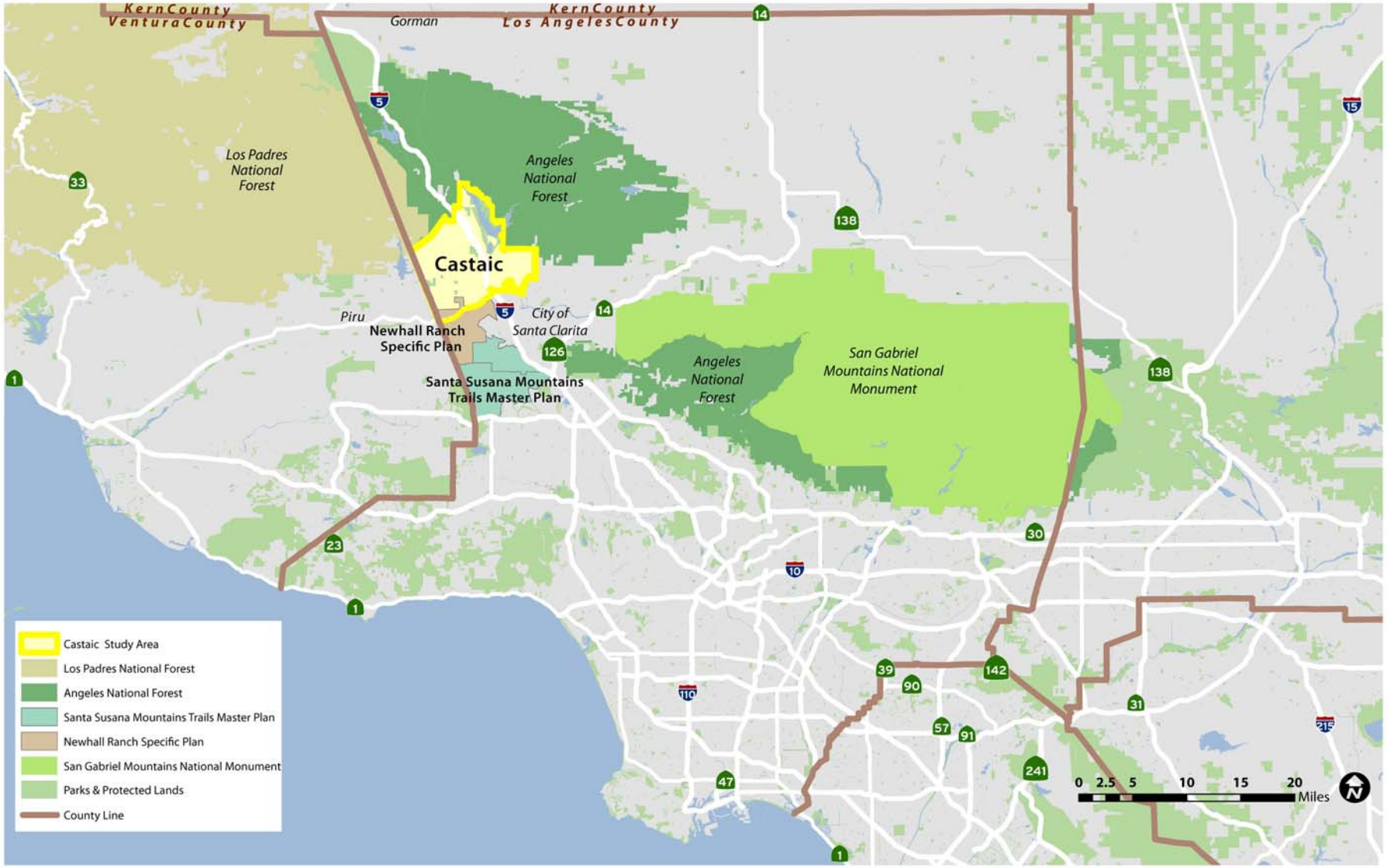
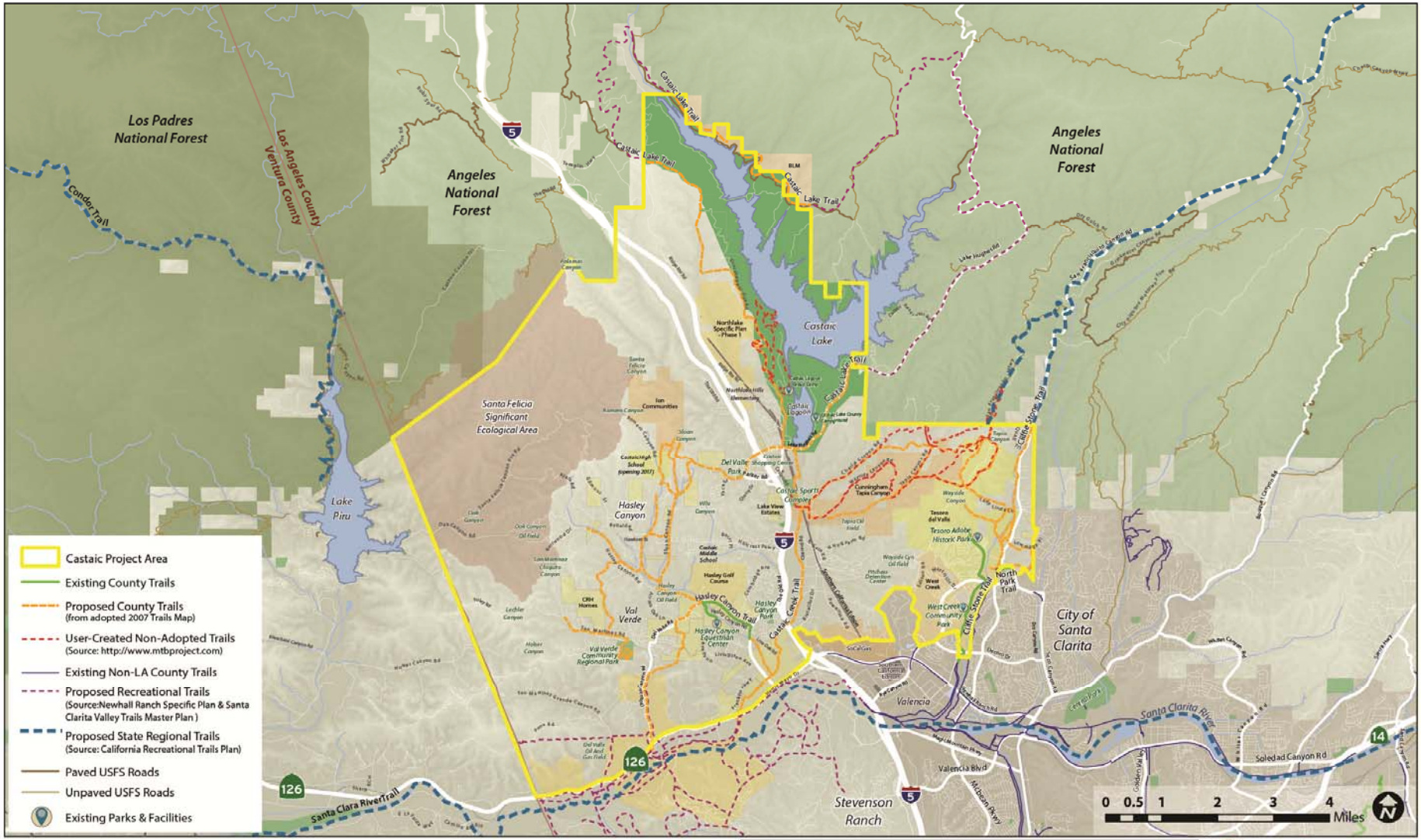


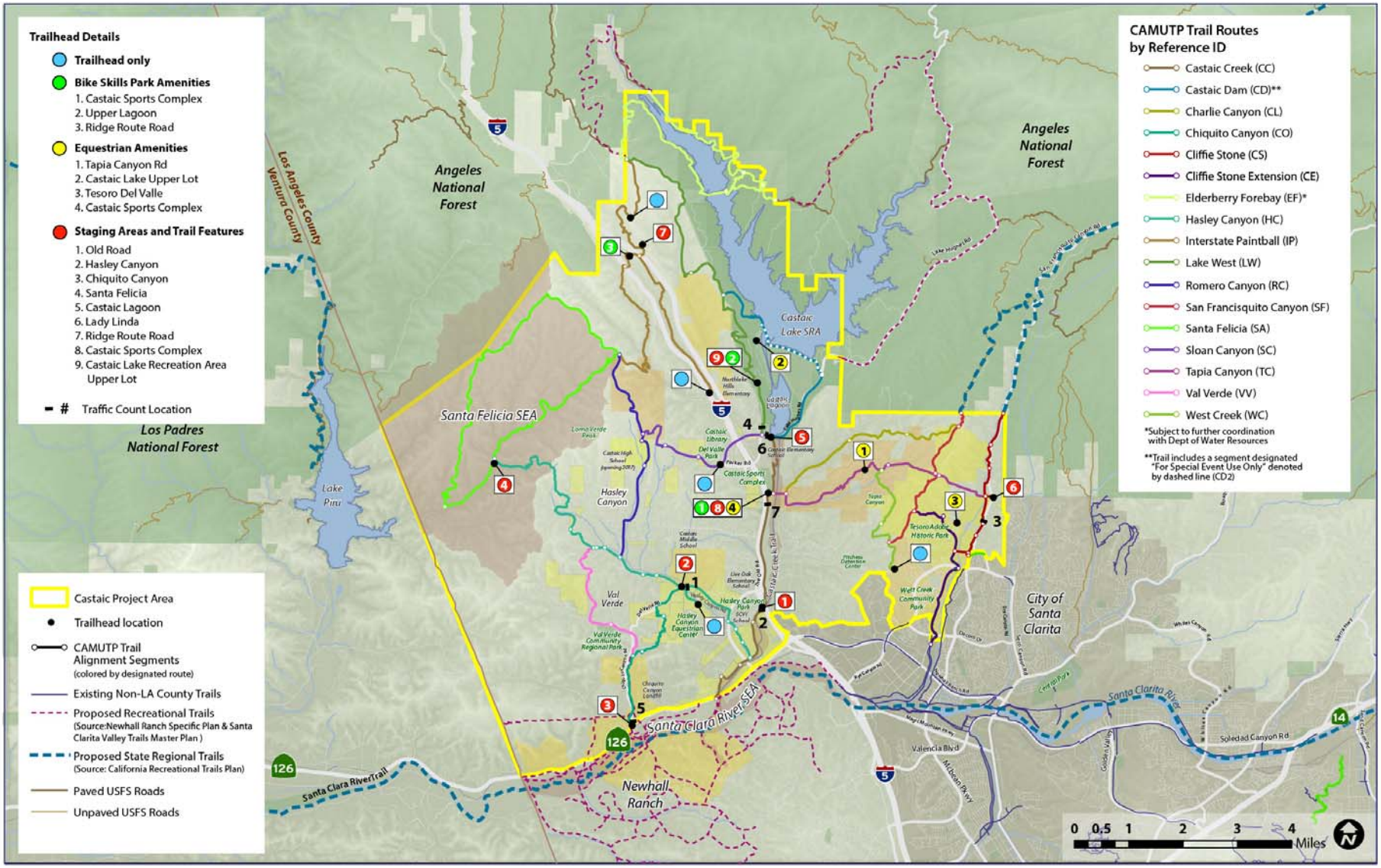
Figure 2: Castaic Local Vicinity Map



Castaic Area Multi-Use Trails Plan - Project Area Overview

MAP DATA SOURCES
Date Map Created/Revised: 9/30/2015 *Basemap:* USGS 2006 LA County LIDAR 10ft DEM
Data Sources: mtbproject.org, ESRI Streetmap NA 2013, Los Angeles County Enterprise GIS, California Protected Areas Database 2015a, Santa Clarita Valley Master Plan of Trails 2015, California Recreational Trails Plan 2011, Los Angeles County General Plan 2007, USFS Road Core, City of Santa Clarita *Map Author:* James Powell

Figure 3: Castaic Proposed Trailheads, Trails and Traffic Count Locations



REGULATORY FRAMEWORK

Los Angeles County General Plan, 2035

Chapter 7, Mobility Element, of the Los Angeles County General Plan 2035 assesses the challenges and constraints of the Los Angeles County transportation system, and offers policy guidance to reach the County's long-term mobility goals. The element states; "Acceptable LOS is determined on a case by case basis, but generally, Level D is the desired minimum LOS. In some instances, LOS below D will be deemed acceptable in order to further other General Plan goals and policies, such as those that protect environmentally sensitive areas, promote active transportation, and encourage infill development, particularly within the Transit Oriented Districts" (Los Angeles County General Plan 2035).

Los Angeles County Traffic Impact Analysis Report Guidelines, Los Angeles County Department of Public Works, 1997

The County of Los Angeles Department of Public Works establishes the Guidelines for the preparation of Traffic Impact Analysis (TIA) reports. The County's Significant Impact Thresholds are as follows:

- If the pre-project LOS is E/F, a 1% increase in passenger cars per hour (PCPH) will cause a "significant" impact.
- If the pre-project LOS is D, a 2% increase in passenger cars per hour (PCPH) will cause a "significant" impact.
- If the pre-project LOS is C, a 4% increase in passenger cars per hour (PCPH) will cause a "significant" impact.

STUDY METHODS

Summary

When predicting future demand for trail use, there is not a linear relationship between popularity of use and the length of trail. Demand for recreational hiking, biking and equestrian trails is mostly dependent upon the quality of the experience. Evaluating the quality of the trail is different for each user group. Furthermore, different users travel different distances per trip and have varying parking needs, both of which affect parking trip generation. Day trip hikers value trails with points of interest such as peaks, canyons, and waterfalls and tend to travel between 1-5 miles (one way). Hikers require more frequent access points and have a higher turn-over in parking than other users. Larger parking areas near popular points of interest and smaller frequent access points are important for hikers. Equestrian users also value trails with points of interest but tend to travel further. Equestrian riders tend to trailer their horses to access continuous trails (over 10 miles) or equestrian arenas. Trails that cater to mountain bikers provide varied terrain, loops, and jumps.

Existing Trailheads Evaluated

Existing trailheads around Los Angeles County were evaluated in terms of their parking supply and relevant points of interest. Generally speaking, dedicated surface parking lots are only provided around trailheads where there is a destination, such as a nature center or recreation facility, co-located at the trailhead. Most surface parking capacity in these instances is provided in unpaved, unstriped lots. The largest paved parking lot sampled was at Eaton Canyon (Nature Center), where

125 spaces are available. The largest unpaved lot was found at Altadena Crest Trailhead (at Sunset Ridge Road), with more than 167 spaces available.

Trailheads that function primarily as linear trail access points, on the other hand, often do not require dedicated parking infrastructure. Moreover, these trailheads tend to be located in less populated areas where there are opportunities to harness existing roadway shoulders for motor vehicle parking.

Table 1: Existing Regional Trailheads Evaluated

Name	Points of Interest	Adjacent Population	Existing Parking	
			Street	Lot
Santa Susana Pass	Vistas, seasonal streams, dense foliage	Yes	30	0
Chatsworth Trails Park/Highland Trails	Devil's Canyon	No	35	0
Limekiln Canyon Road	Green valley, picnic areas	Yes	25	0
O'Melveny Park	Picnic areas, general park use	No	80	34 paved
Los Pinetos trail (at Wilson Canyon Saddle)	Wilson Canyon Saddle	No	0	26+ unpaved
Altadena Crest Trailhead at Sunset Ridge Rd 5.48 miles in County	Parks and recreation facilities	Yes	0	44 paved, 167+ unpaved
Eaton Canyon (Nature Center)	Nature Center	Yes	0	125 paved, 94+ unpaved

Parking Activity and Use at Castaic Lake State Recreation Area

Castaic Lake State Recreation Area offers paid parking at lots on the west side of Castaic Lagoon. These parking lots are adjacent to proposed trailheads at Castaic Lagoon and Castaic Lake State Recreation Area Upper Lot. Historical ticket sales data for these parking lots, which have a capacity of approximately 1,420 standard-sized vehicle spaces, is summarized in Table 2 and Figure 4.

Historical Information on Parking Tickets Sold

Since 2012, the Castaic Lake State Recreation Area has seen an average of 75,200 visitors annually and 206 visitors per day. Annual ticket sales have fallen from a high of 94,613 in 2013 to just under 60,000 in 2014 and 2015 – a decline of at least 36 percent. Daily average visitors fell from a high of 259 in 2013 to 161 in 2014 and 162 in 2015. Excess parking capacity is thus higher today than in 2012 and 2013.

Seasonal Parking Tickets Sold

Parking demand at Castaic Lake State Recreation Area is highly seasonal. The vast majority of parking trips to Castaic Lake State Recreation Area occur in the second quarter (34 percent of all parking trips) or third quarter (44 percent of all parking trips). Parking demand in the first- and fourth-quarter shoulder seasons represents only 22 percent of total parking tickets sold. In these months, parking tickets sold rarely exceeds 500 vehicles per day, and in most cases is well below the overall average of 206 visitors per day. In the second and third quarters, parking demand

ranges dramatically from day-to-day, with daily parking trips typically ranging from about 20 to about 1,500.

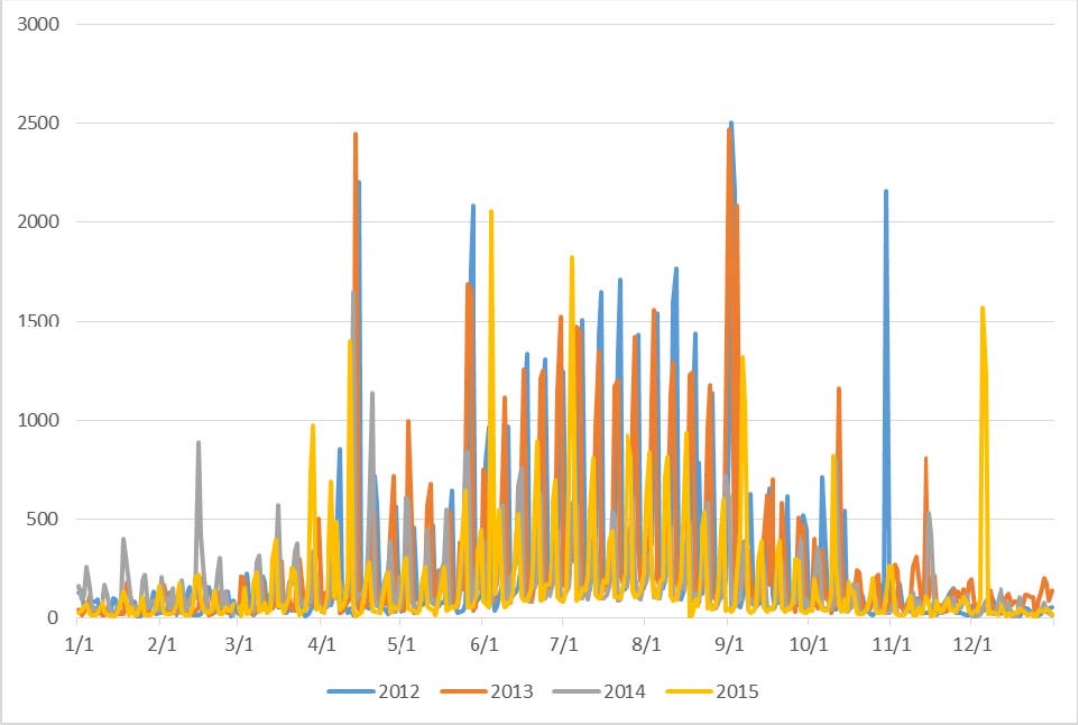
Demand for parking at Castaic Lake State Recreation Area spikes at various points throughout the calendar due to holidays and special events. In these instances, parking demand can reach as high as 2,500 vehicles per day. Although the largest demand spikes have occurred in the busy second quarter and third quarter months (e.g. Memorial Day and Labor Day), spikes have also occurred in October and December due to Halloween and winter holiday events, respectively.

Assuming that vehicle parking spaces at Castaic Lake State Recreation Area turn over approximately 1.5 times per day (i.e. an effective capacity of 2,130 spaces), the parking lot experiences capacity issues only about three to five days per year, and only during special events. Given there is extra capacity 95%+ of the time, the proposed trails are assumed to not experience an impact to parking.

Table 2: Parking Tickets Sold at Castaic Lake State Recreation Area

Year	Total Visitors	Q1	Q2	Q3	Q4	Daily Average
2012	88,160	5,649	28,905	44,696	8,910	241
2013	94,613	6,820	31,764	44,231	11,798	259
2014	58,822	11,381	21,860	18,434	7,147	161
2015	59,201	7,427	18,455	24,741	8,578	162
All	**300,796**	**31,277**	**100,984**	**132,102**	**36,433**	**206**

Figure 4: Parking Tickets Sold at Castaic Lake State Recreation Area



Staging Areas and Trail Amenities

For reasons of sustainability and cost efficiency, additional surface parking lots are only recommended in instances where there is no opportunity to adequately serve parking demand through existing parking and on-street parking alone (e.g. the conversion of shoulders).

Staging Areas are the primary access points to various trailsheds within the Proposed Castaic Area Multi-Use Trail system. Each Staging Area was evaluated by the points of interests it serves, adjacent population and trailshed mileage representing the size of the area it serves to estimate the potential additional parking needed as proposed trails become built.

Three of the Staging Area locations – Ridge Route Road, Castaic Sports Complex and Castaic Lake State Recreation Area Upper Lot – are also candidate locations for Bike or Equestrian Amenities. If any Bike or Equestrian Amenities are constructed at or around Staging Area locations, parking for these trailheads should be supplied as described in Table 4 and 5.

Table 3: Existing Conditions and Recommended Additional Parking for Staging Area and Trail Amenities

Proposed Staging Area Location	Points of Interest	Adjacent Population	Trailshed Mileage	Existing Parking	Add'l Parking	
					Street	Lot
Old Road	Castaic Creek	Yes	4.4	0	0	24
Hasley Canyon	Ridgelines	No	8.9	67 shoulder spaces	20	8
Chiquito Canyon	Santa Clara River Trail	No	8.9	122+ shoulder spaces	0	20
Santa Felicia	Significant Ecological Area, National Forest	No	13.4	0	0	15
Castaic Lagoon	Castaic Lake State Recreation Area	Yes	13.1	0	0	60
Lady Linda	Tapia Canyon	No	4.5	0	10	5
Ridge Route Road	Castaic Lake State Rec Area, Santa Felicia, National Forest	No	17.9	0	0	20
Castaic Sports Complex	Tapia Canyon	Yes	18.0	405	0	0
Castaic Lake State Recreation Area Upper Lot	Castaic Lake State Rec Area	No	13.1	920	0	0

Bike Skills Park Amenities

The amount of potential parking needed to adequately serve a Bike Skills Park is directly correlated to its size. Bike Skills Parks can range from small pump tracks or balance skills areas to large facilities with a range of courses for users of different abilities. Based on best practice review of national bike skill park areas, it is assumed that 2 parking spaces are needed per acre for sites under 30 acres and 3 parking spaces per acre for sites at or over 30 acres.[3] It can be assumed that larger Bike Skill Park areas have lower parking turnover rates as visitors have more options and stay longer. Therefore, the higher end parking range is recommended for bike skill parks 30 acres or over.

Assuming these will be longer stays, a conservative estimate would be that each space would turn over a 3 times during the day (so daily trip generation would be 12 trips [in and out] for sites under 30 acres and 18 trips per acre at or over 30. For example, the 30 acre bike skill park could generate 540 trips during a day. **Table 4** identifies three possible locations for bike skills parks, the potential size (in acres), and existing and recommended.

Table 4: Recommended Additional Parking for Bike Skills Park Amenities

Proposed Bike Skills Park Amenity Location	Proposed size (acres)	Existing Parking	Additional Parking	Notes
Castaic Sports Complex	10	405	20-30	Ample parking area – evaluate opportunities to utilize existing parking.
Upper Lagoon	5	920	10-15	Ample parking area – evaluate opportunities to utilize existing parking.
Ridge Route Rd	30	0	60-90	Opportunity for development of a large bike skills park with regional draw.

Equestrian Amenities

Equestrian Amenities require parking suitable for equestrian trailers. **Table 5** provides the potential parking increases for the proposed Equestrian Amenities. All recommended parking for Equestrian Amenities are assumed to be equestrian spaces. Assume parking turnover of 2 times a day for trip generation.

[3] Based on measuring the parking provided at existing bike skills parks around the country and comparing it to the total acreage of the bike park

Table 5: Recommended Parking for Equestrian Amenities

Proposed Equestrian Amenity Location	Existing Equestrian Trailer Parking	Additional Equestrian Trailer Parking	Notes
Tapia Canyon Rd	0	5	Area proposed by Tapia Ranch development.
Castaic Lake Upper Lot	0	10	At existing large parking lot. Existing trails connect to network.
Tesoro Del Valle	0	5	Existing park with standard-sized parking for current uses.
Castaic Sports Complex	0	10	Existing park.

Existing Traffic Counts

The project team conducted traffic counts along key access roads leading to proposed Staging Areas. Traffic Level of Service was found to be "B" or higher along all roadways sampled at all times of the day. Traffic growth as a result of trail improvements should not experience an impact is expected to be insignificant in relation to existing vehicle volumes. Moreover, peak trail demand (weekends during mid-day) will not coincide with peak roadway demand, and so will have minimal impact on traffic conditions during the weekday AM and PM commuter peaks. As a result, trips associated with the proposed project elements would not have a significant impact level because projected ADT is below the LOS C range per the Los Angeles County Traffic Impact Analysis Report Guidelines.[4]

As part of the traffic assessment of the proposed project, vehicular traffic counts on eight potential trailhead access roads were conducted. Counts were performed on Saturday, February 6, and Tuesday, February 9, to document weekend and weekday volumes, respectively. The counts were conducted in 15-minute time increments over a 24-hour period, beginning at midnight.

[4] LA County Traffic Impact Analysis Report Guidelines

Table 6: Existing Conditions on Proposed Staging Area Access Roads

Proposed Staging Area Location	Count Location	Tube	Land Uses	Travel Lanes (Bi-Directional)	Speed Limit (mph)	Parking	Ped/Bike Facilities
Lady Linda	San Francisquito Cyn Rd Bet. Piute Court & Lowridge Pl	1	Undeveloped	2	55	None	None
Castaic Lagoon	Lake Hughes Rd E/O Ridge Route Rd (E/W)	2	NS: parking lot. SS: undeveloped.	2	35	NS: no parking anytime. SS: no posted restriction.	Gravel shoulders
Bike Skills Park	Ridge Route Rd S/O Castaic Lake State Recreation Area	3 (NB) 4 (SB)	WS: residential. ES: industrial.	6 (+2 turn lanes - NB RT and SB LT)	40	None (no stopping anytime)	Sidewalks
Tapia Canyon Rd	Castaic Rd N/O Tapia Cyn Rd	5	WS: freeway. ES: undeveloped.	2	25	ES: No parking anytime, commercial vehicle restriction. WS: no stopping anytime.	None
Hasley Canyon	Hasley Cyn Rd E/O Del Valle Rd	6	Undeveloped	2	45	NS: no stopping anytime. SS: no posted restriction.	Gravel shoulders
Old Road	The Old Rd S/O Live Oak Rd	7	WS: parking lot. ES: freeway.	2	55	None	WS: paved shoulder
Chiquito Canyon	Chiquito Cyn Rd N/O SR-126	8	Undeveloped	2	35	No posted restrictions.	Gravel shoulders

The traffic counts for each of the potential trailhead access roads are summarized and presented in Table 7. Details of the traffic count data are also provided in the Appendix.

Table 7: Existing Traffic Counts and Level of Service (LOS) Results for Proposed Staging Area Access Roads

Count Location		Direction	Saturday, 2/6/2016				Tuesday, 2/9/2016			
		I / II	Dir I	Dir II	Total	LOS	Dir I	Dir II	Total	LOS
Hasley Cyn Rd E/O Del Valle Rd	1	EB/WB	2,871	2,876	5,747	A/B	3,189	3,210	6,399	A/B
The Old Rd S/O Live Oak Rd	2	NB/SB	2,157	2,407	4,564	A/B	2,565	2,929	5,494	A/B
San Francisquito Cyn Rd Bet. Piute Court & Lowridge Pl	3	NB/SB	1,893	1,851	3,744	A/B	2,560	2,507	5,067	A/B
Ridge Route Rd S/O Castaic Lake State Recreation Area	4	NB/SB	1,704	1,624	3,328	A/B	2,209	2,140	4,349	A/B
Chiquito Cyn Rd N/O SR-126	5	NB/SB	759	*n/a*	*n/a*	A/B	715	784	1,499	A/B
Lake Hughes Rd E/O Ridge Route Rd (E/W)	6	EB/WB	572	627	1,199	A/B	506	518	1,024	A/B
Castaic Rd N/O Tapia Cyn Rd	7	NB/SB	309	318	627	A/B	255	248	503	A/B

RESULTS

Projected Traffic Volumes

The Santa Susana Mountains Trails Master Plan, which is located within 10 miles south of the Castaic project area, developed a derived empirical parking trip rate for trails, based on Saturday AM Peak Hour Vehicle Trip Rate at existing trailheads, of 4.9 trips per mile of trail (56% inbound, 44% outbound). As a conservative estimate, this trip generation rate can be applied to the proposed trails in the Castaic project area. However, to capture the fact that there is not a linear relationship between the popularity and length of trail, Alta has evaluated distributed trips based on the number of attractions and potential popularity of the trailhead as described in the previous section.

The Table 8 shows the assumed proportion of trips to Staging Areas and the daily trip generation (assuming the peak hour represents 10% of total trips). Table 9 estimate the increase in daily traffic by applying the trip generation to the roadway volume counts. It shows how the amount of trips generated are not significant because the projected ADT is well under the Los Angeles County LOS D threshold.[5]

[5] *"Acceptable LOS is determined on a case by case basis, but generally, Level D is the desired minimum LOS. In some instances, LOS below D will be deemed acceptable in order to further other General Plan goals and policies, such as those that protect environmentally sensitive areas, promote active transportation, and encourage infill development, particularly within the Transit Oriented Districts." (From Los Angeles County General Plan 2035).*

Table 8: Trip Generation by Location

Proposed Location	Proportion of General Trailhead Trips	Peak Hour Trip Generation	Daily Trip Generation
Castaic Lagoon	15%	75	750
Castaic Sports Complex	20%	100	1000
Castaic Lake State Rec Area Upper Lot	15%	75	750
Hasley Canyon	10%	50	500
Ridge Route Road	10%	50	500
Old Road	10%	50	500
Chiquito Canyon	10%	50	500
Lady Linda -1	5%	25	250
Santa Felicia	5%	25	250
All Locations	**100%**	**500**	**5,000**

Table 9: Projected Traffic Volumes Counts based on assumed trip generation rate and allocation per location (Saturday, 2/6/2016).

Proposed Location	Count Location	Existing ADT (Sat)	Projected ADT	Impact
Hasley Canyon	Hasley Cyn Rd E/O Del Valle Rd	5,747	6,247	NO
Old Road	The Old Rd S/O Live Oak Rd	4,564	5,064	NO
Lady Linda	San Francisquito Cyn Rd Bet. Piute Court & Lowridge Pl	3,744	3,994	NO
Castaic Lake State Rec Area Upper Lot	Ridge Route Rd S/O Castaic Lake State Recreation Area	3,328	4,078	NO
Chiquito Canyon	Chiquito Cyn Rd N/O SR-126	1,499*	1,999	NO
Castaic Lagoon	Lake Hughes Rd E/O Ridge Route Rd (E/W)	1,199	1,949	NO
Castaic Rd N/O Tapia Cyn Rd	Castaic Sports Complex	627	1,627	NO
**Tuesday counts used at this location because Saturday counts were not available.*				

IMPACT ANALYSIS

Based on the traffic and parking assessment prepared for the proposed project, the following conclusions are made:

- Castaic Lake State Recreation Area parking lots experiences capacity issues only about three to five days per year, and only during special events. Given there is extra capacity 95%+ of the time, the proposed trails are assumed to not pose an impact to parking and no additional parking would be needed inside the Recreation Area for general trail use.

- Additional surface parking lots are only recommended in instances where there is no opportunity to adequately serve parking demand through existing parking and on-street parking alone (e.g. the conversion of shoulders).

- Peak trail demand (weekends during mid-day) will not coincide with peak roadway demand, and so will have minimal impact on traffic conditions during the weekday AM and PM commuter peaks. As a result, no impacts to traffic level of service is anticipated.

- For bike skills park amenities, 2 parking spaces are needed per acre for sites under 30 acres and 3 parking spaces are needed per acre at sites at or over 30 acres.

- Using a conservative trip generation rate of 4.9 trips per mile of trail does not create any impacts to roadway capacity because the projected ADT is well under the Los Angeles County LOS D threshold.

- As part of the Multi-Use Trails Plan, the parking areas for the Staging Area locations should provide on-site parking areas which conform to the nine elements previously identified in the *County of Los Angeles Trails User Manual*.

APPENDIX A
TRAFFIC COUNTS

Prepared by NDS/ATD

VOLUME

San Francisquito Cyn Rd Bet. Piute Court & Lowridge Pl

Day: Saturday
Date: 2/6/2016

City: Castaic
Project #: CA16_5060_001

DAILY TOTALS	NB	SB	EB	WB	Total
	1,893	1,851	0	0	3,744

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	13		0				13		12:00	35		46				81	
00:15	6		0				6		12:15	52		42				94	
00:30	4		0				4		12:30	30		28				58	
00:45	7	30	2	2			9	32	12:45	35	152	36	152			71	304
01:00	5		1				6		13:00	47		33				80	
01:15	5		1				6		13:15	41		42				83	
01:30	4		2				6		13:30	30		41				71	
01:45	0	14	2	6			2	20	13:45	42	160	28	144			70	304
02:00	3		0				3		14:00	41		25				66	
02:15	2		0				2		14:15	33		49				82	
02:30	4		3				7		14:30	33		36				69	
02:45	1	10	4	7			5	17	14:45	43	150	34	144			77	294
03:00	0		1				1		15:00	49		39				88	
03:15	0		1				1		15:15	39		36				75	
03:30	3		2				5		15:30	35		35				70	
03:45	0	3	2	6			2	9	15:45	24	147	36	146			60	293
04:00	1		4				5		16:00	33		39				72	
04:15	0		3				3		16:15	41		48				89	
04:30	3		12				15		16:30	39		43				82	
04:45	1	5	8	27			9	32	16:45	33	146	33	163			66	309
05:00	4		8				12		17:00	32		40				72	
05:15	2		13				15		17:15	35		34				69	
05:30	2		17				19		17:30	28		29				57	
05:45	3	11	16	54			19	65	17:45	28	123	22	125			50	248
06:00	3		19				22		18:00	25		22				47	
06:15	6		13				19		18:15	27		18				45	
06:30	6		27				33		18:30	23		15				38	
06:45	21	36	22	81			43	117	18:45	20	95	16	71			36	166
07:00	22		23				45		19:00	17		12				29	
07:15	21		17				38		19:15	17		12				29	
07:30	15		19				34		19:30	17		5				22	
07:45	27	85	28	87			55	172	19:45	19	70	6	35			25	105
08:00	36		17				53		20:00	21		6				27	
08:15	28		27				55		20:15	19		8				27	
08:30	31		24				55		20:30	12		5				17	
08:45	17	112	37	105			54	217	20:45	16	68	10	29			26	97
09:00	24		37				61		21:00	10		10				20	
09:15	24		25				49		21:15	19		7				26	
09:30	43		27				70		21:30	16		5				21	
09:45	24	115	39	128			63	243	21:45	11	56	5	27			16	83
10:00	16		22				38		22:00	17		6				23	
10:15	20		31				51		22:15	15		7				22	
10:30	28		43				71		22:30	7		2				9	
10:45	34	98	32	128			66	226	22:45	5	44	7	22			12	66
11:00	44		34				78		23:00	8		3				11	
11:15	29		35				64		23:15	8		3				11	
11:30	36		48				84		23:30	4		2				6	
11:45	32	141	36	153			68	294	23:45	2	22	1	9			3	31
TOTALS		660		784				**1444**	**TOTALS**		1233		1067				**2300**
SPLIT %		45.7%		54.3%				**38.6%**	**SPLIT %**		53.6%		46.4%				**61.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	1,893	1,851	0	0	3,744

AM Peak Hour	11:30	11:30						**11:30**	**PM Peak Hour**	14:45	15:45							**14:15**
AM Pk Volume	155	172						**327**	**PM Pk Volume**	166	166							**316**
Pk Hr Factor	0.745	0.896						**0.870**	**Pk Hr Factor**	0.847	0.865							**0.898**
7 - 9 Volume	197	192	0	0				**389**	**4 - 6 Volume**	269	288	0	0					**557**
7 - 9 Peak Hour	07:45	08:00						**07:45**	**4 - 6 Peak Hour**	16:00	16:15							**16:00**
7 - 9 Pk Volume	122	105	0	0				**218**	**4 - 6 Pk Volume**	146	164	0	0					**309**
Pk Hr Factor	0.847	0.709	0.000	0.000				**0.991**	**Pk Hr Factor**	0.890	0.854	0.000	0.000					**0.868**

Prepared by NDS/ATD

VOLUME

San Francisquito Cyn Rd Bet. Piute Court & Lowridge Pl

Day: Tuesday
Date: 2/9/2016

City: Castaic
Project #: CA16_5060_001

DAILY TOTALS	NB	SB	EB	WB	Total
	2,560	2,507	0	0	5,067

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	6		1				7		12:00	22		23				45	
00:15	2		0				2		12:15	13		12				25	
00:30	3		1				4		12:30	25		28				53	
00:45	1	12	0	2			1	14	12:45	19	79	24	87			43	166
01:00	4		3				7		13:00	24		31				55	
01:15	1		2				3		13:15	26		20				46	
01:30	1		0				1		13:30	18		24				42	
01:45	4	10	0	5			4	15	13:45	30	98	21	96			51	194
02:00	3		1				4		14:00	36		14				50	
02:15	2		1				3		14:15	48		29				77	
02:30	1		1				2		14:30	44		26				70	
02:45	2	8	3	6			5	14	14:45	48	176	27	96			75	272
03:00	3		1				4		15:00	59		19				78	
03:15	1		1				2		15:15	48		32				80	
03:30	0		3				3		15:30	73		18				91	
03:45	1	5	11	16			12	21	15:45	109	289	22	91			131	380
04:00	2		7				9		16:00	81		16				97	
04:15	4		15				19		16:15	119		18				137	
04:30	4		21				25		16:30	86		31				117	
04:45	5	15	37	80			42	95	16:45	126	412	17	82			143	494
05:00	6		48				54		17:00	118		18				136	
05:15	4		65				69		17:15	142		20				162	
05:30	5		112				117		17:30	112		26				138	
05:45	10	25	86	311			96	336	17:45	77	449	26	90			103	539
06:00	10		88				98		18:00	77		30				107	
06:15	22		94				116		18:15	81		15				96	
06:30	24		115				139		18:30	58		12				70	
06:45	21	77	132	429			153	506	18:45	48	264	17	74			65	338
07:00	18		94				112		19:00	42		5				47	
07:15	21		98				119		19:15	33		12				45	
07:30	12		111				123		19:30	26		14				40	
07:45	14	65	86	389			100	454	19:45	24	125	8	39			32	164
08:00	22		53				75		20:00	33		7				40	
08:15	16		71				87		20:15	23		17				40	
08:30	15		58				73		20:30	18		8				26	
08:45	14	67	38	220			52	287	20:45	16	90	7	39			23	129
09:00	12		41				53		21:00	18		6				24	
09:15	9		31				40		21:15	17		4				21	
09:30	9		20				29		21:30	12		3				15	
09:45	9	39	30	122			39	161	21:45	13	60	5	18			18	78
10:00	13		28				41		22:00	18		5				23	
10:15	18		37				55		22:15	9		4				13	
10:30	15		27				42		22:30	8		2				10	
10:45	12	58	26	118			38	176	22:45	8	43	5	16			13	59
11:00	13		20				33		23:00	12		4				16	
11:15	20		22				42		23:15	6		1				7	
11:30	16		17				33		23:30	5		0				5	
11:45	17	66	13	72			30	138	23:45	5	28	4	9			9	37
TOTALS		447		1770				2217	TOTALS		2113		737				2850
SPLIT %		20.2%		79.8%				43.8%	SPLIT %		74.1%		25.9%				56.2%

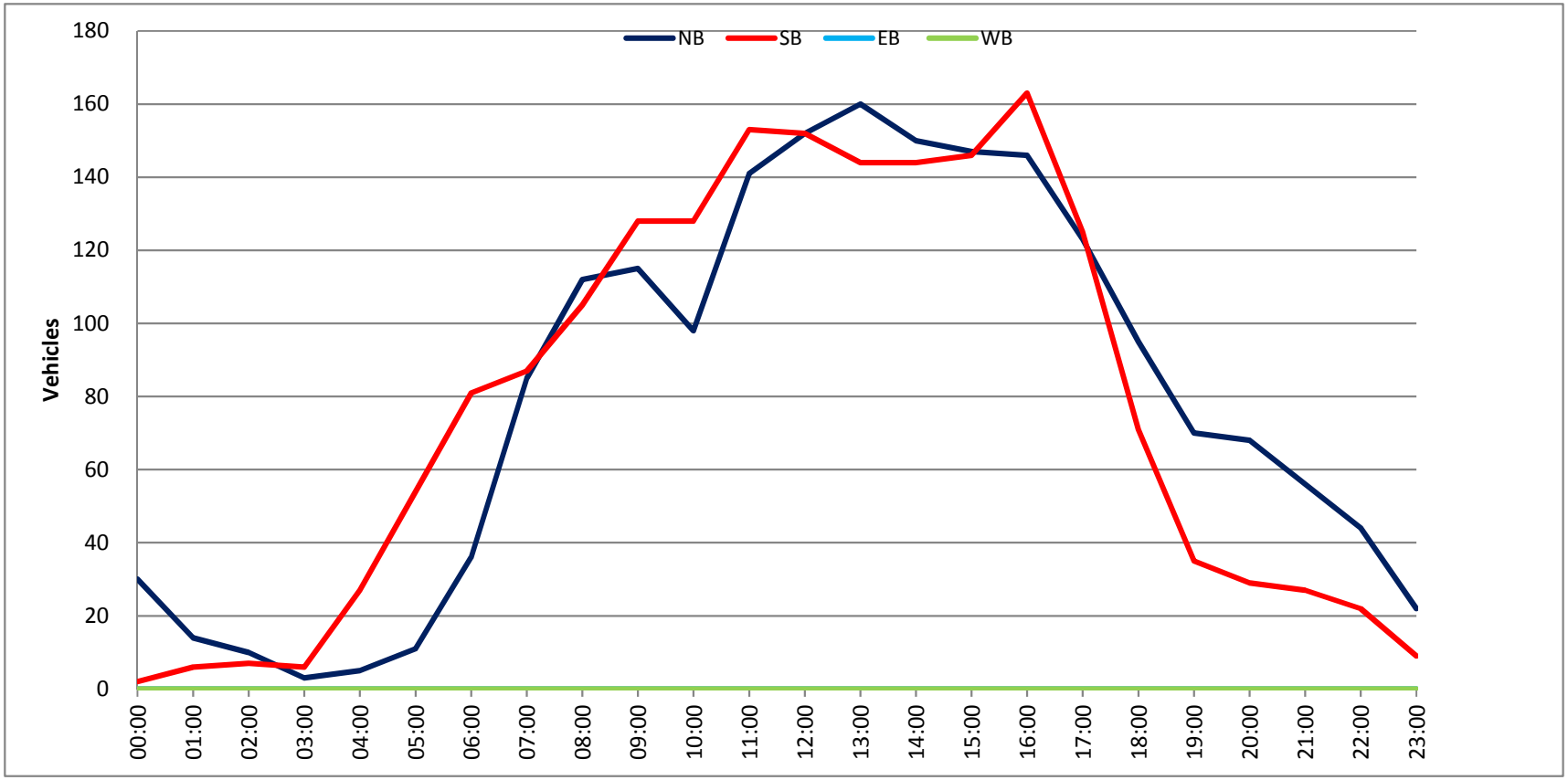
DAILY TOTALS	NB	SB	EB	WB	Total
	2,560	2,507	0	0	5,067

AM Peak Hour	06:15	06:30				06:30	PM Peak Hour	16:45	14:30				16:45
AM Pk Volume	85	439				523	PM Pk Volume	498	104				579
Pk Hr Factor	0.885	0.831				0.855	Pk Hr Factor	0.877	0.813				0.894
7 - 9 Volume	132	609	0	0		741	4 - 6 Volume	861	172	0	0		1033
7 - 9 Peak Hour	07:15	07:00				07:00	4 - 6 Peak Hour	16:45	17:00				16:45
7 - 9 Pk Volume	69	389	0	0		454	4 - 6 Pk Volume	498	90	0	0		579
Pk Hr Factor	0.784	0.876	0.000	0.000		0.923	Pk Hr Factor	0.877	0.865	0.000	0.000		0.894

Prepared by NDS/ATD

Project #: CA16_5060_001 **City:** Castaic

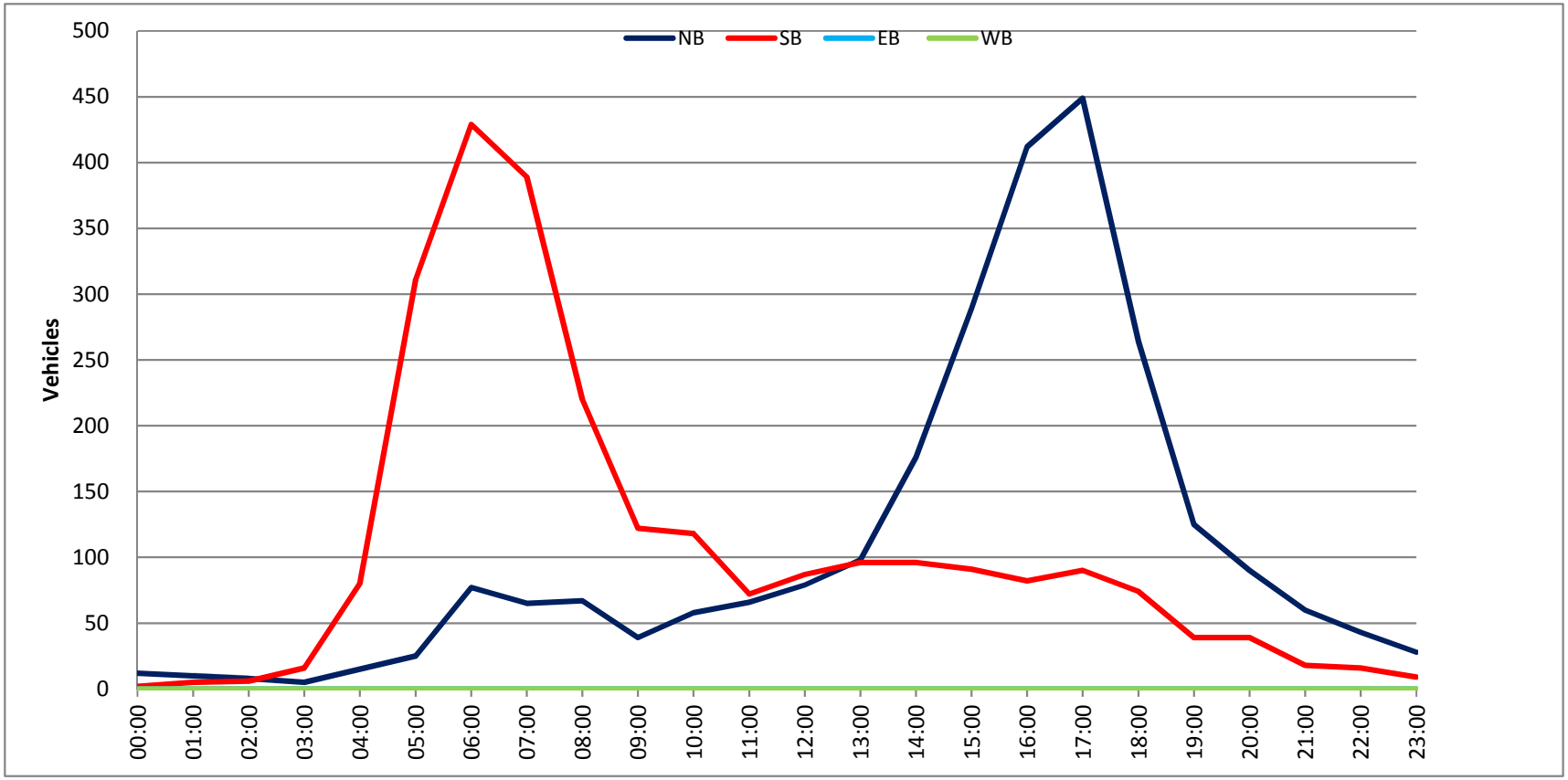
Location: San Francisquito Cyn Rd Bet. Piute Court & **Date:** 2/6/2016



Prepared by NDS/ATD

Project #: CA16_5060_001 **City:** Castaic

Location: San Francisquito Cyn Rd Bet. Piute Court & **Date:** 2/9/2016



Prepared by NDS/ATD

VOLUME

Lake Hughes Rd E/O Ridge Route Rd

Day: Saturday
Date: 2/6/2016

City: Castaic
Project #: CA16_5060_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	572	627	1,199

AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00			1	2	3	12:00			11	11	22
00:15			2	2	4	12:15			16	13	29
00:30			1	1	2	12:30			9	14	23
00:45			3	1	4	12:45			9	7	16
01:00			1	3	4	13:00			9	17	26
01:15			2	2	4	13:15			11	19	30
01:30			2	0	2	13:30			9	16	25
01:45			1	1	2	13:45			8	14	22
02:00			1	0	1	14:00			12	15	27
02:15			0	0	0	14:15			6	14	20
02:30			0	0	0	14:30			13	11	24
02:45			0	1	1	14:45			8	7	15
03:00			0	0	0	15:00			15	14	29
03:15			1	0	1	15:15			11	11	22
03:30			0	0	0	15:30			6	15	21
03:45			1	0	1	15:45			6	7	13
04:00			0	2	2	16:00			8	15	23
04:15			0	3	3	16:15			12	22	34
04:30			2	0	2	16:30			10	13	23
04:45			0	0	0	16:45			10	19	29
05:00			0	0	0	17:00			8	18	26
05:15			3	1	4	17:15			8	12	20
05:30			4	1	5	17:30			7	15	22
05:45			4	3	7	17:45			4	15	19
06:00			10	0	10	18:00			3	13	16
06:15			8	5	13	18:15			1	8	9
06:30			6	2	8	18:30			3	6	9
06:45			10	3	13	18:45			1	4	5
07:00			5	6	11	19:00			2	4	6
07:15			15	5	20	19:15			6	5	11
07:30			9	2	11	19:30			7	1	8
07:45			5	4	9	19:45			1	3	4
08:00			13	3	16	20:00			1	4	5
08:15			7	4	11	20:15			8	1	9
08:30			7	4	11	20:30			7	3	10
08:45			11	7	18	20:45			3	3	6
09:00			7	10	17	21:00			7	5	12
09:15			8	14	22	21:15			3	7	10
09:30			13	8	21	21:30			2	3	5
09:45			11	12	23	21:45			4	2	6
10:00			10	9	19	22:00			2	2	4
10:15			18	14	32	22:15			3	2	5
10:30			16	9	25	22:30			3	4	7
10:45			12	15	27	22:45			1	0	1
11:00			8	6	14	23:00			5	9	14
11:15			14	13	27	23:15			1	5	6
11:30			4	8	12	23:30			2	1	3
11:45			13	12	25	23:45			1	0	1
TOTALS			269	198	**467**	**TOTALS**			303	429	**732**
SPLIT %			57.6%	42.4%	**38.9%**	**SPLIT %**			41.4%	58.6%	**61.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	572	627	1,199

AM Peak Hour			10:00	11:45	**10:00**	**PM Peak Hour**			14:30	16:15	**16:15**
AM Pk Volume			56	50	**103**	**PM Pk Volume**			47	72	**112**
Pk Hr Factor			0.778	0.893	**0.805**	**Pk Hr Factor**			0.783	0.818	**0.824**
7 - 9 Volume	0	0	72	35	**107**	**4 - 6 Volume**	0	0	67	129	**196**
7 - 9 Peak Hour			07:15	08:00	**07:15**	**4 - 6 Peak Hour**			16:00	16:15	**16:15**
7 - 9 Pk Volume	0	0	42	18	**56**	**4 - 6 Pk Volume**	0	0	40	72	**112**
Pk Hr Factor	0.000	0.000	0.700	0.643	**0.700**	**Pk Hr Factor**	0.000	0.000	0.833	0.818	**0.824**

Prepared by NDS/ATD

VOLUME

Lake Hughes Rd E/O Ridge Route Rd

Day: Tuesday
Date: 2/9/2016

City: Castaic
Project #: CA16_5060_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	506	518	1,024

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00					2		1		3		12:00					19		4		23	
00:15					1		3		4		12:15					11		7		18	
00:30					2		1		3		12:30					9		16		25	
00:45					1	6	1	6	2	12	12:45					9	48	8	35	17	83
01:00					3		3		6		13:00					8		9		17	
01:15					0		4		4		13:15					7		14		21	
01:30					1		0		1		13:30					6		18		24	
01:45					0	4	0	7	0	11	13:45					16	37	9	50	25	87
02:00					0		1		1		14:00					5		9		14	
02:15					0		0		0		14:15					11		10		21	
02:30					0		0		0		14:30					16		10		26	
02:45					0		2	3	2	3	14:45					10	42	12	41	22	83
03:00					0		0		0		15:00					8		7		15	
03:15					0		0		0		15:15					10		5		15	
03:30					2		1		3		15:30					18		11		29	
03:45					0	2	0	1	0	3	15:45					10	46	10	33	20	79
04:00					1		3		4		16:00					16		11		27	
04:15					0		0		0		16:15					14		3		17	
04:30					0		2		2		16:30					12		4		16	
04:45					1	2	3	8	4	10	16:45					19	61	11	29	30	90
05:00					2		5		7		17:00					13		8		21	
05:15					0		4		4		17:15					10		15		25	
05:30					5		6		11		17:30					6		14		20	
05:45					3	10	7	22	10	32	17:45					7	36	7	44	14	80
06:00					0		5		5		18:00					13		8		21	
06:15					8		6		14		18:15					6		8		14	
06:30					3		11		14		18:30					3		7		10	
06:45					9	20	8	30	17	50	18:45					7	29	2	25	9	54
07:00					7		15		22		19:00					4		6		10	
07:15					7		9		16		19:15					2		3		5	
07:30					6		7		13		19:30					5		1		6	
07:45					9	29	7	38	16	67	19:45					2	13	2	12	4	25
08:00					9		7		16		20:00					3		0		3	
08:15					8		6		14		20:15					5		1		6	
08:30					2		6		8		20:30					1		2		3	
08:45					4	23	8	27	12	50	20:45					3	12	3	6	6	18
09:00					7		7		14		21:00					3		2		5	
09:15					3		4		7		21:15					1		0		1	
09:30					5		11		16		21:30					1		2		3	
09:45					3	18	3	25	6	43	21:45					1	6	2	6	3	12
10:00					4		3		7		22:00					3		2		5	
10:15					6		3		9		22:15					2		2		4	
10:30					6		11		17		22:30					0		2		2	
10:45					6	22	2	19	8	41	22:45					3	8	2	8	5	16
11:00					5		13		18		23:00					1		1		2	
11:15					7		13		20		23:15					2		1		3	
11:30					6		8		14		23:30					0		0		0	
11:45					10	28	7	41	17	69	23:45					1	4	0	2	1	6
TOTALS						164		227		391	TOTALS						342		291		633
SPLIT %						41.9%		58.1%		38.2%	SPLIT %						54.0%		46.0%		61.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	506	518	1,024

AM Peak Hour			11:45	06:30	11:45	PM Peak Hour			16:00	13:00	16:45
AM Pk Volume			49	43	83	PM Pk Volume			61	50	96
Pk Hr Factor			0.645	0.717	0.830	Pk Hr Factor			0.803	0.694	0.800
7 - 9 Volume	0	0	52	65	117	4 - 6 Volume	0	0	97	73	170
7 - 9 Peak Hour			07:30	07:00	07:00	4 - 6 Peak Hour			16:00	16:45	16:45
7 - 9 Pk Volume	0	0	32	38	67	4 - 6 Pk Volume	0	0	61	48	96
Pk Hr Factor	0.000	0.000	0.889	0.633	0.761	Pk Hr Factor	0.000	0.000	0.803	0.800	0.800

Prepared by NDS/ATD

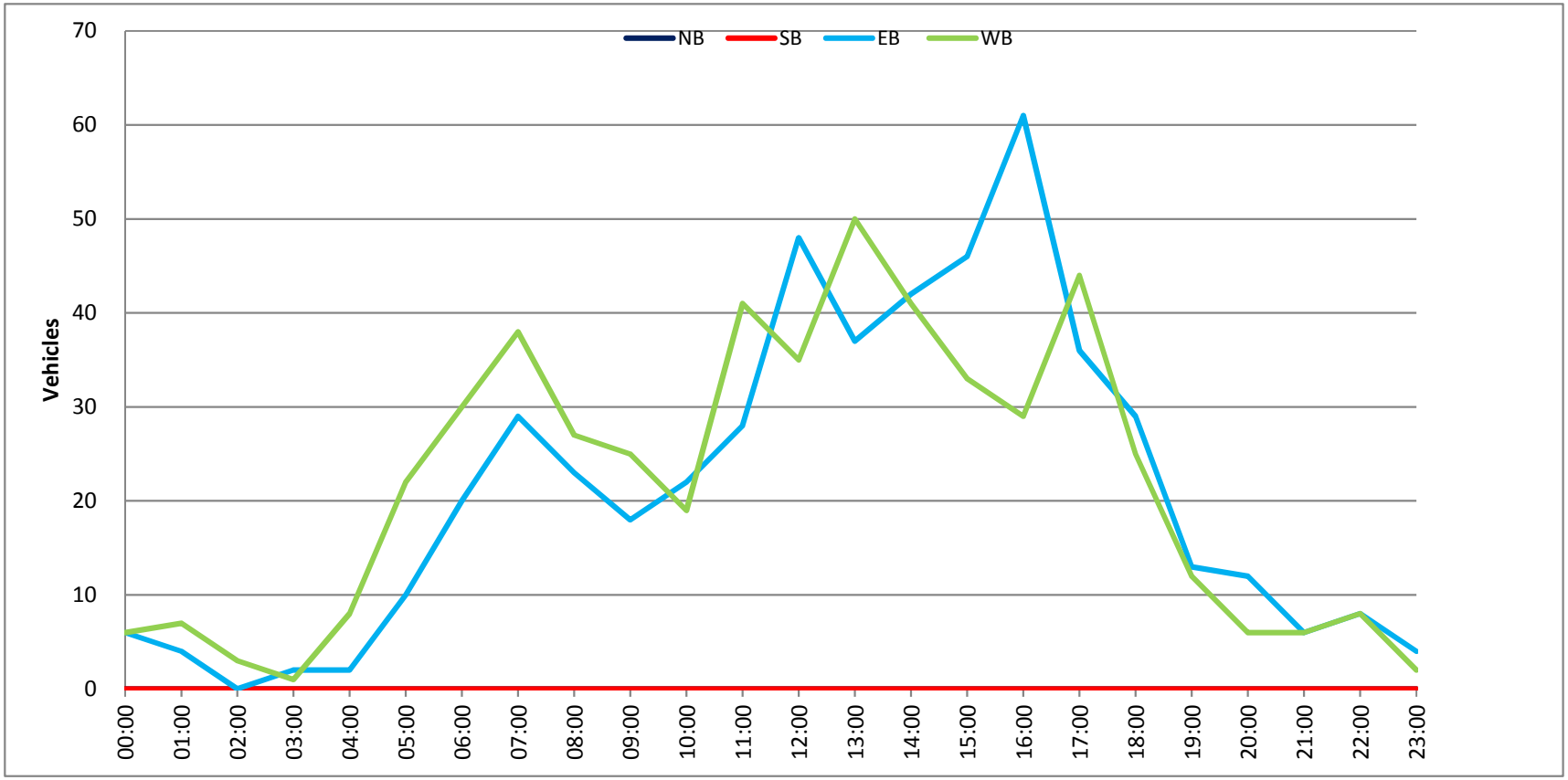
Project #: CA16_5060_002 **City:** Castaic

Location: Lake Hughes Rd E/O Ridge Route Rd **Date:** 2/6/2016

Prepared by NDS/ATD

Project #: CA16_5060_002 **City:** Castaic

Location: Lake Hughes Rd E/O Ridge Route Rd **Date:** 2/9/2016



Prepared by NDS/ATD

VOLUME

Ridge Route Rd NB S/O Castaic Lake Recreation Area

Day: Saturday
Date: 2/6/2016

City: Castaic
Project #: CA16_5060_003

DAILY TOTALS	NB	SB	EB	WB	Total
	1,704	0	0	0	1,704

AM Period	NB		SB	EB	WB	TOTAL		PM Period	NB		SB	EB	WB	TOTAL	
00:00	11		0			11		12:00	27		0			27	
00:15	7		0			7		12:15	34		0			34	
00:30	5		0			5		12:30	35		0			35	
00:45	2	25	0			2	25	12:45	32	128	0			32	128
01:00	1		0			1		13:00	20		0			20	
01:15	2		0			2		13:15	30		0			30	
01:30	1		0			1		13:30	38		0			38	
01:45	2	6	0			2	6	13:45	24	112	0			24	112
02:00	4		0			4		14:00	30		0			30	
02:15	1		0			1		14:15	29		0			29	
02:30	5		0			5		14:30	29		0			29	
02:45	2	12	0			2	12	14:45	31	119	0			31	119
03:00	3		0			3		15:00	28		0			28	
03:15	1		0			1		15:15	22		0			22	
03:30	1		0			1		15:30	35		0			35	
03:45	1	6	0			1	6	15:45	26	111	0			26	111
04:00	0		0			0		16:00	24		0			24	
04:15	1		0			1		16:15	33		0			33	
04:30	1		0			1		16:30	30		0			30	
04:45	1	3	0			1	3	16:45	37	124	0			37	124
05:00	1		0			1		17:00	31		0			31	
05:15	0		0			0		17:15	30		0			30	
05:30	10		0			10		17:30	33		0			33	
05:45	7	18	0			7	18	17:45	76	170	0			76	170
06:00	5		0			5		18:00	52		0			52	
06:15	7		0			7		18:15	37		0			37	
06:30	7		0			7		18:30	24		0			24	
06:45	10	29	0			10	29	18:45	23	136	0			23	136
07:00	14		0			14		19:00	21		0			21	
07:15	6		0			6		19:15	14		0			14	
07:30	9		0			9		19:30	14		0			14	
07:45	13	42	0			13	42	19:45	18	67	0			18	67
08:00	14		0			14		20:00	20		0			20	
08:15	15		0			15		20:15	20		0			20	
08:30	29		0			29		20:30	21		0			21	
08:45	28	86	0			28	86	20:45	8	69	0			8	69
09:00	32		0			32		21:00	7		0			7	
09:15	15		0			15		21:15	14		0			14	
09:30	26		0			26		21:30	12		0			12	
09:45	28	101	0			28	101	21:45	8	41	0			8	41
10:00	30		0			30		22:00	13		0			13	
10:15	29		0			29		22:15	10		0			10	
10:30	32		0			32		22:30	12		0			12	
10:45	20	111	0			20	111	22:45	12	47	0			12	47
11:00	27		0			27		23:00	9		0			9	
11:15	24		0			24		23:15	13		0			13	
11:30	34		0			34		23:30	9		0			9	
11:45	21	106	0			21	106	23:45	4	35	0			4	35
TOTALS		545					545	TOTALS		1159					1159
SPLIT %		100.0%					32.0%	SPLIT %		100.0%					68.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,704	0	0	0	1,704

AM Peak Hour	09:45					09:45	PM Peak Hour	17:30					17:30
AM Pk Volume	119					119	PM Pk Volume	198					198
Pk Hr Factor	0.930					0.930	Pk Hr Factor	0.651					0.651
7 - 9 Volume	128	0	0	0		128	4 - 6 Volume	294	0	0	0		294
7 - 9 Peak Hour	08:00					08:00	4 - 6 Peak Hour	17:00					17:00
7 - 9 Pk Volume	86	0	0	0		86	4 - 6 Pk Volume	170	0	0	0		170
Pk Hr Factor	0.741	0.000	0.000	0.000		0.741	Pk Hr Factor	0.559	0.000	0.000	0.000		0.559

Prepared by NDS/ATD

VOLUME

Ridge Route Rd NB S/O Castaic Lake Recreation Area

Day: Tuesday
Date: 2/9/2016

City: Castaic
Project #: CA16_5060_003

DAILY TOTALS	NB	SB	EB	WB	Total
	2,209	0	0	0	2,209

AM Period	NB		SB	EB	WB	TOTAL		PM Period	NB		SB	EB	WB	TOTAL	
00:00	1		0			1		12:00	19		0			19	
00:15	1		0			1		12:15	27		0			27	
00:30	3		0			3		12:30	26		0			26	
00:45	4	9	0			4	9	12:45	27	99	0			27	99
01:00	1		0			1		13:00	24		0			24	
01:15	0		0			0		13:15	25		0			25	
01:30	0		0			0		13:30	41		0			41	
01:45	0	1	0			0	1	13:45	35	125	0			35	125
02:00	0		0			0		14:00	58		0			58	
02:15	1		0			1		14:15	99		0			99	
02:30	1		0			1		14:30	106		0			106	
02:45	1	3	0			1	3	14:45	48	311	0			48	311
03:00	0		0			0		15:00	39		0			39	
03:15	0		0			0		15:15	34		0			34	
03:30	1		0			1		15:30	35		0			35	
03:45	0	1	0			0	1	15:45	36	144	0			36	144
04:00	0		0			0		16:00	28		0			28	
04:15	0		0			0		16:15	43		0			43	
04:30	1		0			1		16:30	29		0			29	
04:45	2	3	0			2	3	16:45	39	139	0			39	139
05:00	0		0			0		17:00	32		0			32	
05:15	4		0			4		17:15	35		0			35	
05:30	7		0			7		17:30	48		0			48	
05:45	9	20	0			9	20	17:45	41	156	0			41	156
06:00	13		0			13		18:00	46		0			46	
06:15	12		0			12		18:15	37		0			37	
06:30	10		0			10		18:30	26		0			26	
06:45	24	59	0			24	59	18:45	35	144	0			35	144
07:00	46		0			46		19:00	31		0			31	
07:15	68		0			68		19:15	25		0			25	
07:30	141		0			141		19:30	19		0			19	
07:45	118	373	0			118	373	19:45	25	100	0			25	100
08:00	31		0			31		20:00	16		0			16	
08:15	30		0			30		20:15	28		0			28	
08:30	20		0			20		20:30	16		0			16	
08:45	14	95	0			14	95	20:45	20	80	0			20	80
09:00	19		0			19		21:00	16		0			16	
09:15	17		0			17		21:15	12		0			12	
09:30	20		0			20		21:30	15		0			15	
09:45	20	76	0			20	76	21:45	13	56	0			13	56
10:00	11		0			11		22:00	13		0			13	
10:15	8		0			8		22:15	7		0			7	
10:30	18		0			18		22:30	3		0			3	
10:45	22	59	0			22	59	22:45	4	27	0			4	27
11:00	31		0			31		23:00	9		0			9	
11:15	36		0			36		23:15	5		0			5	
11:30	14		0			14		23:30	7		0			7	
11:45	22	103	0			22	103	23:45	5	26	0			5	26
TOTALS		802					802	TOTALS		1407					1407
SPLIT %		100.0%					36.3%	SPLIT %		100.0%					63.7%

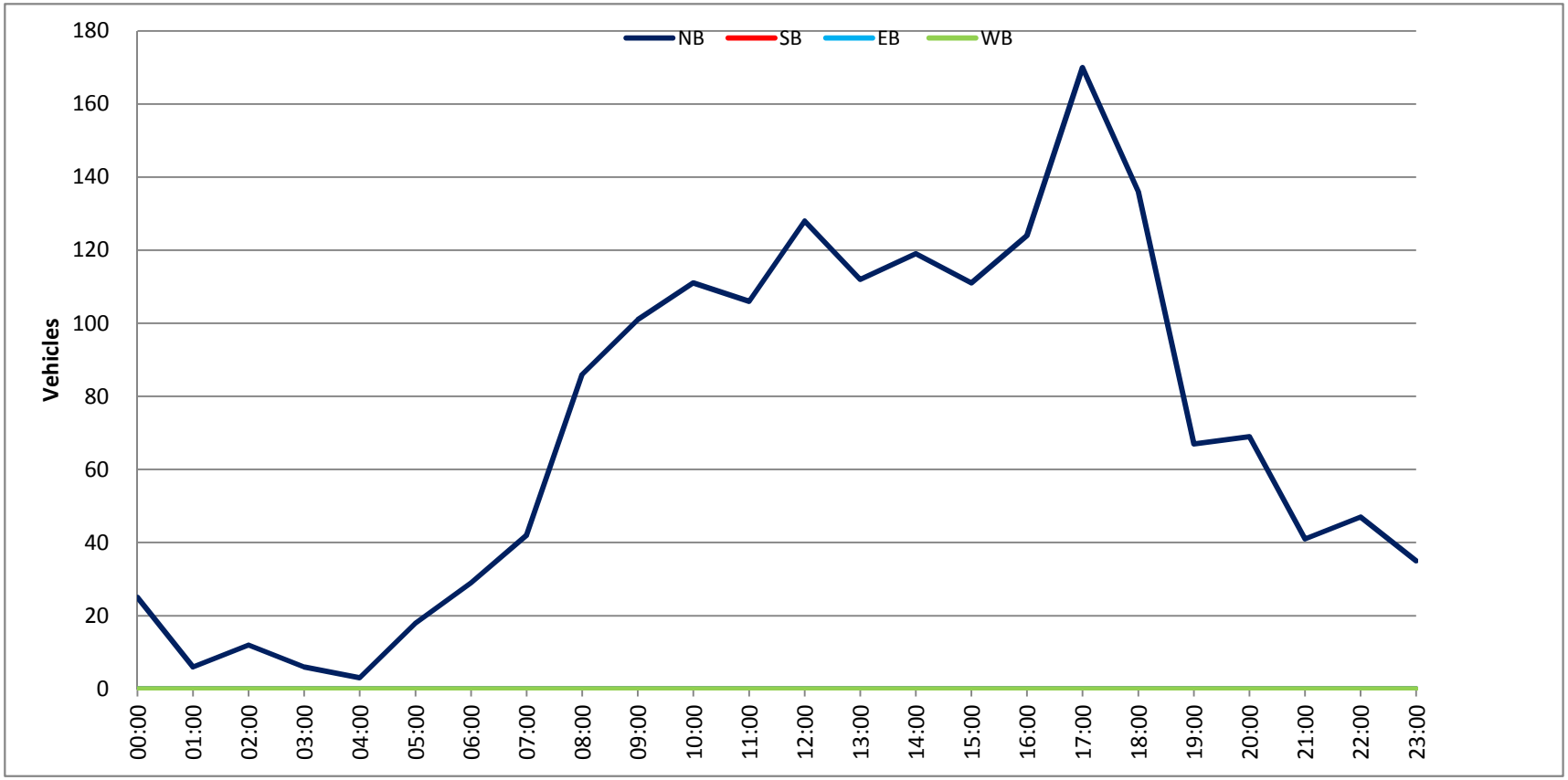
DAILY TOTALS	NB	SB	EB	WB	Total
	2,209	0	0	0	2,209

AM Peak Hour	07:00					07:00		PM Peak Hour	14:00					14:00	
AM Pk Volume	373					373		PM Pk Volume	311					311	
Pk Hr Factor	0.661					0.661		Pk Hr Factor	0.733					0.733	
7 - 9 Volume	468	0	0	0		468		4 - 6 Volume	295	0	0	0		295	
7 - 9 Peak Hour	07:00					07:00		4 - 6 Peak Hour	17:00					17:00	
7 - 9 Pk Volume	373	0	0	0		373		4 - 6 Pk Volume	156	0	0	0		156	
Pk Hr Factor	0.661	0.000	0.000	0.000		0.661		Pk Hr Factor	0.813	0.000	0.000	0.000		0.813	

Prepared by NDS/ATD

Project #: CA16_5060_003 **City:** Castaic

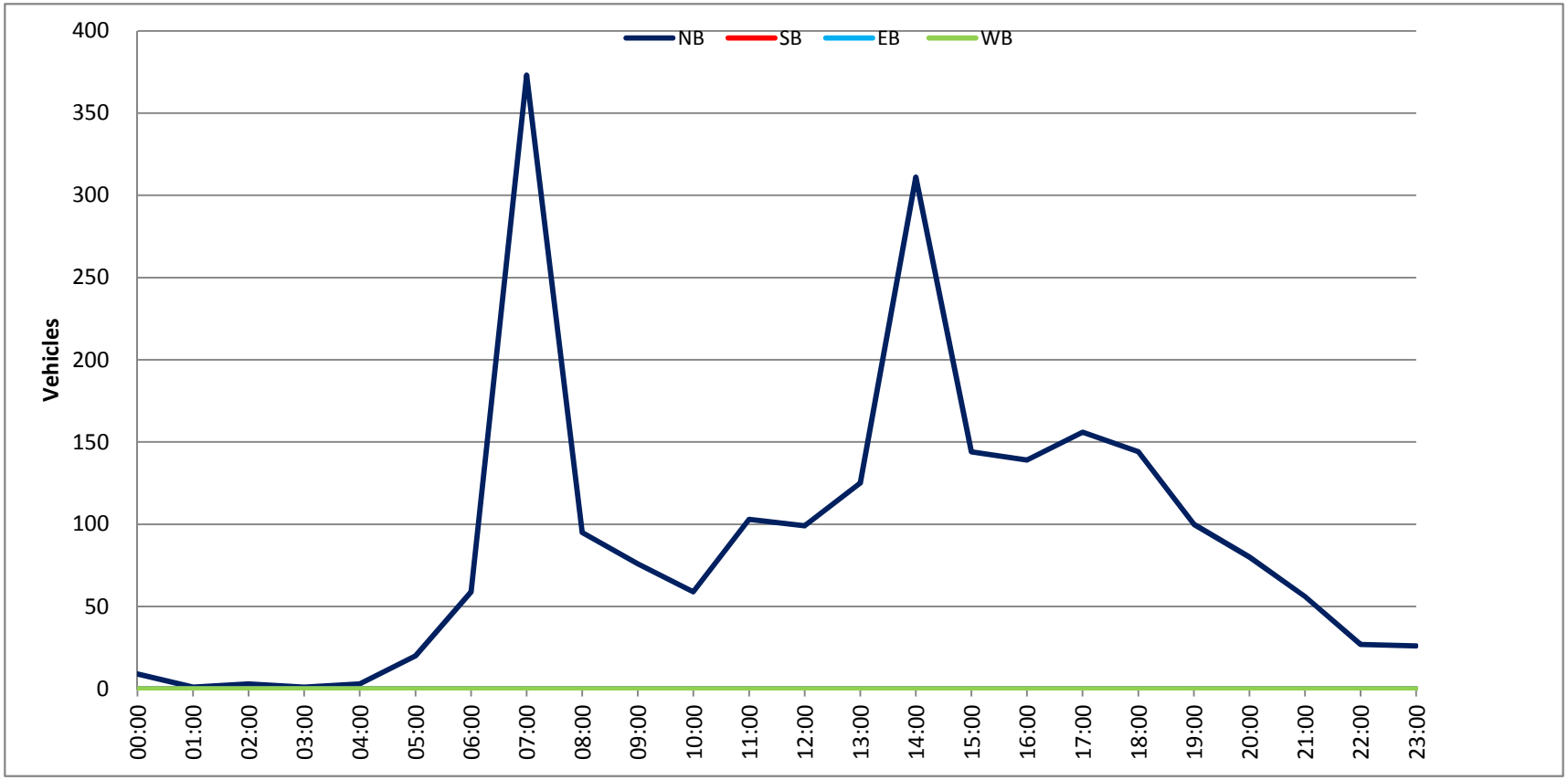
Location: Ridge Route Rd NB S/O Castaic Lake **Date:** 2/6/2016



Prepared by NDS/ATD

Project #: CA16_5060_003 **City:** Castaic

Location: Ridge Route Rd NB S/O Castaic Lake **Date:** 2/9/2016



Prepared by NDS/ATD

VOLUME

Ridge Route Rd SB S/O Castaic Lake Recreation Area

Day: Saturday
Date: 2/6/2016

City: Castaic
Project #: CA16_5060_004

DAILY TOTALS	NB	SB	EB	WB	Total
	0	1,624	0	0	1,624

AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00	0	5			5	12:00	0	41			41
00:15	0	2			2	12:15	0	26			26
00:30	0	1			1	12:30	0	27			27
00:45	0	2	10		2 10	12:45	0	26	120		26 120
01:00	0	0			0	13:00	0	40			40
01:15	0	0			0	13:15	0	24			24
01:30	0	0			0	13:30	0	27			27
01:45	0	1	1		1 1	13:45	0	24	115		24 115
02:00	0	4			4	14:00	0	21			21
02:15	0	1			1	14:15	0	28			28
02:30	0	1			1	14:30	0	36			36
02:45	0	2	8		2 8	14:45	0	32	117		32 117
03:00	0	0			0	15:00	0	25			25
03:15	0	0			0	15:15	0	32			32
03:30	0	0			0	15:30	0	35			35
03:45	0	0			0	15:45	0	10	102		10 102
04:00	0	2			2	16:00	0	36			36
04:15	0	1			1	16:15	0	38			38
04:30	0	3			3	16:30	0	34			34
04:45	0	0	6		0 6	16:45	0	30	138		30 138
05:00	0	5			5	17:00	0	36			36
05:15	0	5			5	17:15	0	23			23
05:30	0	3			3	17:30	0	22			22
05:45	0	3	16		3 16	17:45	0	21	102		21 102
06:00	0	12			12	18:00	0	22			22
06:15	0	5			5	18:15	0	20			20
06:30	0	12			12	18:30	0	23			23
06:45	0	15	44		15 44	18:45	0	11	76		11 76
07:00	0	10			10	19:00	0	13			13
07:15	0	13			13	19:15	0	11			11
07:30	0	11			11	19:30	0	17			17
07:45	0	24	58		24 58	19:45	0	13	54		13 54
08:00	0	25			25	20:00	0	73			73
08:15	0	28			28	20:15	0	29			29
08:30	0	21			21	20:30	0	17			17
08:45	0	31	105		31 105	20:45	0	15	134		15 134
09:00	0	16			16	21:00	0	9			9
09:15	0	31			31	21:15	0	7			7
09:30	0	24			24	21:30	0	4			4
09:45	0	34	105		34 105	21:45	0	5	25		5 25
10:00	0	28			28	22:00	0	13			13
10:15	0	27			27	22:15	0	8			8
10:30	0	31			31	22:30	0	4			4
10:45	0	29	115		29 115	22:45	0	9	34		9 34
11:00	0	24			24	23:00	0	9			9
11:15	0	16			16	23:15	0	1			1
11:30	0	48			48	23:30	0	4			4
11:45	0	34	122		34 122	23:45	0	3	17		3 17
TOTALS		590			590	TOTALS		1034			1034
SPLIT %		100.0%			36.3%	SPLIT %		100.0%			63.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	1,624	0	0	1,624

AM Peak Hour		11:30			11:30	PM Peak Hour		16:00			16:00
AM Pk Volume		149			149	PM Pk Volume		138			138
Pk Hr Factor		0.776			0.776	Pk Hr Factor		0.908			0.908
7 - 9 Volume	0	163	0	0	163	4 - 6 Volume	0	240	0	0	240
7 - 9 Peak Hour		08:00			08:00	4 - 6 Peak Hour		16:00			16:00
7 - 9 Pk Volume	0	105	0	0	105	4 - 6 Pk Volume	0	138	0	0	138
Pk Hr Factor	0.000	0.847	0.000	0.000	0.847	Pk Hr Factor	0.000	0.908	0.000	0.000	0.908

Prepared by NDS/ATD

VOLUME

Ridge Route Rd SB S/O Castaic Lake Recreation Area

Day: Tuesday
Date: 2/9/2016

City: Castaic
Project #: CA16_5060_004

DAILY TOTALS	NB	SB	EB	WB	Total
	0	2,140	0	0	2,140

AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL	
00:00	0	5			5		12:00	0	26			26	
00:15	0	0			0		12:15	0	22			22	
00:30	0	0			0		12:30	0	22			22	
00:45	0	1	6		1	6	12:45	0	16	86		16	86
01:00	0	1			1		13:00	0	21			21	
01:15	0	1			1		13:15	0	18			18	
01:30	0	0			0		13:30	0	19			19	
01:45	0	2	4		2	4	13:45	0	34	92		34	92
02:00	0	0			0		14:00	0	22			22	
02:15	0	0			0		14:15	0	20			20	
02:30	0	0			0		14:30	0	160			160	
02:45	0	1	1		1	1	14:45	0	130	332		130	332
03:00	0	1			1		15:00	0	42			42	
03:15	0	0			0		15:15	0	23			23	
03:30	0	2			2		15:30	0	32			32	
03:45	0	3	6		3	6	15:45	0	22	119		22	119
04:00	0	3			3		16:00	0	36			36	
04:15	0	1			1		16:15	0	23			23	
04:30	0	4			4		16:30	0	31			31	
04:45	0	5	13		5	13	16:45	0	22	112		22	112
05:00	0	13			13		17:00	0	32			32	
05:15	0	10			10		17:15	0	27			27	
05:30	0	16			16		17:30	0	32			32	
05:45	0	14	53		14	53	17:45	0	31	122		31	122
06:00	0	25			25		18:00	0	22			22	
06:15	0	17			17		18:15	0	19			19	
06:30	0	37			37		18:30	0	26			26	
06:45	0	29	108		29	108	18:45	0	20	87		20	87
07:00	0	38			38		19:00	0	14			14	
07:15	0	73			73		19:15	0	16			16	
07:30	0	122			122		19:30	0	8			8	
07:45	0	174	407		174	407	19:45	0	10	48		10	48
08:00	0	72			72		20:00	0	10			10	
08:15	0	46			46		20:15	0	8			8	
08:30	0	40			40		20:30	0	9			9	
08:45	0	34	192		34	192	20:45	0	11	38		11	38
09:00	0	17			17		21:00	0	5			5	
09:15	0	18			18		21:15	0	6			6	
09:30	0	19			19		21:30	0	6			6	
09:45	0	29	83		29	83	21:45	0	3	20		3	20
10:00	0	15			15		22:00	0	2			2	
10:15	0	25			25		22:15	0	6			6	
10:30	0	15			15		22:30	0	4			4	
10:45	0	16	71		16	71	22:45	0	4	16		4	16
11:00	0	19			19		23:00	0	1			1	
11:15	0	27			27		23:15	0	2			2	
11:30	0	47			47		23:30	0	0			0	
11:45	0	24	117		24	117	23:45	0	4	7		4	7
TOTALS		1061			**1061**		**TOTALS**		1079			**1079**	
SPLIT %		100.0%			**49.6%**		**SPLIT %**		100.0%			**50.4%**	

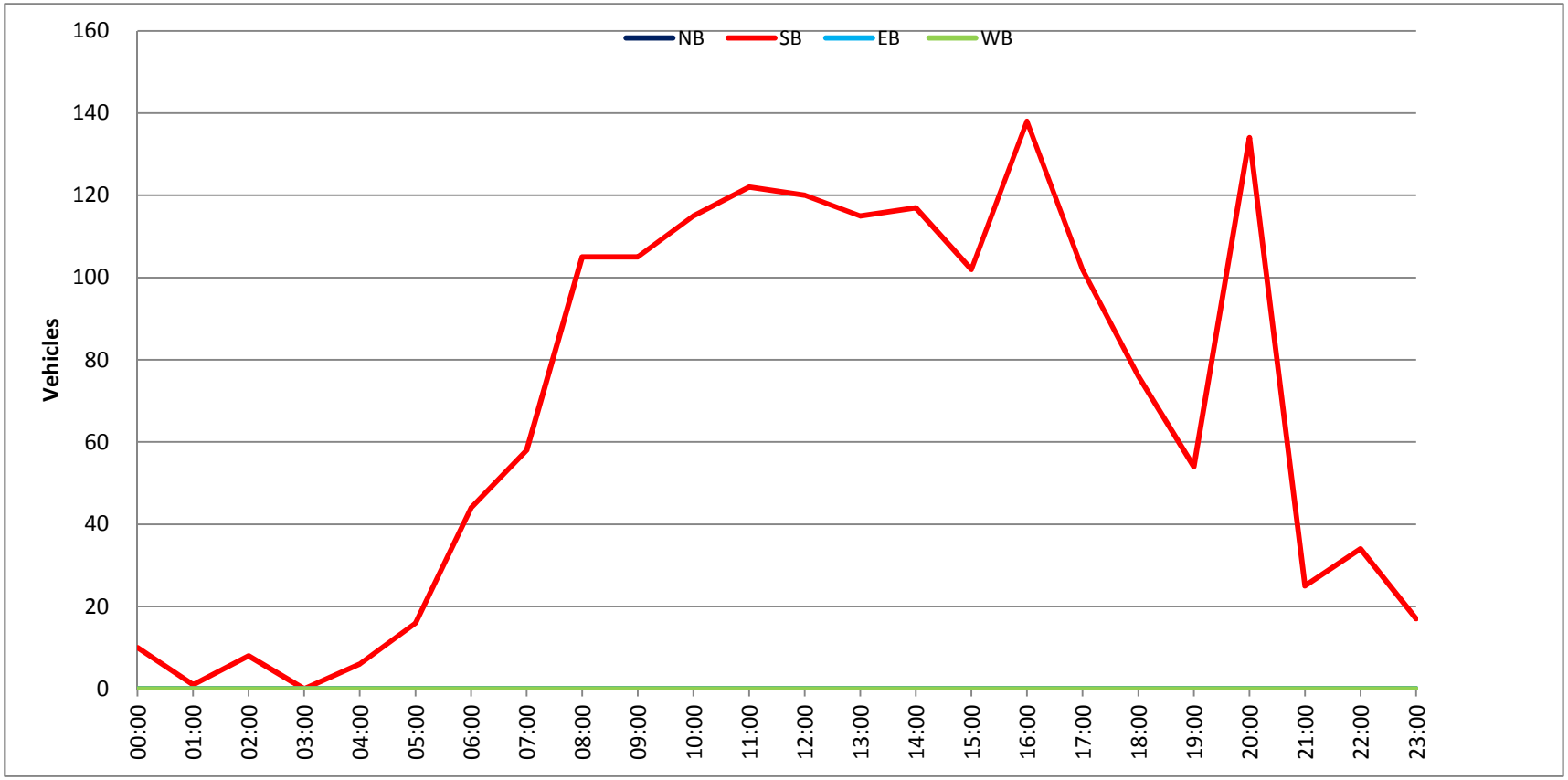
DAILY TOTALS	NB	SB	EB	WB	Total
	0	2,140	0	0	2,140

AM Peak Hour		07:15			**07:15**		**PM Peak Hour**		14:30			**14:30**
AM Pk Volume		441			**441**		**PM Pk Volume**		355			**355**
Pk Hr Factor		0.634			**0.634**		**Pk Hr Factor**		0.555			**0.555**
7 - 9 Volume	0	599	0	0	**599**		**4 - 6 Volume**	0	234	0	0	**234**
7 - 9 Peak Hour		07:15			**07:15**		**4 - 6 Peak Hour**		17:00			**17:00**
7 - 9 Pk Volume	0	441	0	0	**441**		**4 - 6 Pk Volume**	0	122	0	0	**122**
Pk Hr Factor	0.000	0.634	0.000	0.000	**0.634**		**Pk Hr Factor**	0.000	0.953	0.000	0.000	**0.953**

Prepared by NDS/ATD

Project #: CA16_5060_004 **City:** Castaic

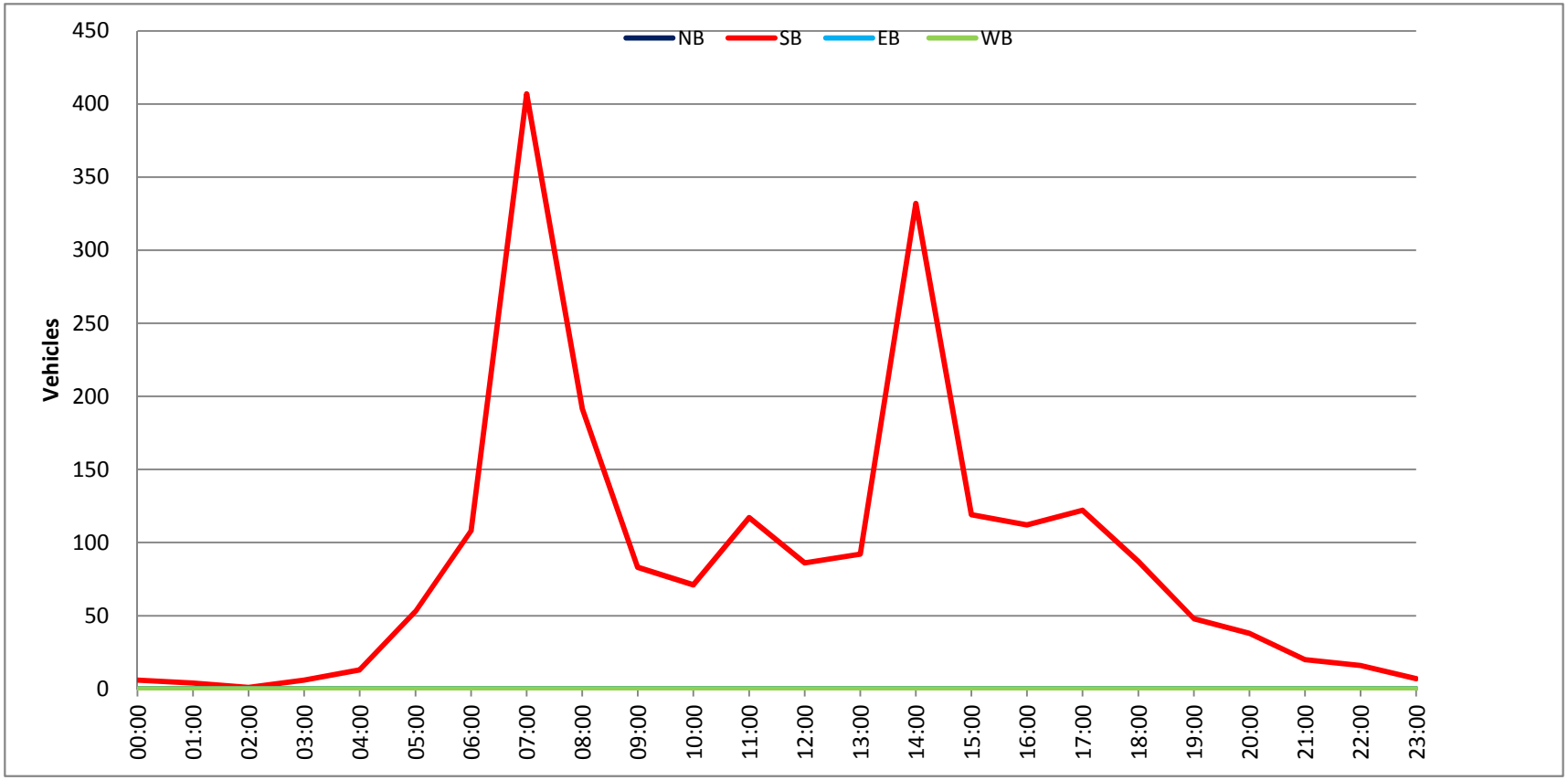
Location: Ridge Route Rd SB S/O Castaic Lake **Date:** 2/6/2016



Prepared by NDS/ATD

Project #: CA16_5060_004 **City:** Castaic

Location: Ridge Route Rd SB S/O Castaic Lake **Date:** 2/9/2016



Prepared by NDS/ATD

VOLUME

Castaic Rd N/O Tapia Cyn Rd

Day: Saturday
Date: 2/6/2016

City: Castaic
Project #: CA16_5060_005

DAILY TOTALS	NB	SB	EB	WB	Total
	309	318	0	0	627

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0		12:00	15		10						25	
00:15	0		0						0		12:15	10		5						15	
00:30	0		0						0		12:30	8		5						13	
00:45	0		0						0		12:45	5	38	10	30					15	68
01:00	0		0						0		13:00	8		4						12	
01:15	0		0						0		13:15	7		7						14	
01:30	0		0						0		13:30	7		7						14	
01:45	1	1	0						1	1	13:45	8	30	5	23					13	53
02:00	1		0						1		14:00	6		9						15	
02:15	0		0						0		14:15	5		4						9	
02:30	0		0						0		14:30	7		8						15	
02:45	0	1	0						0	1	14:45	16	34	9	30					25	64
03:00	0		0						0		15:00	6		5						11	
03:15	0		0						0		15:15	6		3						9	
03:30	0		0						0		15:30	17		7						24	
03:45	1	1	1	1					2	2	15:45	12	41	9	24					21	65
04:00	0		0						0		16:00	5		7						12	
04:15	1		1						2		16:15	7		3						10	
04:30	0		0						0		16:30	7		5						12	
04:45	0	1	0	1					0	2	16:45	6	25	2	17					8	42
05:00	0		0						0		17:00	11		2						13	
05:15	0		0						0		17:15	7		1						8	
05:30	0		1						1		17:30	2		0						2	
05:45	0		1	2					1	2	17:45	2	22	0	3					2	25
06:00	1		1						2		18:00	1		2						3	
06:15	0		2						2		18:15	2		1						3	
06:30	0		1						1		18:30	0		0						0	
06:45	1	2	8	12					9	14	18:45	0	3	2	5					2	8
07:00	0		2						2		19:00	0		2						2	
07:15	1		1						2		19:15	0		1						1	
07:30	0		2						2		19:30	1		0						1	
07:45	1	2	11	16					12	18	19:45	0	1	1	4					1	5
08:00	3		6						9		20:00	2		0						2	
08:15	3		4						7		20:15	0		1						1	
08:30	1		13						14		20:30	1		3						4	
08:45	0	7	14	37					14	44	20:45	1	4	0	4					1	8
09:00	2		6						8		21:00	2		1						3	
09:15	3		15						18		21:15	0		2						2	
09:30	4		8						12		21:30	2		1						3	
09:45	6	15	16	45					22	60	21:45	1	5	0	4					1	9
10:00	9		8						17		22:00	1		1						2	
10:15	8		7						15		22:15	0		0						0	
10:30	9		6						15		22:30	1		1						2	
10:45	9	35	7	28					16	63	22:45	1	3	0	2					1	5
11:00	5		8						13		23:00	0		0						0	
11:15	5		6						11		23:15	1		0						1	
11:30	11		9						20		23:30	2		0						2	
11:45	12	33	7	30					19	63	23:45	2	5	0						2	5
TOTALS		98		172						270	TOTALS		211		146						357
SPLIT %		36.3%		63.7%						43.1%	SPLIT %		59.1%		40.9%						56.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	309	318	0	0	627

AM Peak Hour	11:30	08:30			11:30	PM Peak Hour	14:45	12:00			14:45
AM Pk Volume	48	48			79	PM Pk Volume	45	30			69
Pk Hr Factor	0.800	0.800			0.790	Pk Hr Factor	0.662	0.750			0.690
7 - 9 Volume	9	53	0	0	62	4 - 6 Volume	47	20	0	0	67
7 - 9 Peak Hour	07:45	08:00			08:00	4 - 6 Peak Hour	16:15	16:00			16:15
7 - 9 Pk Volume	8	37	0	0	44	4 - 6 Pk Volume	31	17	0	0	43
Pk Hr Factor	0.667	0.661	0.000	0.000	0.786	Pk Hr Factor	0.705	0.607	0.000	0.000	0.827

Prepared by NDS/ATD

VOLUME

Castaic Rd N/O Tapia Cyn Rd

Day: Tuesday
Date: 2/9/2016

City: Castaic
Project #: CA16_5060_005

DAILY TOTALS	NB	SB	EB	WB	Total
	255	248	0	0	503

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		0						1		12:00	8		13						21	
00:15	0		0						0		12:15	8		7						15	
00:30	0		0						0		12:30	8		4						12	
00:45	0	1	0						0	1	12:45	6	30	10	34					16	64
01:00	0		0						0		13:00	7		5						12	
01:15	1		0						1		13:15	10		6						16	
01:30	0		0						0		13:30	7		5						12	
01:45	0	1	0						0	1	13:45	5	29	4	20					9	49
02:00	0		0						0		14:00	5		3						8	
02:15	1		1						2		14:15	5		2						7	
02:30	0		0						0		14:30	3		3						6	
02:45	0	1	0	1					0	2	14:45	6	19	8	16					14	35
03:00	0		0						0		15:00	9		3						12	
03:15	1		0						1		15:15	8		1						9	
03:30	0		0						0		15:30	7		5						12	
03:45	0	1	0						0	1	15:45	5	29	6	15					11	44
04:00	0		2						2		16:00	0		8						8	
04:15	0		0						0		16:15	3		3						6	
04:30	0		0						0		16:30	6		1						7	
04:45	0		1	3					1	3	16:45	3	12	4	16					7	28
05:00	1		0						1		17:00	7		9						16	
05:15	1		2						3		17:15	2		4						6	
05:30	0		2						2		17:30	8		4						12	
05:45	0	2	3	7					3	9	17:45	6	23	5	22					11	45
06:00	0		2						2		18:00	6		1						7	
06:15	0		4						4		18:15	5		1						6	
06:30	1		1						2		18:30	2		1						3	
06:45	2	3	3	10					5	13	18:45	3	16	3	6					6	22
07:00	0		9						9		19:00	4		2						6	
07:15	1		4						5		19:15	3		3						6	
07:30	3		5						8		19:30	4		1						5	
07:45	2	6	3	21					5	27	19:45	3	14	1	7					4	21
08:00	1		2						3		20:00	0		0						0	
08:15	0		4						4		20:15	3		2						5	
08:30	2		4						6		20:30	0		1						1	
08:45	3	6	5	15					8	21	20:45	3	6	4	7					7	13
09:00	10		4						14		21:00	1		2						3	
09:15	4		3						7		21:15	2		1						3	
09:30	2		1						3		21:30	3		1						4	
09:45	2	18	1	9					3	27	21:45	3	9	1	5					4	14
10:00	2		4						6		22:00	0		1						1	
10:15	2		3						5		22:15	1		1						2	
10:30	4		7						11		22:30	0		0						0	
10:45	4	12	1	15					5	27	22:45	0	1	0	2					0	3
11:00	1		2						3		23:00	0		0						0	
11:15	2		1						3		23:15	0		1						1	
11:30	8		5						13		23:30	0		1						1	
11:45	4	15	7	15					11	30	23:45	1	1	0	2					1	3
TOTALS		66		96						162	TOTALS		189		152						341
SPLIT %		40.7%		59.3%						32.2%	SPLIT %		55.4%		44.6%						67.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	255	248	0	0	503

AM Peak Hour	11:30	11:30			11:30	PM Peak Hour	12:30	12:00			12:00
AM Pk Volume	28	32			60	PM Pk Volume	31	34			64
Pk Hr Factor	0.875	0.615			0.714	Pk Hr Factor	0.775	0.654			0.762
7 - 9 Volume	12	36	0	0	48	4 - 6 Volume	35	38	0	0	73
7 - 9 Peak Hour	07:15	07:00			07:00	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	7	21	0	0	27	4 - 6 Pk Volume	23	22	0	0	45
Pk Hr Factor	0.583	0.583	0.000	0.000	0.750	Pk Hr Factor	0.719	0.611	0.000	0.000	0.703

Prepared by NDS/ATD

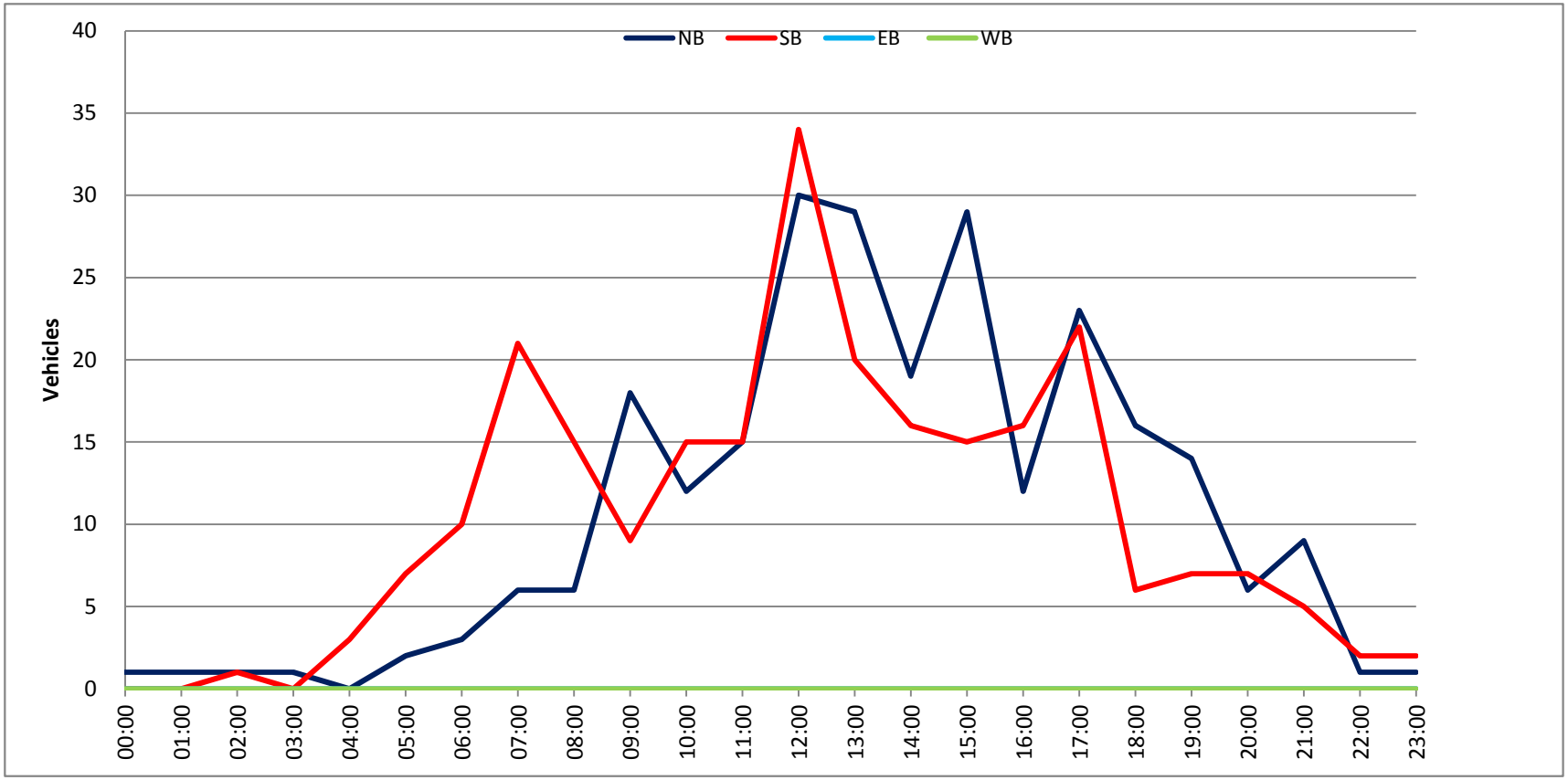
Project #: CA16_5060_005 **City:** Castaic

Location: Castaic Rd N/O Tapia Cyn Rd **Date:** 2/6/2016

Prepared by NDS/ATD

Project #: CA16_5060_005 **City:** Castaic

Location: Castaic Rd N/O Tapia Cyn Rd **Date:** 2/9/2016



Prepared by NDS/ATD

VOLUME

Hasley Cyn Rd E/O Del Valle Rd

Day: Saturday
Date: 2/6/2016

City: Castaic
Project #: CA16_5060_006

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,871	2,876	5,747

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			5		25		30		12:00			53		44		97	
00:15			5		9		14		12:15			55		38		93	
00:30			4		11		15		12:30			57		48		105	
00:45			4	18	9	54	13	72	12:45			48	213	50	180	98	393
01:00			1		10		11		13:00			43		66		109	
01:15			5		10		15		13:15			32		64		96	
01:30			0		14		14		13:30			47		60		107	
01:45			3	9	9	43	12	52	13:45			51	173	52	242	103	415
02:00			3		9		12		14:00			50		55		105	
02:15			3		8		11		14:15			49		54		103	
02:30			3		3		6		14:30			40		54		94	
02:45			3	12	4	24	7	36	14:45			36	175	48	211	84	386
03:00			3		9		12		15:00			56		70		126	
03:15			3		3		6		15:15			46		51		97	
03:30			1		1		2		15:30			43		51		94	
03:45			3	10	0	13	3	23	15:45			46	191	47	219	93	410
04:00			0		0		0		16:00			41		65		106	
04:15			4		2		6		16:15			40		53		93	
04:30			11		0		11		16:30			53		59		112	
04:45			9	24	2	4	11	28	16:45			49	183	49	226	98	409
05:00			6		0		6		17:00			48		71		119	
05:15			14		1		15		17:15			51		56		107	
05:30			15		2		17		17:30			42		56		98	
05:45			25	60	2	5	27	65	17:45			45	186	55	238	100	424
06:00			22		3		25		18:00			46		46		92	
06:15			17		3		20		18:15			33		54		87	
06:30			24		6		30		18:30			27		60		87	
06:45			28	91	7	19	35	110	18:45			39	145	31	191	70	336
07:00			31		9		40		19:00			30		54		84	
07:15			37		14		51		19:15			30		49		79	
07:30			38		17		55		19:30			25		34		59	
07:45			45	151	18	58	63	209	19:45			22	107	53	190	75	297
08:00			41		19		60		20:00			28		33		61	
08:15			47		9		56		20:15			26		29		55	
08:30			71		21		92		20:30			12		38		50	
08:45			49	208	23	72	72	280	20:45			13	79	35	135	48	214
09:00			58		24		82		21:00			25		23		48	
09:15			45		35		80		21:15			16		28		44	
09:30			55		21		76		21:30			17		28		45	
09:45			56	214	30	110	86	324	21:45			14	72	38	117	52	189
10:00			65		35		100		22:00			19		31		50	
10:15			53		37		90		22:15			10		30		40	
10:30			56		41		97		22:30			8		26		34	
10:45			56	230	36	149	92	379	22:45			15	52	20	107	35	159
11:00			53		48		101		23:00			11		14		25	
11:15			60		47		107		23:15			9		22		31	
11:30			58		45		103		23:30			7		14		21	
11:45			65	236	58	198	123	434	23:45			5	32	21	71	26	103
TOTALS				1263		749		**2012**	**TOTALS**				1608		2127		**3735**
SPLIT %				62.8%		37.2%		**35.0%**	**SPLIT %**				43.1%		56.9%		**65.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,871	2,876	5,747

AM Peak Hour			11:00	11:00	**11:00**	**PM Peak Hour**			12:00	13:00	**16:30**
AM Pk Volume			236	198	**434**	**PM Pk Volume**			213	242	**436**
Pk Hr Factor			0.908	0.853	**0.882**	**Pk Hr Factor**			0.934	0.917	**0.916**
7 - 9 Volume	0	0	359	130	**489**	**4 - 6 Volume**	0	0	369	464	**833**
7 - 9 Peak Hour			08:00	08:00	**08:00**	**4 - 6 Peak Hour**			16:30	17:00	**16:30**
7 - 9 Pk Volume	0	0	208	72	**280**	**4 - 6 Pk Volume**	0	0	201	238	**436**
Pk Hr Factor	0.000	0.000	0.732	0.783	**0.761**	**Pk Hr Factor**	0.000	0.000	0.948	0.838	**0.916**

Prepared by NDS/ATD

VOLUME

Hasley Cyn Rd E/O Del Valle Rd

Day: Tuesday
Date: 2/9/2016

City: Castaic
Project #: CA16_5060_006

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,189	3,210	6,399

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			3		7		10		12:00			46		49		95	
00:15			1		10		11		12:15			51		45		96	
00:30			3		6		9		12:30			34		45		79	
00:45			1	8	8	31	9	39	12:45			48	179	35	174	83	353
01:00			1		5		6		13:00			35		43		78	
01:15			0		4		4		13:15			37		46		83	
01:30			3		3		6		13:30			43		52		95	
01:45			1	5	0	12	1	17	13:45			48	163	36	177	84	340
02:00			0		3		3		14:00			69		42		111	
02:15			0		4		4		14:15			49		41		90	
02:30			3		2		5		14:30			40		80		120	
02:45			3	6	1	10	4	16	14:45			40	198	64	227	104	425
03:00			1		2		3		15:00			49		57		106	
03:15			4		0		4		15:15			40		91		131	
03:30			3		1		4		15:30			37		76		113	
03:45			8	16	1	4	9	20	15:45			40	166	78	302	118	468
04:00			6		0		6		16:00			47		64		111	
04:15			12		1		13		16:15			45		62		107	
04:30			11		3		14		16:30			55		77		132	
04:45			31	60	3	7	34	67	16:45			46	193	70	273	116	466
05:00			23		2		25		17:00			47		84		131	
05:15			37		2		39		17:15			46		91		137	
05:30			48		1		49		17:30			55		76		131	
05:45			52	160	6	11	58	171	17:45			39	187	79	330	118	517
06:00			58		10		68		18:00			56		74		130	
06:15			63		4		67		18:15			33		85		118	
06:30			64		19		83		18:30			32		82		114	
06:45			63	248	18	51	81	299	18:45			45	166	51	292	96	458
07:00			72		19		91		19:00			23		55		78	
07:15			90		24		114		19:15			20		62		82	
07:30			121		24		145		19:30			28		60		88	
07:45			128	411	43	110	171	521	19:45			25	96	58	235	83	331
08:00			81		47		128		20:00			20		38		58	
08:15			64		43		107		20:15			11		44		55	
08:30			51		45		96		20:30			17		36		53	
08:45			62	258	30	165	92	423	20:45			15	63	41	159	56	222
09:00			45		26		71		21:00			8		35		43	
09:15			51		27		78		21:15			11		38		49	
09:30			49		28		77		21:30			10		37		47	
09:45			61	206	17	98	78	304	21:45			10	39	30	140	40	179
10:00			37		26		63		22:00			5		20		25	
10:15			42		25		67		22:15			7		25		32	
10:30			46		28		74		22:30			5		30		35	
10:45			45	170	24	103	69	273	22:45			8	25	14	89	22	114
11:00			36		32		68		23:00			8		22		30	
11:15			34		49		83		23:15			3		15		18	
11:30			33		31		64		23:30			5		12		17	
11:45			39	142	33	145	72	287	23:45			8	24	16	65	24	89
TOTALS				1690		747		**2437**	**TOTALS**				1499		2463		**3962**
SPLIT %				69.3%		30.7%		**38.1%**	**SPLIT %**				37.8%		62.2%		**61.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,189	3,210	6,399

AM Peak Hour			07:15	07:45	**07:15**	**PM Peak Hour**			13:30	17:00	**17:00**
AM Pk Volume			420	178	**558**	**PM Pk Volume**			209	330	**517**
Pk Hr Factor			0.820	0.947	**0.816**	**Pk Hr Factor**			0.757	0.907	**0.943**
7 - 9 Volume	0	0	669	275	**944**	**4 - 6 Volume**	0	0	380	603	**983**
7 - 9 Peak Hour			07:15	07:45	**07:15**	**4 - 6 Peak Hour**			16:30	17:00	**17:00**
7 - 9 Pk Volume	0	0	420	178	**558**	**4 - 6 Pk Volume**	0	0	194	330	**517**
Pk Hr Factor	0.000	0.000	0.820	0.947	**0.816**	**Pk Hr Factor**	0.000	0.000	0.882	0.907	**0.943**

Prepared by NDS/ATD

Project #: CA16_5060_006 **City:** Castaic

Location: Hasley Cyn Rd E/O Del Valle Rd **Date:** 2/6/2016

Prepared by NDS/ATD

Project #: CA16_5060_006 **City:** Castaic

Location: Hasley Cyn Rd E/O Del Valle Rd **Date:** 2/9/2016

Prepared by NDS/ATD

VOLUME

The Old Rd S/O Live Oak Rd

Day: Saturday
Date: 2/6/2016

City: Castaic
Project #: CA16_5060_007

DAILY TOTALS	NB	SB	EB	WB	Total
	2,157	2,407	0	0	4,564

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	16		4				20		12:00	34		47				81	
00:15	6		1				7		12:15	49		45				94	
00:30	3		2				5		12:30	51		51				102	
00:45	4	29	2	9			6	38	12:45	45	179	64	207			109	386
01:00	2		3				5		13:00	42		53				95	
01:15	1		1				2		13:15	57		47				104	
01:30	1		0				1		13:30	45		56				101	
01:45	3	7	1	5			4	12	13:45	37	181	47	203			84	384
02:00	4		2				6		14:00	51		36				87	
02:15	2		1				3		14:15	38		33				71	
02:30	2		3				5		14:30	42		39				81	
02:45	4	12	4	10			8	22	14:45	50	181	23	131			73	312
03:00	2		6				8		15:00	54		21				75	
03:15	4		3				7		15:15	36		23				59	
03:30	1		1				2		15:30	38		26				64	
03:45	2	9	2	12			4	21	15:45	39	167	22	92			61	259
04:00	1		5				6		16:00	44		26				70	
04:15	1		5				6		16:15	37		27				64	
04:30	6		6				12		16:30	46		18				64	
04:45	6	14	7	23			13	37	16:45	40	167	22	93			62	260
05:00	3		6				9		17:00	33		28				61	
05:15	6		19				25		17:15	30		25				55	
05:30	4		24				28		17:30	45		19				64	
05:45	9	22	23	72			32	94	17:45	26	134	22	94			48	228
06:00	7		19				26		18:00	24		31				55	
06:15	3		22				25		18:15	30		17				47	
06:30	6		28				34		18:30	35		15				50	
06:45	9	25	29	98			38	123	18:45	24	113	15	78			39	191
07:00	14		28				42		19:00	33		8				41	
07:15	10		36				46		19:15	40		14				54	
07:30	13		39				52		19:30	30		12				42	
07:45	11	48	44	147			55	195	19:45	30	133	9	43			39	176
08:00	10		57				67		20:00	28		13				41	
08:15	15		59				74		20:15	12		10				22	
08:30	16		66				82		20:30	26		13				39	
08:45	23	64	55	237			78	301	20:45	17	83	15	51			32	134
09:00	17		48				65		21:00	17		14				31	
09:15	19		55				74		21:15	27		12				39	
09:30	23		71				94		21:30	14		16				30	
09:45	33	92	55	229			88	321	21:45	20	78	10	52			30	130
10:00	22		65				87		22:00	19		10				29	
10:15	29		45				74		22:15	15		9				24	
10:30	39		66				105		22:30	10		10				20	
10:45	33	123	64	240			97	363	22:45	21	65	8	37			29	102
11:00	46		57				103		23:00	11		7				18	
11:15	55		67				122		23:15	10		3				13	
11:30	46		49				95		23:30	6		6				12	
11:45	52	199	50	223			102	422	23:45	5	32	5	21			10	53
TOTALS		644		1305				**1949**	**TOTALS**		1513		1102				**2615**
SPLIT %		33.0%		67.0%				**42.7%**	**SPLIT %**		57.9%		42.1%				**57.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	2,157	2,407	0	0	4,564

AM Peak Hour	11:00	10:30					**10:30**		**PM Peak Hour**	12:30	12:45					**12:30**		
AM Pk Volume	199	254					**427**		**PM Pk Volume**	195	220					**410**		
Pk Hr Factor	0.905	0.948					**0.875**		**Pk Hr Factor**	0.855	0.859					**0.940**		
7 - 9 Volume	112	384	0	0			**496**		**4 - 6 Volume**	301	187	0	0			**488**		
7 - 9 Peak Hour	08:00	08:00					**08:00**		**4 - 6 Peak Hour**	16:00	16:15					**16:00**		
7 - 9 Pk Volume	64	237	0	0			**301**		**4 - 6 Pk Volume**	167	95	0	0			**260**		
Pk Hr Factor	0.696	0.898	0.000	0.000			**0.918**		**Pk Hr Factor**	0.908	0.848	0.000	0.000			**0.929**		

Prepared by NDS/ATD

VOLUME

The Old Rd S/O Live Oak Rd

Day: Tuesday
Date: 2/9/2016

City: Castaic
Project #: CA16_5060_007

DAILY TOTALS	NB	SB	EB	WB	Total
	2,565	2,929	0	0	5,494

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	3		3				6		12:00	43		48				91	
00:15	4		0				4		12:15	47		40				87	
00:30	1		3				4		12:30	56		49				105	
00:45	2	10	1	7			3	17	12:45	44	190	53	190			97	380
01:00	5		3				8		13:00	40		50				90	
01:15	2		1				3		13:15	44		43				87	
01:30	4		2				6		13:30	49		46				95	
01:45	0	11	3	9			3	20	13:45	53	186	34	173			87	359
02:00	2		0				2		14:00	51		36				87	
02:15	3		2				5		14:15	56		49				105	
02:30	2		1				3		14:30	53		51				104	
02:45	1	8	3	6			4	14	14:45	54	214	44	180			98	394
03:00	1		1				2		15:00	85		31				116	
03:15	2		5				7		15:15	72		43				115	
03:30	3		4				7		15:30	62		39				101	
03:45	1	7	10	20			11	27	15:45	66	285	33	146			99	431
04:00	6		11				17		16:00	59		42				101	
04:15	1		16				17		16:15	58		28				86	
04:30	8		20				28		16:30	54		41				95	
04:45	8	23	22	69			30	92	16:45	60	231	23	134			83	365
05:00	5		31				36		17:00	64		30				94	
05:15	7		54				61		17:15	57		32				89	
05:30	9		56				65		17:30	51		21				72	
05:45	10	31	96	237			106	268	17:45	46	218	30	113			76	331
06:00	15		76				91		18:00	40		32				72	
06:15	11		65				76		18:15	56		19				75	
06:30	9		93				102		18:30	28		24				52	
06:45	13	48	72	306			85	354	18:45	31	155	20	95			51	250
07:00	13		49				62		19:00	31		18				49	
07:15	18		67				85		19:15	17		9				26	
07:30	18		75				93		19:30	22		16				38	
07:45	23	72	97	288			120	360	19:45	17	87	11	54			28	141
08:00	30		82				112		20:00	19		7				26	
08:15	34		73				107		20:15	13		10				23	
08:30	29		53				82		20:30	23		6				29	
08:45	24	117	49	257			73	374	20:45	22	77	10	33			32	110
09:00	23		45				68		21:00	27		12				39	
09:15	25		42				67		21:15	14		8				22	
09:30	25		43				68		21:30	16		14				30	
09:45	31	104	48	178			79	282	21:45	24	81	9	43			33	124
10:00	30		43				73		22:00	21		11				32	
10:15	45		36				81		22:15	15		21				36	
10:30	35		39				74		22:30	12		13				25	
10:45	41	151	41	159			82	310	22:45	11	59	6	51			17	110
11:00	43		33				76		23:00	11		7				18	
11:15	42		46				88		23:15	10		8				18	
11:30	31		35				66		23:30	6		5				11	
11:45	53	169	42	156			95	325	23:45	4	31	5	25			9	56
TOTALS		751		1692				2443	TOTALS		1814		1237				3051
SPLIT %		30.7%		69.3%				44.5%	SPLIT %		59.5%		40.5%				55.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	2,565	2,929	0	0	5,494

AM Peak Hour	11:45	05:45			07:30	PM Peak Hour	15:00	12:30			14:30
AM Pk Volume	199	330			432	PM Pk Volume	285	195			433
Pk Hr Factor	0.888	0.859			0.900	Pk Hr Factor	0.838	0.920			0.933
7 - 9 Volume	189	545	0	0	734	4 - 6 Volume	449	247	0	0	696
7 - 9 Peak Hour	08:00	07:30			07:30	4 - 6 Peak Hour	16:15	16:00			16:00
7 - 9 Pk Volume	117	327	0	0	432	4 - 6 Pk Volume	236	134	0	0	365
Pk Hr Factor	0.860	0.843	0.000	0.000	0.900	Pk Hr Factor	0.922	0.798	0.000	0.000	0.903

Prepared by NDS/ATD

Project #: CA16_5060_007 **City:** Castaic

Location: The Old Rd S/O Live Oak Rd **Date:** 2/6/2016

Prepared by NDS/ATD

Project #: CA16_5060_007 **City:** Castaic

Location: The Old Rd S/O Live Oak Rd **Date:** 2/9/2016

Prepared by NDS/ATD

VOLUME

Chiquito Cyn Rd N/O SR-126

Day: Saturday
Date: 2/6/2016

City: Castaic
Project #: CA16_5060_008

DAILY TOTALS	NB	SB	EB	WB	Total
	759	0	0	0	759

AM Period	NB		SB	EB	WB	TOTAL		PM Period	NB		SB	EB	WB	TOTAL	
00:00	1		0			1		12:00	12		0			12	
00:15	2		0			2		12:15	20		0			20	
00:30	2		0			2		12:30	11		0			11	
00:45	2	7	0			2	7	12:45	10	53	0			10	53
01:00	3		0			3		13:00	9		0			9	
01:15	0		0			0		13:15	11		0			11	
01:30	2		0			2		13:30	11		0			11	
01:45	0	5	0			0	5	13:45	7	38	0			7	38
02:00	4		0			4		14:00	13		0			13	
02:15	1		0			1		14:15	8		0			8	
02:30	1		0			1		14:30	17		0			17	
02:45	2	8	0			2	8	14:45	11	49	0			11	49
03:00	3		0			3		15:00	14		0			14	
03:15	1		0			1		15:15	14		0			14	
03:30	1		0			1		15:30	6		0			6	
03:45	0	5	0			0	5	15:45	9	43	0			9	43
04:00	0		0			0		16:00	9		0			9	
04:15	0		0			0		16:15	14		0			14	
04:30	3		0			3		16:30	15		0			15	
04:45	3	6	0			3	6	16:45	12	50	0			12	50
05:00	1		0			1		17:00	15		0			15	
05:15	0		0			0		17:15	18		0			18	
05:30	7		0			7		17:30	11		0			11	
05:45	13	21	0			13	21	17:45	14	58	0			14	58
06:00	5		0			5		18:00	10		0			10	
06:15	2		0			2		18:15	10		0			10	
06:30	11		0			11		18:30	18		0			18	
06:45	9	27	0			9	27	18:45	3	41	0			3	41
07:00	11		0			11		19:00	13		0			13	
07:15	7		0			7		19:15	11		0			11	
07:30	11		0			11		19:30	5		0			5	
07:45	13	42	0			13	42	19:45	7	36	0			7	36
08:00	11		0			11		20:00	4		0			4	
08:15	14		0			14		20:15	8		0			8	
08:30	10		0			10		20:30	7		0			7	
08:45	13	48	0			13	48	20:45	4	23	0			4	23
09:00	14		0			14		21:00	3		0			3	
09:15	15		0			15		21:15	7		0			7	
09:30	11		0			11		21:30	5		0			5	
09:45	15	55	0			15	55	21:45	5	20	0			5	20
10:00	9		0			9		22:00	6		0			6	
10:15	15		0			15		22:15	2		0			2	
10:30	15		0			15		22:30	3		0			3	
10:45	11	50	0			11	50	22:45	2	13	0			2	13
11:00	10		0			10		23:00	4		0			4	
11:15	12		0			12		23:15	3		0			3	
11:30	14		0			14		23:30	2		0			2	
11:45	13	49	0			13	49	23:45	3	12	0			3	12
TOTALS	323					323		TOTALS	436					436	
SPLIT %	100.0%					42.6%		SPLIT %	100.0%					57.4%	

DAILY TOTALS	NB	SB	EB	WB	Total
	759	0	0	0	759

AM Peak Hour	11:30				11:30	PM Peak Hour	16:30				16:30
AM Pk Volume	59				59	PM Pk Volume	60				60
Pk Hr Factor	0.738				0.738	Pk Hr Factor	0.833				0.833
7 - 9 Volume	90	0	0	0	90	4 - 6 Volume	108	0	0	0	108
7 - 9 Peak Hour	07:30				07:30	4 - 6 Peak Hour	16:30				16:30
7 - 9 Pk Volume	49	0	0	0	49	4 - 6 Pk Volume	60	0	0	0	60
Pk Hr Factor	0.875	0.000	0.000	0.000	0.875	Pk Hr Factor	0.833	0.000	0.000	0.000	0.833

Prepared by NDS/ATD

VOLUME

Chiquito Cyn Rd N/O SR-126

Day: Tuesday
Date: 2/9/2016

City: Castaic
Project #: CA16_5060_008

DAILY TOTALS	NB	SB	EB	WB	Total
	715	784	0	0	1,499

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	4		1						5		12:00	8		9						17	
00:15	3		0						3		12:15	2		12						14	
00:30	0		1						1		12:30	7		9						16	
00:45	1	8	0	2					1	10	12:45	11	28	4	34					15	62
01:00	2		1						3		13:00	7		9						16	
01:15	0		0						0		13:15	13		10						23	
01:30	1		0						1		13:30	5		9						14	
01:45	1	4	0	1					1	5	13:45	5	30	6	34					11	64
02:00	1		1						2		14:00	11		12						23	
02:15	1		1						2		14:15	13		11						24	
02:30	2		0						2		14:30	15		15						30	
02:45	2	6	1	3					3	9	14:45	16	55	7	45					23	100
03:00	0		1						1		15:00	17		24						41	
03:15	1		0						1		15:15	14		10						24	
03:30	0		1						1		15:30	14		8						22	
03:45	1	2	5	7					6	9	15:45	21	66	8	50					29	116
04:00	0		4						4		16:00	13		9						22	
04:15	1		2						3		16:15	18		7						25	
04:30	0		6						6		16:30	27		13						40	
04:45	1	2	6	18					7	20	16:45	12	70	10	39					22	109
05:00	1		10						11		17:00	16		10						26	
05:15	4		13						17		17:15	24		6						30	
05:30	4		16						20		17:30	24		5						29	
05:45	3	12	10	49					13	61	17:45	18	82	5	26					23	108
06:00	13		23						36		18:00	16		15						31	
06:15	6		16						22		18:15	12		10						22	
06:30	2		24						26		18:30	12		9						21	
06:45	8	29	29	92					37	121	18:45	22	62	10	44					32	106
07:00	3		16						19		19:00	10		9						19	
07:15	7		17						24		19:15	15		9						24	
07:30	6		25						31		19:30	11		9						20	
07:45	8	24	15	73					23	97	19:45	5	41	5	32					10	73
08:00	9		14						23		20:00	9		5						14	
08:15	4		16						20		20:15	11		3						14	
08:30	7		18						25		20:30	8		5						13	
08:45	4	24	14	62					18	86	20:45	7	35	0	13					7	48
09:00	8		17						25		21:00	6		3						9	
09:15	6		11						17		21:15	7		3						10	
09:30	3		15						18		21:30	8		1						9	
09:45	6	23	12	55					18	78	21:45	6	27	2	9					8	36
10:00	10		8						18		22:00	3		1						4	
10:15	7		9						16		22:15	13		2						15	
10:30	5		16						21		22:30	1		1						2	
10:45	10	32	12	45					22	77	22:45	4	21	1	5					5	26
11:00	8		11						19		23:00	4		1						5	
11:15	4		12						16		23:15	4		4						8	
11:30	2		5						7		23:30	4		2						6	
11:45	4	18	10	38					14	56	23:45	2	14	1	8					3	22
TOTALS		184		445						**629**	**TOTALS**		531		339						**870**
SPLIT %		29.3%		70.7%						**42.0%**	**SPLIT %**		61.0%		39.0%						**58.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	715	784	0	0	1,499

AM Peak Hour	10:00	06:00			**06:00**	**PM Peak Hour**	17:00	14:15			**14:15**
AM Pk Volume	32	92			**121**	**PM Pk Volume**	82	57			**118**
Pk Hr Factor	0.800	0.793			**0.818**	**Pk Hr Factor**	0.854	0.594			**0.720**
7 - 9 Volume	48	135	0	0	**183**	**4 - 6 Volume**	152	65	0	0	**217**
7 - 9 Peak Hour	07:15	07:00			**07:15**	**4 - 6 Peak Hour**	17:00	16:15			**16:30**
7 - 9 Pk Volume	30	73	0	0	**101**	**4 - 6 Pk Volume**	82	40	0	0	**118**
Pk Hr Factor	0.833	0.730	0.000	0.000	**0.815**	**Pk Hr Factor**	0.854	0.769	0.000	0.000	**0.738**

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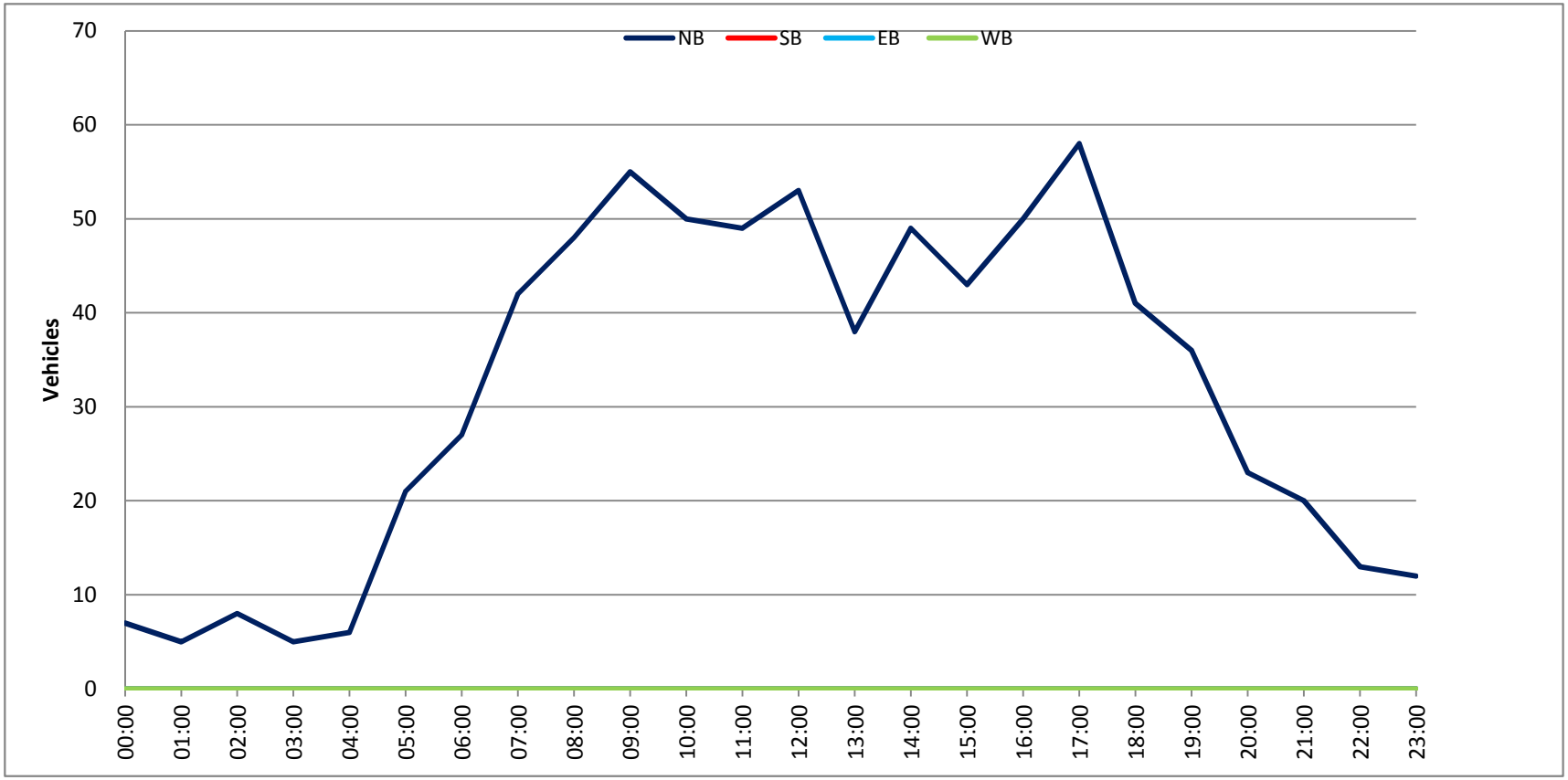

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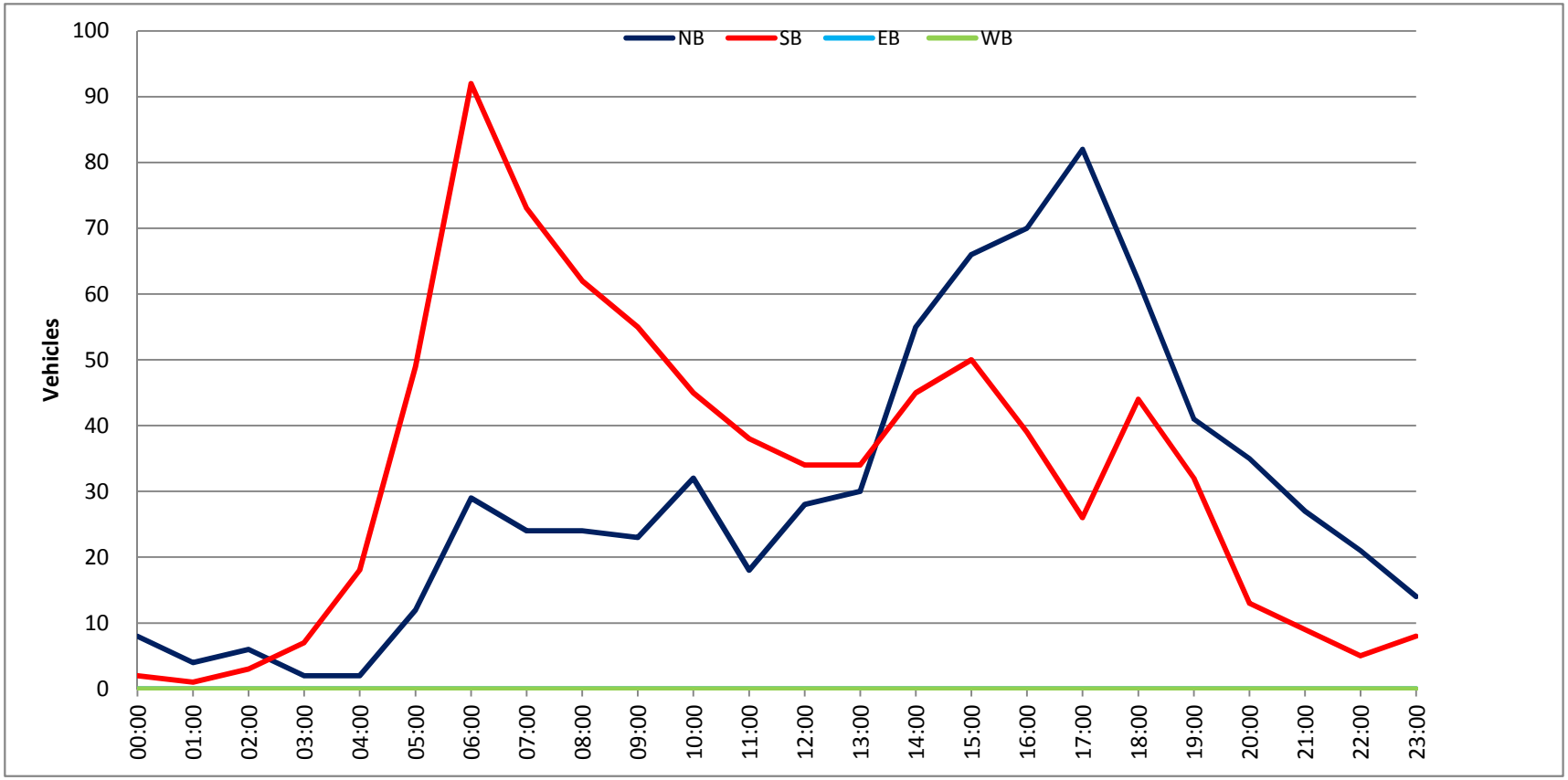

Appendix I

Letters Received from Agencies for the Trails Plan

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY
EDMUND G. BROWN JR., Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

March 24, 2016

Zachary Likins
County of Los Angeles Department of Parks and Recreation
510 South Vermont Avenue
Los Angeles, CA 90020

CASTAIC AREA MULTI-USE TRAILS IMPROVEMENT PLAN, COUNTY OF LOS ANGELES PARKS AND RECREATION DEPARTMENT, CASTAIC LAKE

Dear Mr. Likins:

On December 21, 2015, Department of Water Resources (DWR) staff from the Division of Operations & Maintenance (O&M) met with staff from the Los Angeles County of Parks and Recreation (County), to discuss proposed improvements to Castaic Area Multi-Use Trails system. Several proposals to improve connections between existing trails were discussed. DWR staff expressed concerns about any use of dam crest roads for Castaic Dam and the Elderberry forebay dam for potential recreational trail purposes.

O&M received a preliminary study prepared for the County by Alta Planning & Design, dated February 17, 2016, that discusses gaps and barriers in the existing County trail network and contains recommendations for recreational use of the dam crest roads. DWR maintains our earlier stated objection to recreational use of any of the DWR operational road segments contained within the Castaic Lake trail study area.

DWR has identified several safety and security concerns supporting our objection/denial of the proposed recreational use of either of the dam crest roads, including but not limited to:

- Protection of State Water Project critical infrastructure (water intake tower, spillway, and the dam itself.)

- The dam crest roads were not designed or intended to be used for public access or recreational traffic and do not provide adequate clearance for combined vehicular and pedestrian use.

- The absence of emergency call-boxes, frequent patrols, or first-responder emergency vehicle access in the event of an accident or life-threatening event.

- DWR access roads at the base of Castaic Dam are not compatible with recreational use out of concern for the protection of critical dam instrumentation, stream release valves, and power generating facilities.

The remainder of the proposed trail improvement segments in the Castaic Lake study area may also fall within the Federal Energy Regulatory Commission boundary for the Castaic power generation license, of which Los Angeles County Department of Water and Power (LADWP) and DWR are co-licensees. LADWP should be brought into the conversation for their input into any modifications to the trail system that could impact the FERC license.

Please provide DWR with a copy of any subsequent trail improvement plan documentation when it becomes available for public review.

If you have any question, please contact Leroy Ellinghouse of my staff at (916) 653-7168.

Sincerely,

Sheree Edwards, Chief
Civil Maintenance Branch
Division of Operations and Maintenance

bcc: David Panec
Leroy Ellinghouse
Bob Martinez
Joel Quintero
Dave Brown, SFD