Historic Property Identification Report (Archaeological Resources) and Paleontological Resources Study

Santiago Creek Dam Outlet and Spillway Project, Irvine, Orange County, California

Prepared for
Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine, California 92618

Prepared by
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February 2024

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Historic Property Identification Report (Archaeological Resources) and Paleontological Resources Study for the Santiago Creek Dam Outlet and Spillway Project,

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BY

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February 2024

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Prepared for: NEPA & CEQA Documentation
USGS Geologic Map Black Star Canyon 7.5-Minute Quadrangles

Psomas Project Number: 3IRW001101
Key Words: Archaeological Survey, Lithic Scatter, Precontact Archaeology, Orange County

EXECUTIVE/MANAGEMENT SUMMARY

PURPOSE AND SCOPE

The purpose of this Historic Property Identification Report (Archaeological Resources) and Paleontological Resources Study (report) is to determine the potential for impacts to archaeological and paleontological resources within the proposed Santiago Creek Dam Outlet and Spillway Project (hereinafter referred to as "the Project"), located in Orange County, California. In addition to compliance with the California Environmental Quality Act (CEQA), the Project requires a technical study that will allow for federal funding by the State Water Board. Therefore, this report has been prepared for compliance with Section 15064.5 of the CEQA Guidelines and to satisfy Section 106 of the National Historic Preservation Act (NHPA), with respect to the identification and preservation of cultural resources (i.e., archaeological sites). According to the *Code of Federal Regulations* (CFR, Title 40, Section 1506.4, Combining documents), "Any environmental document in compliance with NEPA (National Environmental Policy Act) may be combined with any other agency documents to reduce duplication and paperwork". Therefore, the format of this report follows an amended version of the Office of Historic Preservation's *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Office of Historic Preservation 1990) to meet both CEQA and NEPA requirements.

DATES OF INVESTIGATION

Psomas requested the cultural resources literature and records search for the Project from the South-Central Coastal Information Center (SCCIC) at the California State University, Fullerton on September 11, 2020. On May 23, 2022, Psomas requested an additional records search, including spatial data (shapefiles) for all precontact (before arrival of Europeans) archaeological resources within a 1-mile search radius from the proposed Project Area of Potential Effects (APE).

On September11, 2020, Psomas requested that the Native American Heritage Commission (NAHC) conduct a search of its Sacred Lands File (SLF) to determine if cultural resources important to Native Americans have been recorded within the Project APE or in the immediate vicinity of the Project APE.

On October 15, 2020, Psomas requested that the Natural History Museum (NHM) of Los Angeles County conduct a search of its paleontology collection records for the locality and specimen data for the Project APE and surrounding area.

A pedestrian survey of the Project APE was conducted on October 20, 2020. This 1st draft report was completed in August 2023 and is based on the findings from the SCCIC, NAHC, Native American outreach and consultation, and the pedestrian survey of the Project APE. As a subconsultant to Psomas, South Environmental completed an architectural history and built environment study of the Santiago Dam under separate cover and is included as Attachment E. This technical report addresses only the archaeological and paleontological resources identified within the Project APE and the 1.6 km (1-mile) search radius surrounding the Project APE.

FINDINGS OF THE INVESTIGATION

Psomas conducted archaeological resources field investigations within the proposed Project APE on October 20, 2020. The main goal of the investigations was to gather and analyze information needed to determine if the Project would have a significant impact on properties eligible for the National Register of Historic Places (NRHP) and the California Register of Historic Places (CRHR) and to provide mitigation measures for those resources. The results of the 2021 SCCIC cultural resources records searches identified 18 previously recorded cultural resources within 1.6

kilometers (km) (1 mile) of the Project site. The previously recorded resources include two precontact isolates (ground stone), 12 precontact sites, three historic sites/built environments, and one multicomponent site. The precontact sites consist of rock shelters, lithic scatters (stone debris left over from making stone tools), hearths (roasting pits/remnants of campfires), cairns (rock features), bedrock milling features (ground stone technology), habitation debris (midden), and burials. The historic sites consist of roads/trails, single family residences, standing structures, wells/cisterns, water conveyance systems, and a standing engineering structure (dam). Of the 18 cultural resources, two (P-30-001012 and P-30176757) were identified within the Project APE. Cultural resource P-30-001012 is described as a precontact lithic scatter and cultural resource P-30-17657 is the Santiago Dam (see Attachment E). Furthermore, the NAHC SLF search was positive for sacred sites.

The NHM record search included a thorough search of the NHM paleontology collection records for the locality and specimen data for the Project APE and surrounding area. The records search identified fossil localities that lie directly within the proposed Project APE as well as numerous fossil localities nearby from the same sedimentary deposits that occur in the proposed Project area, either at the surface or at depth. One locality, LACM IP 26171, is located along the northwest shore of Santiago Reservoir, where unspecified invertebrates were collected from the Williams Formation during excavations for the spillway in 1969 (depth of fossils is not known). Additionally, eight localities were located nearby from the same sedimentary deposits that occurs in the Project site, either at the surface or at depth below the surface.

Fieldwork (archaeological and paleontological survey) relocated P-30-001012; however, none of the cultural resources recorded by W. H. Bryce 1982 were observed on the surface; though, MBA noted in 2004 the artifact assemblage and site boundary for P-30-001012 were not relocated due to the site being stripped for agricultural practices and scattered debris piled placed along a nearby small drainage. No new archaeological resources and/or paleontological resources were identified within the Project APE. Nevertheless, it should be noted that both the Project APE and the surrounding area should be considered highly sensitive for archaeological resources dating to both the precontact period and the historic era and paleontological resources.

DISPOSITION OF DATA

This report will be filed with the Psomas and the SCCIC. All field notes and other documentation related to the report are on file at Psomas.

1.0 INTRODUCTION

1.1 PROJECT LOCATION

The Project is located at Santiago Creek Dam at the northwest end of Irvine Lake in unincorporated Orange County, California. Santiago Creek Dam impounds Irvine Lake. It is south of State Route (SR) 261 and east of SR-241 and Santiago Canyon Road. More specifically, the Project APE is located on the Blackstar 7.5-minute United States Geological Survey (USGS) topographic quadrangle within Township 04; 05 South, Range 08 West, and Sections 33, 34, 35, 02, 03, and 04 of the San Bernardino Base and Meridian (Exhibit 1 and Exhibit 2).

1.2 PROJECT BACKGROUND AND PROJECT DESCRIPTION

1.2.1 Project Background

Irvine Ranch Water District (IRWD) and Serrano Water District (SWD), jointly referred to as the Districts, operate Irvine Lake and the Santiago Creek Dam that serves as a critical water supply reservoir for significant portions of Villa Park in Orange County, California and impounds water for Irvine Lake on Santiago Creek, a tributary to the Santa Ana River. Santiago Creek Dam is a compacted earth-fill embankment completed in 1933 and certified by the State of California, Department of Water Resources (DWR), Division of Safety of Dams (DSOD), which identifies it as Dam No. 75-000.

The Districts have been working with the DSOD to evaluate different structural elements of the existing Santiago Creek Dam, including the evaluation of the existing outlet tower and an alternative analysis for seismic retrofits or replacements of the tower. DSOD requested the Districts perform a seismic evaluation of the outlet tower; evaluation of the results shows that the tower is inadequate under some failure modes in a maximum credible earthquake. The existing outlet tower could potentially fail during the design seismic event, which could block the existing outlet conduit with pieces of the concrete tower and/or with reservoir silt. In addition, DSOD also requested a spillway condition assessment be performed for the spillway at Santiago Creek Dam. The assessment found that the aging spillway is nearing the end of its useful life and the design did not meet current standards.

In light of the findings from the seismic evaluation for the existing outlet tower and comprehensive assessment of the existing spillway, the Districts have elected to develop designs for an inclined outlet structure that would be placed near the left abutment of the existing dam and replacement of the existing spillway with a side-channel spillway on the left abutment. The spillway crest would be raised by six feet to provide more operation capacity in the reservoir for the Districts. The existing outlet tower would be abandoned, and the new inclined outlet structure would connect to the existing outlet conduit within the reservoir.

The rehabilitation and replacement of the Santiago Creek Dam outlet works, and spillway facilities is necessary to address identified seismic safety concerns; to meet current DSOD regulatory requirements; to satisfy the Districts' operational requirements; to extend the useful life of the facilities; and to improve reliability.

Irvine Lake is held at varying levels depending on the time of year. In the wet winter months, water can be stored up to the 791.9-foot elevational contour. The height of the existing spillway with the flashboards installed is at the 795.9-foot elevation contour; this is the current maximum capacity of the reservoir and is only permitted in the summer months. Historically, the inflow into the reservoir during storm events is high enough to cause the water to flow over the spillway crest, located at the 791.9-foot elevation, approximately once every four to five years (1937 to 2019).

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Project Location

Exhibit 1

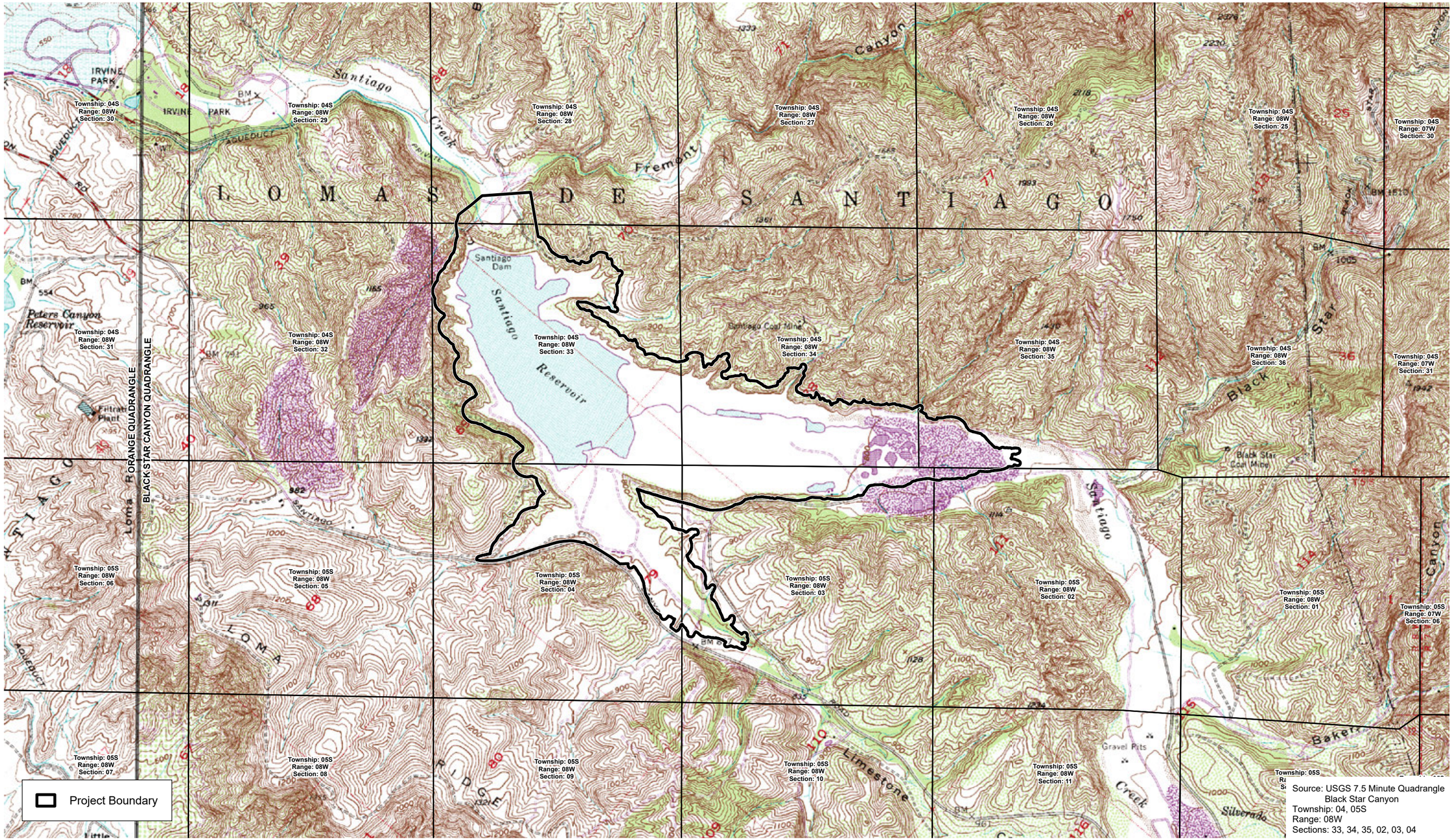
Santiago Creek Dam Outlet Tower and Spillway Improvement Project

N W E S

1,200 600 0 1,200 Feet

PSOMAS

(Rev: 11/03/2023 JVR) R:\Projects\IRW_IRWD\3IRW001101\Graphics\CEQA\ex_Aerial.pdf



Source: USGS 7.5 Minute Quadrangle
Black Star Canyon
Township: 04, 05S
Range: 08W
Sections: 33, 34, 35, 02, 03, 04

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USGS 7.5-Minute Digital Quadrangle

Exhibit 2

Santiago Creek Dam Outlet Tower and Spillway Improvement Project

N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

(Rev: 11/03/2023 JVR) R:\Projects\IRW_IRWD\3IRW001101\Graphics\CEQA\ex_USGS.pdf

From October 2002 to September 2020, the reservoir has been filled to the spillway crest a total of four times and water has been high enough to flow over the spillway twice. The water levels in the lake during this period (2002 to 2020) fluctuated between approximately 736 feet elevation contour to 795 feet elevation contour. Between 2002 and 2020, the longest consecutive period that water was stored in the upper 2 feet of the reservoir (793.9 to 795.9 feet) was approximately 35 days.

1.2.2 Project Description

General elements of each portion of the Project are included below. A more detailed description of the proposed facilities is included in the Environmental Impact Report (EIR).

- The existing outlet tower would be demolished; the portion below the sediment would be filled with concrete and capped with a concrete plug. A new inclined outlet structure would be constructed on the left abutment. Each riser would include an intake fish screen.
- The inlet/outlet works would be configured to incorporate the new structure, including new valves and fittings. Water from the lake would enter the new inclined inlet/outlet structure and would convey lake water through an existing conduit under the dam. At the downstream toe of the dam, a new fitting would be installed to bifurcate the flow to the Irvine Lake Pipeline (ILP) or the emergency outlet pipeline. Water that enters the ILP would reach the Districts' distribution systems. Water that enters the emergency outlet pipeline would be released at the end of the new spillway.
- The ILP would be increased from 36 inches to 54 inches to match the pipeline coming from the inclined inlet/outlet structure, as well as to increase the capacity of the line to improve the hydraulic performance of the system.
- The existing spillway would be demolished and replaced with a new side-channel spillway in a rock cut on the left abutment.
- A new access road and ramp would be constructed to provide vehicle access to the new inlet/outlet structure. A new retaining wall would be needed to cut the roadway into the existing slope without affecting the existing landfill facility above.
- A new dam control building would be constructed to house the valve system at the end of the existing dam crest. The preliminary layout shows a fire-hardened building with dimensions 52 feet by 18 feet and a height of 12 feet.
- The dam crest would be widened from 10 feet to 12 feet with a retaining wall on the downstream side of the crest. The retaining wall would be 1,300 feet in length and would have a height of 10 feet.
- The dam crest would be raised with an approximately 1.5-foot-tall concrete parapet wall on the upstream side of the dam crest.
- A new emergency access walkway (5 feet wide) and stair system would be constructed along the left wall of the new spillway channel to reach the inlet/outlet structure and dam crest from the adjacent landfill during a spillway event. The walkway would connect to the new access road (described above).
- A new steel bridge structure would be included for vehicles across the new spillway.
- Existing structures would be demolished, including the existing outlet tower, portions of the existing spillway, portions of the upstream dam embankment concrete facing, storage building on the dam crest, portions of the outlet work, portions of the ILP, catwalk/stairs across Santiago Creek, and piezometers/monitoring wells.

- The existing Southern California Edison (SCE) overhead power lines and power poles in the vicinity would be relocated outside the construction limits. This relocation would be completed by SCE.
- When construction is occurring, the lake would be dewatered and an access road would be located along the edge of the dewatered lakebed to allow construction access between the staging area and the dam structure.

1.3 PROJECT PERSONNEL

The staff members for the proposed Project were selected based on their familiarity with the site's geographic location and understanding of the archaeology and paleontology discipline. The team includes experts with experience in California archaeology (precontact and historic era), paleontology, cultural resources management, project administration, and other appropriate skills including spatial analysis. Key personnel are Registered Professional Archaeologists (RPA) who meet or exceed the Secretary of the Interior's Professional Qualification Standards (NPS 1994) for archaeology. Project roles and responsibilities are summarized below.

1.3.1 Charles Cisneros, M.S., RPA

Charles Cisneros is a Registered Professional Archaeologist and served as the Project's Principal Investigator. Mr. Cisneros supervised all aspects of the archaeological Project, including the field survey and the preparation of this report.

1.3.2 Daniella Balassa, M.S.

Daniella Balassa was responsible for contributing to the geological and paleontological history and analysis section of this report.

2.0 REGULATORY SETTING

2.1 CULTURAL RESOURCES

Cultural resource laws, regulations, and guidelines set up the processes for defining what is or is not a significant cultural resource and include various agency procedures for managing these archaeological and historical resources and assessing the information from the cultural remains to determine their significance. Most importantly is whether these resources are eligible for inclusion in a national or State register (i.e., NRHP and CRHR). As defined by archaeologists Thomas Neumann and Robert Sanford (2001: 27), the laws and regulations serve to do the following:

- Set forth the criteria for assessing the relative importance of cultural remains;
- Outline the procedures for reviewing assessments;
- Delineate the responsible parties involved in making such assessments;
- Identify and then define the extent of jurisdiction and responsibility of each party in the evaluation process;
- Set forth the criteria for making a determination of significance, as well as indicating which party can or cannot make such determinations;
- Set forth the criteria for the archaeological and historic preservation work performed; and
- Set forth the criteria regarding who can perform the archaeological and historic preservation work.

A summary of both federal and State laws, regulations, and standards that govern cultural resource management within the Project's APE is provided below.

2.1.1 Federal Regulatory Setting

Section 106 of the National Historic Preservation Act

Section 106 of the NHPA of 1966, as amended, is required by the Advisory Council on Historic Preservation, with regulations contained in 36 CFR Part 800. Section 106 requires that federal agencies consider the effects of proposed projects on historic properties as part of the environmental assessment process, and it defines "historic properties" as follows (36 CFR Part 800, Protection of Historic Properties; Section 800.16[l][1], Definitions):

> Any Precontact or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

According to 36 CFR 60.4, a resource may be considered *historically significant* if it retains integrity and meets at least one of the following criteria. A property may be eligible for the NRHP if the resource:

A. is associated with events that have made a significant contribution to the broad patterns of our history;

B. is associated with the lives of persons significant in our past;

C. embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or

D. has yielded, or may be likely to yield, information important in prehistory or history.

For a property to be listed in the NRHP, it must meet one or more of the criteria of significance, and it must also retain integrity. The National Park Service's (1995a) *How to Apply the National Register Criteria* recognizes seven aspects or qualities that, in various combinations, define integrity. The seven aspects of integrity are described below:

- **Location:** Location is the place where the historic property was constructed or the place where the historic event occurred.
- **Design:** Design is the combination of elements that create the form, plan, space, structure, and style of a property.
- **Setting:** Setting is the physical environment of a historic property.
- **Materials:** Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- **Workmanship:** Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- **Feeling:** Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.
- **Association:** Association is the direct link between an important historic event or person and a historic property.

The steps in evaluating integrity are further described by the National Park Service (1995):

- Define the essential physical features that must be present for a property to represent its significance;
- Determine whether the essential physical features are visible enough to convey their significance;
- Determine whether the property needs to be compared with similar properties; and
- Determine, based on the significance and essential physical features, which aspects of integrity are particularly vital to the property being nominated and if they are present.

Native American Graves and Repatriation Act

The Native American Graves and Repatriation Act (NAGPRA) established a means for Native Americans, including Indian Tribes, to request the return of human remains and other sensitive cultural items held by federal agencies or federally assisted museums or institutions. NAGPRA also contains provisions regarding the intentional excavation and removal of, inadvertent discovery of, and illegal trafficking in Native American human remains and sensitive cultural items.

2.1.2 State Regulatory Setting

California Register of Historical Resources

The CEQA requires a lead agency to determine whether a project would have a significant effect on one or more historical resources. According to Section 15064.5(a) of the State CEQA

Guidelines, a "historical resource" is defined as a resource listed in or determined to be eligible for listing in the CRHR (*California Public Resources Code* [PRC] Section 21084.1); a resource included in a local register of historical resources (*California Code of Regulations* [CCR], Title 14, Section 15064.5[a][2]); or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (14 CCR 15064.5[a][3]).

Section 5024.1 of the PRC, Section 15064.5 of the State CEQA Guidelines (CCR, Title 14, Chapter 3, Sections 15000–15387), and Sections 21083.2 and 21084.1 of the CEQA (PRC, Sections 21000–21189) were used as the basic guidelines for the cultural resources study. PRC Section 5024.1 requires an evaluation of historical resources to determine their eligibility for listing in the CRHR. The purpose of the CRHR is to maintain listings of the State's historical resources and to indicate which properties are to be protected from substantial adverse change. The criteria for listing resources in the CRHR, which were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP (per the criteria listed at 36 CFR 60.4), are stated below.

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:

(1) Are associated with events that have made a significant contribution to the broad patterns of our history; or

(2) Are associated with the lives of persons significant in our past; or

(3) Embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(4) Have yielded, or may be likely to yield, information important in prehistory or history.

According to Section 15064.5(a)(3) (A–D) of the State CEQA Guidelines, a resource is considered historically significant if it meets the criteria for listing in the NRHP, as stated above, in addition to the CRHR. Impacts that affect those characteristics of the resource, that qualify it for the NRHP or that would adversely alter the significance of a resource listed in or eligible for listing in the CRHR, are considered to have a significant effect on the environment. Impacts to cultural resources from the proposed Project are thus considered significant if the Project: (1) physically destroys or damages all or part of a resource; (2) changes the character of the use of the resource or physical feature within the setting of the resource that contributes to its significance; or (3) introduces visual, atmospheric, or audible elements that diminish the integrity of significant features of the resource.

The purpose of a cultural resources' investigation is to evaluate whether any cultural resources remain exposed on the surface of a project site or can reasonably be expected to exist in the subsurface. If resources are discovered, management recommendations would be required for evaluation of the resources for CRHR eligibility.

Assembly Bill 52

Assembly Bill (AB) 52 (Chapter 532, Statutes of 2014), which became effective on July 1, 2015, 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 such notice in writing. Once Native American tribes receive a project notification, they have 30 days to respond as to whether

they wish to initiate consultation regarding the project, including subjects such as mitigation for any potential project impacts to tribal cultural resources (TCR). A TCR is defined as either a site, feature, place, or cultural landscape that is geographically defined in terms of size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is eligible for the CRHR or a local historic register. If a tribe requests consultation and the lead agency and the tribe ultimately agree on mitigation to address any potentially significant impacts to TCRs, the mitigation measures agreed upon during consultation must be recommended for inclusion in the environmental document.

2.1.3 Human Remains

Section 7050.5 of the *California Health and Safety Code* provides for the disposition of accidentally discovered human remains. Section 7050.5 states that, if human remains are found, no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains would occur until the County Coroner has determined the appropriate treatment and disposition of the human remains.

Section 5097.98 of the PRC states that, if remains are determined by the Coroner to be of Native American origin, the Coroner must notify the NAHC within 24 hours. The NAHC, in turn, must identify the person or persons it believes to be the most likely descendant of the deceased Native American. The descendant shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

2.1.4 Paleontological Resources

Paleontological resources are afforded protection by environmental legislation set forth under CEQA. Appendix G of the CEQA Guidelines provides guidance relative to significant impacts on paleontological resources, indicating that a project will have a significant impact on paleontological resources if it disturbs or destroys a unique paleontological resource or site or unique geological feature.

Under Guidelines for the Implementation of CEQA, as amended on March 29, 1999 (Title 14, Division 6, Chapter 3, California Code of Regulations: 15000 et seq.), procedures define types of activities, persons, and public agencies required to comply with CEQA and include as one of the questions to be answered in the Environmental Checklist: “Will the proposed project disturb paleontological resources?” (Appendix G, Section VII, Part f)

The California Public Resources Code Section 5097.5 states:

a) “No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or Precontact ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

b) As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.”

3.0 SETTING

3.1 CONTEMPORARY SETTING

The Project site is located on the USGS' Black Star Canyon 7.5-minute quadrangle. It is within the Santa Ana Watershed. The drainage area for the Project encompasses approximately 63.4 square miles. Irvine Lake (also called the Santiago Creek Reservoir) was originally constructed in 1933 to store water for the benefit of the surrounding communities.

3.1.1 Embankment Dam

The Santiago Creek Dam is a compacted earthfill embankment completed in 1933 that is under the jurisdiction of the State of California, DWR, and DSOD. Santiago Creek Dam allows IRWD to impound water within Irvine Lake, a critical water supply reservoir for IRWD and SWD. The reservoir provides flood control, water supply, fisheries enhancement, and recreational opportunities for the surrounding area. The existing silt level within the lake varies throughout the lake; however, it is estimated that the accumulated sediment occupies approximately 2,150 acre-feet of the lake to date.

3.1.2 Outlet Works

The outlet works for the dam consists of a tower, an outlet conduit, and downstream control house. A concrete-encased welded steel pipe outlet conduit is located at the base of the outlet tower and runs beneath the dam to the toe of the dam where a bifurcation splits the flow into a main pipe and diverter pipe. The main pipe supplies water to IRWD and SWD.

3.1.3 Spillway

The existing spillway is a reinforced concrete structure located on the left abutment of the dam and consists of an approach, control structure, chute, and flip bucket at the downstream end. The spillway has vertical reinforced concrete walls through the length and a bridge structure with piers at the spillway crest. The spillway crest elevation is located at elevation 791.9 feet. Historical records of spillway flows at Santiago Creek Dam indicate that the spillway has flowed 24 times between 1937 and 2019 (82 years). The downstream end of the spillway was extensively modified in 1969 and 1970 after sustaining significant damage during a February 1969 flood event. The damaged waste channel and spillway chute were removed, and a new flip bucket was constructed at the end of the existing spillway chute. Surrounding land uses primarily consist of undeveloped open space. Irvine Regional Park is located northwest of SR-241; Limestone Canyon Regional Park is located south of Santiago Canyon Road; and Oak Canyon Park is located at the southeast end of Irvine Lake. The closed Santiago Canyon Landfill is located adjacent to the west of Irvine Lake. Residential development is located west of SR-241.

Irvine Lake (named Santiago Creek Reservoir on the USGS) was created by constructing a dam across Santiago Creek. Santiago Creek, a named blueline stream, enters Irvine Lake from the east and continues downstream of the dam flowing north and then west. It has a relatively broad floodplain both above and below the dam. The slopes around the western and northern portions of the lake are relatively steep while the areas to the southeast and east include areas that are relatively flat. Three unnamed blueline streams enter the lake from the north and eight unnamed blueline streams enter the lake from the west, southeast, and south. One unnamed blueline stream enters the Project area in the northwest, downstream of the Dam, while Fremont Canyon Creek merges with Santiago Creek downstream of the Project area. Elevations in the Project area range from approximately 657 to 996 feet above mean sea level.

3.2 BASIN PHYSIOLOGY AND ENVIRONMENT

3.2.1 Basin Physiology

The Project APE is located on the western slope of the Santa Ana Mountains in southern California. Santiago Creek is within the APE and flows in a northwesterly direction for about 32 miles from its headwaters near Santiago Peak to its confluence with the Santa Ana River about 14.5 miles downstream of Santiago Creek Dam. Santiago Creek Dam drains about 63 square miles of the Santiago Creek watershed. The drainage basin upstream of the dam generally consists of steep and mountainous terrain, ranging in elevation from approximately 780 feet at the dam to 5,680 feet in the headwaters near Santiago Peak. Urban development and agricultural use within the watershed are limited, with much of the drainage basin located in the Cleveland National Forest. Vegetation within the basin generally consists of scrub/rangeland with areas of dense shrubs and trees. Most of the basin soils fall into Natural Resources Conservation Service (NRCS) hydrologic group D, indicating a poor infiltration rate and high runoff potential when thoroughly wet, though there are pockets of more well-drained soils.

The climate of the basin is characterized by hot, dry summers and mild, wet winters, with over 80 percent of annual precipitation falling between November and March. The Santiago Creek Dam watershed receives a 30-year mean annual precipitation of approximately 22 inches, ranging from approximately 14 inches at lower elevations to over 29 inches in the basin headwaters. Due to the basin's relatively low elevations and mild climate, precipitation within the basin generally falls as rain.

3.2.2 Environmental Setting

The Project APE is in the Central/Coastal Subregion of the Natural Communities Conservation Plan/Habitat Conservation Plan. The following vegetation types occur in the Project APE: sagebrush scrub, disturbed sagebrush scrub, sagebrush-coyote bush scrub, southern cactus scrub, disturbed southern cactus scrub, disturbed floodplain sage scrub, toyon-sumac chaparral, annual grassland, ruderal, riparian herb, southern willow scrub, mulefat scrub, disturbed mulefat scrub, southern sycamore riparian woodland, southern sycamore-coast live oak riparian woodland, southern black willow forest, disturbed southern black willow forest, southern black willow forest/riparian herb, coast live oak woodland, and western sycamore, and vegetated fluctuating shoreline. Many of these vegetation types would have been utilized by the first Californians, the ancestors of today's local Native American communities.

Other landcover includes cliff, open water, fluctuating shoreline, fluctuating shoreline, perennial stream, ornamental, developed, and disturbed areas.

3.3 REGIONAL GEOLOGY

Principal sources of existing information for this subsection included geologic maps and reports on the regional geology published by the U.S. Geological Survey (Schoellhamer et al. 1981; Morton and Miller 1981; Morton and Miller 2006) and unpublished reports, drawings, and photographs related to site-specific studies and construction of Santiago Creek Dam (Kempkey 1930; Marliave 1939). Review of these geologic publications and unpublished project reports provided a framework of the subsurface geologic conditions at the Project site, which served as the basis for preparation of the geotechnical investigation work plan and subsurface exploration program discussed in the Project's Environmental Impact Report (EIR) and this technical study.

As discussed above, Santiago Creek Dam is on Santiago Creek, which is a major north-flowing drainage in the Northern Santa Ana Mountains. Geologic mapping by Schoellhamer et al. (1981) and other subsequent geologic maps (e.g., Morton and Miller 1981; Morton and Miller 2006),

show the Project APE to be underlain by Cretaceous to Eocene sedimentary rock, which is locally overlain by Pleistocene to Holocene age alluvium. Bedrock in the vicinity of the outlet tower and spillway consists of marine sediments of the Williams Formation (Schoellhamer et al. 1981; WCC 1979). The Williams Formation is subdivided into the Schulz Ranch Sandstone Member and the Pleasants Sandstone Member. The Schulz Ranch Member, which is the stratigraphically lower member of the Williams Formation, is typically a brownish yellow to gray, massive coarse-grained sandstone, and conglomerate. Schoellhamer et al. (1981) also reported that portions of the Schulz Ranch Member consist of interbedded conglomeratic sandstone with siltstone beds that are about 12 to 30 feet thick. Schoellhamer et al. (1981) described the Pleasants Sandstone Member as a light brown to gray, fine-grained sandstone (Schoelhammer et al. 1981). The contact between the two members is mapped in the vicinity of the spillway.

Although the published literature (Schoellhamer 1954, 1981) describes the Williams Formation as predominantly consisting of sandstone, Marliave (1939) and WCC (1979) mapped much of the Williams Formation in the left abutment and spillway area as shale. Marliave (1939) mapped much of the spillway excavation and the entire length of the trench for the outlet pipe, and his mapping indicates a predominance of shale. Shale also was encountered in a diamond drill hole (Drill Hole No. 9) about 50 feet south of the outlet tower that was done as part of the original dam explorations (Kempkey 1930). The log of the borehole suggests that the top of the brown shale bedrock was at an elevation of approximately 672 feet. Based on the mapping and outlet trench log by Marliave (1939), the orientation of the bedrock in the vicinity of the spillway and outlet tower typically strikes northwest and dips approximately 50 to 75 degrees toward the southwest.

3.4 PRECONTACT SETTING

Southern California has a long history of human occupation, with dates of the earliest evidence of human occupation during the late Pleistocene, circa (ca.) 11,000 years B.C. (Glassow et al. 2007: 191). Precontact material culture in the State's southern region has been categorized according to periods or patterns that define technological, economic, social, and ideological elements. Within these periods, archaeologists have defined cultural patterns or complexes specific to prehistory within the State's southern region, including the Project site.

The following text and table (Table 1) illustrates the chronological framework developed for Southern California. This framework is divided into four major periods: Paleoindian period (ca. 11,000–7000 B.C.), Milling Stone period (7000 B.C.–3000 B.C.), Intermediate period (3000 B.C.–A.D. 500), and Late Precontact period (A.D. 500–Historic Contact). Within these broad temporal periods are variations in the timing and nomenclature of cultural complexes for the region. The timescales referenced in the following discussion are presented as calendar dates (years B.C.–A.D.).

TABLE 1
CULTURAL CHRONOLOGY FOR SOUTHERN CALIFORNIA

Period	Cultural Traits	Years (B.C.–A.D.)
Paleoindian	Clovis and Folsom Fluted Projectile Points	11,000 B.C.–7000 B.C.
Milling Stone	Ground Stone Implements; Large Leaf-Shaped Projectile Points	7000 B.C.–3000 B.C.
Intermediate	Large Side-Notched, Stemmed, and Leaf-Shaped Projectile Points; Mortar and Pestle	3000 B.C.–A.D. 500
Late Precontact	Smaller Projectile Points with Convex or Concave Bases, Bow and Arrow; Increased Population Size	A.D. 500 –1769

3.4.1 Paleoindian Period (11,000–7000 B.C.)

Recent data from coastal and inland sites during this period indicate that the economy was a diverse mixture of hunting and gathering, with a major emphasis on aquatic resources in many coastal areas and on Pleistocene lakeshores (Moratto 1984:90–92). Although few Clovis-like or Folsom-like fluted points have been found in Southern California, it is widely thought that there was a greater emphasis on hunting at near-coastal and inland sites during the Paleoindian Period than in later periods (e.g., Dillon 2002; Erlandson et al. 1987). Subsistence patterns shifted around 6000 B.C., concurrent with the gradual desiccation associated with the onset of the Altithermal, a warm and dry period that lasted for about 3,000 years. As the climate changed, a greater emphasis was placed on plant foods and small animals.

3.4.2 Milling Stone Period (7000–3000 B.C.)

The Milling Stone Period (Wallace 1955, 1978) is the earliest well-established period of occupation in Southern California (Glassow et al. 2007: 192). This period is characterized by an ecological adaptation to collecting, accompanied by a dependence on ground stone implements associated with the horizontal motion of grinding small seeds: milling stones (metates, slabs) and hand stones (manos, mullers). Milling stones are found in large numbers for the first time and become more numerous toward the end of this period. As evidenced by their tool kits and shell middens in coastal sites, people during this period practiced a mixed food-procurement strategy. Subsistence patterns became more specialized as groups became better adapted to their regional or local environments. Projectile points from the period are relatively rare, but are large and generally leaf-shaped, and were probably employed with darts or spears thrown with atlatls. Bone tools, such as awls, and items made from shell, including beads, pendants, and abalone dishes, are also quite uncommon. Evidence of weaving or basketry is present at a few sites. The mortar and pestle, associated with the vertical motion of pounding foods such as acorns, were introduced during the Milling Stone Period but do not become common until the Intermediate Period.

3.4.3 Intermediate Period (3000 B.C.–A.D. 500)

The Intermediate Period is characterized by a shift toward a hunting and maritime subsistence strategy, along with a wider use of plant foods. During this period, a pronounced trend toward greater adaptation to regional or local resources can be observed. For example, the remains of fish, land mammals, and marine mammals are increasingly abundant and diverse in sites along the Southern California coast. Chipped stone tools suitable for hunting are more common and both stylistically and technologically varied. Projectile points include large side-notched, stemmed, and lanceolate or leaf-shaped forms. Larger knives, a variety of stone flake scrapers, and drill-like implements are also common during this period. Shell fishhooks become an integral part of the tool kit. Bone tools, including awls, are more numerous than in the preceding period; and the use of asphaltum adhesive becomes more common.

3.4.4 Late Precontact Period (A.D. 500–1769)

During the Late Precontact Period, use of plant food resources increased in conjunction with land and marine mammal hunting. The variety and complexity of material culture also increased during this period, demonstrated by more diverse classes of artifacts. The recovery of many small, finely chipped projectile points, usually stemless with convex or concave bases, suggests an increased utilization of the bow and arrow for hunting rather than the atlatl and dart.

During this period, an increase in population size is accompanied by the advent of larger, more permanent villages with greater numbers of inhabitants (Wallace 1955:223). Some coastal and near coastal settlements were occupied by as many as 1,500 people. Many of these larger

settlements were permanent villages where at least some people resided year-round. The populations of these villages may have also increased seasonally.

3.5 POST CONTACT HISTORY

Prior to European exploration and colonization efforts in the 18th century, Orange County and the Santiago Canyon was home to Juaneño and Gabrielino Native American communities. The earliest European colonizers traveled through Orange County as part of Don Gaspar de Portolá's overland expedition into Alta California. The Portola expedition camped in what is now Santiago Canyon in July of 1769 and again in January of 1770 when missionary Juan Crespi noted the location of the Santiago Creek and that the missionaries had named it Santiago after the patron Saint of Spain. In 1797, Father Junipero Serra founded Mission San Gabriel in present day Los Angeles and Mission San Juan Capistrano in 1776. Between these two missions, the majority of Orange County was under mission control and used primarily as grazing lands. In 1821, Mexico gained independence from Spain and in 1833 the Mexican government moved to secularize former mission lands and granted them to Mexican citizens. Teodocio Yorba, the youngest son of Jose Antonio Yorba who was one of the largest landowners in orange County, received the Rancho Lomas de Santiago land grant in 1846. Teodocio established his ranch headquarters at the present site of Irvine Lake.

With the signing of the Treaty of Guadalupe Hidalgo in 1848, Alta California was ceded to the United States and California became a U.S. Territory. The Congressional Act of 1851 forced landholders to reapply to the Board of Land Commissioners to get valid title to their ranchos. Yorba was able to retain his claim to Rancho Lomas de Santiago and sold the rancho to William Wolfskill in 1860. After suffering financial misfortune as a result of the drought of 1863–1864, Wolfskill sold the rancho to Llewellyn Bixby, Thomas and Benjamin Flint, and James Irvine in 1866. Bixby, the Flints, and Irvine had also purchased other large sections of rancho land, but the acquisition of Rancho Lomas de Santiago was important to securing water rights in the region. In 1877, James Irvine acquired his partner's shares in the various ranchos they had purchased together becoming sole owner of over 110,000 acres of land that stretched 23 miles from the Pacific Ocean to the Santa Ana River.

3.5.1 Santiago Dam

Unless otherwise noted, the following information regarding the Santiago Dam was excerpted from the DPR 523 Series Forms for P-30-176757 (Santiago Dam) prepared by Cary D. Cotterman of Chambers Group, Inc.

For most of the late 19th and early 20th centuries, the land around the present site of Santiago Dam was used for cattle and sheep grazing, as well as recreation. The Serrano Irrigation District (known today as the SWD) provided water for the earliest citrus groves in the Orange and Villa Park areas, beginning in 1876. By the late 1920's, the demand for irrigation water had increased to the point that a large storage reservoir was needed. In response to this demand, the Serrano Irrigation District and the John T. Carpenter Water Company of Villa Park undertook a joint project in 1930, selling bond issues worth $400,000 to finance half of the dam's construction. The Irvine Company, which owned the land, matched that amount, for a total of $800,000. By October of 1930, engineer A. Kempkey of San Francisco, assisted by Irvine Company engineer Roy Browning, was making exploratory drillings into the bedrock at the proposed dam site on Santiago Creek prior to drawing the construction blueprints. Santiago Dam was constructed, creating Santiago Reservoir (now called Irvine Lake), during 1931. Although the dam was designed by Kempkey, the on-site supervising engineer was Wess Albert, and the construction contractor was R.G. Tourneau. The dam was completed in December 1931, and the reservoir was first completely filled, with water running over the spillway at its west end, in 1937. In 1934, a dam keeper's residence was constructed on a hillside overlooking the east end of the dam. The water

provided by the creation of the dam and reservoir contributed significantly to the early and mid-20th century development of the citrus industry in Orange County, one of the leading citrus-producing regions of the U.S. at that time. The facility was originally intended only for irrigation water storage but was opened for recreational use in 1941. Today, the IRWD still distributes untreated water from the reservoir for irrigation, while the SWD supplies treated drinking water to Villa Park and portions of Orange and operates Irvine Lake's recreational concessions.

4.0 METHODS

4.1 CULTURAL RESOURCES

4.1.1 Cultural Resource Records Search and Literature Review

An archaeological resources records search was conducted by Psomas at the South-Central Coastal Information Center (SCCIC) at California State University, Fullerton on September 21, 2021, and provided to PaleoWest. The SCCIC is the designated branch of the California Historical Resources Information System (CHRIS) for the Project area and houses records concerning archaeological and historic resources in Los Angeles, Ventura, San Bernardino, and Orange Counties. The review consisted of an examination of the USGS Black Star Canyon 7.5-minute quadrangle to evaluate the Project area for any sites recorded or cultural resources studies conducted on the parcel and within a one-mile radius. Data sources consulted at the SCCIC include the Historic Property Data File maintained by the California Office of Historic Preservation, archaeological records, Archaeological Determinations of Eligibility, Historical Landmarks, and historic maps. The records were reviewed to accomplish the following:

- Identify cultural resources (e.g., archaeological sites) in the Project site and surrounding areas;
- Identify and determine the adequacy of previous cultural resources studies in the Project site;
- Develop management recommendations for cultural resources within or adjacent to the Project site; and
- Assess what additional cultural resources studies would need to be undertaken for the proposed Project.

The results of the records searches are presented below in Subsection 5.1.

4.1.2 Native American Sacred Lands File Review

An inquiry was made of the NAHC on September 11, 2020, to request a review of the Sacred Lands File (SLF) database regarding the possibility of Native American cultural resources and/or sacred places in the Project vicinity that are not documented on other databases. The results of the SLF Review are presented below in Subsection 5.2.

4.1.3 Natural History Museum of Los Angeles County

Psomas requested a paleontological literature and records search from the Natural History Museum of Los Angeles County (NHM) on October 20, 2020. The results of the NHM search are presented below in Subsection 5.3.

4.1.4 Archaeological and Paleontological Field Survey

Psomas surveyed the Project site on October 20, 2020. The entire Project site (Figure 1) was surveyed by walking evenly spaced transects spaced no more than 10 meters (32 feet) apart. The archaeologist examined all areas considered highly sensitive for cultural resources and the ground surface for the presence of the following:

- Precontact artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools);
- Historic artifacts (e.g., metal, glass, ceramics);

- Sediment discoloration that might indicate the presence of a cultural midden;
- Depressions and other features indicative of the former presence of structures or buildings (e.g., post holes, foundations); and
- Fossil Localities.

Psomas maintained transect accuracy in the Project site using a Garmin global positioning system (GPS) receiver and Project field maps. A field notebook and a digital camera were used to record the survey conditions and findings. The results of the archaeological field survey are presented below in Subsection 5.4.

FIGURE 1: OVERVIEW OF PROJECT SITE

5.0 REPORT OF FINDINGS

5.1 SOUTH CENTRAL COASTAL INFORMATION CENTER

The SCCIC record search identified 28 prior technical cultural resources studies and academic overviews within 1.6 kilometer (km) (i.e., 1 mile) of the Project APE. Of the 28 previous investigations, 14 of these studies occurred or overlapped within the Project APE (Table 2). The studies crossed the current Project site as early as 1979 and as recently as 2007. The types of studies include academic overviews, cultural resource surveys and assessments, mitigation monitoring, and testing and evaluations. The academic overview studies are a testament to the archaeological sensitivity of region, including the Project site. The records search results summary letter from SCCIC is presented as Attachment A.

TABLE 2
CULTURAL RESOURCE STUDIES WITHIN THE PROJECT SITE

Report	Author	Year	Study	Type of Study
OR-00305	Schroth, Adella	1979	The History of Archaeological Research on Irvine Ranch Property: The Evolution of a Company Tradition	Cultural Resources Research
OR-00648	Breece, Bill and Beth Padon	1982	Cultural Resource Survey: Archaeological Resources. Foothill Transportation Corridor, Phase II	Cultural Resources Research
OR-00752	Mason, Roger D.	1984	Eastern Corridor Alignment Study, Orange County, California. Volume II: Prehistory and History	Cultural Resources Research
OR-00983	Bissell, Ronald M.	1989	Cultural Resources Reconnaissance of East Orange Planning Area 1: 1,800 Acres in Eastern Orange County, California	Cultural Resources Research
OR-01005	Breece, William H.	1989	Archaeological Survey of Proposed Landfill Gas Recovery and Disposal System at the Santiago Canyon and Prima Descheta Landfills	Cultural Resources Research
OR-01026	Mason, Roger D.	1990	Cultural Resources Survey Report Santiago Canyon Road Alignment Study Orange County, California	Cultural Resources Research
OR-01039	Sturm, Bradley L.	Unknown	An Archaeological Assessment of the Irvine Lake Desilting Project	Cultural Resources Research
OR-01080	Palmer, Robert	1991	Archaeological Monitoring at Santiago Canyon Landfill Flare Station	Cultural Resources Research
OR-02225	Strozier, Hardy	1978	The Irvine Company Planning Process and California Archaeology: A Review and Critique	Cultural Resources Research
OR-02534	Anonymous	1976	Annual Report to the Irvine Company from Archaeological Research, Inc.	Cultural Resources Research
OR-02858	Chace, Paul G.	1971	The Black Star Canyon Project: A Landmarks Survey	Cultural Resources Research

TABLE 2
CULTURAL RESOURCE STUDIES WITHIN THE PROJECT SITE

Report	Author	Year	Study	Type of Study
OR-02882	Dice, Michael and Christeen Taniguchi	2004	Final Phase II Archaeological Testing Evaluation of Irvine Ranch Cultural Resources. Santiago Hills Planned Community – Tract Maps Nos 16199 and 16201 and East Orange Planned Community Area – Tract Map No 16514 and the East Orange Planned Community	Cultural Resources Research
OR-02918	Cotterman, Cary D., Evelyn N. Chandler, and Roger D. Mason	2003	Cultural Resources Survey Report for a Verizon Telecommunications Facility: Santiago Dam Located at Irvine Lake (Santiago Reservoir), Orange County, California	Cultural Resources Research
OR-03600	Garcia, Kyle H. and Marcy Rockman	2007	Results of Archaeological Survey and Monitoring for Southern California Edison's Pole Replacements After Santiago Fire Along Santiago Canyon Road, Modjeska Canyon Road, and Hicks Canyon Road; Orange County, California	Cultural Resources Research

The SCCIC records searches identified 18 previously recorded cultural resources within 1.6 km (1 mile) of the Project site (Table 3). The previously recorded resources include two precontact isolates (ground stone), 12 precontact sites, three historic sites/built environments and one multicomponent site. The precontact sites consist of rock shelters, lithic scatters (stone debris left over from making stone tools), hearths (roasting pits/remnants of campfires), cairns (rock features), bedrock milling features (ground stone technology), habitation debris (midden), and burials. The historic sites consist of roads/trails, single family residences, standing structures, wells/cisterns, water conveyance systems and a standing engineering structure (dam). Of the 18 cultural resources, two (P-30-001012 and P-30176757) were identified within the Project APE. Cultural resource P-30-001012 is described as a precontact lithic scatter and cultural resource P-30-17657 is the Santiago Dam.

TABLE 3
PRIOR CULTURAL RESOURCES WITHIN THE 1-MILE RADIUS OF THE PROJECT APE

Primary Number	Site Number	Site Type	Attribute Type	Year(s) Recorded	Proximity to Project Site
P-30-000237	CA-ORA-237	Precontact: lithic scatter; cairns/rock features; burials; hearth/pits; other	AP02; AP08; AP09; AP11; AP16	1969	Outside
P-30-000238	CA-ORA-238	Precontact: burials; hearths/pits	AP09; AP11	1969	Outside
P-30-000239	CA-ORA-239	Precontact: lithic scatter	AP02	1969	Outside
P-30-000240	CA-ORA-240	Precontact: habitation debris	AP15	1968	Outside
P-30-000304	CA-ORA-304	Precontact: lithic scatter; bedrock milling feature	AP02; AP04	1971	Outside
P-30-000319	CA-ORA-319	Precontact: lithic scatter	AP02	1982	Outside
P-30-000320	CA-ORA-320	Precontact: lithic scatter; hearth/pits; rock shelter/cave	AP02; AP11; AP14	1995	Outside
P-30-001012	CA-ORA-1012	Precontact: lithic scatter	AP02	1971	Within
P-30-001272	CA-ORA-1272	Precontact: lithic scatter	AP02	1990	Outside
P-30-001277	CA-ORA-1277	Precontact: lithic scatter; rock shelter/cave	AP02; AP14	1971	Outside
P-30-001294	CA-ORA-1294	Precontact: lithic scatter; hearth/pits	AP02; AP11	1990	Outside
P-30-001460	CA-ORA-460/H	Multicomponent: lithic scatter; monument/mural/gravestone	AP02; HP26	1982	Outside
P-30-001474	CA-ORA-1474H	Historic: foundations/structures pads; landscaping/orchard; water conveyance system; standing structures; single family property; farm/ranch	AH02; AH03; AH06; AH15; HP02; HP33	2004	Outside
P-30-001535	CA-ORA-1535	Precontact: lithic scatter; cairns/rock features	AP02; AP08	1991	Outside
P-30-001771	CA-ORA-1771H	Historic: foundations/structure pads; landscaping/orchard; roads/trails/railroad grades	AH02; AH03; AH07	1990	Outside
P-30-100304	–	Precontact: isolated lithic scatter	AP02 (Isolate)	1991	Outside
P-30-100460	–	Precontact: isolated lithic scatter	AP02 (Isolate)	2004	Outside
P-30-176757	–	Historic: engineering structure; dam	HP11; HP21	2018	Within

P-30-001012 (CA-ORA-1012)

This archaeological site was originally recorded by W. H. Bryce in 1982 as a precontact lithic scatter measuring 70 x 95 meters and consisting of debitage (debris from manufacturing stone tools) and groundstone (stone that has been pecked or ground into a specific shape). The debitage includes 16 pieces of secondary debitage comprising of 12 white chert secondary flakes and four chalcedony flakes, all described as small to medium in size. The groundstone assembly includes one piece (fragment) of a basin metate and one piece (fragment) of a shallow bowl. The metate fragment measured 19 x 19 x 7 centimeters (cm) and the stone bowl fragment measured 21 x 14 x 26 cm.

In 2004, Michael Brandman and Associates (MBA) relocated the archaeological site. None of the cultural resources (artifacts discussed above) identified by Bryce in 1982 were visible on the ground surface. However, it should be noted disturbance from agricultural activities may have displaced these resources after 1982.

Using the previous archaeological site record prepared by Bryce in 1982, MBA placed a backhoe trench 30 meters north of Santiago Canyon Road to determine if cultural resources and/or a cultural midden is located below the surface. The trench was placed northwest of the intersection of Santiago Canyon Road and Blue Diamond Road and was excavated to a depth of 2.5 meters below the surface. No cultural resources (i.e., groundstone, projectile points) were recovered from the excavations. Furthermore, no stratigraphic evidence for cultural middens (habitation debris) was observed in the trench. MBA also described the first 80 cm below the surface as a plow zone (top layer of soil through which a plow penetrates).

MBA evaluated the archaeological site in accordance with CEQA, using criteria outlined for the CRHR eligibility. MBA's conclusion was the site does not qualify for the CRHR and is not a unique archaeological resource for the purposes of CEQA. MBA also concluded it is unlikely that any of the characteristics from the site described by Bryce will be impacted should modifications to the road be necessary at a future date; however, MBA also concluded that should modifications take place within the site boundary beyond the area tested, additional subsurface investigations should be considered.

P-30-176757 (Santiago Dam)

As a cultural resource, Santiago Dam (Figure 2) was first documented by Cary D. Cotterman of Chambers Group, Inc in 2003. Cotterman prepared a DPR 523 Series Form documenting the dam was built in 1931 as an earthen and concrete structure containing 1,100,000 cubic yards of clay, porous soil, and rock. Cotterman notes the dam is 1,425 feet (0.27 mile) long as it's crest, which rises 136 feet above the surrounding ground at its highest point. Cotterman recommended the dam as eligible for listing on the NRHP under Criterion A (see Subsection 2.1.1 for eligibility criteria).

FIGURE 2: VIEW OF SANTIAGO DAM

5.2 NATIVE AMERICAN SACRED LANDS FILE REVIEW RESULTS

On September 11, 2020, Psomas requested that the NAHC conduct a search of its SLF to determine if cultural resources important to Native Americans have been recorded in the Project site or in the immediate vicinity. The results of the NAHC SLF search were received on October 9, 2020, and were positive for sacred lands in the vicinity of the Project APE. The NAHC recommended contacting the Juaneño Band of Mission Indians Acjachemen Nation – Belardes for more information.

The results letter also included a list of tribes affiliated with the Project APE (see Table 4). Consultation pursuit to AB 52 was conducted by the Districts. The results of the AB 52 consultation between the Districts and local Native American representatives will be documented as part of the CEQA review prepared for the Project. The SLF search results summary letter from the NAHC is presented as Attachment C.

TABLE 4
NAHC TRIBAL REPRESENTATIVES CONTACT LIST

Tribal Organization	Indigenous Affiliation	Contact(s)
Campo Band of Diegueno Mission Indians	Diegueno	Ralph Goff
Ewiiaapaayp Band of Kumeyaay Indians	Diegueno	Robert Pinto; Michael Garcia
Cabazon Band of Mission Indians	Cahuilla	Daniel Salgada
Gabrieleno Band of Mission Indians – Kizh Nation	Gabrieleno	Andrew Salas
Gabrieleno/Tongva San Gabriel Band of Mission Indians	Gabrieleno	Anthony Morales
Gabrielino/Tongva Nation	Gabrielino	Sandonne Goad
Gabrielino Tongva Indians of California Tribal Council	Gabrielino	Robert Dorame
Gabrielino-Tongva Tribe	Gabrielino	Charles Alvarez
Juaneño Band of Mission Indians Acjachemen - Belardes	Juaneño	Matias Belardes
La Posta Band of Diegueno Mission Indians	Diegueno	Gwendolyn Parada; Javaugh Miller
Pala Band of Mission Indians	Cupeno; Luiseno	Shasta Gaughen
Manzanita Band of Kumeyaay Nation	Diegueno	Angela Elliott
Mesa Grande Band of Diegueno Mission Indians	Diegueno	Michael Linton
Pala Band of Mission Indians	Cupeno; Luiseno	Shasta Gaughen
Santa Rosa Band of Cahuilla Indians	Cahuilla	Lovina Redner
Soboba Band of Luiseno Indians	Cahuilla; Luiseno	Isaiah Vivanco

5.2.1 Paleontological Record Search Results

The paleontological records search was completed on October 16, 2020. The record search included a thorough search of the NHM paleontology collection records for the locality and specimen data for the Project APE and surrounding area. The records search identified fossil localities that lie directly within the proposed Project APE as well as numerous fossil localities nearby from the same sedimentary deposits that occur in the proposed Project area, either at the surface or at depth. One locality, LACM IP 26171, is located along the northwest shore of Santiago Reservoir, where unspecified invertebrates were collected from the Williams Formation during excavations for the spillway in 1969 (depth of fossils is not known). Additionally, eight localities were located nearby from the same sedimentary deposits that occurs in the Project site, either at

the surface or at depth. As indicated above, the Project site is generally underlain by Pleistocene to Holocene age alluvium, which could contain unknown fossils.

5.3 ARCHAEOLOGICAL AND PALEONTOLOGICAL FIELD SURVEY RESULTS

As indicated above, a Psomas cross-trained archaeologist/paleontologist surveyed the Project APE on October 20, 2020. The Psomas archaeologist did not identify new archaeological and/or paleontological resources within the Project APE; however, it should be noted the ground visibility was obscured by several species of native and non-native vegetation. Additionally, Psomas relocated archaeological site P-30-001012 (Figure 3). None of the cultural resources recorded by W. H. Bryce 1982 were observed on the surface; however, as MBA noted in 2004 the artifact assemblage and site boundary were not observed due to the site being stripped for agricultural practices along with scattered debris piled and placed along a nearby small drainage (see Attachment D for updated record).

Additionally, the Santiago Dam is located within the Project APE. As noted in the Executive and Management Summary above, a separate historic built environment assessment of the structures and technical report has been prepared by South Environmental.

FIGURE 3: OVERVIEW OF P-30-001012 (CA-ORA-1012)

6.0 DISCUSSION AND IMPACT ANALYSIS

6.1 DISCUSSION

Psomas conducted archaeological resources field investigations within the proposed Project APE on October 20, 2020. The main goal of the investigations was to gather and analyze information needed to determine if the Project would have a significant impact on properties eligible for the NRHP and the CRHR and to provide mitigation measures for those resources. The results of the 2021 SCCIC cultural resources records searches identified 18 previously recorded cultural resources within 1.6 km (1 mile) of the Project site. The previously recorded resources include two precontact isolates (ground stone), 12 precontact sites, three historic sites/built environments and one multicomponent site. The precontact sites consist of rock shelters, lithic scatters (stone debris left over from making stone tools), hearths (roasting pits/remnants of campfires), cairns (rock features), bedrock milling features (ground stone technology), habitation debris (midden), and burials. The historic sites consist of roads/trails, single family residences, standing structures, wells/cisterns, water conveyance systems and a standing engineering structure (dam). Of the 18 cultural resources, two (P-30-001012 and P-30176757) were identified within the Project APE. Cultural resource P-30-001012 is described as a precontact lithic scatter and cultural resource P-30-17657 is the Santiago Dam. Furthermore, the NAHC SLF search was positive for sacred sites. Consultation with tribal representatives was initiated by the Districts.

Fieldwork (archaeological and paleontological survey) relocated P-30-001012; however, none of the cultural resources recorded by W. H. Bryce 1982 were observed on the surface; though, MBA noted in 2004 the artifact assemblage and site boundary for P-30-001012 were not relocated due to the site being stripped for agricultural practices and scattered debris piled placed along a nearby small drainage. No new archaeological resources and/or cultural resources were identified within the Project APE. Nevertheless, it should be noted both the Project APE and the surrounding area should be considered highly sensitive for archaeological resources dating to both the precontact period and the historic era.

Additionally, no new paleontological resources (fossil localities and/or unique geologic units) were identified during the field survey. As noted above, LACM IP 26171, located along the northwest shore of Santiago Reservoir, was collected from the Williams Formation during excavations for the spillway in 1969.

Moreover, the Santiago Dam is located within the Project APE. As noted in the Executive and Management Summary above, a separate historic built environment assessment of the structures and technical report has been prepared by South Environmental.

6.2 FINDINGS OF NO EFFECT/SIGNIFICANT IMPACT

This analysis is provided to assist the Lead Agencies in fulfilling their compliance responsibilities under NEPA and CEQA. The results of the 2021 field study did not identify new archaeological and/or cultural resources. Additionally, the archaeological resource, P-30-001012 was relocated; however, the artifact assemblage and original site boundary for P-30-001012 were not relocated due to the site being stripped for agricultural practices and scattered debris piled placed along a nearby small drainage. Furthermore, MBA evaluated the archaeological site in accordance with CEQA, using criteria outlined for the CRHR eligibility. MBA's conclusion was the site does not qualify for the CRHR and is not a unique archaeological resource for the purposes of CEQA. MBA also concluded it is unlikely that any of the characteristics from the site described by Bryce will be impacted should modifications to the road be necessary at a future date; however, MBA also concluded that should modifications take place within the site boundary beyond the area tested, additional subsurface investigations should be considered.

Moreover, no new fossil localities were identified during the field survey; therefore, all data considered, the proposed Project will not have a significant impact or adverse effect on eligible archaeological resources or known fossil localities and/or unique geological units within the Project APE.

7.0 RECOMMNENDED MITIGATION MEASURES

While no significant and/eligible archaeological and/or TCRs were identified in the Project site, several cultural resources from both the precontact and historic periods of California history have been documented within 1-mile of the Project APE.

Furthermore, no significant paleontological resources were identified in the Project site; however, the results from the NHM identified the Project APE and the surrounding area as highly sensitive for marine fossil localities and unique geologic units.

Therefore, Psomas recommends the following mitigation measures in the event of an accidental discovery of archaeological and/or paleontological resources and adherence to existing regulations and protocols for the discovery of human remains. Furthermore, additional mitigation measures may be requested during the AB 52 tribal consultation process.

7.1 MITIGATION MEASURES

MM CUL-1 Prior to the issuance of the grading permit, the applicant shall provide written evidence to the Districts that the applicant has retained an Orange County-certified archaeologist to observe grading activities within previously undisturbed soils, including geotechnical excavations, and to salvage and catalogue archaeological resources as necessary. The archaeologist shall be present at the pre-grade conference, shall establish procedures for archaeological resource surveillance within previously undisturbed soils, and shall establish, in cooperation with the applicant, procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the artifacts as appropriate. If archaeological resources are inadvertently unearthed during excavation activities (within disturbed or undisturbed soils), the contractor shall immediately cease all earth-disturbing activities within a 100-foot radius of the area of discovery and the archaeologist and Districts shall be notified immediately. If the archaeological resources are found to be significant, the archeologist, in consultation with the Districts and tribal representatives, shall determine appropriate actions for exploration and salvage. After the find has been appropriately avoided or mitigated, work in the area may resume.

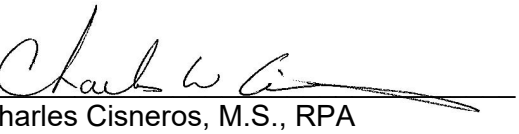
MM GEO 1 Prior to the issuance of the grading permit, the applicant shall provide written evidence to the Districts that the applicant has retained an Orange County-certified paleontologist to observe grading activities within previously undisturbed soils, including geotechnical excavations, and to salvage and catalogue paleontological resources as necessary. The paleontologist shall be present at the pre-grade conference, shall establish procedures for paleontological resource surveillance within previously undisturbed soils, and shall establish, in cooperation with the applicant, procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the fossils/unique geological units as appropriate. In the event that paleontological resources are inadvertently unearthed during excavation activities, the contractor shall immediately cease all earth-disturbing activities within a 100-foot radius of the area of discovery and the contractor shall contact the Districts immediately. If the paleontological resources are found to be significant, the paleontologist, in consultation with the District, shall determine appropriate actions for exploration and salvage. After the find has been appropriately avoided or mitigated, work in the area may resume.

7.2 EXISTING REGULATORY REQUIREMENTS

RR CUL-1 If human remains are found during ground-disturbing activities, no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur, in accordance with Section 7050.5 of the California Health and Safety Code. The County Coroner shall be notified of the discovery immediately. If the County Coroner determines that the remains are or believed to be Native American, s/he shall notify the NAHC in Sacramento within 24 hours of the discovery. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site by the Districts. The Districts would meet and confer with the most likely descendant regarding their recommendations prior to disturbing the site by further construction activity.

8.0 CERTIFICATION

I hereby certify that the statements furnished above in this draft report and in the attached exhibits present the data and information required for this Historic Property Identification Report (Archaeological Resources) and Paleontological Resources Study, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: February 9, 2024 SIGNED: 

Charles Cisneros, M.S., RPA
Senior Archaeologist

9.0 REFERENCES CITED

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Erlandson, J. M., T. C., and R. Carrico.1987. A Fluted Projectile Point Fragment from the Southern California Coast: Chronology and Context at CA-SBA-1951. *Journal of California and Great Basin Anthropology* 9:120–128.

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Morton, P.K. and Miller R.V. 1981. Geologic map of Orange County, California, showing mines and mineral deposits. California Division of Mines and Geology, U.S. Geological Survey Professional Paper 420-D

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Schoellhamer, J. E., D. M. Kinney, R. F. Yerkes, and J. G. Vedder, 1954, Geologic map of the northern Santa Ana Mountains, Orange and Riverside counties, California: USGS Oil and Gas Inv. Map OM-154.

Schoellhamer, J.G., Vedder, J.G., Yerkes, R.F. and Kinney, D.M. 1981. Geology of the Northern Santa Ana Mountains, California: U.S. Geological Survey Professional Paper 420-D.

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ATTACHMENT A

SCCIC CULTURAL RESOURCES LITERAURE REVIEW AND RECORDS SEARCH RESULTS

ReportNum	DocAddlCitLetter	Status	OtherIDs	Xrefs	Authors	CitYear	CitMonth	CitTitle	CitPublisher
OR-00305					Schroth, Adella	1979		The History of Archaeological Research on Irvine Ranch Property: the Evolution of a Company Tradition	Archaeological Resource Management Corp.
OR-00648					Breece, Bill and Beth Padon	1982		Cultural Resource Survey: Archaeological Resources: Foothill Transportation Corridor, Phase Ii	LSA Associates, Inc.
OR-00752					Mason, Roger D.	1984		Eastern Corridor Alignment Study, Orange County, California; Volume II: Prehistory and History	Scientific Resource Surveys, Inc.
OR-00983					Bissell, Ronald M.	1989		Cultural Resources Reconnaisance of East Orange Planning Area 1, 1,800 Acres in Eastern Orange County, California	RMW Paleo Associates, Inc.
OR-01005					Breece, William H.	1989		Archaeological Survey of Proposed Landfill Gas Recovery and Disposal System at the Santiago Canyon and Prima Deschecha Landfills	LSA Associates, Inc.
OR-01026					Mason, Roger D.	1990		Cultural Resources Survey Report Santiago Canyon Road Alignment Study Orange County, California	The Keith Companies Archaeological Division
OR-01039					Sturm, Bradley L.			An Archaeological Assessment of the Irvine Lake Desilting Project	Bradley Strum
OR-01080					Palmer, Robert	1991		Archaeological Monitoring at Santiago Canyon Landfill Flare Station	LSA Associates, Inc.
OR-02225			Other - Irvine Ranch		Strozier, Hardy	1978		The Irvine Company Planning Process and California Archaeology- A Review and Critique	The Irvine Company
OR-02534						1976		Annual Report to The Irvine Company from Archaeological Research, Inc.	ARI

ReportNum	DocAddlCitLetter	Status	OtherIDs	Xrefs	Authors	CitYear	CitMonth	CitTitle	CitPublisher
OR-02858					Chace, Paul G.	1971		The Black Star Canyon Project a Landmarks Survey	Pacific Coast Archaeological Society Quarterly
OR-02882					Dice, Michael and Christeen Taniguchi	2004		Final Phase 2 Archaeological Testing Evaluation of Irvine Ranch Cultural Resources: Santiago Hill Ii Planned Community (shiipc)-tract Maps Nos. 16199 and 16201 and the East Orange Planned Community (eopc) Area I-tract Map No. 16514 and the East Orange Pla	Michael Brandman Associates
OR-02918			Cellular -		Cotterman, Cary D., Chandler, Evelyn N., and Mason, Roger D.	2003		Cultural Resources Survey Report for a Verizon Telecommunications Facility: Santiago Dam Located at Irvine Lake (Santiago Reservoir) Orange County, California	Chambers Group, Inc.
OR-03600					Garcia, Kyle H. and Marcy Rockman	2007		Results of Archaeological Survey and Monitoring for Southern California Edison's Pole Replacements After Santiago Fire Along Santiago Canyon Road, Modjeska Canyon Road, and Hicks Canyon Road; Orange County, California; Jo:6259-0468	PCR Services Corporation

ReportNum	CitPages	CitMaps	ReportType	InventorySize	InventoryDisclosure	InventoryCollections	InventoryNotes	Resources	ResourceCount	HasInformals	Counties	Maps
OR-00305	33		Literature search	QC	Not for publication	Unknown	Mapped to Irvine Ranch boundaries found online. Removed from unmappable folder.	30-000002, 30-000044, 30-000047, 30-000048, 30-000051, 30-000053, 30-000059, 30-000060, 30-000061, 30-000062, 30-000063, 30-000064, 30-000065, 30-000066, 30-000067, 30-000068, 30-000069, 30-000070, 30-000071, 30-000072, 30-000073, 30-000077, 30-000091, 30-000099, 30-000100, 30-000104, 30-000106, 30-000107, 30-000109, 30-000111	30	No	Orange	BLACK STAR CANYON, EL TORO, LAGUNA BEACH, ORANGE, SAN JUAN CAPISTRANO, TUSTIN
OR-00648	59		Archaeological, Field study	QC				30-000244, 30-000304, 30-000361, 30-000442, 30-000450, 30-000451, 30-000458, 30-000479, 30-000485, 30-000486, 30-000487, 30-000488, 30-000507, 30-000545, 30-000564, 30-000601, 30-000629, 30-000630, 30-000641, 30-000649, 30-000650, 30-000651, 30-000710, 30-000711, 30-000712, 30-000713, 30-000719, 30-000725, 30-000726, 30-000853, 30-000864, 30-000865, 30-000866	33	No	Orange	BLACK STAR CANYON, CANADA GOBERNADORA, EL TORO, ORANGE, SANTIAGO PEAK, TUSTIN
OR-00752	210		Archaeological, Field study	QC				30-000184, 30-000303, 30-000304, 30-000321, 30-000513, 30-000541, 30-000546, 30-000547, 30-000556, 30-000557, 30-000584, 30-000585, 30-000586, 30-000587, 30-000588, 30-000589, 30-000590, 30-000591, 30-000592, 30-000626, 30-000770, 30-000771, 30-000772, 30-000793, 30-000794, 30-000795, 30-000818, 30-000819, 30-000820, 30-000962, 30-001067, 30-001068, 30-001195, 30-001196, 30-001197, 30-001198, 30-001199, 30-001200, 30-001201	39	No	Orange	BLACK STAR CANYON, EL TORO, ORANGE, TUSTIN
OR-00983	25		Archaeological, Field study	QC				30-000304, 30-000770, 30-001068, 30-001218, 30-001219, 30-001220	6	No	Orange	BLACK STAR CANYON, ORANGE
OR-01005	15		Archaeological, Field study	QC					0	No	Orange	BLACK STAR CANYON, DANA POINT, SAN CLEMENTE
OR-01026	16		Archaeological, Field study	QC				30-000304, 30-000476, 30-000479, 30-000556, 30-000629, 30-000722, 30-000770, 30-001005, 30-001008, 30-001012, 30-001097, 30-001220, 30-001224, 30-001225, 30-001226, 30-001227, 30-001228	17	No	Orange	BLACK STAR CANYON, EL TORO, ORANGE, SANTIAGO PEAK
OR-01039	25		Archaeological, Field study	QC					0	No	Orange	BLACK STAR CANYON
OR-01080	3		Monitoring	QC					0	No	Orange	BLACK STAR CANYON
OR-02225	5		Management/planning	QC	Unrestricted	No			0	No	Orange	BLACK STAR CANYON, EL TORO, LAGUNA BEACH, NEWPORT BEACH, ORANGE, SAN JUAN CAPISTRANO, TUSTIN
OR-02534	17		Archaeological, Other research	QC	Not for publication	Yes	Mapped to Irvine Ranch boundaries found online, removed from unmappable folder.	30-000051, 30-000064, 30-000099, 30-000100, 30-000106, 30-000119, 30-000130, 30-000184, 30-000196, 30-000197, 30-000484, 30-000518, 30-000575	13	No	Orange	BLACK STAR CANYON, EL TORO, LAGUNA BEACH, ORANGE, SAN JUAN CAPISTRANO, TUSTIN

ReportNum	CitPages	CitMaps	ReportType	InventorySize	InventoryDisclosure	InventoryCollections	InventoryNotes	Resources	ResourceCount	HasInformals	Counties	Maps
OR-02858	40		Archaeological, Evaluation, Field study	QC				30-000132, 30-000317, 30-000318, 30-000319, 30-000320	5	No	Orange	BLACK STAR CANYON
OR-02882	193		Excavation, Other research	QC				30-000237, 30-000238, 30-000239, 30-001012, 30-001218, 30-001240, 30-001294, 30-001474, 30-001548, 30-001549	10	No	Orange	BLACK STAR CANYON, ORANGE
OR-02918	37		Archaeological, Field study	QC				30-176757	1	No	Orange	BLACK STAR CANYON
OR-03600	13		Monitoring	QC					0	No	Orange	BLACK STAR CANYON, EL TORO, SANTIAGO PEAK

PrimaryString	TrinomialString	ResourceName	Status	OtherIDs	Xrefs	ResType	Age	InfoBase	Attribs	ResourceDisclosure	ResourceCollections	RecordingEvents	Reports	CountyName	Maps	Address
P-30-000237	CA-ORA-000237	Limestone Canyon Site, Santiago Canyon Site		Resource Name - Limestone Canyon Site, Santiago Canyon Site		Site	Prehistoric	Survey, Excavation	AP02; AP08; AP09; AP11; AP16	Not for publication	Yes	1969 (HUDSON, PCAS)	OR-00302, OR-00528, OR-00530, OR-01353, OR-01995, OR-02882	Orange	BLACK STAR CANYON	
P-30-000238	CA-ORA-000238	Limestone Canyon Site, Santiago Canyon Site		Resource Name - Limestone Canyon Site, Santiago Canyon Site		Site	Prehistoric	Survey, Excavation	AP09; AP11	Not for publication	No	1969 (HUDSON, D.T., PCAS)	OR-00302, OR-00528, OR-00530, OR-01995, OR-02882	Orange	BLACK STAR CANYON	
P-30-000239	CA-ORA-000239	Santiago Canyon Site, Limestone Canyon Site		Resource Name - Santiago Canyon Site, Limestone Canyon Site		Site	Prehistoric	Survey, Excavation	AP02	Not for publication	Unknown	1969 (HUDSON, PCAS)	OR-00302, OR-00528, OR-00530, OR-01995, OR-02882	Orange	BLACK STAR CANYON	
P-30-000240	CA-ORA-000240					Site	Prehistoric	Survey	AP15	Not for publication	No	1968 (HUDSON, PCAS)	OR-00302, OR-01995	Orange	BLACK STAR CANYON	
P-30-000304	CA-ORA-000304					Object, Site	Prehistoric	Survey, Testing, Excavation, Other	AP02; AP04	Not for publication	Yes	1971 (Fritz, Ken, PCAS); 1982 (Breece, William H., LSA); 1995 (Schultz, Lynna, Raytheon Infrastructure Services)	OR-00302, OR-00648, OR-00752, OR-00983, OR-01026, OR-01484, OR-01995	Orange	BLACK STAR CANYON	
P-30-000319	CA-ORA-000319					Site	Prehistoric	Survey	AP02	Not for publication	Unknown	1971 (COLEGROVE, Archaeological Research, Inc); 1990 (Evans, Stuart, RMW Paleo Associates)	OR-00521, OR-01106, OR-01758, OR-01995, OR-02858	Orange	BLACK STAR CANYON	
P-30-000320	CA-ORA-000320					Site	Prehistoric	Survey	AP02; AP11; AP14	Not for publication	Yes	1971 (Colegrove, S., Archaeological Research Inc); 1990 (Becker, Kenneth, RMW Paleo Associates)	OR-00521, OR-01106, OR-01758, OR-01995, OR-02858	Orange	BLACK STAR CANYON	
P-30-001012	CA-ORA-001012	WH8-#1		Resource Name - WH8-#1		Site	Prehistoric	Survey, Testing	AP02	Not for publication	No	1982 (W.H. Breece); 2004 (Keasling; Dice, Michael Brandman Associates)	OR-01026, OR-02882	Orange	BLACK STAR CANYON	
P-30-001272	CA-ORA-001272	NOCLATS-91-1		Resource Name - NOCLATS-91-1		Site	Prehistoric	Survey	AP02	Not for publication	No	1991 (BECKER / EVANS, RMW Paleo Associates)	OR-01089, OR-02009, OR-02073	Orange	BLACK STAR CANYON	
P-30-001277	CA-ORA-001277	NOCLATS-SE-2		Resource Name - NOCLATS-SE-2		Site	Prehistoric	Survey	AP02; AP14	Not for publication	No	1990 (EVANS, RMW Paleo Associates, Inc.)	OR-01089, OR-01106	Orange	BLACK STAR CANYON	
P-30-001294	CA-ORA-001294	MCKENNA NO. 1		Resource Name - MCKENNA NO. 1		Site	Prehistoric	Survey, Testing, Excavation	AP02; AP11	Not for publication	Yes	1991 (MCKENNA, McKenna et al.); 2004 (Keasling; Dice, Michael Brandman Associates); 2018 (Hubert Switalski, Stantec)	OR-01136, OR-02882	Orange	BLACK STAR CANYON	
P-30-001460	CA-ORA-001460/H	ETC 96-1, ETC 96-2, ETC 96-3		Resource Name - ETC 96-1, ETC 96-2, ETC 96-3		Site	Prehistoric, Historic	Survey, Testing, Excavation	AP02; HP26	Not for publication	No	1996 (Davy, D., Foster Wheeler Environmental Corp.); 2015 (T. Fulton, LSA)	OR-03418, OR-04513, OR-04559, OR-04560	Orange	BLACK STAR CANYON	
P-30-001474	CA-ORA-001474H	Wilmont Camp, ETC-97-2		Resource Name - Wilmont Camp, ETC-97-2		Site	Historic	Survey, Testing, Other	AH02; AH03; AH06; AH15; HP02; HP33	Not for publication	No	1997 (McKeehan, Judy, Foster Wheeler Environmental Corp.); 2004 (Keasling; Dice, Michael Brandman Associates)	OR-02882	Orange	BLACK STAR CANYON	Santiago Canyon Road
P-30-001535	CA-ORA-001535	Jail 3		Resource Name - Jail 3		Site	Prehistoric	Survey	AP02; AP08	Not for publication	Unknown	1999 (D. Ferraro, RMW Paleo Associates, Inc.)	OR-02073	Orange	BLACK STAR CANYON	
P-30-001771	CA-ORA-001771H	Saddleback Park		Resource Name - Saddleback Park		Site	Historic	Survey	AH02; AH03; AH07	Not for publication	No	2018 (Hubert Switalski, Stantec)		Orange	BLACK STAR CANYON	
P-30-100304		Santiago Road Overcrossing Isolates		Resource Name - Santiago Road Overcrossing Isolates; Voided - 30-100042	See also 30-100042	Other	Prehistoric	Survey	AP02	Not for publication	Unknown	1995 (B. Padon, Petra Resources, Inc); 2018 (Hubert Switalski, Stantec)		Orange	BLACK STAR CANYON	
P-30-100460		Isolate (Mano)		Resource Name - Isolate (Mano)		Other	Prehistoric	Survey, Surface collection	AP02	Not for publication	Yes	1991 (J. McKenna, McKenna et al); 2018 (Hubert Switalski, Stantec)		Orange	BLACK STAR CANYON	
P-30-176757		Santiago Dam		OHP Property Number - 152819; Resource Name - Santiago Dam; Other - California Department of Water Resources Dam No. 75-000		Structure	Historic	Survey	HP11; HP21	Unrestricted		2003 (C. D. Cotterman, Chambers Group, Inc)	OR-02918	Orange	BLACK STAR CANYON	3301 Santiago Rd Orange

ATTACHMENT B

NATIVE AMERICAN HERITAGE COMMISSION
SACRED LANDS FILE SEARCH RESULTS

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

October 9, 2020

Charles Cisneros
Psomas

Via Email to: Charles.Cisneros@psomas.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Santiago Dam Project, Orange County

Dear Mr. Cisneros:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

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.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (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 that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- 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;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the 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 measures.

      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 public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was positive. Please contact the Juaneno Band of Mission Indians Acjachemen Nation - Belardes on the attached list for more information.

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

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

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. 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 event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

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

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
Orange County
10/9/2020

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Band of Kumeyaay Indians
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Ewiiaapaayp Band of Kumeyaay Indians
Michael Garcia, Vice Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 — Gabrielino
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 — Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street — Gabrielino
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
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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 is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Santiago Dam Project, Orange County.

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10/9/2020

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ATTACHMENT C

NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY
PALEONTOLOGY RECORDS SEARCH RESULTS

Records Removed for Purposes of Confidentiality

ATTACHMENT D

CONFIDENTIAL DEPARTMENT OF PARKS & RECREATION 523 FORM P-30-001012 (CA-ORA-1012)

Records Removed for Purposes of Confidentiality

ATTACHMENT E

SOUTH ENVIRONMENTAL HISTORICAL RESOURCES EVALUATION REPORT

Historic Property Identification Report

Santiago Creek Dam Outlet Tower and Spillway Improvements Project, Orange County, California

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November 2023

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Executive Summary

South Environmental was retained by Psomas to complete a Historic Property Inventory Report (HPIR) for the Santiago Creek Dam Outlet Tower and Spillway Improvements Project (proposed project) located in Orange County, California. This report includes the results of an intensive-level pedestrian survey of all built environmental resources over 45 years old within the project's Area of Potential Effect (APE); building development and archival research; recordation and evaluation of the Santiago Creek Dam Complex (P-30-176757) and the Southern California Edison (SCE) Taiwan 12 kilovolt (kV) overhead distribution line for historical significance in consideration of federal, state, and local designation criteria and integrity requirements; and an assessment of project-related effects on historic properties/historical resources.

The report was prepared in conformance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulation Title 36 Code of Federal Regulations (CFR) Part 800, the California Environmental Quality Act (CEQA) Section 15064.5 for historical resources, and in consideration of all applicable local guidelines and regulations concerning cultural resources.

One historic property/historical resource was identified within the project APE: the Santiago Dam Complex (P-30-176757), which currently has a status code of 2S2, indicating it has been determined eligible for the NRHP and is listed in the CRHR. The updated evaluation completed as part of the current study found that the Dam remains eligible for the NRHP/CRHR under Criterion A/1. The Dam is eligible for its important historical associations with water resources development in Orange County, as well as with the citrus agriculture industry.

Although specific aspects of the Dam will be modified, it will remain recognizable as an earthen embankment dam and will continue to perform the historic function for which it is eligible. The character-defining features of the Dam necessary for it to continue to convey its historical significance under Criterion A/1 include its ongoing function as an earthen embankment dam on Santiago Creek, maintaining the same general massing and scale. Therefore, the proposed project will result in no adverse effects to historic properties under Section 106 of the NHPA, and no significant impacts to historical resources under CEQA.

1 Introduction

South Environmental was retained by Psomas to complete a Historic Property Inventory Report (HPIR) for the Santiago Creek Dam Outlet Tower and Spillway Improvements Project (proposed project) located in Orange County, California. This report includes the results of an intensive-level pedestrian survey of all built environmental resources over 45 years old within the project's Area of Potential Effect (APE); building development and archival research; recordation and evaluation of the Santiago Creek Dam Complex (P-30-176757) and the Southern California Edison (SCE) Taiwan 12 kilovolt (kV) overhead distribution line for historical significance in consideration of federal, state, and local designation criteria and integrity requirements; and an assessment of project-related effects on historic properties/historical resources.

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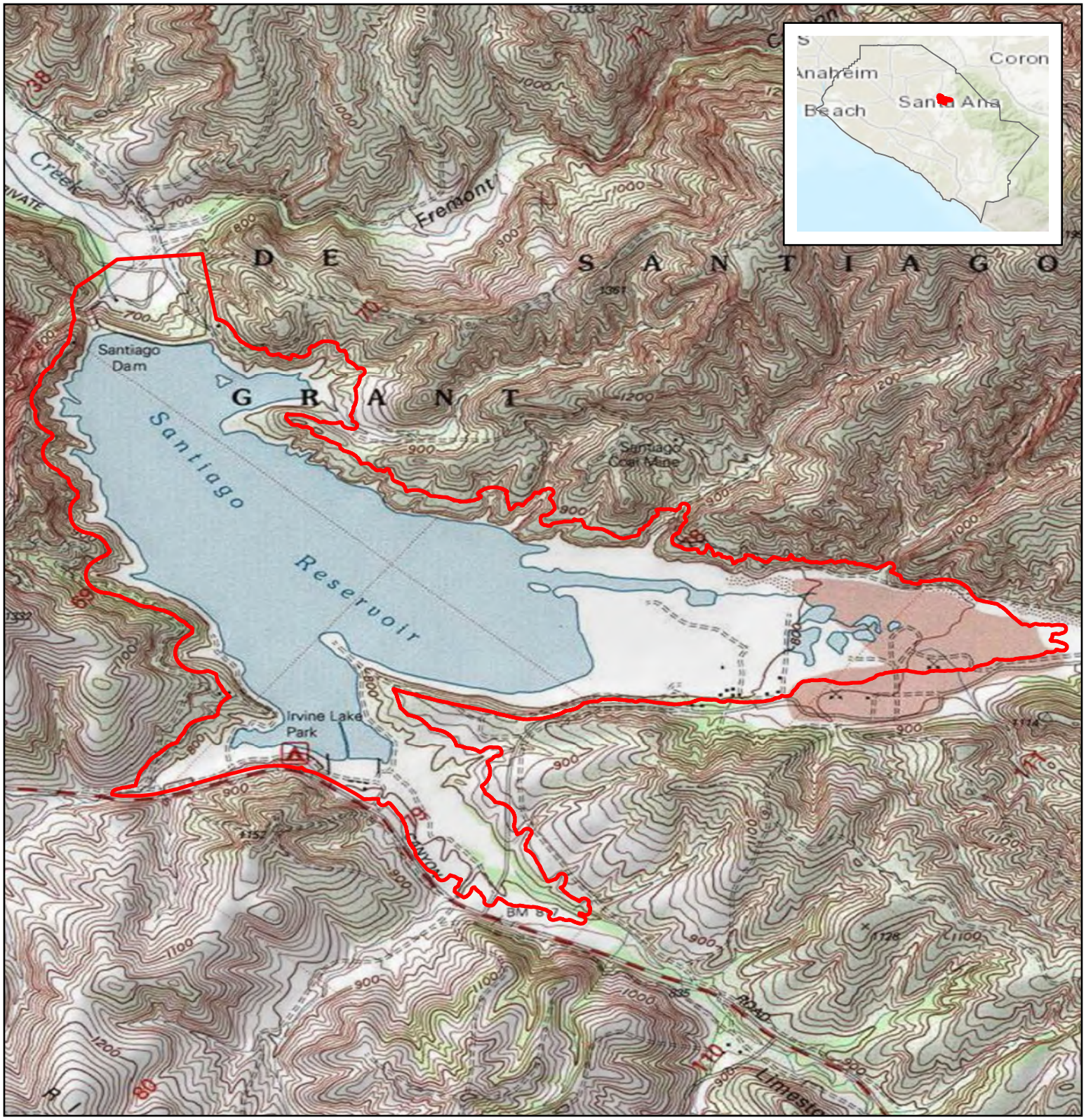
This report was prepared by South Environmental Senior Architectural Historian Laura Carias, MA and Cultural Resources Director Samantha Murray, MA. All project personnel meet the Secretary of the Interior's Professional Qualifications Standards for Architectural History and History (Appendix B).

1.1 Project Location and Description

1.1.1 Project Location

The project is located at Santiago Creek Dam at the northwest end of Irvine Lake in unincorporated Orange County, California (Figure 1). It is south of State Route (SR) 261 and east of SR-241 and Santiago Canyon Road. Existing structures include the dam, outlet tower in Irvine Lake, spillway channel, flashboard storage shed, control house/outlet works, energy dissipater structure, dam keeper's house, Irvine Lake pipeline, and dam access road (Figure 2). The project site is located on the U.S. Geological Survey's (USGS') Black Star Canyon 7.5-minute quadrangle within the Santa Ana Watershed. The drainage area for the project encompasses approximately 63.4 square miles.



Source: ESRI USA Topo Maps and World Topo Map 2023

IRWD Santiago Dam Project

Figure 1. Project Location Map

Project Site

Project Location is within unincorporated, California, in Orange County on the USGS Black Star Canyon 7.5-minute quadrangle map in Sections 28, 33, 34, and 35 of Township 04 South and Range 08 West and Sections 2, 3, and 4 of Township 05 South and Range 08 West

Center Coordinate (Decimal Degrees):
Latitude: 33.7759880N Longitude: -117.7150020W

0 1,000 2,000 Feet

Scale: 1:24,000

N

SOUTH ENVIRONMENTAL

1.1.2 Project Description

Project Objectives

The primary objective of the proposed Project is the rehabilitation and replacement of the Santiago Creek Dam outlet tower and spillway facilities. In implementing the proposed Project, the Districts would:

- Ensure the new facilities meet or exceed the current seismic, safety and design requirements established by the California DWR DSOD, which is the governing state agency associated with this Project;
- Satisfy IRWD and SWD's operational requirements;
- Extend the useful life of the facilities;
- Improve water supply reliability; and
- Minimize impacts to local environmental resources and surrounding property owners.

Project Description

General elements of each portion of the Project are included below. A more detailed description of the proposed facilities is included in the Environmental Impact Report (EIR).

- The existing outlet tower would be demolished; the portion below the sediment would be filled with concrete and capped with a concrete plug. A new inclined outlet structure would be constructed on the left abutment. Each riser would include an intake fish screen.
- The inlet/outlet works would be configured to incorporate the new structure, including new valves and fittings. Water from the lake would enter into the new inclined inlet/outlet structure and would convey lake water through an existing conduit under the dam. At the downstream toe of the dam, a new fitting would be installed to bifurcate the flow to the Irvine Lake Pipeline (ILP) or the emergency outlet pipeline. Water that enters the ILP would reach the Districts' distribution systems. Water that enters the emergency outlet pipeline would be released at the end of the new spillway.
- The ILP would be increased from 36 inches to 54 inches to match the pipeline coming from the inclined inlet/outlet structure, as well as to increase the capacity of the line to improve the hydraulic performance of the system.
- The existing spillway would be demolished and replaced with a new side-channel spillway in a rock cut on the left abutment.
- A new access road and ramp would be constructed to provide vehicle access to the new inlet/outlet structure. A new retaining wall would be needed to cut the roadway into the existing slope without affecting the existing landfill facility above.

- A new dam control building would be constructed to house the valve system at the end of the existing dam crest. The preliminary layout shows a fire-hardened building with dimensions 52 feet by 18 feet and a height of 12 feet.
- The dam crest would be widened from 10 feet to 12 feet with a retaining wall on the downstream side of the crest. The retaining wall would be 1,300 feet in length and would have a height of 10 feet.
- The dam crest would be raised with an approximately 1.5-foot-tall concrete parapet wall on the upstream side of the dam crest.
- A new emergency access walkway (5 feet wide) and stair system would be constructed along the left wall of the new spillway channel to reach the inlet/outlet structure and dam crest from the adjacent landfill during a spillway event. The walkway would connect to the new access road (described above).
- A new steel bridge structure would be included for vehicles across the new spillway.
- Existing structures would be demolished, including the existing outlet tower, portions of the existing spillway, portions of the upstream dam embankment concrete facing, storage building on the dam crest, portions of the outlet works, portions of the ILP, catwalk/stairs across Santiago Creek, and piezometers/monitoring wells.
- The existing Southern California Edison (SCE) overhead power lines and power poles in the vicinity would be relocated outside the construction limits. This relocation would be completed by SCE.
- When construction is occurring, the lake would be dewatered and an access road would be located along the edge of the dewatered lakebed to allow construction access between the staging area and the dam structure.

1.1.3 Area of Potential Effect

The APE is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties if any such properties exist. Determination of the APE is influenced by a project's setting, the scale and nature of the undertaking, and the different kinds of effects that may result from the undertaking (36 CFR 800.16(d)).

The project APE for built environment resources includes the entirety of the Santiago Dam Complex, which includes Irvine Lake and the Santiago Dam and its associated infrastructure to the north where project-related impacts will occur. The APE Map (Figure 2) identifies all the existing built environment within the APE.

Source: Bing Aerial Imagery 2023

IRWD Santiago Dam Project

Figure 2. APE Map

0 300 600 Feet

N

Scale: 1:6,000

Project Site/APE

Structure

1. Dam
2. Spillway
3. Outlet Tower
4. Storage Shed
5. Control Building and Valve Vault
6. OCWR Landfill Flare Facility
7. Dam Keeper's Residence
8. Dam Keeper's Garage
9. Second Garage
10. Dock
11. Taiwan 12kV Overhead Distribution Line

SOUTH ENVIRONMENTAL

2 Regulatory Framework

2.1 Federal

2.1.1 The National Historic Preservation Act

Section 106 of the NHPA (16 United States Code 470f) requires federal agencies to account for the effects of their undertakings on historic properties, and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. Historic properties are defined as buildings, structures, districts, sites, or objects which are included in or eligible for inclusion in the NRHP. Section 106 is implemented through 36 Code of Federal Regulations (CFR) Part 800, which outlines the process for historic preservation review, including participants, identification efforts, and the assessment and resolution of adverse effects. Per 36 CFR 800.16(y), a federal undertaking is defined as any project requiring or receiving a federal permit, license, approval, or funding. Federal agencies must take steps to determine if the undertaking would result in adverse effect to historic properties and take measures to avoid or resolve those effects as feasible.

2.1.2 National Register of Historic Places

The NRHP is the United States' official list of districts, sites, buildings, structures, and objects worthy of preservation. Overseen by the National Park Service, under the U.S. Department of the Interior, the NRHP was authorized under the National Historic Preservation Act, as amended. Its listings encompass all National Historic Landmarks and historic areas administered by the National Park Service (NPS).

NRHP guidelines for the evaluation of historic significance were developed to be flexible and to recognize the accomplishments of all who have made significant contributions to the nation's history and heritage. Its criteria are designed to guide federal agencies, state and local governments, and others in evaluating potential entries in the NRHP. For a property to be listed in or determined eligible for listing, it must be demonstrated to possess integrity and to meet at least one of the following criteria:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent

a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

Integrity is defined in NRHP guidance, How to Apply the National Register Criteria for Evaluation, as "the ability of a property to convey its significance. To be listed in the NRHP, a property must not only be shown to be significant under the NRHP criteria, but it also must have integrity" (NPS 1990). NRHP guidance further asserts that properties be completed at least 50 years ago to be considered for eligibility. Properties completed fewer than 50 years before evaluation must be proven to be "exceptionally important" (criteria consideration G) to be considered for listing.

2.2 State

2.2.1 California Register of Historical Resources

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (California PRC Section 5020.1(j)). In 1992, the California legislature established the California Register of Historical Resources (CRHR) "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (California PRC Section 5024.1(a)). The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP, enumerated below. According to California PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 CCR 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

2.2.2 California Environmental Quality Act

As described further below, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- California PRC Section 21083.2(g) defines "unique archaeological resource."
- California PRC Section 21084.1 and CEQA Guidelines Section 15064.5(a) define "historical resources." In addition, CEQA Guidelines Section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource." It also defines the circumstances when a project would materially impair the significance of an historical resource.
- California PRC Section 21074(a) defines "tribal cultural resources."
- California PRC Section 5097.98 and CEQA Guidelines Section 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- California PRC Sections 21083.2(b)-(c) and CEQA Guidelines Section 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource" (California PRC Section 21084.1; CEQA Guidelines Section 15064.5(b).) If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources or identified as significant in a historical resources survey (meeting the requirements of California PRC Section 5024.1(q)), it is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA (California PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption (California PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)).

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1); California PRC Section 5020.1(q)). In turn, CEQA Guidelines section 15064.5(b)(2) states the significance of an historical resource is materially impaired when a project:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

2.3 Local

2.3.1 Orange County General Plan

Chapter VI. Resources Element; Cultural-Historic Resources

Preservation of Orange County's significant archaeological, paleontological and historical resources in a manner that both preserves the site and is compatible with development is desirable. The County encourages early identification of significant resources in order that cultural resources can be given major consideration in land use planning.

Goals, Objectives, and Policies: Cultural-Historic Resources

Goal 1. To raise the awareness and appreciation of Orange County's cultural and historic heritage.

Objectives

1.1 Facilitate and participate in activities that inform people about the social, cultural, economic, and scientific values of Orange County's heritage.

1.2 Work through the Orange County Historical Commission in the areas of history, paleontology, archaeology, and historical preservation.

Policies

1.1 To stimulate and encourage financial support for projects in the public and private sector.

1.2 To coordinate countywide programs and be the liaison for local organizations.

1.3 To advise and aid the public and private sectors in meeting museum needs and finding funding sources for same.

1.4 To stimulate and encourage research, writing, and publication of articles on Orange County subjects.

1.5 To develop and maintain a County archive for historically valuable records.

1.6 To encourage and facilitate cooperation among local historical societies.

Goal 2. To encourage through a resource management effort the preservation of the county's cultural and historic heritage.

Objectives

2.1 Promote the preservation and use of buildings, sites, structures, objects, and districts of importance in Orange County through the administration of planning, environmental, and resource management programs.

2.2 Take all reasonable and proper steps to achieve the preservation of archaeological and paleontological remains, or their recovery and analysis to preserve cultural, scientific, and educational values.

2.3 Take all reasonable and proper steps to achieve the preservation and use of significant historic resources including properties of historic, historic architectural, historic archaeological, and/or historic preservation value.

2.4 Provide assistance to County agencies in evaluating the cultural environmental impact of proposed projects and reviewing EIRs.

2.5 Provide incentives to encourage greater private sector participation in historic preservation.

Policies

The following policies addressing archaeological, paleontological, and historical resources shall be implemented at appropriate stage(s) of planning, coordinated with the processing of a project application, as follows:

- Identification of resources shall be completed at the earliest stage of project planning and review such as general plan amendment or zone change.
- Evaluation of resources shall be completed at intermediate stages of project planning and review such as site plan review, subdivision map approval, or at an earlier stage of project review.
- Final preservation actions shall be completed at final stages of project planning and review such as grading, demolition, or at an earlier stage of project review.

Historic Resources Policies

1. To identify historic resources through literature and records research and/or on-site surveys.

2. To evaluate historic resources through comparative analysis or through subsurface or materials testing.

3. To preserve significant historic resources by one or a combination of the following alternatives, as agreed upon by RDMD and the project sponsor:

a) Adaptive reuse of historic resource.

b) Maintaining the historic resource in an undisturbed condition.

c) Moving the historic resource and arranging for its treatment.

d) Salvage and conservation of significant elements of the historic resources.

e) Documentation (i.e., research narrative, graphics, photography) of the historic resource prior to destruction.

Goal 3. To preserve and enhance buildings structures, objects, sites, and districts of cultural and historic significance.

Objectives

3.1 Undertake actions to identify, preserve, and develop unique and significant cultural and historic resources.

3.2 Develop and maintain a County archive for historically valuable records, thereby promoting knowledge and understanding of the origins, programs, and goals of the County of Orange.

Policies

3.1 To pursue grants and innovative funding strategies for acquisition or development of significant properties.

3.2 To develop, utilize, and promote effective technical conservation and restoration strategies.

3.3 To appraise, collect, organize, describe, preserve, and make available County of Orange records of permanent, historical value.

3.4 To serve as a research center for the study of County history

2.3.2 Orange County Municipal Code

Sec. 7-9-42.2. - Definitions

Historic structure. Any structure that is:

(1) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

(2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

(3) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or

(4) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either by an approved state program as determined by the Secretary of the Interior or directly by the Secretary of the Interior in states without approved programs.

3 Survey and Research Methods

3.1 Built Environment Survey

A survey of all built environment within the APE was completed by Psomas on July 17, 2023. The survey included documenting all built environment with notes and photographs, as well as the immediate setting.

3.2 Background Research

3.2.1 Previous Evaluations of the Santiago Dam (30-176757)

The Santiago Dam is listed in the Office of Historic Preservation's (OHP's) Built Environment Resources Directory (BERD) with a status code of 2S2, indicating it was determined eligible for the NRHP by consensus through the Section 106 process and is listed in the CRHR.

The Santiago Dam was first recorded and evaluated for historical significance by Carey D. Cotterman of Chambers Group, Inc. in 2003, who found the dam eligible under NRHP Criterion A for its important historical associations (Cotterman 2003:3, see Appendix A, DPR Forms):

> The water provided by the creation of Santiago Dam and Reservoir contributed significantly to the early and mid-20th century development of the citrus industry in Orange County, which was a leading supplier of oranges, lemons, and grapefruit to the entire nation at that time. Therefore, given its strong association with the history of water resources development in Orange County, as well as with the citrus agriculture industry on not only a regional but on a state and national level, the dam is recommended eligible for listing on the NRHP under Criterion A. Because the dam has undergone little modifications since its construction, it retains good integrity of location, design, materials, workmanship, and association.

In 2021, PaleoWest LLC prepared a Continuation Sheet update to Cotterman's 2003 evaluation stating they "found no evidence to indicate that the historic integrity of the Santiago Dam has been compromised subsequent to its initial recordation in 2003. Therefore, PaleoWest, LLC concurs with the 2003 recommendation that the Santiago Dam is eligible for listing on the NRHP under Criterion A at the local, state, and national level and retains sufficient integrity to convey that historical significance" (PaleoWest LLC 2021:1 see Appendix A, DPR Forms).

Neither of these studies appear to have addressed the eligibility of other aspects of the Dam Complex, such as the Dam Keeper's Residence, Dam Keeper's Garage, Second Garage, Storage Shed, Orange County Waster & Recycling (OCWR) Landfill Flare Facility, or Control Building and Valve Vault.

3.2.2 Psomas-Provided Materials

South Environmental reviewed all background materials provided by Psomas regarding the dam. These materials included previously conducted built environment studies, historic photographs and current architectural and engineering plans.

3.2.3 Historical Newspaper Search

South Environmental reviewed all available historical newspapers covering the APE in an effort to understand the development of the project APE and surrounding areas and to review relevant articles pertaining to Santiago Dam development and other structures within the project APE.

3.2.4 Sanborn Fire Insurance Maps

South Environmental reviewed Sanborn Fire Insurance Company maps, available on the Los Angeles Public Library website, to understand the development of properties in and around the project APE. No Sanborn maps were available for the location of the project APE.

3.2.5 Historical Aerial Photographs

South Environmental reviewed all available historic topographic maps and aerial imagery to understand the development history of the project APE. Historic topographic maps of the APE were available from USGS topoView for various years for the Black Star Canyon (1949, 1950, 1967, 1974, 1997, 2012, 2015, 2018, 2022) Quadrangle. Historic aerial photographs of the APE were available from Nationwide Environmental Title Research LLC (NETR) for the years 1946, 1948, 1952, 1963, 1966, 1967, 1972, 1980, 1981, 1985, 1987, 1988, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2002, 2003, 2004, 2005, 2009, 2010, 2012, 2014, 2016, 2018, and 2020 and from the University of California, Santa Barbara, FrameFinder Maps for the years 1931, 1938, 1947, 1952, 1960, 1969, 1977, 1983, 1989, 2002, and 2007 (NETR var., UCSB var.).

4 Historic Context: Santiago Dam

The following historic context is adapted from Donovan-Boyd, Kaiser, and Murray 2021.

4.1 Rancho Lomas de Santiago

Extensive land grants or ranchos were established in the interior during the Mexican period (1822-1848), in part to increase the population inland from the more settled coastal areas where the Spanish first concentrated their colonization efforts. The APE is located in Ranchos Lomas de Santiago, originally owned by José Antonio Yorba's youngest son, Teodocio Yorba. Yorba was granted Rancho Lomas de Santiago (Ranch of the Hills of St. James) in 1846, just before California was annexed to the United States at the end of the Mexican American War. The Yorba family was one of the most successful landowners in Southern California during the Mexican Period. Beginning in the 1840s and 1850s, the Yorba family had acquired six adjoining ranchos (Nelson 2009:2). Yorba filed a United States claim for the Rancho Lomas de Santiago in 1852.

Teodosio Yorba sold Rancho Lomas de Santiago to William Wolfskill in 1860 for $7,000 and Joseph E. Pleasants took charge of Wolfskill's new cattle operations. Already overgrazed, and largely unfarmable due to its steep, hilly terrain, the Santa Ana range could not sustain large cattle herds. In 1866, Benjamin and Thomas Flint, Llewellyn Bixby and James Irvine acquired the rancho from Wolfskill, and it eventually became part of the Irvine Ranch (Irvine Historical Society 2020).

4.2 Development of the Irvine Ranch

The APE is located in the northern portion of what would become known as the Irvine Ranch, one of the largest, most prosperous agricultural operations in Orange County. William Wolfskill purchased the land that would become the Irvine Ranch from Teodocio Yorba in c. 1860 with plans to use the land for grazing sheep (Nelson 2009:2). Wolfskill was a California pioneer, and a prolific landowner, businessman, and rancher. He is also credited with being one of California's first Valencia orange ranchers (OCHC 1983: Section 8). In 1866, Wolfskill sold the 47,000-acre property to Benjamin and Thomas Flint, Llewellyn Bixby, and James Irvine (Irvine Historical Society 2020). Flint and Bixby were also sheep men, who were expanding their land holdings to increase their annual production of wool (Nelson 2009:2).

James Irvine, a pioneer of California agriculture and prosperous San Francisco merchant, purchased the Flint and Bixby shares of the Rancho Lomas Santiago in 1876 for $150,000 dollars. This gave Irvine control of approximately 110,000 acres of land in and around the Santa Ana Canyon (Nelson 2009:3). Irvine, an Irishman, came to America in 1846, and lived for a time in New York City. He came to California in 1849, to find his fortunes in the California Gold Rush. After working in the mines for several years, Irvine began selling merchandise to miners, and eventually established a successful market in San Francisco (The San Francisco Examiner 1886:3). James Irvine died in 1886, leaving his estate to his

son, James Irvine Jr. George Irvine, James Irvine Sr.'s brother, managed the property until Irvine Jr. came into possession of the estate at the age of 25 (Nelson 2009:2; The Mail 1886:2).

When James Irvine Jr. took over the estate in 1892, he converted the ranch into an "increasingly modern, productive enterprise of field crops, grain and irrigated orchards," which was achieved by digging wells, building reservoirs, and laying pipeline to irrigate the crops (Nelson 2009:3). In 1893, Irvine Jr. began to divert water from Santiago Creek to an area known as "The Flats" where the property's new ranch house was located. Also, in the 1880s, Irvine Jr. began to lease land to tenant farmers. These farmers grew grain and bean crops that required minimal rainfall and little to no irrigation. Historic aerials from 1946 suggest the Project site was never brought under agricultural use during the Irvine ownership. While the Project site does not appear to have been cultivated, the road through Santiago Canyon, along the Santiago Creek, that eventually becomes Santiago Canyon Road, is visible on the 1901 topographic map of the area in generally the same orientation as it found today.

4.2.1 The Irvine Company

In 1894, James Irvine Jr. incorporated the Ranch as the Irvine Company and became the company's first president (Brower 2013: xxi). One of James Irvine Jr's first acts as president was to donate 160 acres of land, that had long been a popular pioneer picnic spot, to the State Board of Supervisors. This donation, land northeast of Irvine Lake, became the Irvine Ranch Historic Park, which is now the oldest park in Orange County (OCHC 1983: section 8). Around this same time, in 1889, Orange County formed out of parts of Los Angeles County (Figure 3). When Orange County was formed, the Irvine Company owned almost one-fifth of the County's acreage.

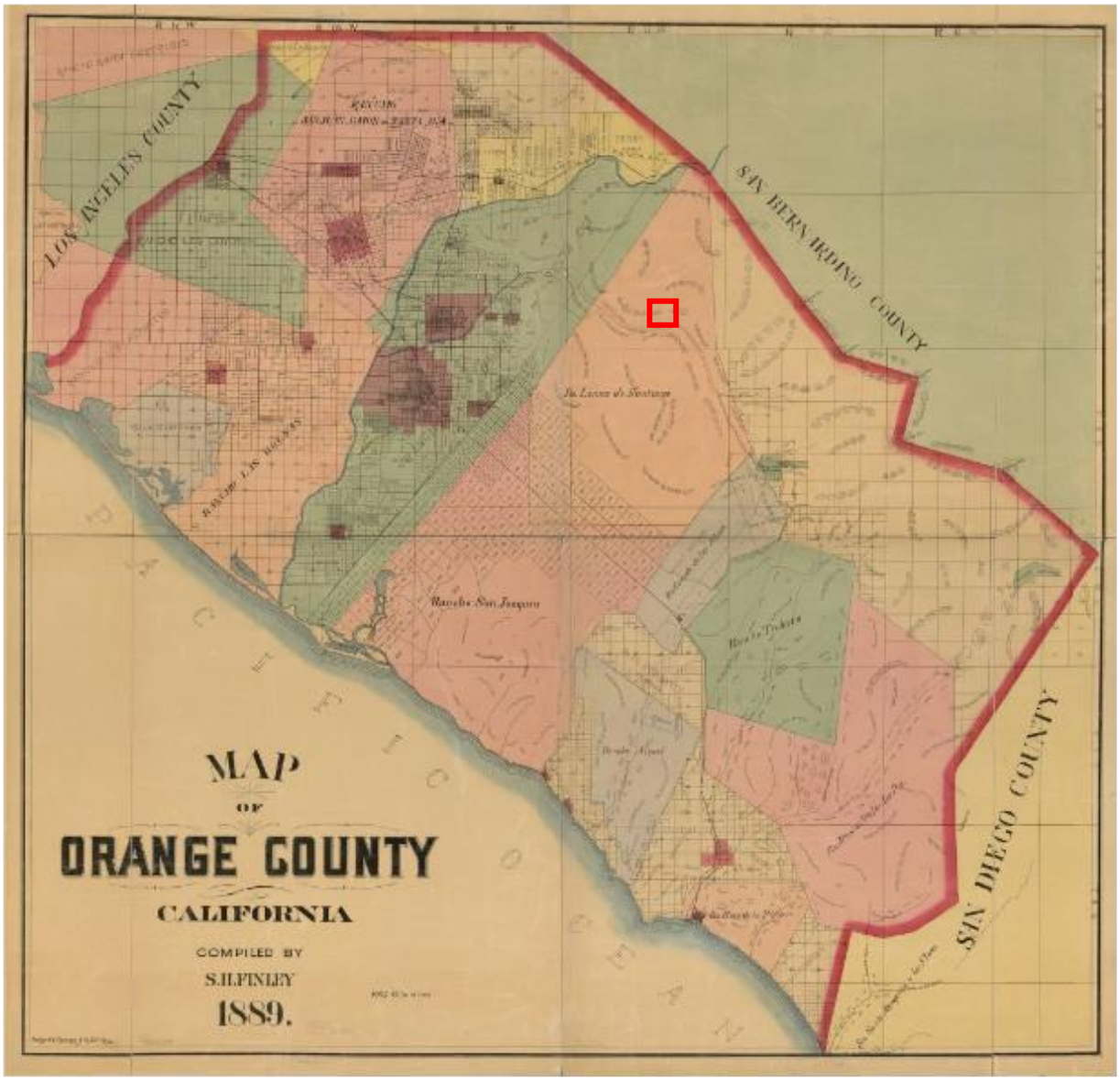


Figure 3. Orange County California Map, 1889. Shows the Ranchos and the growing population areas of Orange County. Compiled by S.H. Finley. Approximate Project Location in red (Library of Congress, Geography and Map Division) (Finley 1889).

Irvine Ranch quickly became one of the most productive tracts in California, known for the growing of lima beans, black-eyed peas, barley, oats, sugar beets, olives, walnuts, lemons, and oranges (Santa Ana Daily Register 1915:8). As the tenants on the Irvine Ranch increased, James Irvine Jr. developed an extensive system of wells to irrigate the land (Nelson 2009:7). By 1920, it is estimated that nearly 1,200 wells had been drilled on his acreage and many were running with electric pumps. By 1930, the Irvine Ranch had 31,000 acres of lima beans under cultivation, which was often described as the "largest lima bean field in the world" (Nelson 2009:7).

In 1935, James Irvine III (known as Jase), Irvine Jr.'s oldest son, tragically died of tuberculosis. Jase was on track to be the president of the Irvine Company and his death left James Irvine Jr. distraught and without sound leadership for the future of the company (Brower 2013: xxi). Several years later, in 1937, James Irvine Jr. established the James Irvine Foundation with 51% of the company's stock to be held by the foundation and the other 49% to be distributed to family (Brower 2013: xxii).

4.2.2 Irvine Ranch Water Management Facilities

Ongoing water quality problems and water scarcity made it clear that further work was necessary to irrigate crops at Irvine Ranch. The water conveyance facilities on the Ranch became one of the largest water management systems in Orange County. The first distribution irrigation feature on the Irvine Ranch property was the Irvine Ditch, constructed in 1893 from the Santiago Canyon to the Peters "Flats" (near the present-day location of the Peters Canyon Dam, which is approximately 2 miles to the west of the Project site). Wells were the primary source of water at the turn of the century, with 1,200 wells constructed in the area, most equipped with electric pumps. These wells allowed for large citrus orchards to be planted starting in 1906 (Nelson 2009: 17).

Irvine began to construct a series of winter water conservation features on the Ranch starting in the 1920s. Water runoff and irrigation rights were a constant struggle between the Irvine, Carpenter, and Serrano Irrigation Districts and the conservation projects were an effort to offset the marked decline in his groundwater system. P. R. Browning was the principal designer of all the Ranch's water conservation facilities except for the Santiago Dam which was designed by Augustus Kempkey (Nelson 2009:7). The dispute between the competing irrigation districts was eventually settled in 1928, with an agreement between the three litigants that led to the construction of the Santiago Dam and Outlet Tower (Nelson 2009:8). This period also saw the establishment of a massive irrigation system on the site (Brower 2013: xxi). In 1950, there were 4,550 irrigated acres and 33,430 dry farming acreage. Just ten years later, the Irvine company had increased the irrigated acreage to 7,417 acres and dry farming acres accounted for only 16,853 acres (Nelson 2009: 18).

County-wide flood control bonds failed to gather appropriate support in 1929 and 1931, leaving James Irvine Jr. to complete some large-scale water management projects without government support. Flood control created both land security and pooled runoff water for domestic and agricultural uses. Irvine was increasingly worried about water rights, and in 1932 he filed suit against upper basin users to protect the rights to the Santa Ana River (OCWD 2015: 24). The following water conservation projects were completed on the Irvine Ranch Site between 1929 and 1959: Lambert Reservoir (1929); Santiago Dam (1931); Irvine Conservation Dam (1932); Peters Canyon Dam (1931); the High Line Canal (1930s); Laguna Reservoir (1937-38); Bonita Reservoir (1937-38); Little Peters Reservoir (1940); Sand Canyon Reservoir (1942); Syphon (sometimes spelled Siphon) Canyon Dam (1948-49); and the Rattlesnake Canyon Reservoir (1959) (Nelson 2009:8). In 1970, the construction of the Irvine Lake Pipeline brought water from the Colorado River to the Rattlesnake Canyon Reservoir.

4.3 Consolidation of Orange County Water Districts

While the Irvine Ranch was creating a sophisticated water system for Ranch operations, the rest of Orange County was using a patchwork method of establishing water rights. Early water conveyance developments in Orange County generally organized as groups of property owners that banded together to provide water services through groundwater wells, these co-ops were called "mutuals." The mutuals sold shares of water to landowners based on the number of acres held by each property owner. As metropolitan areas grew it became clear that the current system, collections of property owners, would not be sufficient for the rapidly growing population in Orange County (MWDOC 2017).

In 1928, several southern Orange County cities banded together to form the Metropolitan Water District of Southern California (MWD) with the lofty goal of importing water from the Colorado River. The MWD succeeded in the planning and construction of the Colorado River Aqueduct, which, starting in 1939, brought water from the Colorado River near the Arizona border to the east side of the Santa Ana Mountains. This ongoing consolidation of the cooperative system became a necessity as water became Southern California's most precious resource. In 1957, there were an estimated 151 of these mutual water groups remaining in Orange County. By 1963, it was estimated that by 1965, no more than 25 would remain. Postwar population growth further encouraged the consolidation of mutuals and districts and in other areas, growth brought city services within reach of previously rural areas (LAT 1963c:2).

The success of the MWD, and the continued need for more water lead to the formation of several other large districts who hoped to tap into Colorado River water as well as Northern California water from the State Water Project. Developments continued into the 1960s and 1970s to move water through areas in eastern Orange County. The Santiago lateral, completed in 1961, and the East Orange County Feeder Line No, 2, both extended water into the southeast section of the County (LAT 1961a: E:2; LAT 1961b: 52).

4.3.1 Irvine Ranch Water District

The IRWD was formed by the Irvine Company in 1961 as a California Special District with headquarters in Irvine. Orange County approved the boundaries of the District in December of 1960, with the District being bound on the west by Newport Avenue, the south by the Santa Ana Marine Corps Air Facility, the east by the Rancho Canada De Los Alisos, and the north by the Coastal Municipal Water District (LAT 1960: R-28cia). The District's boundaries initially included approximately 60 square miles (IRWD 2021: Liquid News). Initially, the IRWD served mainly agricultural customers, but the quickly growing Orange County population included many residential customers in need of water. The IRWD grew through annexations in the 1960s and 1970s and by 1991, the District provided water to one-sixth of Orange County (LAT 1991: A3).

As water districts became more established, growth continued through consolidation of districts. Between 1997 and 2008, the IRWD consolidated with five other water districts, including the South

Coast Water District in 2006. Other districts that joined the IRWD include: Orange Park Acres Mutual Water Company (2008), Los Alisos Water District (2001), Carpenter Irrigation District (2000), and the Santa Ana Height Mutual Water Company in (1997) (IRWD 2021: Consolidations). Today the IRWD serves more than 425,000 residential customers and spans 181 square miles (IRWD 2021: Liquid News).

4.3.2 Serrano Irrigation District

The Serrano Irrigation District, now known as the Serrano Water District (SWD), was developed in 1876 by a consolidation of several water companies and associations privately-owned by ranchers and farmers in Villa Park. The Serrano Water Association, the John T. Carpenter Water District, and the Irvine Company came together in 1927 to form the Serrano Irrigation District as a public corporation under the Irrigation Districts Act of the State of California. "This enabled the district to hold elections to establish the bonds to finance their share of the construction of the Santiago Dam." (OAC n.d.). The Serrano Irrigation District was responsible for issuing bonds and borrowing money for the construction of the Santiago Dam and The Irvine Company provided the land (Serrano Irrigation District n.d.).

In the early 1960s, the decrease in need for agricultural water led the district to build a water filtration plant and then later reservoirs at Sycamore and Taft to use water from the Irvine Lake for residential use (Serrano Irrigation District n.d.). Today, the district has 43 miles of pipe, three wells, two reservoirs, and one treatment plant. The district owns fifty percent of Irvine Lake and is the managing district for Irvine Lake (Serrano Water District 2023).

4.3.3 Post St. Francis Dam Disaster Development (1928-1947)

In 1928 the St. Francis Dam, located in the Santa Clara Valley just outside Los Angeles, failed, killing 430 people, destroying 1,250 buildings and 7,900 acres of farmland, to become one of the greatest dam failure disasters of the 20th century. Between 1929 and 1931, the State engineer examined 827 dams and found near one third of them to require significant repairs according to new safety guidelines.

In 1929, the State of California also required any person that practices civil engineering or any of its branches to be registered with the state. This also included any person that acted in the position of an "assistant engineer" or higher. The state also created a board which developed standards for applicants that wanted to register with the state as an engineer. Some standards included: must be over 25 years of age, demonstrate no less than six years of professional experience, work references, and an application fee (Rogers n.d.).

4.4 Property Types

The following discussion of property types is adapted from Murray et al 2020:

Reservoir complexes, like Irvine Lake, are usually comprised of several elements including the water-retaining structure (dam), a water-retention area (reservoir), a water-releasing structure (spillway), a water-conveying structure (conduits and outlet tower), and other essential elements including water treatment plants (Zhang et al 2016). Each of these portions of the reservoir provides an essential function that ensures water will be retained and released safely.

4.4.1 Dams

The purpose of a dam is to store water and facilitate flood control for human and livestock water supply, irrigation, energy generation, recreation, and pollution control. Typically, dams fulfill a combination of these functions. Manmade dams are classified according to their type of construction, materials, slope, seepage control method, and resistance to the forces of water pressure. The materials used to construct modern dams included earth, rocks, concrete, masonry, steel, timber, rubber, and sometimes a combination of these materials. Dams can be classified into five basic types including embankment, concrete, gravity, buttress, and arch (ASDSO 2020).

Embankment Dams

Embankment dams are a type of massive dam that is built with natural materials, either rock or earth instead of concrete, leading to the sub-classification of earth-filled embankment dams and rock-filled embankment dams. The basic elements of embankment dams consist of a core, an earth- or rock-filled embankment on both sides, and protection on the upstream face. Embankment dams are trapezoidal in shape and resist the flow of water by both their strength and weight. Embankment dams can retain water because they have a low permeability throughout the structure or a layer of low-permeability material (Billington et al. 2005; TCEQ 2018).

Earth-filled Embankment Dams

Earth-filled embankment dams were the first type of dam to be constructed by humans and were first documented in approximately 3,000 BC in the Middle East. In fact, earth-filled embankment dams are still the most prevalent dam-type, and a 2005 report on large federal dams estimated that of the 70,000 dams present in the United States, 85% were earth-filled embankment dams. Many of the dams in the United States were built in the early twentieth century prior to the advent of technology that would have facilitated the construction of structural dams. However, the report goes on to say that throughout the twentieth century, even with the advent of new technology, 65% of the dams built were earth-filled embankment dams. Earth-filled dams are the most prevalent type of dam because they can be built from locally available materials that require minimal processing, saving money on the construction process. The main detraction from earth-filled dams is that they are subject to the erosive

action of water if a sufficient spillway is not provided as part of the dam design (Billington et al. 2005; Bureau of Reclamation 1987). Examples of other earth-filled embankment dams in Orange County include:

- Peters Canyon Dam (1929)
- Villa Park Dam (1963)
- Seven Oaks Dam (1993)

4.4.2 Reservoirs

A reservoir is typically formed by the construction of a dam across a linear water source, such as a river or creek, to create an artificial lake where water is stored. The adjacent dam is responsible for the amount of water that flows out of the reservoir, therefore controlling its water level. The amount of water in a reservoir can also be controlled by natural elements including rainfall, snowfall, and droughts. In conjunction with storing water, reservoirs often become recreation centers for boating and fishing. The water in a reservoir is very still causing sediment to sink to the bottom which over time can reduce the total amount of water in the reservoir (NG 2020).

4.4.3 Spillways

A spillway is a structure used for the control of flood flows and diverting surplus water from a reservoir after it has been filled. The primary purpose of a spillway is to ensure water does not overtop the dam and destroy it. A controlled spillway manages flood water through the use of gates, where an uncontrolled spillway only utilizes the elevation of the spillway crest to control the water. The gates allow small amounts of water to be released to prevent a sudden large discharge of water which could cause the dam to fail. There are seven types of spillways including straight drop, ogee, shaft, chute, side channel, siphon, and labyrinth (PE 2019).

4.4.4 Outlet Towers

The outlet tower is a vertical structure located within the reservoir used for capturing water and conveying it to a hydroelectric or water-treatment plant. The tower sits above an outlet tunnel or pipe used to transport the water out of the reservoir which is controlled by the opening and closing of valves or gates. The value controls are usually located in a room at the top of the outlet tower (BDS 2020).

4.4.5 Secondary Property Types

Unlike the primary property types discussed above, secondary property types are not necessarily vital to keeping the reservoir complex running. Although secondary property types range greatly in their design and function, they are frequently associated with dam and reservoir sites. Examples of

secondary property types include Dam Keeper's houses, cisterns and water tanks, pumping stations, wells, vaults, and any other components the larger water system built to support the reservoir complex.

- Dam Keeper's House: a small purpose-built cottage constructed to house the dam's keeper who moderated water levels in response to drought and heavy rain
- Cistern and Water Tank: an artificial reservoir, tank, or container used for the storing or holding of water on a dam site
- Pumping Station: Building(s) of this type can vary in size, their function is to house machinery that transport water from one site to another.
- Well: An excavation or structure created by digging, driving, or drilling to access water underground

5 Historic Context: Southern California Edison

SCE's Historic-Era Electrical Infrastructure Management Program (HEIMP) requires examination of electrical infrastructure in consideration of three major themes: 1) association with SCE's organizational history; 2) association with SCE's construction and implementation campaigns or the established period of significance for 66kV, 220kV, and 500kV systems; and 3) association and embodiment of SCE's architectural programming and aesthetic ideology at SCE Substations (Tinsley Becker et al 2017). The following historic context examines relevant portions of these major themes in consideration of the types of SCE resources identified within the APE (see Section 6, Identified Resources), referencing information from the HEIMP and other relevant sources throughout.

5.1 Organizational History

The West Side Lighting Company was formed by a syndicate of businessmen from Los Angeles in 1896. One year later, the company merged with General Electric to become the new Edison Electric Company of Los Angeles. Soon after, the newly formed Edison Electric Company began to look for additional power supplies in Downtown Los Angeles and purchased the Southern California Power Company in 1898. Over the next few years, Edison merged with other electric lighting and power companies, expanding its footprint beyond Los Angeles to areas as far as Santa Barbara and Redlands. By 1909, the Edison Electrical Company provided service to over 600,000 customers across five counties. "To reflect this expanded presence, the company was reincorporated as the Southern California Edison Company (SCE)." (Williams et al 2016).

In the early part of the twentieth century, SCE continued to expand its service territory throughout Southern California, beginning construction of the Long Beach Steam Plant in 1910 and new 66kV steel tower transmission lines to upgrade the old 33kV network of wood poles. After successfully merging with Henry Huntington's Pacific Light and Power Company (PLPC) in 1916, SCE added 69 additional communities to its service territory. SCE then focused its efforts on expanding the existing 150kV Big Creek Hydroelectric System, upgrading it to 220kV in 1923. In the 1920s SCE undertook a massive building campaign which included "dams and reservoirs, building of powerhouses, rail lines, and tunnels, as well as support camps replete with food and housing for workers, recreation and entertainment offerings, medical facilities, and administrative offices." (Williams et al 2016)

In 1930, SCE contracted with the U.S. Department of the Interior to generate power for construction of the Hoover Dam. Similar contracts were established between the U.S. federal government and the City of Los Angeles and Southern Sierras Power Company (SSP) in order to pay for project costs over a 50-year period. Initially constructed for the purpose of powering construction of the Hoover Dam, the SSP Boulder Dam to San Bernardino Transmission line went into service in 1931. Upon completion of the dam, the line carried electricity to San Bernardino. This line was acquired by SCE as part of the 1964 Calectric merger (Tinsley Becker et al 2017).

Calectric and SCE had overlapping service territories from approximately 1917 until 1964 throughout the Los Angeles Basin and Inland Empire. In order to improve costs, Calectric was acquired by SCE in 1964. This was last major merger/change in the company's organizational history (Tinsley Becker et al 2017).

5.2 Transmission Lines

In the first part of the twentieth century, SCE was continuing to expand in response to a growing Southern California region. "By 1904 the common voltage capacity of transmission lines was reported to be 66,000 volts (66kV), which was considered the minimum voltage necessary for lighting plants in major United States cities." (Tinsley 2017). The earliest identified steel lattice towers within the existing SCE System were installed for the Kern River-Los Angeles Transmission Line in 1907. Shortly thereafter, SCE implemented additional all-steel lattice tower lines throughout its 66kV system. In 1910, SCE began construction of its Long Beach Steam Plant and implemented a new 66kV transmission line system to replace the old 33kV wooden pole lines that had been installed at the end of the 19th century. By 1912, double-circuit 66kV towers were widely used, coinciding with the completion of the Long Beach Steam Plant between 1910 and 1914 (Tinsley Becker et al 2017).

The SCE Big Creek Hydroelectric System East-West Transmission Line was put into service in 1912-1913 to carry 150kV from the Big Creek Hydroelectric System in the Sierra National Forest northeast of Fresno to the Eagle Rock Substation in Los Angeles. The purpose of the 241-mile transmission line was to convey electricity from the powerhouses at Big Creek to Los Angeles for distribution to SCE service territories (Tinsley Becker et al 2012). The East and West lines were upgraded in 1922-1923 to carry 220kV, doubling the capacity of the lines (Pomona Progress 1922). In May 1923, the last span of the 241-mile 220kV transmission line was tied in, touted as being "the world's greatest achievement in long distance, high voltage transmission." (The Bulletin 1923). SCE continued to develop the Big Creek Hydroelectric System into the 1920s with the construction of dams, reservoirs, powerhouses, rail lines, and tunnels. Additionally, updates were made to the existing East and West Transmission Lines, with new lines installed to convey electricity between Big Creek and Los Angeles.

"By 1930 the backbone of SCE's 66kv and 220kV system was fully developed and included the use of 220kV double-circuit towers and 66kV multi-circuit towers ranging from 4 to 14 circuits." (Tinsley Becker et al 2017). SCE continued to develop new tower types for its 220kV system into the 1930s, creating larger single- and double-circuit towers inspired by old designs. These designs became standard, 'off the shelf' tower types by the 1940s.

The identified period of significance for 66kV and below transmission lines is 1907-1930, which includes the construction of the Kern River-Los Angeles Transmission Line in 1907 through completion of the 66kV system by 1930 (Tinsley Becker et al 2017).

5.3 Wooden Distribution Lines

The use of wood pole support structures for electrical transmission or distribution lines represents borrowed technology from the telegraph transmission system, and the technology itself has changed little over time. Wood poles carry the electrical wires (with voltages 33kV and below) on cross arms or via a connection to their insulators. Given this lack of change in technology and appearance over time, it is difficult for a wooden distribution line to convey a particular period of significance in electrical infrastructure history, and by extension, to any significant themes and associations (Tinsley Becker et al. 2017, Williams 2023).

> The "typical" life of a wood pole transmission or distribution line structure is 50 years, although some last longer and others deteriorate much sooner. Wood pole supported transmission or distribution lines over 50 years of age usually lack original integrity of materials despite substantially retaining the look and feel of the original wood-pole transmission or distribution line. Replacement wood-poles or hardware parts, therefore, can continue the utilitarian historic fabric representative of the original potentially historic transmission or distribution line structures because of the lack of any distinct engineering or architectural attributes. The common and indistinctive nature of wood-pole transmission or distribution line structures disqualify them as potentially National Register eligible. They are purely functional and utilitarian in use and common in appearance (Tinsley Becker et al. 2017:64).

6 Identified Resources

6.1 Santiago Dam Complex (P-30-176757)

6.1.1 Property Description

The Santiago Dam Complex consists of the various dam components (i.e., the dam, spillway, outlet tower), reservoir, and associated structures, including the Dam Keeper's Residence and Garage, Storage Shed, Second Garage, Control Building and Valve Vault, Boat Dock, and the OCWR Landfill Flare Facility which sits above the dam on a ridge to the west. All of these elements are numbered on the APE Map and referenced throughout the discussion below (Figure 2).

Dam Components

The Santiago Dam is an earthen and concrete structure constructed in 1931 (Exhibit 1) (APE Map #1). It contains 1.1 million cubic yards of clay, porous clay and rock that was moved in for its construction. The upstream portion of the dam was filled with clay material to prevent water seepage and has a 2.5 to 1 slope and is capped with concrete blocks that measure six feet by 6 inches thick (Exhibit 2). The Irvine Lake (also called the Santiago Creek Reservoir) has a storage capacity of approximately 25,000-acre feet of water. The Dam's footprint features a gentle "S" curve, with a concrete spillway at its west end (APE Map #2). Eight narrow pylons support a 12-foot-wide concrete catwalk that extends over the spillway (Exhibit 3). Safety railings for the catwalk are provided by 4-foot-high concrete parapets (Exhibit 4). An outlet tower is located southwest of the spillway (Castells 2021)(APE Map #3).

Exhibit 1: South elevation of Santiago Dam and view of Irvine Lake, view north (Psomas 2023)

Exhibit 2: South elevation of Santiago Dam, view west (Psomas 2023)

Exhibit 3: North elevation of Santiago Dam and outlet tower, view southwest (Psomas 2023)

Exhibit 4: View of Santiago Dam concrete spillway, view north (PaleoWest 2021)

Exhibit 5: View of Santiago Dam concrete spillway, view north (Psomas 2023)

Associated Buildings and Structures

Dam Keeper Residence and Garage

The Dam Keeper Residence and Garage were constructed in 1931 and are visible in the 1938 historic aerial photograph (APE Map #7, #8). The Dam Keeper Residence is a one-story, single-family residence located on a hill east of the dam with a front gabled roof clad in composition shingles (Exhibit 6). The residence is clad in vertical clapboard siding. The primary elevation faces south and features a covered porch located under a secondary front gabled roof (Exhibit 7). There are three replaced single-hung windows at the primary elevation. The west elevation consists of a screened porch that extends almost the entire width of the building. The porch cantilevers over the hill and provides a full view of the dam (Exhibit 8).

Directly south of the residence, across the asphalt paved driveway, is a two-car garage with a front facing gable clad with composition shingles (APE Map #9). The building features narrow, horizontal wood siding and north facing primary elevation. The garage does not have a door, rather the interior has been modified and sectioned off, now featuring a smaller room within the garage. Single hung windows are visible on the east, west, and south elevations (Exhibit 9).

Alterations to the Dam Keeper Residence include replacement of all original windows and siding. The siding may have been replaced in the 1980s, but the windows were likely replaced more recently.

Exhibit 6. Dam Keeper Residence and Garage, view north (Psomas 2023)

Exhibit 7. Dam Keeper Residence, primary south elevation, view north (Provided by Psomas: Moeder 2023)

Exhibit 8. Dam Keeper Residence, west elevation, view northeast (Psomas 2023)

Exhibit 9. Dam Keeper Garage, north elevation, view south (Psomas 2023)

Second Garage

A second garage is located approximately 190 feet south of the Dam Keeper Residence and Garage along an asphalt and gravel driveway (APE Map #9). Although it appears that other garages with smaller footprints were once located in the same vicinity, the current Second Garage first appears in a 2002 historic aerial. The garage is located at the base of hill. It has a rectangular floor plan and a front gabled roof clad in composition shingles. The Second Garage is clad in vertical clapboard siding and the main entrance is located on the north elevation. The garage door is a modern sectional door (Exhibit 10).

Exhibit 10. Second Garage, north elevation, view south (Psomas 2023)

Storage Shed

The Storage Shed is located above the dam spillway, approximately 55 feet to the east (APE Map #4). It appears in historic aerial photographs as early as 1947. It has a rectangular floor plan and a front gabled roof clad in composition shingles. The building is clad with vertical clapboard siding and features a contemporary sectional garage door (Exhibit 11).

Exhibit 11. Storage Shed, north elevation, view south (Psomas 2023)

OCWR Landfill Flare Facility

The OCWR Landfill Flare Facility is an industrial structure located approximately 266 feet southwest of the concrete catwalk, on the northwesternmost hillside adjacent to the reservoir (APE Map #6). It consists of three squared metal towers with metal catwalks that surround each tower on three elevations. The facility is made up of other industrial components such as tanks and pipes (Exhibit 12). It can be accessed via a private road stemming from Santiago Canyon Road.

Exhibit 12. OCWR Landfill Flare Facility, view southwest.

Control Building and Valve Vault

The Control Building and Valve Vault is located northeast of the spillway. It is located at the base of a hill and features a single-story building with a rectangular floor plan and front gabled roof (APE Map #5). The roof is clad with composition shingles and the building is clad with vertical wood siding. A single door is located on the east elevation and a sectional garage door is located on the south elevation. A chain linked fence is located east of the building surrounding a small shed building (Exhibit 13). The building is isolated and there is a road to its east that extends east before it travels north connecting to State Road 241.

Exhibit 13. Control Building and Valve Vault, south and east elevations, view northwest (Psomas 2023)

Boat Dock

The boat dock is not permanently attached or anchored to the lakeshore. It currently sits on the southwest end of the lake and is a rectangular dock with a shed (APE Map #10). The dock measures approximately 193 feet long and 18 feet wide.

6.1.2 Construction History

The land surrounding the current site of the Santiago Dam Complex was used during the 19th and early 20th century for cattle and sheep grazing. Beginning in 1876, the Serrano Irrigation District provided water for citrus groves in the Orange and Villa Park areas. By the late 1920s, the demand for irrigation water intensified and required the construction of a reservoir (Serrano Irrigation District n.d.).

At the request of the Serrano and Irvine Irrigation Districts, bids for a contractor for the new construction of the Santiago Dam began in early 1931. The lowest bidder, R.G. Letourneau Company Inc., won the contract at the value of $507,721.50 which was well below the engineer's estimate of $725,000 (LAT 1931). Augustus Kempkey was the consulting engineer on the project. The dam was a "earth fill" type which was constructed to be 125 feet high above the Santiago Creek bed, 600 feet through the base and narrowing to 10 feet at the top. The dam was 1,400 feet long and could accommodate approximately 25,000-acre feet of water. The Wheatland Construction Company placed

all the steel and concrete on the dam including 400 tons of steel and 7,000 cubic yards of concrete; the spillway required an additional 400 tons of reinforcing steel and 5,000 yards of concrete (Whittier News 1931). The dam was completed in 1931 and its reservoir, Irvine Lake, was filled by 1933. The lake opened to the public in 1941 (Orange County Grand Jury 2018-2019). A dam keeper residence was added in 1931 and was located on the east end of the dam (Santa Ana Register 1932).

Exhibit 14: Base of outlet tower circa 1931 (Courtesy of IRWD)

Exhibit 15: Outlet tower under construction circa 1931 (Courtesy of IRWD)

Exhibit 16: Spillway crest and chute under construction circa 1931 (Courtesy of IRWD)

Exhibit 17: Santiago Dam and outlet tower under construction circa 1931 (Courtesy of IRWD)

Review of historic aerial photographs indicates that the dam has always been located in a mountainous, undeveloped area. In the earliest photograph dating from 1931, Santiago Creek was visible but the dam was not yet in place (UCSB 1931). The Dam, Dam Keeper's Residence, and Dam Keeper's Garage were visible in the 1938 historic aerial as well as the Storage Shed. By 1947, the boat dock was visible at the south end of Irvine Lake for recreational purposes (UCSB 1938, 1947). The Control Building and Valve Vault appears in the 1960 aerial approximately 400 feet northeast of the spillway. By 1977, a parking lot has been added near the dock, presumably for those making use of recreational activities at the lake (UCSB 1977). Grading of the hills west of the dam appears to begin circa 1969, expands in 1977, and is visibly larger by 1989 (UCSB 1989). The location of the parking lot and dock appear to move several times throughout the years. Aerial photographs show water levels were low between 2016 and 2020 and the dock was moved further north along the western bank presumably to deeper water. the OWCR Landfill Flare Facility first appears in the 2002 historic aerial, located west of the dam, and is still present today (UCSB 2002).

Review of historic architectural drawings show that in 1956 a pipeline connecting Metropolitan Water District and Santiago Dam was constructed (Santiago Creek Dam Drawings 1956). A spillway overflow recorder was added in 1957 by Boyle Engineering (Santiago Creek Dam Drawings 1957). In 1969 Leeds, Hill, and Jewett Inc. were the consulting engineers on record that designed a series of updates on the dam including embankment construction, spillway reconstruction and reinforcement, and outlet works

reconstruction (Santiago Creek Dam Drawings 1959). An extension of the water tower was completed in 2001 by Cho Design Associates, Inc. The drawing set consists of three sheets and does not indicate the level of work proposed. The drawing set included cover sheet, sheet index, and as-built information (Santiago Creek Dam Drawings 2001). In 2003, Verizon added a cellphone tower near the dam (Santiago Creek Dam Drawings 2003).

6.1.3 Engineer: Augustus Kempkey (c. 1885-1975)

Augustus Kempkey was a native of Oakland and graduated from the University of California in 1902. Upon graduation, he worked as assistant engineer for the Berkeley branch of the Contra Costa Water Works (Oakland Tribune 1902). He belonged to a number of Masonic bodies and was the grand commander of California Knights of Templar in 1938. He worked as a consulting civil engineer (Sacramento Bee 1975). Through archival research Kempkey appeared to work as a consultant very early in his career for various agencies. He worked on projects such as the Patterson irrigation system, Turlock irrigation project, Modesto irrigation project, and Brentwood irrigation project. Most of his work was on at advisory level. Other dams he worked on include Conn Dam and Lake Hodges Dam.

6.2 Taiwan 12kV Overhead Distribution Line

The Taiwan 12kV wooden overhead distribution line was first energized in c. 1952 (Communication with SCE). SCE has no original drawings or other information pertaining to the line's construction.

The Taiwan 12kV line runs as far north as the Windy Ridge Toll Plaza on State Road 241 (Eastern Transportation Toll Road); as far east as the intersection of Blackstar Canyon Road and State Spur Road; as far south as intersection of Black Star Canyon Road, Silverado Canyon Road, and Santiago Canyon Road; and as far west as East Chapman Avenue, just west of South Rancho Santiago Road. The line is mostly concentrated in a housing development bounded by East Chapman Avenue and Canyon View Avenue to the west, east Chapman Avenue to the north, Jamboree Road to the east, and Canyon View Avenue to the south.

The Taiwan line interests the project boundary at the northern and southern borders. To the north, the line runs east to west from the spillway to the Dam Keeper's Residence and is located just north of the spillway. To the south, the line intersects the project boundary at three different points running north to south.

Exhibit 18. Taiwan 12kV Overhead Distribution Line, view north (Psomas 2023)

7 Significance Evaluation

7.1 Santiago Dam Complex (P-30-176757)

7.1.1 NRHP, CRHR, and County Designation Criteria

The Santiago Dam appears to remain eligible for the NRHP, CRHR, and local landmark designation based on the following application of designation criteria and integrity requirements.

NRHP Criterion A. That are associated with events that have made a significant contribution to the broad patterns of our history.

CRHR Criterion 1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

Santiago Dam is directly associated with events that made significant contributions to the development of the citrus industry in Orange County in the late 19th and early 20th century with a period of significance of 1931, when the dam was built. The subject property was constructed by the Serrano Irrigation District, John T. Carpenter Water Company, and the Irvine Company. Prior to construction on the dam, farmers dug wells, built reservoirs, and laid pipelines to irrigate their crops. Water quality and water scarcity prompted a change in water distribution and the installation of wells. Water runoff and irrigation rights were a constant struggle between the Irvine, Carpenter, and Serrano Irrigation Districts. The dispute between the three districts was resolved when they came together to construct the Santiago Dam. The Dam provided water for domestic and agricultural uses and is directly related to the development of the citrus industry in Orange County during the late 19th and early 20th century.

The Santiago Dam, including the dam, outlet tower, spillway, and reservoir, is directly associated with the historical and current function of the Dam. Although the Dam Keeper's Residence and Garage appear to have been constructed around the same time as the Dam, their significantly altered appearance makes them unrecognizable from the period of significance of the Dam. The remaining features within the Dam complex such as the Storage Shed, Second Garage, Control Building and Valve Vault, Boat Dock, and OCWR Landfill Flare Facility are non-contributing features constructed outside the period of significance of the Dam.

Therefore, the Santiago Dam Complex is eligible under NRHP Criterion A and CRHR Criterion 1 for its important contributions to local water and agricultural history.

NRHP Criterion B. That are associated with the lives of persons significant in our past.

CRHR Criterion 2. Is associated with the lives of persons important in our past.

The subject property is a dam constructed by the John T. Carpenter Water Company, Serrano Irrigation District, and the Irvine Company. Review of local publications and newspaper articles failed to indicate that the subject property has any important associations with significant persons in regional history. Therefore, the subject property is not eligible under NRHP Criterion B or CRHR Criterion 2.

NRHP Criterion C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

CRHR Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The Santiago Dam is an earthen and concrete structure constructed in 1931. Although Augustus Kempkey appears to have consulted on numerous water projects throughout California, he does not appear to have been a master engineer when considered among others in his field. Further, the Santiago Dam is an earthen embankment dam, the most common type of dam in the United States; they can be built from locally available materials that require minimal processing, saving money on the construction process. The Dam does not possess high artistic value or innovative engineering features. Therefore, the Santiago Dam is not eligible under NRHP Criterion C or CRHR Criterion 3.

NRHP Criterion D. That have yielded, or may be likely to yield, information important in prehistory or history.

CRHR Criterion 4. Has yielded, or may be likely to yield, information important in prehistory or history.

The subject property is not significant as a source, or likely source, of important historical information nor does it appear likely to yield important information about historic construction methods, materials or technologies. Therefore, the subject property is not eligible under NRHP Criterion D or CRHR Criterion 4.

7.1.2 Integrity

Location: The subject property retains integrity of location as it remains in its current location.

Design: The subject property has integrity of design. Although there have been a few alterations, the design of the Dam remains relatively unchanged.

Setting: The subject property has integrity of setting. The Dam is still located in an undeveloped rural setting.

Materials: The subject property retains integrity of materials as the dam and spillway retain original materials.

Workmanship: The subject property retains integrity of workmanship as evidence of the original craftsmanship is present.

Feeling: The subject property retains integrity of feeling as the area remains undeveloped and rural.

Association: The subject property continues to be associated with the distribution of water for agricultural and domestic use.

The Santiago Dam is eligible for listing under NRHP and CRHR under Criterion A/1.

7.2 Taiwan 12kV Overhead Distribution Line

The Taiwan 12kV Overhead Distribution Line is not eligible for the NRHP, CRHR, and local landmark designation based on the following application of designation criteria and integrity requirements.

NRHP Criterion A. That are associated with events that have made a significant contribution to the broad patterns of our history.

CRHR Criterion 1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

Guidance provided in Tinsley Becker et al. 2015 states that subtransmission lines and their associated infrastructure should be evaluated under two important themes, which are most appropriately examined below under Criteria A/1/2:

(1) An association with and representation of SCE's organizational history as evidence of key expansion periods that contributed to or served as the genesis of settlement or marked growth in community services by SCE.

The Taiwan 12kV Overhead Distribution line was energized c. 1952. Information regarding the construction of the line is limited. The design for distribution lines was borrowed from telegraph transmission technology and uses infrastructure that is found state-wide. The principles of the design of distribution systems is rudimentary with minor changes since its inception and is unable to reflect significance from the period from which they were constructed

(2) An association with SCE's original construction and implementation campaigns or the established period of significance for the company's 66kV, 220kV, and 500kV systems.

The Taiwan 12kV Overhead Distribution line is not associated with SCE's early construction and implementation campaigns, nor does it fall within the period of significance for either SCE's 66kV, 220kV, or 500kV systems.

For the reasons demonstrated above, the subject property is not eligible under NRHP Criterion A or CRHR Criterion 1,

NRHP Criterion B. That are associated with the lives of persons significant in our past.

CRHR Criterion 2. Is associated with the lives of persons important in our past.

The subject property is a transmission line that is not associated with any specific owners. Its only owners have been SCE. Review of local publications and newspaper articles failed to indicate that the subject property has any important associations with significant persons in regional or SCE history. Therefore, the subject property is not eligible under NRHP Criterion B, CRHR Criterion 2, or County Criterion 3.

NRHP Criterion C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

CRHR Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The Taiwan 12kV Overhead Distribution Line does not serve as an important example of electrical infrastructure on SCE's system. Under this criterion, wood poles are considered ubiquitous and indistinctive utilitarian structures that are purely functional and do not exhibit any important construction methods or technologies. Further, the line is not an early example of electrical voltage or transmission technology and does not represent an innovation in engineering design or for construction material technology. Therefore, the subject line is not eligible under NRHP Criterion C or CRHR Criterion 3.

NRHP Criterion D. That have yielded, or may be likely to yield, information important in prehistory or history.

CRHR Criterion 4. Has yielded, or may be likely to yield, information important in prehistory or history.

The subject property is not significant as a source, or likely source, of important historical information nor does it appear likely to yield important information about historic construction methods, materials, or technologies. Therefore, the property is not eligible under NRHP Criterion D or CRHR Criterion 4.

7.2.1 Integrity

Location: The subject property retains integrity of location as it remains in its current location.

Design: The subject property has integrity of design. Although there have been a few alterations, the design of the dam and spillway remain unchanged.

Setting: The subject property has integrity of setting. The line continues to be located in an undeveloped rural setting.

Materials: The subject property appears to retain integrity of materials as they do not appear to have been replaced.

Workmanship: The subject property retains integrity of workmanship as evidence of the original craftsmanship is present.

Feeling: The subject property retains integrity of feeling as the presence of wood poles help it retain a circa 1952 feeling.

Association: The subject property has no important associations with any patterns of regional development or SCE organization history and falls outside the period of significance for 66kV electrical transmission.

The Taiwan 12kV Overhead Distribution line is not eligible for listing under NRHP and CRHR under any designation criteria.

8 Project Effects/Impacts Assessment

8.1 Historic Properties Identified

One historic property/historical resource was identified within the project APE: the Santiago Dam Complex (P-30-176757), which currently has a status code of 2S2, indicating it has been determined eligible for the NRHP and is listed in the CRHR. The updated evaluation completed as part of the current study found that the Dam remains eligible for the NRHP/CRHR under Criterion A/1. The Dam is eligible for its important historical associations with water resources development in Orange County, as well as with the citrus agriculture industry. Therefore, it is necessary to consider the proposed project's potential to adversely affect this historic property/historical resource.

8.2 Application of the Criteria of Adverse Effect

As stated in 36 CFR 800.5(a)(1), Criteria of adverse effect:

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Examples of adverse effects on historic properties include, but are not limited to (36 CFR 800.5(a)(2)):

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

8.3 Physical Effects of the Proposed Project

The following project-related physical effects were identified for the Santiago Dam Complex (P-30-176757):

- Demolition of the existing outlet tower, spillway, and portions of the upstream Dam embankment concrete facing
- Construction of a new spillway
- Widening and raising of the Dam crest
- Construction of a new 1.5-foot-tall concrete parapet wall on the upstream side of the Dam
- Construction of a 10-foot-tall, 1,300-foot-long retaining wall on the downstream face of the Dam
- Construction of a new emergency access walkway and stair system
- Construction of a new steel bridge structure

8.4 Analysis of Potential Adverse Effects

The major components of the Santiago Dam Complex include the dam, spillway, outlet tower, and reservoir, as these elements are directly associated with the historical and current function of the resource. However, the Dam is not eligible for its engineering or construction techniques, and it is not the specifics of the Dam's design or individual elements that make it eligible for the NRHP/CRHR under Criterion A/1. Rather, it is the Dam's ongoing function and location that conveys its historical associations with Orange County water development and the citrus industry. Although the proposed project will result in the loss of some original historic materials, design, and workmanship associated with the spillway and outlet tower, the loss of these elements will not prevent the Dam from conveying its important historical associations. The same is true for proposed alterations to the Dam crest. Although specific aspects of the Dam will be modified, it will remain recognizable as an earthen embankment dam and will continue to perform the historic function for which it is eligible. The character-defining features of the Dam necessary for it to continue to convey its historical significance under Criterion A/1 include its ongoing function as an earthen embankment dam on Santiago Creek, maintaining the same general massing and scale. Therefore, the proposed project will result in no adverse effects to historic properties under Section 106 of the NHPA, and no significant impacts to historical resources under CEQA.

9 Findings

One historic property/historical resource was identified within the project APE: the Santiago Dam Complex (P-30-176757), which currently has a status code of 2S2, indicating it has been determined eligible for the NRHP and is listed in the CRHR. The updated evaluation completed as part of the current study found that the Dam remains eligible for the NRHP/CRHR under Criterion A/1. The Dam is eligible for its important historical associations with water resources development in Orange County, as well as with the citrus agriculture industry.

Although specific aspects of the Dam will be modified, it will remain recognizable as an earthen embankment dam and will continue to perform the historic function for which it is eligible. The character-defining features of the Dam necessary for it to continue to convey its historical significance under Criterion A/1 include its ongoing function as an earthen embankment dam on Santiago Creek, maintaining the same general massing and scale. Therefore, the proposed project will result in no adverse effects to historic properties under Section 106 of the NHPA, and no significant impacts to historical resources under CEQA.

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Appendix A:
DPR Forms

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # 19-176757 (Update)
HRI #
Trinomial
NRHP Status Code 2S2

Other Listings
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 28 ***Resource Name or #:** Santiago Dam Complex
P1. Other Identifier:
***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted**
***a. County** Orange **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Black Star Canyon **Date** 2023 **T** 4S; **R** 8W ; _ ☐ **of** _ ☐ **of Sec** 28, 33, 24, 35 SB **B.M.**
c. Address n/a City Silverado Zip 92676
d. UTM: Zone 11S, 432961.61 mE/ 3738156.58 mN;
e. Other Locational Data:
APN: 043-0-070-055. The Santiago Dam is located at the northwest end of Irvine Lake in unincorporated Orange County, California. It is south of State Route (SR) 261 and east of SR-241 and Santiago Canyon Road.

***P3a. Description:** The Santiago Dam Complex consists of the various dam components (i.e., the dam, spillway, outlet tower), reservoir, and associated structures, including the Dam Keeper's Residence and Garage, Storage Shed, Second Garage, Control Building and Valve Vault, and the OCWR Landfill Flare Facility which sits above the dam on a ridge to the west. All of these elements are numbered on the APE Map and referenced throughout the discussion below (Figure 2). (see Continuation Sheet).

***P3b. Resource Attributes:** HP2. Single family property; HP4. ancillary building; HP11, engineering structure
***P4.Resources Present:** ■ Building ■ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)
P5b. Description of Photo: Photograph 1. Santiago Dam, view facing northwest

***P6. Date Constructed/Age and Source:** ■ Historic ☐ Prehistoric ☐☐Both
1931 (Los Angeles Times 1931)

***P7. Owner and Address:**
Serrano Water District
P.O. Box 57000
Irvine, CA 92619

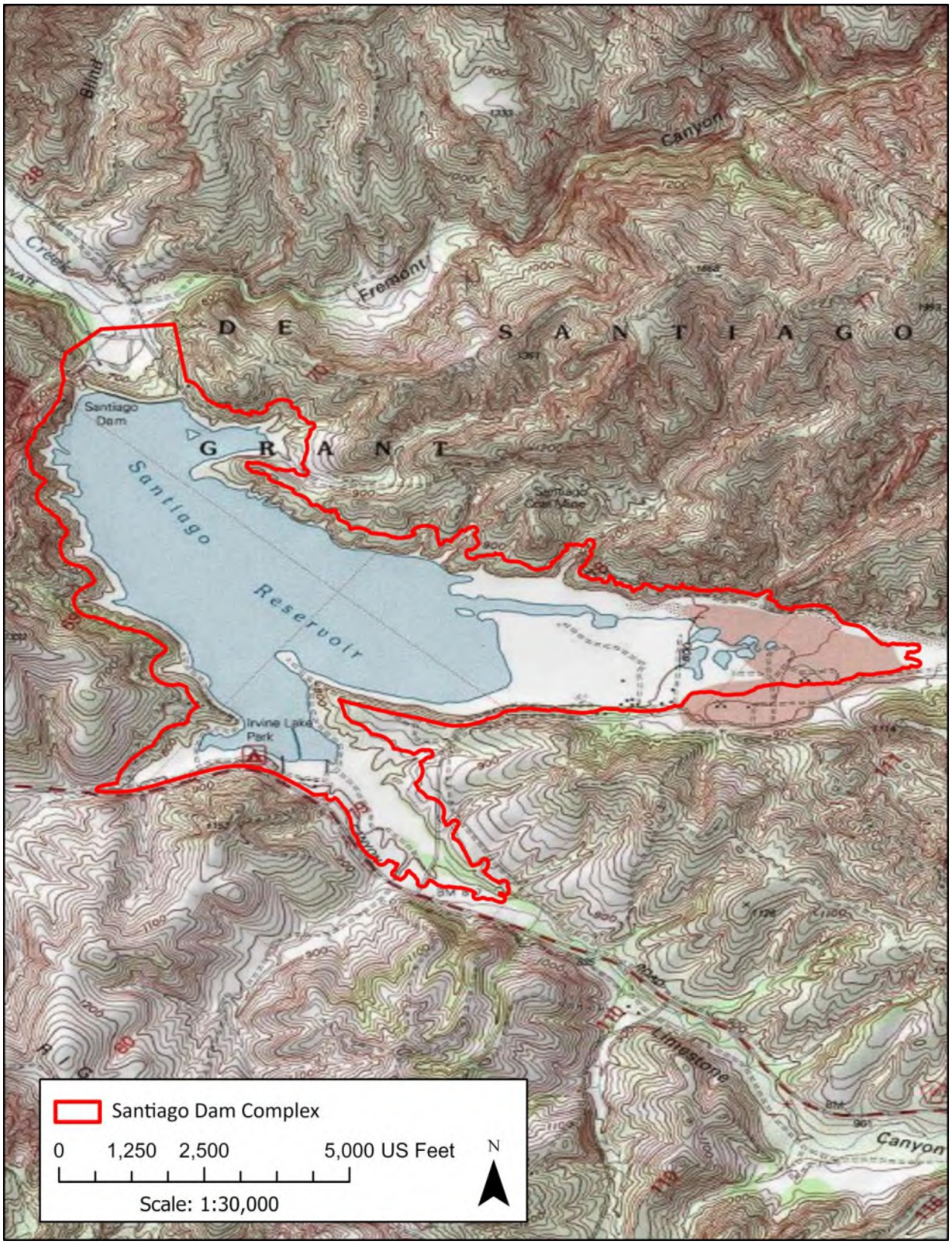
***P8. Recorded by:**
Laura Carias
South Environmental
2061 N Los Robles Ave. #205
Pasadena, CA 91104

***P9. Date Recorded:** 11/3/2023

***P10. Survey Type:** Intensive

***P11. Report Citation:**
Historical Resources Assessment Santiago Creek Dam Outlet Tower and Spillway Improvements Project (South Environmental 2023)

***Attachments:** ☐NONE ■Location Map
■Continuation Sheet ■Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List): _____


Santiago Dam Complex
0 1,250 2,500 5,000 US Feet
Scale: 1:30,000
N
Santiago Dam
Santiago Reservoir
Irvine Lake Park
Fremont Canyon
Limestone Canyon
D E S A N T I A G O
G R A N T


Dam Spur Rd
Dam Spur Rd
Dam Spur Rd
Lake View Scenic Rd
Santiago Creek
1
2
3
4
5
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BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) Santiago Dam Complex ***NRHP Status Code** 2S2

B1. Historic Name: Santiago Dam
B2. Common Name: Santiago Dam
B3. Original Use: Dam B4. Present Use: dam
***B5. Architectural Style:** earth-filled embankment dam
***B6. Construction History:**
The dam was constructed in 1931 (LAT 1931). The Dam Keeper's Residence and Garage were constructed in 1931 (Santa Ana Register 1932). A second garage was added in circa 2002; storage shed added circa 1947; OCWR landfill flare facility circa 1992; control building and valve vault in 1960; and boat dock in circa 1947.

***B7. Moved?** ☐No ☐Yes ■Unknown **Date:** _____ **Original Location:** _____
***B8. Related Features:**
B9a. Architect: Engineer: Augustus Kempkey b. Builder: R.G. Letourneau Company
***B10. Significance: Theme** Water and agricultural history **Area** Orange County **Period of Significance** 1931 **Property Type** Dam **Applicable Criteria** A/1

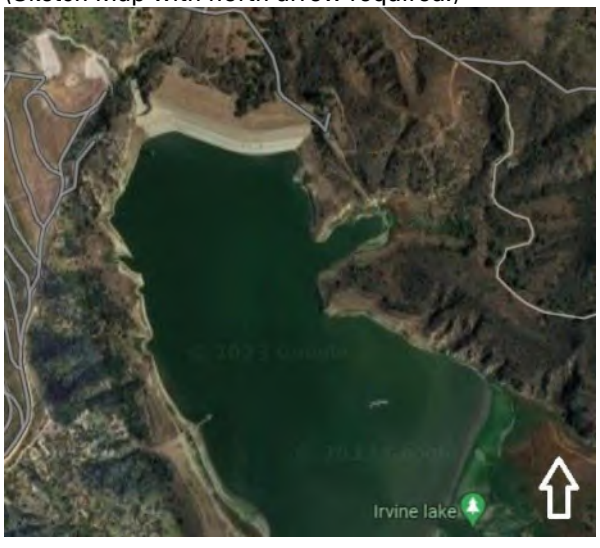
The Santiago Dam appears eligible for the NRHP, CRHR, and local landmark designation based on the following application of designation criteria and integrity requirements. (see Continuation Sheets).

B11. Additional Resource Attributes: (List attributes and codes) _____
***B12. References:** See Continuation Sheets

B13. Remarks:

B14. Evaluator: Laura Carias, South Environmental
***Date of Evaluation:** 11/3/2023

(Sketch Map with north arrow required.)



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***P3a. Description (Continued):**

Dam Components

The Santiago Dam is an earthen and concrete structure constructed in 1931 (Exhibit 1) (APE Map #1). It contains 1.1 million cubic yards of clay, porous clay and rock that was moved in for its construction. The upstream portion of the dam was filled with clay material to prevent water seepage and has a 2.5 to 1 slope and is capped with concrete blocks that measure six feet by 6 inches thick (Exhibit 2). The Irvine Lake (also called the Santiago Creek Reservoir) has a storage capacity of approximately 25,000-acre feet of water. The Dam's footprint features a gentle "S" curve, with a concrete spillway at its west end (APE Map #2). Eight narrow pylons support a 12-foot-wide concrete catwalk that extends over the spillway (Exhibit 3). Safety railings for the catwalk are provided by 4-foot-high concrete parapets (Exhibit 4). An outlet tower is located southwest of the spillway (Castells 2021)(APE Map #3).

Exhibit 1: South elevation of Santiago Dam and view of Irvine Lake, view north (Psomas 2023)

Exhibit 2: South elevation of Santiago Dam, view west (Psomas 2023)

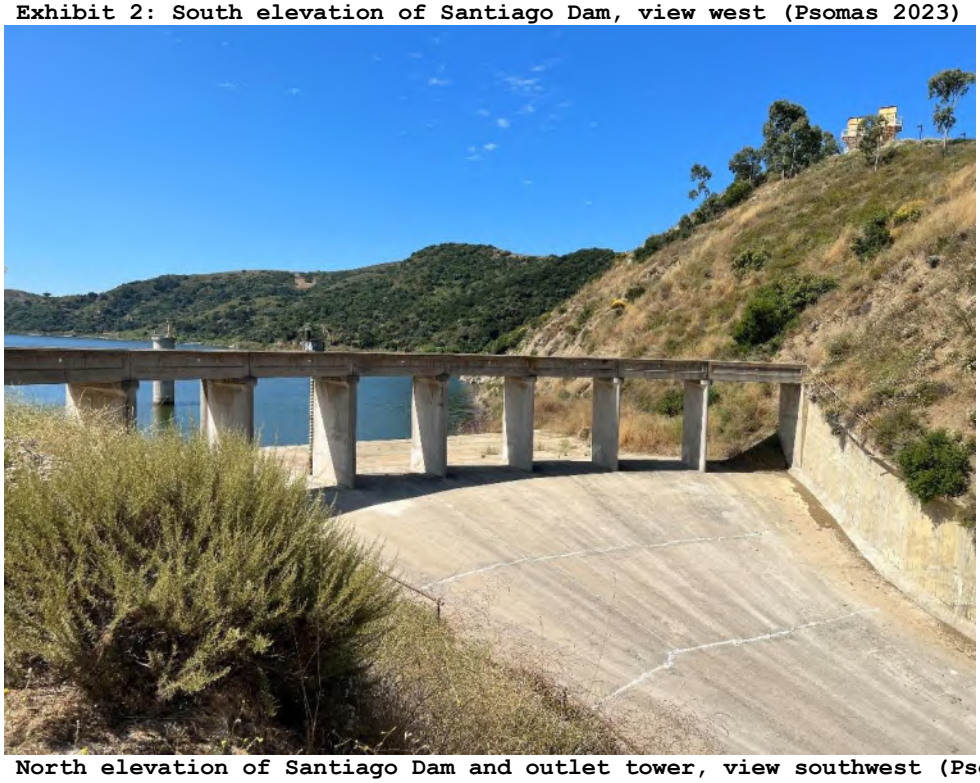

Exhibit 3: North elevation of Santiago Dam and outlet tower, view southwest (Psomas 2023)

Exhibit 4: View of Santiago Dam concrete spillway, view north (PaleoWest 2021)

Exhibit 5: View of Santiago Dam concrete spillway, view north (Psomas 2023)

Associated Buildings and Structures

Dam Keeper Residence and Garage

The Dam Keeper Residence and Garage were constructed in 1931 and are visible in the 1938 historic aerial photograph (APE Map #7, #8). The Dam Keeper Residence is a one-story, single-family

residence located on a hill east of the dam with a front gabled roof clad in composition shingles (Exhibit 6). The residence is clad in vertical clapboard siding. The primary elevation faces south and features a covered porch located under a secondary front gabled roof (Exhibit 7). There are three replaced single-hung windows at the primary elevation. The west elevation consists of a screened porch that extends almost the entire width of the building. The porch cantilevers over the hill and provides a full view of the dam (Exhibit 8).

Directly south of the residence, across the asphalt paved driveway, is a two-car garage with a front facing gable clad with composition shingles (APE Map #9). The building features narrow, horizontal wood siding and north facing primary elevation. The garage does not have a door, rather the interior has been modified and sectioned off, now featuring a smaller room within the garage. Single hung windows are visible on the east, west, and south elevations (Exhibit 9).

Alterations to the Dam Keeper Residence include replacement of all original windows and siding. The siding may have been replaced in the 1980s, but the windows were likely replaced more recently.

Exhibit 6. Dam Keeper Residence and Garage, view north (Psomas 2023)

Exhibit 7. Dam Keeper Residence, primary south elevation, view north (Provided by Psomas: Moeder 2023)

Exhibit 8. Dam Keeper Residence, west elevation, view northeast (Psomas 2023)

Exhibit 9. Dam Keeper Garage, north elevation, view south (Psomas 2023)

Second Garage

A second garage is located approximately 190 feet south of the Dam Keeper Residence and Garage along an asphalt and gravel driveway (APE Map #9). Although it appears that other garages with smaller footprints were once located in the same vicinity, the current Second Garage first appears in a 2002 historic aerial. The garage is located at the base of hill. It has a rectangular floor plan and a front gabled roof clad in composition shingles. The Second Garage is clad in vertical clapboard siding and the main entrance is located on the north elevation. The garage door is a modern sectional door (Exhibit 10).

Exhibit 10. Second Garage, north elevation, view south (Psomas 2023)

Storage Shed

The Storage Shed is located above the dam spillway, approximately 55 feet to the east (APE Map #4). It appears in historic aerial photographs as early as 1947. It has a rectangular floor plan and a front gabled roof clad in composition shingles. The building is clad with vertical clapboard siding and features a contemporary sectional garage door (Exhibit 11).

Exhibit 11. Storage Shed, north elevation, view south (Psomas 2023)

OCWR Landfill Flare Facility

The OCWR Landfill Flare Facility is an industrial structure located approximately 266 feet southwest of the concrete catwalk, on the northwesternmost hillside adjacent to the reservoir (APE Map #6). It consists of three squared metal towers with metal catwalks that surround each tower on three elevations. The facility is made up of other industrial components such as tanks and pipes

(Exhibit 12). It can be accessed via a private road stemming from Santiago Canyon Road.

Exhibit 12. OCWR Landfill Flare Facility, view southwest.

Control Building and Valve Vault

The Control Building and Valve Vault is located northeast of the spillway. It is located at the base of a hill and features a single-story building with a rectangular floor plan and front gabled roof (APE Map #5). The roof is clad with composition shingles and the building is clad with vertical wood siding. A single door is located on the east elevation and a sectional garage door is located on the south elevation. A chain linked fence is located east of the building surrounding a small shed building (Exhibit 13). The building is isolated and there is a road to its east that extends east before it travels north connecting to State Road 241.

Exhibit 13. Control Building and Valve Vault, south and east elevations, view northwest (Psomas 2023)

Boat Dock

The boat dock is not permanently attached or anchored to the lakeshore. It currently sits on the southwest end of the lake and is a rectangular dock with a shed (APE Map #10). The dock measures approximately 193 feet long and 18 feet wide.

Construction History

The land surrounding the current site of the Santiago Dam Complex was used during the 19th and early 20th century for cattle and sheep grazing. Beginning in 1876, the Serrano Irrigation District provided water for citrus groves in the Orange and Villa Park areas. By the late 1920s, the demand for irrigation water intensified and required the construction of a reservoir (Serrano Irrigation District n.d.).

At the request of the Serrano and Irvine Irrigation Districts, bids for a contractor for the new construction of the Santiago Dam began in early 1931. The lowest bidder, R.G. Letourneau Company Inc., won the contract at the value of $507,721.50 which was well below the engineer's estimate of $725,000 (LAT 1931). Augustus Kempkey was the consulting engineer on the project. The dam was a "earth fill" type which was constructed to be 125 feet high above the Santiago Creek bed, 600 feet through the base and narrowing to 10 feet at the top. The dam was 1,400 feet long and could accommodate approximately 25,000-acre feet of water. The Wheatland Construction Company placed all the steel and concrete on the dam including 400 tons of steel and 7,000 cubic yards of concrete; the spillway required an additional 400 tons of reinforcing steel and 5,000 yards of concrete (Whittier News 1931). The dam was completed in 1931 and its reservoir, Irvine Lake, was filled by 1933. The lake opened to the public in 1941 (Orange County Grand Jury 2018-2019). A dam keeper residence was added in 1931 and was located on the east end of the dam (Santa Ana Register 1932).

Exhibit 14: Base of outlet tower circa 1931 (Courtesy of IRWD)

Exhibit 15: Outlet tower under construction circa 1931 (Courtesy of IRWD)

Exhibit 16: Spillway crest and chute under construction circa 1931 (Courtesy of IRWD)

Exhibit 17: Santiago Dam and outlet tower under construction circa 1931 (Courtesy of IRWD)

Review of historic aerial photographs indicates that the dam has always been located in a mountainous, undeveloped area. In the earliest photograph dating from 1931, Santiago Creek was visible but the dam was not yet in place (UCSB 1931). The Dam, Dam Keeper's Residence, and Dam Keeper's Garage were visible in the 1938 historic aerial as well as the Storage Shed. By 1947, the boat dock was visible at the south end of Irvine Lake for recreational purposes (UCSB 1938, 1947). The Control Building and Valve Vault appears in the 1960 aerial approximately 400 feet northeast of the spillway. By 1977, a parking lot has been added near the dock, presumably for those making use of recreational activities at the lake (UCSB 1977). Grading of the hills west of the dam appears to begin circa 1969, expands in 1977, and is visibly larger by 1989 (UCSB 1989). The location of the parking lot and dock appear to move several times throughout the years. Aerial photographs show water levels were low between 2016 and 2020 and the dock was moved further north along the western bank presumably to deeper water. the OWCR Landfill Flare Facility first appears in the 2002 historic aerial, located west of the dam, and is still present today (UCSB 2002).

Review of historic architectural drawings show that in 1956 a pipeline connecting Metropolitan Water District and Santiago Dam was constructed (Santiago Creek Dam Drawings 1956). A spillway overflow recorder was added in 1957 by Boyle Engineering (Santiago Creek Dam Drawings 1957). In 1969 Leeds, Hill, and Jewett Inc. were the consulting engineers on record that designed a series of updates on the dam including embankment construction, spillway reconstruction and reinforcement, and outlet works reconstruction (Santiago Creek Dam Drawings 1959). An extension of the water tower was completed in 2001 by Cho Design Associates, Inc. The drawing set consists of three sheets and does not indicate the level of work proposed. The drawing set included cover sheet, sheet index, and as-built information (Santiago Creek Dam Drawings 2001). In 2003, Verizon added a cellphone tower near the dam (Santiago Creek Dam Drawings 2003).

Engineer: Augustus Kempkey (c. 1885-1975)

Augustus Kempkey was a native of Oakland and graduated from the University of California in 1902. Upon graduation, he worked as assistant engineer for the Berkeley branch of the Contra Costa Water Works (Oakland Tribune 1902). He belonged to a number of Masonic bodies and was the grand commander

of California Knights of Templar in 1938. He worked as a consulting civil engineer (Sacramento Bee 1975). Through archival research Kempkey appeared to work as a consultant very early in his career for various agencies. He worked on projects such as the Patterson irrigation system, Turlock irrigation project, Modesto irrigation project, and Brentwood irrigation project. Most of his work was on at advisory level. Other dams he worked on include Conn Dam and Lake Hodges Dam.

***B10. Significance (Continued):**

Historic Context

The following historic context is adapted from Donovan-Boyd, Kaiser, and Murray 2021.

Rancho Lomas de Santiago

Extensive land grants or ranchos were established in the interior during the Mexican period (1822-1848), in part to increase the population inland from the more settled coastal areas where the Spanish first concentrated their colonization efforts. The APE is located in Ranchos Lomas de Santiago, originally owned by José Antonio Yorba's youngest son, Teodocio Yorba. Yorba was granted Rancho Lomas de Santiago (Ranch of the Hills of St. James) in 1846, just before California was annexed to the United States at the end of the Mexican American War. The Yorba family was one of the most successful landowners in Southern California during the Mexican Period. Beginning in the 1840s and 1850s, the Yorba family had acquired six adjoining ranchos (Nelson 2009:2). Yorba filed a United States claim for the Rancho Lomas de Santiago in 1852.

Teodosio Yorba sold Rancho Lomas de Santiago to William Wolfskill in 1860 for $7,000 and Joseph E. Pleasants took charge of Wolfskill's new cattle operations. Already overgrazed, and largely unfarmable due to its steep, hilly terrain, the Santa Ana range could not sustain large cattle herds. In 1866, Benjamin and Thomas Flint, Llewellyn Bixby and James Irvine acquired the rancho from Wolfskill, and it eventually became part of the Irvine Ranch (Irvine Historical Society 2020).

Development of the Irvine Ranch

The APE is located in the northern portion of what would become known as the Irvine Ranch, one of the largest, most prosperous agricultural operations in Orange County. William Wolfskill purchased the land that would become the Irvine Ranch from Teodocio Yorba in c. 1860 with plans to use the land for grazing sheep (Nelson 2009:2). Wolfskill was a California pioneer, and a prolific landowner, businessman, and rancher. He is also credited with being one of California's first Valencia orange ranchers (OCHC 1983: Section 8). In 1866, Wolfskill sold the 47,000-acre property to Benjamin and Thomas Flint, Llewellyn Bixby, and James Irvine (Irvine Historical Society 2020). Flint and Bixby were also sheep men, who were expanding their land holdings to increase their annual production of wool (Nelson 2009:2).

James Irvine, a pioneer of California agriculture and prosperous San Francisco merchant, purchased the Flint and Bixby shares of the Rancho Lomas Santiago in 1876 for $150,000 dollars. This gave Irvine control of approximately 110,000 acres of land in and around the Santa Ana Canyon (Nelson 2009:3). Irvine, an Irishman, came to America in 1846, and lived for a time in New York City. He came to California in 1849, to find his fortunes in the California Gold Rush. After working in the mines for several years, Irvine began selling merchandise to miners, and eventually established a successful market in San Francisco (The San Francisco Examiner 1886:3). James Irvine died in 1886, leaving his estate to his son, James Irvine Jr. George Irvine, James Irvine Sr.'s brother, managed the property until Irvine Jr. came into possession of the estate at the age of 25 (Nelson 2009:2; The Mail 1886:2).

When James Irvine Jr. took over the estate in 1892, he converted the ranch into an "increasingly modern, productive enterprise of field crops, grain and irrigated orchards," which was achieved by digging wells, building reservoirs, and laying pipeline to irrigate the crops (Nelson 2009:3). In 1893, Irvine Jr. began to divert water from Santiago Creek to an area known as "The Flats" where the property's new ranch house was located. Also, in the 1880s, Irvine Jr. began to lease land to tenant farmers. These farmers grew grain and bean crops that required minimal rainfall and little to no irrigation. Historic aerials from 1946 suggest the Project site was never brought under

agricultural use during the Irvine ownership. While the Project site does not appear to have been cultivated, the road through Santiago Canyon, along the Santiago Creek, that eventually becomes Santiago Canyon Road, is visible on the 1901 topographic map of the area in generally the same orientation as it found today.

The Irvine Company

In 1894, James Irvine Jr. incorporated the Ranch as the Irvine Company and became the company's first president (Brower 2013: xxi). One of James Irvine Jr's first acts as president was to donate 160 acres of land, that had long been a popular pioneer picnic spot, to the State Board of Supervisors. This donation, land northeast of Irvine Lake, became the Irvine Ranch Historic Park, which is now the oldest park in Orange County (OCHC 1983: section 8). Around this same time, in 1889, Orange County formed out of parts of Los Angeles County (Figure 3). When Orange County was formed, the Irvine Company owned almost one-fifth of the County's acreage.

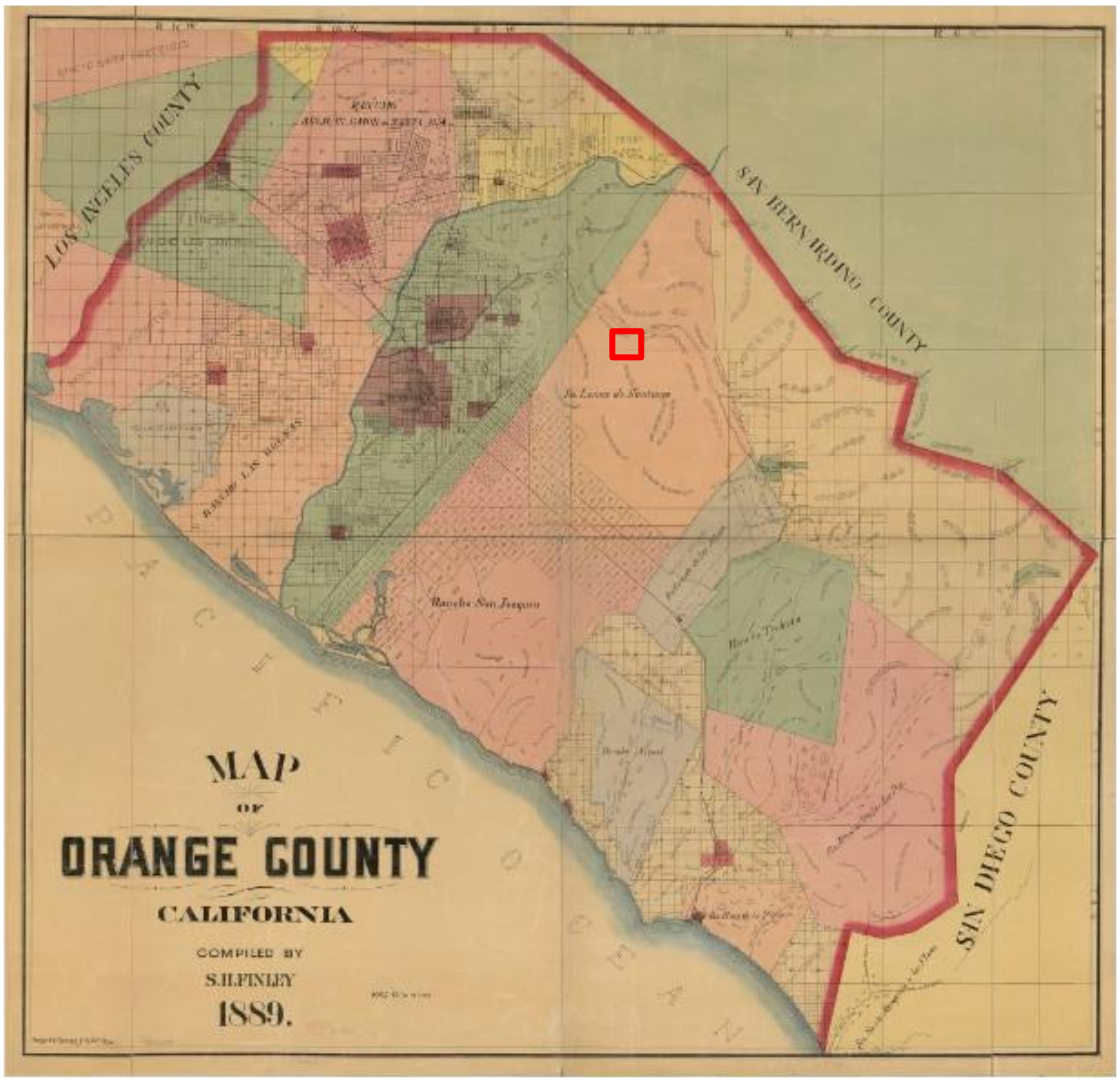

Figure 1. Orange County California Map, 1889. Shows the Ranchos and the growing population areas of Orange County. Compiled by S.H. Finley. Approximate Project Location in red (Library of Congress, Geography and Map Division) (Finley 1889).

Irvine Ranch quickly became one of the most productive tracts in California, known for the growing of lima beans, black-eyed peas, barley, oats, sugar beets, olives, walnuts, lemons, and oranges (Santa Ana Daily Register 1915:8). As the tenants on the Irvine Ranch increased, James Irvine Jr. developed an extensive system of wells to irrigate the land (Nelson 2009:7). By 1920, it is estimated that nearly 1,200 wells had been drilled on his acreage and many were running with electric pumps. By 1930, the Irvine Ranch had 31,000 acres of lima beans under cultivation, which was often described as the "largest lima bean field in the world" (Nelson 2009:7).
In 1935, James Irvine III (known as Jase), Irvine Jr.'s oldest son, tragically died of tuberculosis. Jase was on track to be the president of the Irvine Company and his death left James Irvine Jr. distraught and without sound leadership for the future of the company (Brower 2013: xxi). Several years later, in 1937, James Irvine Jr. established the James Irvine Foundation with 51% of the company's stock to be held by the foundation and the other 49% to be distributed to family (Brower 2013: xxii).

Irvine Ranch Water Management Facilities

Ongoing water quality problems and water scarcity made it clear that further work was necessary to irrigate crops at Irvine Ranch. The water conveyance facilities on the Ranch became one of the largest water management systems in Orange County. The first distribution irrigation feature on the Irvine Ranch property was the Irvine Ditch, constructed in 1893 from the Santiago Canyon to the Peters "Flats" (near the present-day location of the Peters Canyon Dam, which is approximately 2 miles to the west of the Project site). Wells were the primary source of water at the turn of the century, with 1,200 wells constructed in the area, most equipped with electric pumps. These wells allowed for large citrus orchards to be planted starting in 1906 (Nelson 2009: 17).

Irvine began to construct a series of winter water conservation features on the Ranch starting in the 1920s. Water runoff and irrigation rights were a constant struggle between the Irvine, Carpenter, and Serrano Irrigation Districts and the conservation projects were an effort to offset the marked decline in his groundwater system. P. R. Browning was the principal designer of all the Ranch's water conservation facilities except for the Santiago Dam which was designed by Augustus Kempkey (Nelson 2009:7). The dispute between the competing irrigation districts was eventually settled in 1928, with an agreement between the three litigants that led to the construction of the Santiago Dam and Outlet Tower (Nelson 2009:8). This period also saw the establishment of a massive irrigation system on the site (Brower 2013: xxi). In 1950, there were 4,550 irrigated acres and 33,430 dry farming acreage. Just ten years later, the Irvine company had increased the irrigated acreage to 7,417 acres and dry farming acres accounted for only 16,853 acres (Nelson 2009: 18).

County-wide flood control bonds failed to gather appropriate support in 1929 and 1931, leaving James Irvine Jr. to complete some large-scale water management projects without government support. Flood control created both land security and pooled runoff water for domestic and agricultural uses. Irvine was increasingly worried about water rights, and in 1932 he filed suit against upper basin users to protect the rights to the Santa Ana River (OCWD 2015: 24). The following water conservation projects were completed on the Irvine Ranch Site between 1929 and 1959: Lambert Reservoir (1929); Santiago Dam (1931); Irvine Conservation Dam (1932); Peters Canyon Dam (1931); the High Line Canal (1930s); Laguna Reservoir (1937-38); Bonita Reservoir (1937-38); Little Peters Reservoir (1940); Sand Canyon Reservoir (1942); Syphon (sometimes spelled Siphon) Canyon Dam (1948-49); and the Rattlesnake Canyon Reservoir (1959) (Nelson 2009:8). In 1970, the construction of the Irvine Lake Pipeline brought water from the Colorado River to the Rattlesnake Canyon Reservoir.

Consolidation of Orange County Water Districts

While the Irvine Ranch was creating a sophisticated water system for Ranch operations, the rest of Orange County was using a patchwork method of establishing water rights. Early water conveyance developments in Orange County generally organized as groups of property owners that banded together to provide water services through groundwater wells, these co-ops were called "mutuals." The mutuals sold shares of water to landowners based on the number of acres held by each property owner. As metropolitan areas grew it became clear that the current system, collections of property owners, would not be sufficient for the rapidly growing population in Orange County (MWDOC 2017).

In 1928, several southern Orange County cities banded together to form the Metropolitan Water District of Southern California (MWD) with the lofty goal of importing water from the Colorado River. The MWD succeeded in the planning and construction of the Colorado River Aqueduct, which, starting in 1939, brought water from the Colorado River near the Arizona border to the east side of the Santa Ana Mountains. This ongoing consolidation of the cooperative system became a necessity as water became Southern California's most precious resource. In 1957, there were an estimated 151 of these mutual water groups remaining in Orange County. By 1963, it was estimated that by 1965, no more than 25 would remain. Postwar population growth further encouraged the consolidation of mutuals and districts and in other areas, growth brought city services within reach of previously rural areas (LAT 1963c:2).

The success of the MWD, and the continued need for more water lead to the formation of several other large districts who hoped to tap into Colorado River water as well as Northern California water from the State Water Project. Developments continued into the 1960s and 1970s to move water through areas in eastern Orange County. The Santiago lateral, completed in 1961, and the East Orange County Feeder Line No, 2, both extended water into the southeast section of the County (LAT 1961a: E:2; LAT 1961b: 52).

Irvine Ranch Water District

The IRWD was formed by the Irvine Company in 1961 as a California Special District with headquarters in Irvine. Orange County approved the boundaries of the District in December of 1960, with the District being bound on the west by Newport Avenue, the south by the Santa Ana Marine Corps Air Facility, the east by the Rancho Canada De Los Alisos, and the north by the Coastal Municipal Water District (LAT 1960: R-28cia). The District's boundaries initially included approximately 60 square miles (IRWD 2021: Liquid News). Initially, the IRWD served mainly agricultural customers, but the quickly growing Orange County population included many residential customers in need of water. The IRWD grew through annexations in the 1960s and 1970s and by 1991, the District provided water to one-sixth of Orange County (LAT 1991: A3).

As water districts became more established, growth continued through consolidation of districts. Between 1997 and 2008, the IRWD consolidated with five other water districts, including the South Coast Water District in 2006. Other districts that joined the IRWD include: Orange Park Acres Mutual Water Company (2008), Los Alisos Water District (2001), Carpenter Irrigation District (2000), and the Santa Ana Height Mutual Water Company in (1997) (IRWD 2021: Consolidations). Today the IRWD serves more than 425,000 residential customers and spans 181 square miles (IRWD 2021: Liquid News).

Serrano Irrigation District

The Serrano Irrigation District, now known as the Serrano Water District (SWD), was developed in 1876 by a consolidation of several water companies and associations privately-owned by ranchers and farmers in Villa Park. The Serrano Water Association, the John T. Carpenter Water District, and the Irvine Company came together in 1927 to form the Serrano Irrigation District as a public corporation under the Irrigation Districts Act of the State of California. "This enabled the district to hold elections to establish the bonds to finance their share of the construction of the Santiago Dam." (OAC n.d.). The Serrano Irrigation District was responsible for issuing bonds and borrowing money for the construction of the Santiago Dam and The Irvine Company provided the land (Serrano Irrigation District, Appendix A, n.d.).

In the early 1960s, the decrease in need for agricultural water led the district to build a water filtration plant and then later reservoirs at Sycamore and Taft to use water from the Irvine Lake for residential use (Serrano Irrigation District n.d.). Today, the district has 43 miles of pipe, three wells, two reservoirs, and one treatment plant. The district owns fifty percent of Irvine Lake and is the managing district for Irvine Lake (Serrano Water District 2023).

Post St. Francis Dam Disaster Development (1928-1947)

In 1928 the St. Francis Dam, located in the Santa Clara Valley just outside Los Angeles, failed, killing 430 people, destroying 1,250 buildings and 7,900 acres of farmland, to become one of the greatest dam failure disasters of the 20th century. Between 1929 and 1931, the State engineer

examined 827 dams and found near one third of them to require significant repairs according to new safety guidelines.

In 1929, the State of California also required any person that practices civil engineering or any of its branches to be registered with the state. This also included any person that acted in the position of an "assistant engineer" or higher. The state also created a board which developed standards for applicants that wanted to register with the state as an engineer. Some standards included: must be over 25 years of age, demonstrate no less than six years of professional experience, work references, and an application fee (Rogers n.d.).

Property Types

The following discussion of property types is adapted from Murray et al 2020:

Reservoir complexes, like Irvine Lake, are usually comprised of several elements including the water-retaining structure (dam), a water-retention area (reservoir), a water-releasing structure (spillway), a water-conveying structure (conduits and outlet tower), and other essential elements including water treatment plants (Zhang et al 2016). Each of these portions of the reservoir provides an essential function that ensures water will be retained and released safely.

Dams
The purpose of a dam is to store water and facilitate flood control for human and livestock water supply, irrigation, energy generation, recreation, and pollution control. Typically, dams fulfill a combination of these functions. Manmade dams are classified according to their type of construction, materials, slope, seepage control method, and resistance to the forces of water pressure. The materials used to construct modern dams included earth, rocks, concrete, masonry, steel, timber, rubber, and sometimes a combination of these materials. Dams can be classified into five basic types including embankment, concrete, gravity, buttress, and arch (ASDSO 2020).

Embankment Dams
Embankment dams are a type of massive dam that is built with natural materials, either rock or earth instead of concrete, leading to the sub-classification of earth-filled embankment dams and rock-filled embankment dams. The basic elements of embankment dams consist of a core, an earth- or rock-filled embankment on both sides, and protection on the upstream face. Embankment dams are trapezoidal in shape and resist the flow of water by both their strength and weight. Embankment dams can retain water because they have a low permeability throughout the structure or a layer of low-permeability material (Billington et al. 2005; TCEQ 2018).

Earth-filled Embankment Dams
Earth-filled embankment dams were the first type of dam to be constructed by humans and were first documented in approximately 3,000 BC in the Middle East. In fact, earth-filled embankment dams are still the most prevalent dam-type, and a 2005 report on large federal dams estimated that of the 70,000 dams present in the United States, 85% were earth-filled embankment dams. Many of the dams in the United States were built in the early twentieth century prior to the advent of technology that would have facilitated the construction of structural dams. However, the report goes on to say that throughout the twentieth century, even with the advent of new technology, 65% of the dams built were earth-filled embankment dams. Earth-filled dams are the most prevalent type of dam because they can be built from locally available materials that require minimal processing, saving money on the construction process. The main detraction from earth-filled dams is that they are subject to the erosive action of water if a sufficient spillway is not provided as part of the dam design (Billington et al. 2005; Bureau of Reclamation 1987). Examples of other earth-filled embankment dams in Orange County include:

- Peters Canyon Dam (1929)
- Villa Park Dam (1963)
- Seven Oaks Dam (1993)

Reservoirs
A reservoir is typically formed by the construction of a dam across a linear water source, such as a river or creek, to create an artificial lake where water is stored. The adjacent dam is responsible for the amount of water that flows out of the reservoir, therefore controlling its water level. The amount of water in a reservoir can also be controlled by natural elements including rainfall, snowfall, and droughts. In conjunction with storing water, reservoirs often become recreation centers for boating and fishing. The water in a reservoir is very still causing sediment to sink to the bottom which over time can reduce the total amount of water in the reservoir (NG 2020).

Spillways
A spillway is a structure used for the control of flood flows and diverting surplus water from a reservoir after it has been filled. The primary purpose of a spillway is to ensure water does not overtop the dam and destroy it. A controlled spillway manages flood water through the use of gates, where an uncontrolled spillway only utilizes the elevation of the spillway crest to control the water. The gates allow small amounts of water to be released to prevent a sudden large discharge of water which could cause the dam to fail. There are seven types of spillways including straight drop, ogee, shaft, chute, side channel, siphon, and labyrinth (PE 2019).

Outlet Towers
The outlet tower is a vertical structure located within the reservoir used for capturing water and conveying it to a hydroelectric or water-treatment plant. The tower sits above an outlet tunnel or pipe used to transport the water out of the reservoir which is controlled by the opening and closing of valves or gates. The value controls are usually located in a room at the top of the outlet tower (BDS 2020).

Secondary Property Types
Unlike the primary property types discussed above, secondary property types are not necessarily vital to keeping the reservoir complex running. Although secondary property types range greatly in their design and function, they are frequently associated with dam and reservoir sites. Examples of secondary property types include Dam Keeper's houses, cisterns and water tanks, pumping stations, wells, vaults, and any other components the larger water system built to support the reservoir complex.

- Dam Keeper's House: a small purpose-built cottage constructed to house the dam's keeper who moderated water levels in response to drought and heavy rain
- Cistern and Water Tank: an artificial reservoir, tank, or container used for the storing or holding of water on a dam site
- Pumping Station: Building(s) of this type can vary in size, their function is to house machinery that transport water from one site to another.
- Well: An excavation or structure created by digging, driving, or drilling to access water underground

Significance Evaluation
The following presents an evaluation of the subject property in consideration of NRH and CRHR designation criteria. Because of the similarities in the criteria of these programs, they have been addressed together to avoid duplicative text.

The Santiago Dam appears to remain eligible for the NRHP, CRHR, and local landmark designation based on the following application of designation criteria and integrity requirements.

NRHP Criterion A. That are associated with events that have made a significant contribution to the broad patterns of our history.

CRHR Criterion 1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

Santiago Dam is directly associated with events that made significant contributions to the development of the citrus industry in Orange County in the late 19th and early 20th century with a period of significance of 1931, when the dam was built. The subject property was constructed by the Serrano Irrigation District, John T. Carpenter Water Company, and the Irvine Company. Prior to construction on the dam, farmers dug wells, built reservoirs, and laid pipelines to irrigate their crops. Water quality and water scarcity prompted a change in water distribution and the installation of wells. Water runoff and irrigation rights were a constant struggle between the Irvine, Carpenter, and Serrano Irrigation Districts. The dispute between the three districts was resolved when they came together to construct the Santiago Dam. The Dam provided water for domestic and agricultural uses and is directly related to the development of the citrus industry in Orange County during the late 19th and early 20th century.

The Santiago Dam, including the dam, outlet tower, spillway, and reservoir, is directly associated with the historical and current function of the Dam. Although the Dam Keeper's Residence and Garage appear to have been constructed around the same time as the Dam, their significantly altered appearance makes them unrecognizable from the period of significance of the Dam. The remaining features within the Dam complex such as the Storage Shed, Second Garage, Control Building and Valve Vault, Boat Dock, and OCWR Landfill Flare Facility are non-contributing features constructed outside the period of significance of the Dam.

Therefore, the Santiago Dam Complex is eligible under NRHP Criterion A and CRHR Criterion 1 for its important contributions to local water and agricultural history.

NRHP Criterion B. That are associated with the lives of persons significant in our past.

CRHR Criterion 2. Is associated with the lives of persons important in our past.

The subject property is a dam constructed by the John T. Carpenter Water Company, Serrano Irrigation District, and the Irvine Company. Review of local publications and newspaper articles failed to indicate that the subject property has any important associations with significant persons in regional history. Therefore, the subject property is not eligible under NRHP Criterion B or CRHR Criterion 2.

NRHP Criterion C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

CRHR Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The Santiago Dam is an earthen and concrete structure constructed in 1931. Although Augustus Kempkey appears to have consulted on numerous water projects throughout California, he does not appear to have been a master engineer when considered among others in his field. Further, the Santiago Dam is an earthen embankment dam, the most common type of dam in the United States; they can be built from locally available materials that require minimal processing, saving money on the construction process. The Dam does not possess high artistic value or innovative engineering features. Therefore, the Santiago Dam is not eligible under NRHP Criterion C or CRHR Criterion 3.

NRHP Criterion D. That have yielded, or may be likely to yield, information important in prehistory or history.

CRHR Criterion 4. Has yielded, or may be likely to yield, information important in prehistory or history.

The subject property is not significant as a source, or likely source, of important historical

information nor does it appear likely to yield important information about historic construction methods, materials or technologies. Therefore, the subject property is not eligible under NRHP Criterion D or CRHR Criterion 4.

Integrity

Location: The subject property retains integrity of location as it remains in its current location.

Design: The subject property has integrity of design. Although there have been a few alterations, the design of the Dam remains relatively unchanged.

Setting: The subject property has integrity of setting. The Dam is still located in an undeveloped rural setting.

Materials: The subject property retains integrity of materials as the dam and spillway retain original materials.

Workmanship: The subject property retains integrity of workmanship as evidence of the original craftsmanship is present.

Feeling: The subject property retains integrity of feeling as the area remains undeveloped and rural.

Association: The subject property continues to be associated with the distribution of water for agricultural and domestic use.

The Santiago Dam is eligible for listing under NRHP and CRHR under Criterion A/1.

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The Santiago Dam (P-30-176757) was constructed in 1933 and was initially recorded and evaluated for historical significance in 2003 by Cary D. Cotterman of Chambers Group, Inc. Cotterman recommended that that the Santiago Dam was eligible for listing on the NRHP under Criterion A at the local, state, and national level due to its "strong association with the history of water resources development in Orange County, as well as with the entire citrus agriculture industry" (Cotterman 2003). Further, Cotterman found that the dam retains good integrity of location, design, materials, workmanship, and association.

PaleoWest, LLC revisited the property on January 27, 2021. Based on field observations, PaleoWest found no evidence to indicate that the historic integrity of the Santiago Dam has been compromised subsequent to its initial recordation in 2003. Therefore, PaleoWest, LLC concurs with the 2003 recommendation that the Santiago Dam is eligible for listing on the NRHP under Criterion A at the local, state, and national level and retains sufficient integrity to convey that historical significance.

***B12. References:**

Cotterman, Cary
2003 DPR 523 Series Forms for P-30-176757. On file at the SCCIC.

South elevation of Santiago Dam and view of Irvine Lake, facing north

South elevation of Santiago Dam, facing west

North elevation of Santiago Dam, facing east

View of concrete spillway, facing north

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #: 30-176757
HRI # :
Trinomial: 152819
NRHP Status Code: 3S
Other Listings:

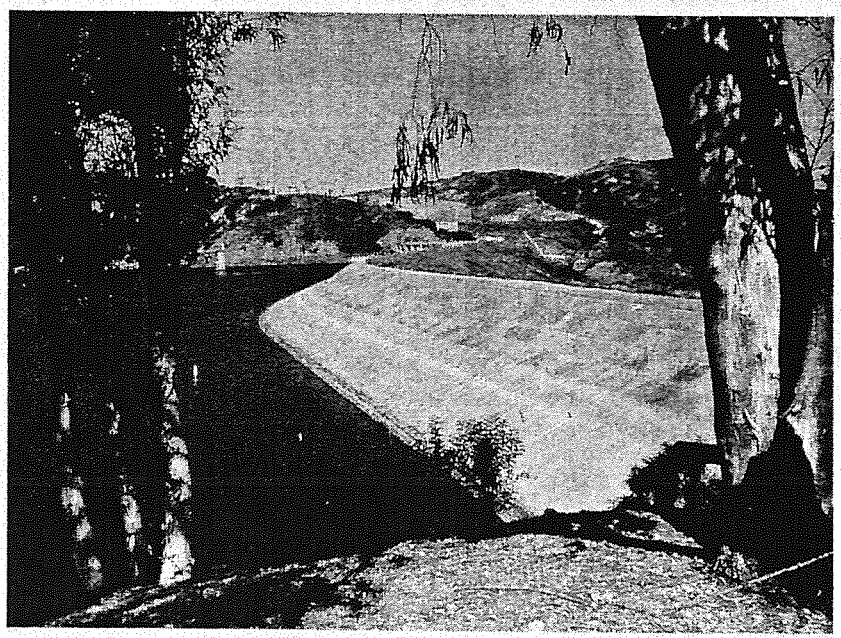
☐ Update or Supplement
Review Code: Reviewer:
Date:

*Resource Name or Number (Assigned by Recorder): Santiago Dam
P1. Other Identifier: California Department of Water Resources Dam No. 75-000

*P2. Location: ☒ Not for Publication ☐ Unrestricted *a. County: Orange
*b. USGS 7.5' Quad: Black Star Canyon, Calif. Date: 1988; T 4S R 8W NE ¼ of NW ¼ of Sec. 33 San Bernardino B.M.
c. Address: 3301 Santiago Rd. City: Orange
d. UTM: (Give more than one for large and/or linear resources) Zone: 11; 432680 mE 3738750 mN (NAD 83)
e. Other Locational Data (e.g., parcel #, directions to resource, elevation, etc., when appropriate: Santiago Dam is located at the north end of Irvine Lake (Santiago Reservoir) in the Santa Ana Mountains, approximately 7.0 miles east of downtown Orange. A paved road leads from Irvine Regional Park, through a locked gate, approximately 1.25 miles east, then southeast, to the dam.

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):
Santiago Dam is an earthen and concrete structure containing 1,100,000 cubic yards of clay, porous soil, and rock . The dam is 1,425 feet (0.27 mile) long at its crest, which rises 136 feet above the surrounding ground at its highest point. The reservoir created by the dam covers an area of 650 to 700 acres, depending on the surface level, and has a storage capacity of approximately 25,000 acre-feet of water. The south face of the dam, which holds back the reservoir, is filled with clay to prevent water penetration, and is faced with concrete slabs that are 6 inches thick and 6 feet square. The downstream portion of the dam is filled with earth, gravel, and rocks (Irvine Ranch Water District 2003; Compton et al. 2000; Serrano Irrigation District ca. 1959; University of California, Berkeley 2003). In plan view, the dam forms a gentle "S" curve, with a concrete spillway at its west end. A narrow gravel road runs along the crest of the dam from the east end to the spillway. Eight narrow concrete pylons support a 12-foot-wide concrete catwalk that extends over the spillway. Safety railings for the catwalk are provided by 4-foot-high concrete parapets.

*P3b. Resource Attributes (List Attributes and Codes): HP11 (Engineering Structure); HP21 (Dam)
*P4. Resources Present: ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of ☒ Photos ☐ Drawing (View, date, accession#): South face of dam; view toward west; 5/28/2003; photo no. 20.



*P6. Date Constructed/Age and Sources ☐ Prehistoric ☒ Historic ☐ Both : Dam built 1931

*P7. Owner and Address:
Serrano Water District
18021 E. Lincoln St.
Villa Park, CA 92861
and
Irvine Ranch Water District
15600 Sand Canyon Ave.
Irvine, CA 92619

P8. Recorded by (Name, affiliation, address):
Cary D. Cotterman
Chambers Group, Inc.
302 Brookside Avenue
Redlands, CA 92373

*P9. Date ☒ Recorded ☐Updated: 5/28/2003

*P10. Type of Study (Describe): Historic Resource Evaluation for Proposed Telecommunications Antenna Installation

*P11. Report Citation (Cite survey report and other sources, or enter "none."):
Cary D. Cotterman, Evelyn N. Chandler, and Roger M. Mason
2003 *Cultural Resources Records Search, Literature Review, and Field Survey Report for a Verizon Telecommunications Facility: Santiago Dam, Located at Irvine Lake (Santiago Reservoir), Orange County, California.* Prepared for Clayton Group Services, Costa Mesa, California. Prepared by Chambers Group, Inc., Redlands, California.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheets ☒ Building, Structure, and Object Record ☐ Linear Feature Record ☐ Archaeological Site Record ☐ District Record ☐ Bedrock Grinding Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

*Required Information

*Resource Name or Number (Assigned by Recorder): Santiago Dam

B1. Historic Name: Santiago Damn
B2. Common Name: Santiago Dam

B3. Original Use: Dam B4. Present Use: Dam

*B5. Architectural Style: Earthen Dam

*B6. Construction History (Construction date, alterations, and date of alterations):

Date of construction: Completed December, 1931

*B7. Moved? ☒ No ☐ Yes ☐ Unknown Date: N.A. Original Location: N.A.

*B8. Related Features: The dam restricts the flow of Santiago Creek, creating Irvine Lake (Santiago Reservoir). A dam keeper's residence and garage, constructed in 1934, is located approximately 100 meters east of the east end of the dam. A pump house, built in the 1980s, is located near the base of the west end of the dam, and a storage shed, also built in the 1980s, is located on top of the dam at its west end, near the spillway.

B9a. Architect: Design Engineer: A. Kempkey (San Francisco)
Assisted by Roy Browning (Irvine Co. Engineer)

B9b. Builder: On-site Engineer: Wess Albert
Contractor: R.G. Tourneau

*B10. Significance: Theme: 20th Century Water Resources Management/Citrus Industry Area: Orange County, California
Period of Significance: 1931-present Property Type: Dam Applicable Criteria: A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

For most of the late 19th and early 20th centuries, the land around the present site of Santiago Dam was used for cattle and sheep grazing, as well as recreation. The Serrano Irrigation District (known today as the Serrano Water District) provided water for the earliest citrus groves in the Orange and Villa Park areas, beginning in 1876. By the late 1920s, the demand for irrigation water had increased to the point that a large storage reservoir was needed. In response to this demand, the Serrano Irrigation District and the John T. Carpenter Water Company of Villa Park undertook a joint project in 1930, selling bond issues worth $400,000 to finance half of the dam's construction. The Irvine Company, which owned the land, matched that amount, for a total of $800,000. By October of 1930, engineer A. Kempkey of San Francisco, assisted by Irvine Company engineer Roy Browning, was making exploratory drillings into the bedrock at the proposed dam site on Santiago Creek prior to drawing the construction blueprints. Santiago Dam was constructed, creating Santiago Reservoir (now called Irvine Lake), during 1931. Although the dam was designed by Kempkey, the on-site supervising engineer was Wess Albert, and the construction contractor was R.G. Tourneau. The dam was completed in December, 1931, and the reservoir was first completely filled, with water running over the spillway at its west end, in 1937. In 1934, a dam keeper's residence was constructed on a hillside overlooking the east end of the dam (Brigandi and Turnbull 2003; Genterra Consultants, Inc. 2003; Irvine Ranch Water District 2003; Orange City News 1930a, 1930b; Serrano Irrigation District n.d., 1959, 1967; Staub 2003). The water provided by the creation of the dam and reservoir contributed significantly to the early and mid 20th century development of the citrus industry in Orange County, one of the leading citrus-producing regions of the U.S. at that time. (See Continuation Sheet)

B11. Additional Resource Attributes (List attributes and codes): HP11 (Engineering Structure); HP21 (Dam)

*B12. References: (See Continuation Sheet.)

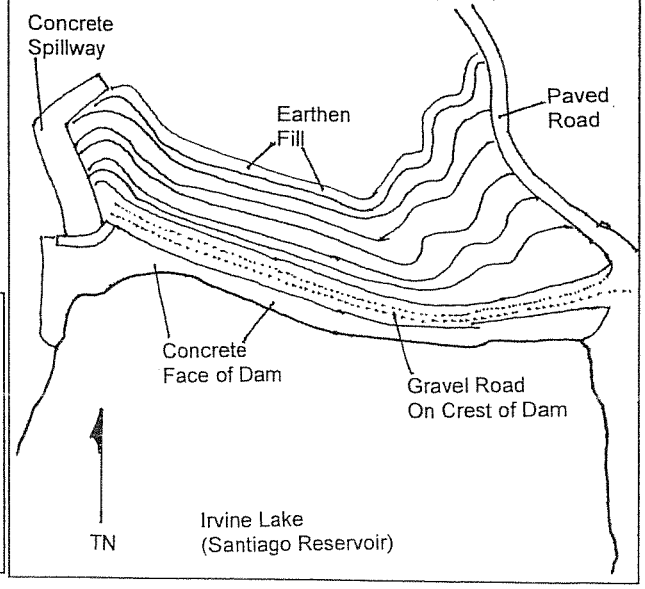
B13. Remarks:

*B14. Evaluator: Cary D. Cotterman
Chambers Group, Inc.
302 Brookside Avenue
Redlands, CA 92373

*Date of Evaluation: 5/28/2003

(This space reserved official comments.)

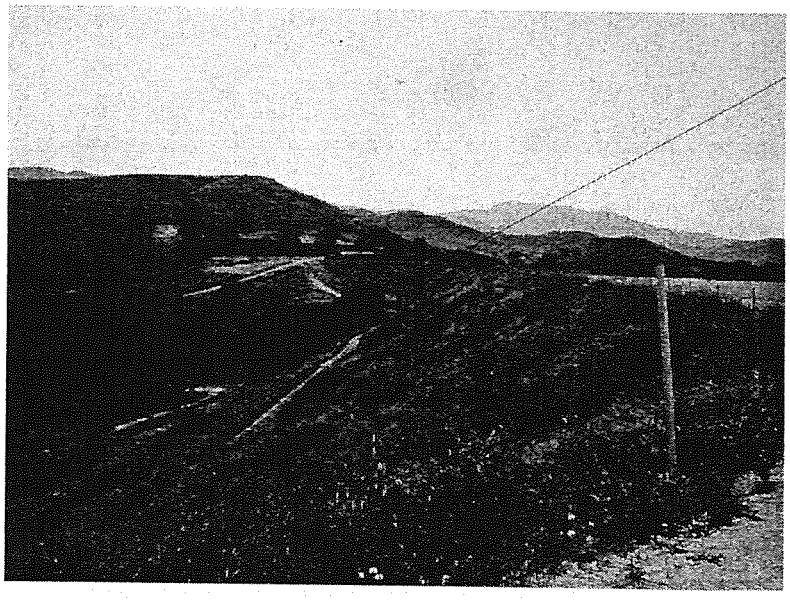
(Sketch Map with north arrow required.)



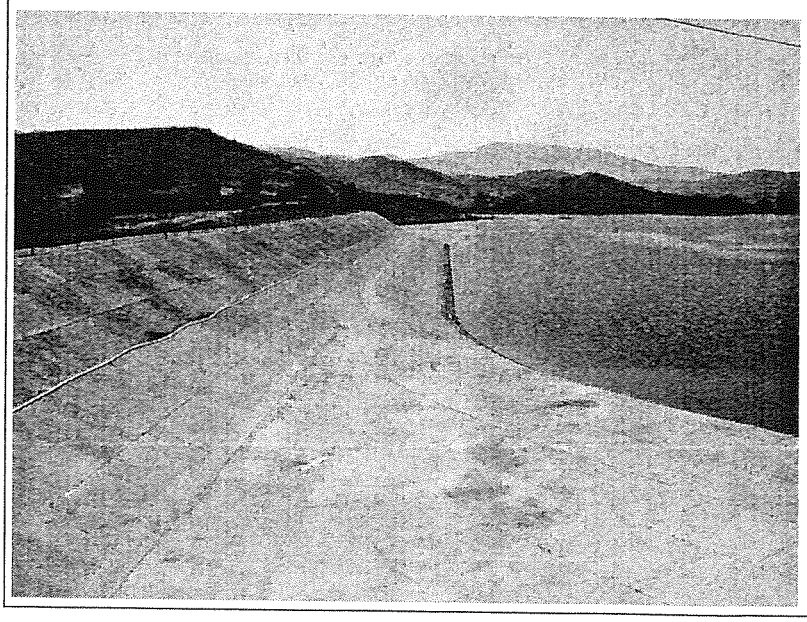
B10. Significance (continued from Building, Structure, and Object Record):

The facility was originally intended only for irrigation water storage, but was opened for recreational use in 1941. Today, the Irvine Ranch Water District still distributes untreated water from the reservoir for irrigation, while the Serrano Water District supplies treated drinking water to Villa Park and portions of Orange, and operates Irvine Lake's recreational concessions (Irvine Ranch Water District 2003; Compton et al. 2000; University of California, Berkeley 2003).

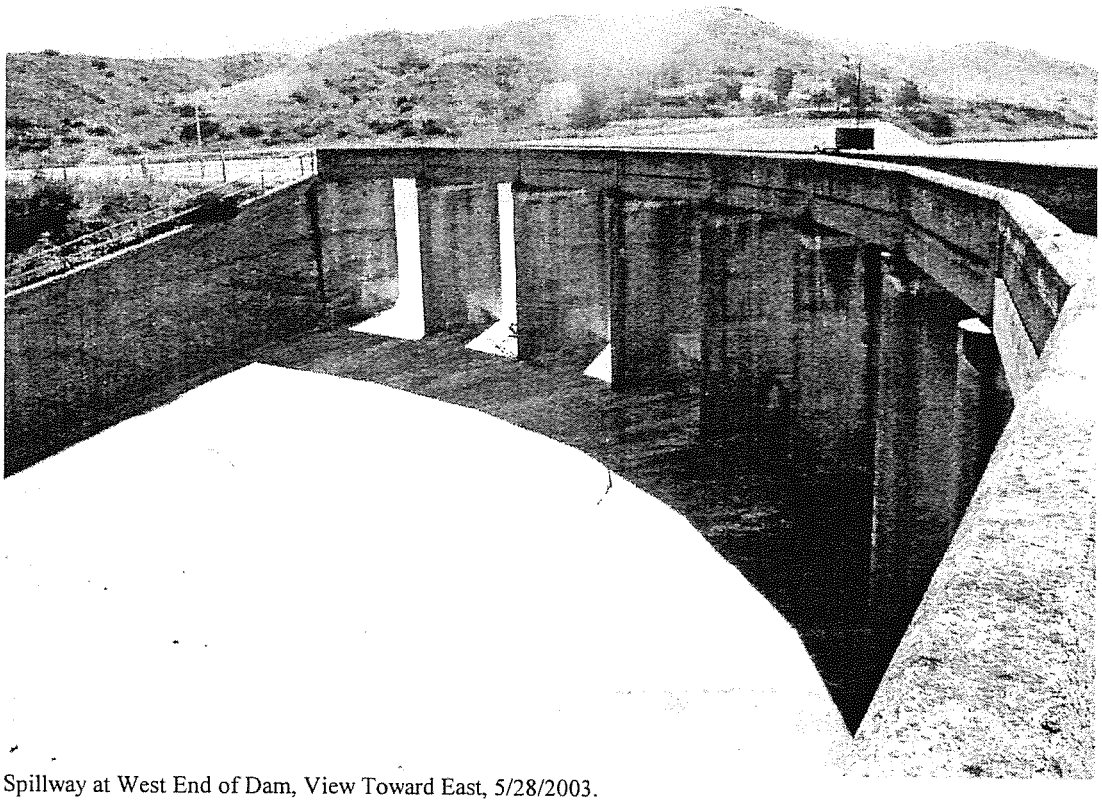
The water provided by the creation of Santiago Dam and Reservoir contributed significantly to the early and mid 20th century development of the citrus industry in Orange County, which was a leading supplier of oranges, lemons, and grapefruit to the entire nation at that time. Therefore, given its strong association with the history of water resources development in Orange County, as well as with the citrus agriculture industry on not only a regional but on a state and national level, the dam is recommended eligible for listing on the NRHP under Criterion A. Because the dam has undergone little modifications since its construction, it retains good integrity of location, design, materials, workmanship, and association.



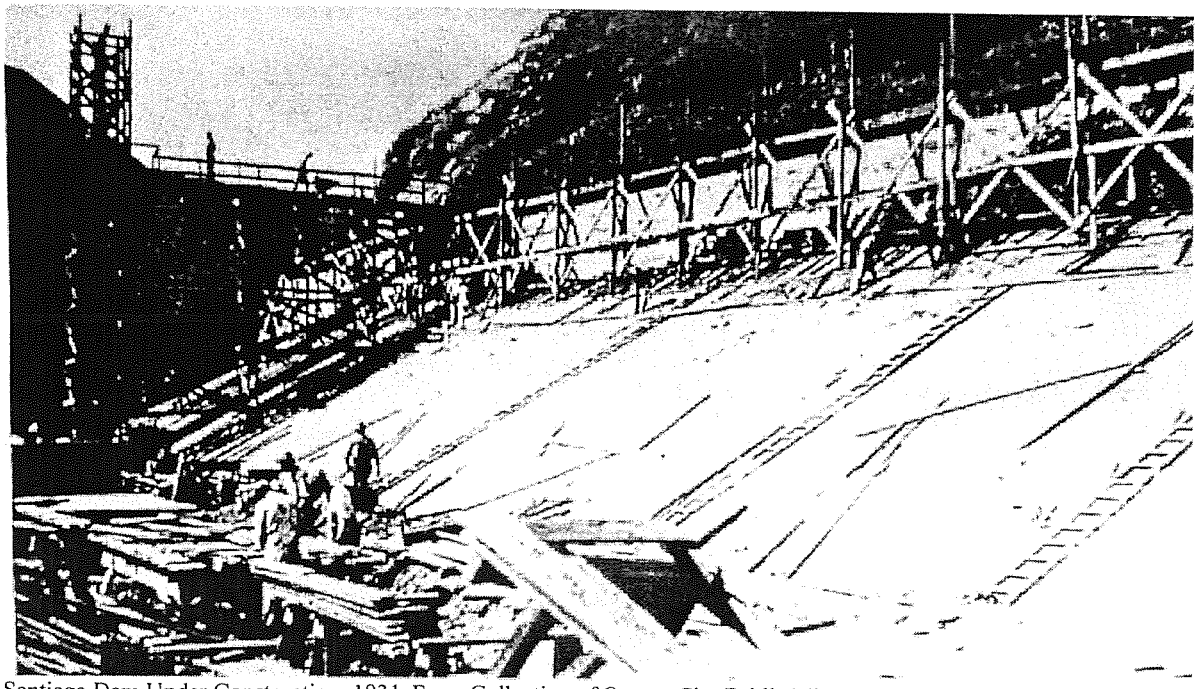
North Face of Dam, View Toward East, 5/28/2003



South Face of Dam, View Toward East, 5/28/2003



Spillway at West End of Dam, View Toward East, 5/28/2003.



Santiago Dam Under Construction, 1931. From Collection of Orange City Public Library.

B12. References (from Building, Structure, and Object Record):

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2003 "A Place Called Home – Orange's Architectural Legacy." www.oldtowneorange.net/aplacecalledhomec.htm.

Compton, Chris, Lane Waldner, Ward Allebach, Mel Newman, Bryan Pastor, and Cesar Sarmiento
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Irvine Ranch Water District
2003 "Irvine Lake Information." www.irwd.com/aboutirwd/lakeinfo.html.

Orange City News
1930a "Santiago Storage Dam Bonds Sold as Work Is Near on Project." October 15. On file in the local history collection, Orange City Public Library, Main Branch.

1930b "A Financial Achievement." October 15. On file in the local history collection, Orange City Public Library, Main Branch.

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n.d. *Serrano Irrigation District*. On file in the local history collection, Orange City Public Library, Main Branch.

ca. 1959 *Facts About Santiago Dam (Irvine Lake)*. On file in the local history collection, Orange City Public Library, Main Branch.

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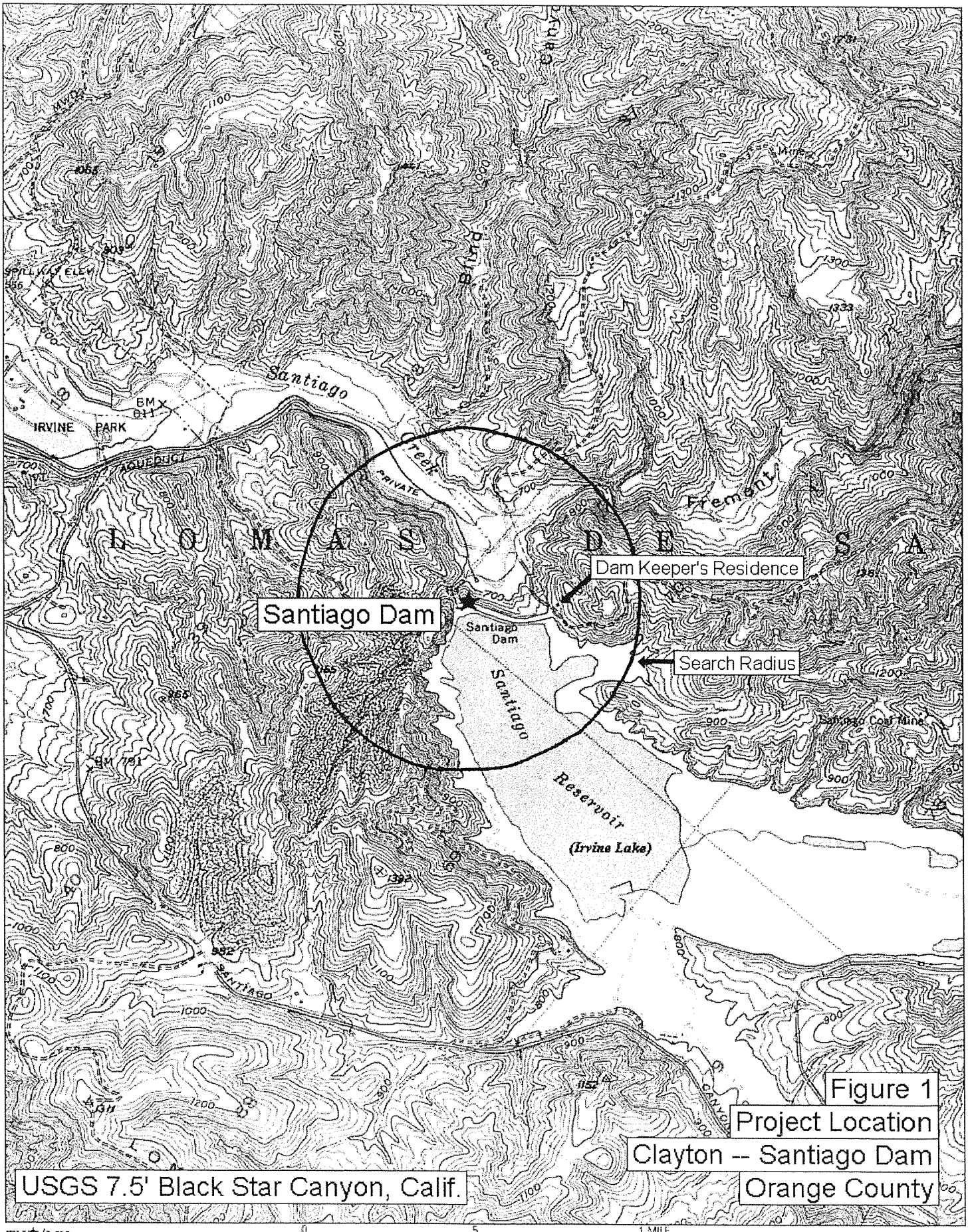
Staub, Ron
2003 Reservoir and Dam Technician, Santiago Dam. Interview with Cary D. Cotterman, Chambers Group, Inc., May 28.

University of California, Berkeley
2003 "Santiago Creek." http://elib.cs.berkeley.edu/kopec/b17/html/75-000.html.

30-176757



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z

Other Listings
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 8 ***Resource Name or #:** Taiwan 12kV Overhead Distribution Line
P1. Other Identifier:
***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted**
***a. County** Orange **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Black Star Canyon **Date** 2023 **T** ; **R** ; ☐ **of** ☐ **of Sec** ; SB **B.M.**
c. Address n/a City n/a Zip n/a
d. UTM: Zone 11S, 432779.56 mE/ 3738819.80mN
e. Other Locational Data:

The Taiwan 12kV overhead distribution line runs as far north as the Windy Ridge Toll Plaza on State Road 241 (Eastern Transportation Toll Road); as far east as the intersection of Blackstar Canyon Road and State Spur Road; as far south as intersection of Black Star Canyon Road, Silverado Canyon Road, and Santiago Canyon Road; and as far west as East Chapman Avenue, just west of South Rancho Santiago Road. The line is mostly concentrated in a housing development bounded by East Chapman Avenue and Canyon View Avenue to the west, east Chapman Avenue to the north, Jamboree Road to the east, and Canyon View Avenue to the south. (see Location Map).

***P3a. Description:** The subject property includes the Taiwan 12kV overhead distribution line that was first energized in circa 1952(see Continuation Sheets).

***P3b. Resource Attributes:** HP11. Engineering Structure

***P4.Resources Present:** ☐ Building ■ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)
P5b. Description of Photo: Photograph 1. Overview of lines where they cross the project boundary, view northwest

***P6. Date Constructed/Age and Source:** ■ Historic ☐ Prehistoric ☐Both
c. 1952(SCE communication)

***P7. Owner and Address:**
Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

***P8. Recorded by:**
Laura Carias
South Environmental
2061 N Los Robles Ave. #205
Pasadena, CA 91104

***P9. Date Recorded:** 11/3/2023

***P10. Survey Type:**
Reconnaissance

***P11. Report Citation:**
Historic-Era Built Environment Survey Report Santiago Creek Dam Outlet Tower and Spillway Improvements Project (South Environmental 2023)

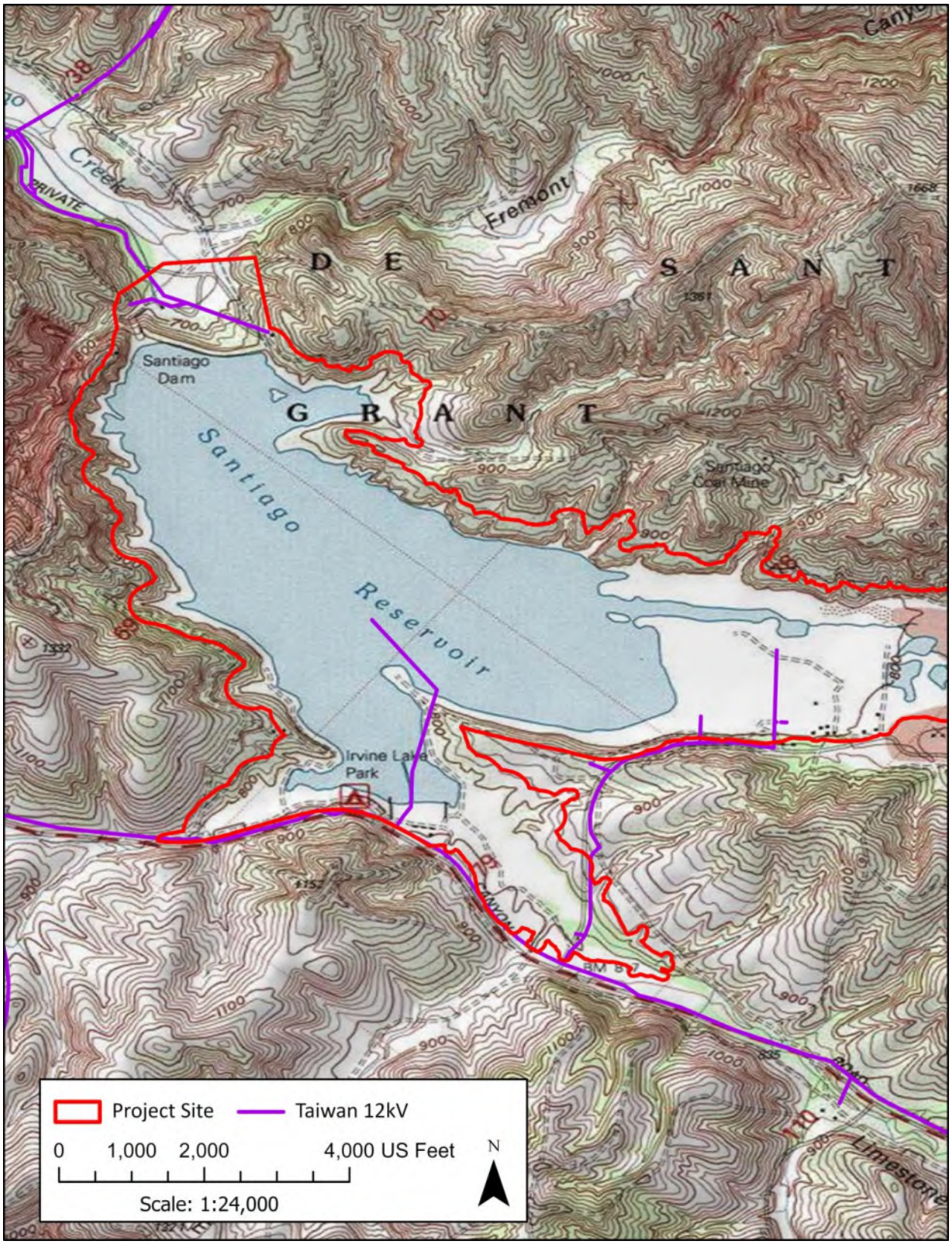
***Attachments:** ☐NONE ■Location Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List): ___

State of California Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial

Page 2 **of** 8 ***Resource Name or #** (Assigned by recorder) Taiwan 12kV Overhead Distribution Line
***Map Name:** Black Star Canyon, California ***Scale:** 1:24,000 ***Date of map:** 2023



State of California The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI# _____

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** Taiwan 12kV Overhead Distribution Line ***NRHP Status Code** 6Z

B1. Historic Name: unknown
B2. Common Name: Taiwan 12kV Overhead Distribution Line
B3. Original Use: Overhead distribution line B4. Present Use: Overhead distribution line
***B5. Architectural Style:** n/a
***B6. Construction History:**
SCE has no original drawings or other information pertaining to the line's construction but indicated that it was likely energized c. 1952 (SCE Communication).

***B7. Moved?** ■**No** □**Yes** □**Unknown** **Date:** _____ **Original Location:** _____
***B8. Related Features:**
B9a. Architect: n/a b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a **Period of Significance** n/a **Property Type** n/a **Applicable Criteria** n/a

The Taiwan 12kV overhead distribution line is not eligible for designation in the NRHP, CRHR, or local register due to a lack of significant historical associations and a lack of architectural/engineering merit (see Continuation Sheets).

B11. Additional Resource Attributes: (List attributes and codes) _____
***B12. References:** See Continuation Sheets

B13. Remarks:

B14. Evaluator: Laura Carias, South Environmental
***Date of Evaluation:** 11/3/2023

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

***P3a. Description (Continued):**

The Taiwan 12kV line runs as far north as the Windy Ridge Toll Plaza on State Road 241 (Eastern Transportation Toll Road); as far east as the intersection of Blackstar Canyon Road and State Spur Road; as far south as intersection of Black Star Canyon Road, Silverado Canyon Road, and Santiago Canyon Road; and as far west as East Chapman Avenue, just west of South Rancho Santiago Road. The line is mostly concentrated in a housing development bounded by East Chapman Avenue and Canyon View Avenue to the west, east Chapman Avenue to the north, Jamboree Road to the east, and Canyon View Avenue to the south.

The Taiwan line interests the project boundary at the northern and southern borders. To the north, the line runs east to west from the spillway to the Dam Keeper's Residence and is located just north of the spillway. To the south, the line intersects the project boundary at three different points running north to south.

Exhibit 1: Taiwan 12kV Overhead Distribution Line, view north (Psomas 2023)

***B10. Significance (Continued):**

Historic Context

SCE's Historic-Era Electrical Infrastructure Management Program (HEIMP) requires examination of electrical infrastructure in consideration of three major themes: 1) association with SCE's organizational history; 2) association with SCE's construction and implementation campaigns or the established period of significance for 66kV, 220kV, and 500kV systems; and 3) association and embodiment of SCE's architectural programming and aesthetic ideology at SCE Substations (Tinsley Becker et al 2017). The following historic context examines relevant portions of these major themes in consideration of the types of SCE resources identified within the APE (see Section 6, Identified Resources), referencing information from the HEIMP and other relevant sources throughout.

Organizational History

The West Side Lighting Company was formed by a syndicate of businessmen from Los Angeles in 1896. One year later, the company merged with General Electric to become the new Edison Electric Company of Los Angeles. Soon after, the newly formed Edison Electric Company began to look for additional power supplies in Downtown Los Angeles and purchased the Southern California Power Company in 1898. Over the next few years, Edison merged with other electric lighting and power companies, expanding its footprint beyond Los Angeles to areas as far as Santa Barbara and Redlands. By 1909, the Edison Electrical Company provided service to over 600,000 customers across five counties. "To reflect this expanded presence, the company was reincorporated as the Southern California Edison Company (SCE)." (Williams et al 2016).

In the early part of the twentieth century, SCE continued to expand its service territory throughout Southern California, beginning construction of the Long Beach Steam Plant in 1910 and new 66kV steel tower transmission lines to upgrade the old 33kV network of wood poles. After successfully merging with Henry Huntington's Pacific Light and Power Company (PLPC) in 1916, SCE added 69 additional communities to its service territory. SCE then focused its efforts on expanding the existing 150kV Big Creek Hydroelectric System, upgrading it to 220kV in 1923. In the 1920s SCE undertook a massive building campaign which included "dams and reservoirs, building of powerhouses, rail lines, and tunnels, as well as support camps replete with food and housing for workers, recreation and entertainment offerings, medical facilities, and administrative offices." (Williams et al 2016)

In 1930, SCE contracted with the U.S. Department of the Interior to generate power for construction of the Hoover Dam. Similar contracts were established between the U.S. federal government and the City of Los Angeles and Southern Sierras Power Company (SSP) in order to pay for project costs over a 50-year period. Initially constructed for the purpose of powering construction of the Hoover Dam, the SSP Boulder Dam to San Bernardino Transmission line went into service in 1931. Upon completion of the dam, the line carried electricity to San Bernardino. This line was acquired by SCE as part of the 1964 Calectric merger (Tinsley Becker et al 2017).

Calectric and SCE had overlapping service territories from approximately 1917 until 1964 throughout the Los Angeles Basin and Inland Empire. In order to improve costs, Calectric was acquired by SCE in 1964. This was last major merger/change in the company's organizational history (Tinsley Becker et al 2017).

Transmission Lines

In the first part of the twentieth century, SCE was continuing to expand in response to a growing Southern California region. "By 1904 the common voltage capacity of transmission lines was reported to be 66,000 volts (66kV), which was considered the minimum voltage necessary for lighting plants in major United States cities." (Tinsley 2017). The earliest identified steel lattice towers within the existing SCE System were installed for the Kern River-Los Angeles Transmission Line in 1907. Shortly thereafter, SCE implemented additional all-steel lattice tower lines throughout its 66kV system. In 1910, SCE began construction of its Long Beach Steam Plant and implemented a new 66kV transmission line system to replace the old 33kV wooden pole lines that had been installed at the end of the 19th century. By 1912, double-circuit 66kV towers were widely used, coinciding with the completion of the Long Beach Steam Plant between 1910 and 1914 (Tinsley Becker et al 2017).

The SCE Big Creek Hydroelectric System East-West Transmission Line was put into service in 1912-

1913 to carry 150kV from the Big Creek Hydroelectric System in the Sierra National Forest northeast of Fresno to the Eagle Rock Substation in Los Angeles. The purpose of the 241-mile transmission line was to convey electricity from the powerhouses at Big Creek to Los Angeles for distribution to SCE service territories (Tinsley Becker et al 2012). The East and West lines were upgraded in 1922-1923 to carry 220kV, doubling the capacity of the lines (Pomona Progress 1922). In May 1923, the last span of the 241-mile 220kV transmission line was tied in, touted as being "the world's greatest achievement in long distance, high voltage transmission." (The Bulletin 1923). SCE continued to develop the Big Creek Hydroelectric System into the 1920s with the construction of dams, reservoirs, powerhouses, rail lines, and tunnels. Additionally, updates were made to the existing East and West Transmission Lines, with new lines installed to convey electricity between Big Creek and Los Angeles.

"By 1930 the backbone of SCE's 66kv and 220kV system was fully developed and included the use of 220kV double-circuit towers and 66kV multi-circuit towers ranging from 4 to 14 circuits." (Tinsley Becker et al 2017). SCE continued to develop new tower types for its 220kV system into the 1930s, creating larger single- and double-circuit towers inspired by old designs. These designs became standard, 'off the shelf' tower types by the 1940s.

The identified period of significance for 66kV and below transmission lines is 1907-1930, which includes the construction of the Kern River-Los Angeles Transmission Line in 1907 through completion of the 66kV system by 1930 (Tinsley Becker et al 2017).

Wooden Distribution Lines

The use of wood pole support structures for electrical transmission or distribution lines represents borrowed technology from the telegraph transmission system, and the technology itself has changed little over time. Wood poles carry the electrical wires (with voltages 33kV and below) on cross arms or via a connection to their insulators. Given this lack of change in technology and appearance over time, it is difficult for a wooden distribution line to convey a particular period of significance in electrical infrastructure history, and by extension, to any significant themes and associations (Tinsley Becker et al. 2017, Williams 2023).

> The "typical" life of a wood pole transmission or distribution line structure is 50 years, although some last longer and others deteriorate much sooner. Wood pole supported transmission or distribution lines over 50 years of age usually lack original integrity of materials despite substantially retaining the look and feel of the original wood-pole transmission or distribution line. Replacement wood-poles or hardware parts, therefore, can continue the utilitarian historic fabric representative of the original potentially historic transmission or distribution line structures because of the lack of any distinct engineering or architectural attributes. The common and indistinctive nature of wood-pole transmission or distribution line structures disqualify them as potentially National Register eligible. They are purely functional and utilitarian in use and common in appearance (Tinsley Becker et al. 2017:64).

Significance Evaluation

The Taiwan 12kV Overhead Distribution Line is not eligible for the NRHP, CRHR, and local landmark designation based on the following application of designation criteria and integrity requirements.

NRHP Criterion A. That are associated with events that have made a significant contribution to the broad patterns of our history.

CRHR Criterion 1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

Guidance provided in Tinsley Becker et al. 2015 states that subtransmission lines and their associated infrastructure should be evaluated under two important themes, which are most appropriately examined below under Criteria A/1/2:

(1) An association with and representation of SCE's organizational history as evidence of key expansion periods that contributed to or served as the genesis of settlement or marked growth in community services by SCE.

The Taiwan 12kV Overhead Distribution line was energized c. 1952. Information regarding the construction of the line is limited. The design for distribution lines was borrowed from telegraph transmission technology and uses infrastructure that is found state-wide. The principles of the design of distribution systems is rudimentary with minor changes since its inception and is unable to reflect significance from the period from which they were constructed

(2) An association with SCE's original construction and implementation campaigns or the established period of significance for the company's 66kV, 220kV, and 500kV systems.

The Taiwan 12kV Overhead Distribution line is not associated with SCE's early construction and implementation campaigns, nor does it fall within the period of significance for either SCE's 66kV, 220kV, or 500kV systems.

For the reasons demonstrated above, the subject property is not eligible under NRHP Criterion A or CRHR Criterion 1,

NRHP Criterion B. That are associated with the lives of persons significant in our past.

CRHR Criterion 2. Is associated with the lives of persons important in our past.

The subject property is a transmission line that is not associated with any specific owners. Its only owners have been SCE. Review of local publications and newspaper articles failed to indicate that the subject property has any important associations with significant persons in regional or SCE history. Therefore, the subject property is not eligible under NRHP Criterion B, CRHR Criterion 2, or County Criterion 3.

NRHP Criterion C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

CRHR Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The Taiwan 12kV Overhead Distribution Line does not serve as an important example of electrical infrastructure on SCE's system. Under this criterion, wood poles are considered ubiquitous and indistinctive utilitarian structures that are purely functional and do not exhibit any important construction methods or technologies. Further, the line is not an early example of electrical voltage or transmission technology and does not represent an innovation in engineering design or for construction material technology. Therefore, the subject line is not eligible under NRHP Criterion C or CRHR Criterion 3.

NRHP Criterion D. That have yielded, or may be likely to yield, information important in prehistory or history.

CRHR Criterion 4. Has yielded, or may be likely to yield, information important in prehistory or history.

The subject property is not significant as a source, or likely source, of important historical information nor does it appear likely to yield important information about historic construction methods, materials, or technologies. Therefore, the property is not eligible under NRHP Criterion D or CRHR Criterion 4.

Integrity

Location: The subject property retains integrity of location as it remains in its current location.

Design: The subject property has integrity of design. Although there have been a few alterations, the design of the dam and spillway remain unchanged.

Setting: The subject property has integrity of setting. The line continues to be located in an undeveloped rural setting.

Materials: The subject property appears to retain integrity of materials as they do not appear to have been replaced.

Workmanship: The subject property retains integrity of workmanship as evidence of the original craftsmanship is present.

Feeling: The subject property retains integrity of feeling as the presence of wood poles help it retain a circa 1952 feeling.

Association: The subject property has no important associations with any patterns of regional development or SCE organization history and falls outside the period of significance for 66kV electrical transmission.

The Taiwan 12kV Overhead Distribution line is not eligible for listing under NRHP and CRHR under any designation criteria.

References

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Tinsley Becker, Wendy L. and Heather Crane. Historic American Engineering Record: Big Creek Hydroelectric System East & West Transmission Line. HAER No, CA-167-N. Prepared by Urbana Preservation Planning, LLC, 2012. On file with the Library of Congress: http://lcweb2.loc.gov/master/pnp/habshaer/ca/ca3900/ca3976/data/ca3976data.pdf.

Tinsley Becker, Wendy L., Audry Williams, Thomas Jackson and Adam Sriro. Historic-Era Electrical Infrastructure Management Program. Prepared by Urbana Preservation & Planning, LLC and SCE, 2015 (updated 2017).

Williams, Audry and Wendy Tinsely Becker, Historical Resource Analysis Report / Historic Property Survey Report, Southern California Edison Company, Saugus-Santa Susana 66kV Transmission Line. Prepared for SCE, July 2016.

Appendix B:
Resumes

Email: lCarías@southenvironmental.com
Mobile: 310-809-4696

EDUCATION

M.A., Public History, California State University, Sacramento, 2006

B.A., History and Chicano Studies, California State University, Dominguez Hills, 2003

PROFESSIONAL AFFILIATIONS

California Preservation Foundation

Society of Architectural Historians

National Trust for Historic Preservation

Laura G. Carías, MA

SENIOR ARCHITECTURAL HISTORIAN

Laura Carías has over 17 years' experience in the field of historic and cultural resources evaluation, identification, documentation, and preservation. Ms. Carías specializes in historic resources assessments including historic significance evaluation in consideration of the California Register of Historical Resources (CRHR), and the National Register of Historic Places (NRHP), and local-level evaluation criteria. She also has experience in intensive-level field surveys, historic structure reports, design consultation, conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) documentation, local Mills Act contracts, and local, state, and national landmark designations.

Ms. Carías meets the Secretary of the Interior's Professional Qualification Standards for both Architectural History and History. She has experience preparing environmental compliance documentation in support of projects that fall under the California Environmental Quality Act (CEQA/National Environmental Quality Act (NEPA), and Section 106 of the National Historic Preservation Act (NHPA).

EXPERTISE

- CEQA, NEPA, and Section 106 of the NHPA compliance documentation in consideration of impacts to historical resources, and historic properties
- Historic resource significance evaluations in consideration of NRHP, CRHR, and local designation criteria
- Project design review for conformance with the Secretary of the Interior's Standards
- Preparation of archival documentation for HABS/HAER/HALS
- Historic Structure Reports
- Historic Preservation Certification Part 1 and 2 Tax Credit Applications

RECENT PROJECT EXPERIENCE

Historic-Era Built Environmental Survey Report for SCE Sespe Creek Pole Replacement Project and Overhead Modification Project, Ventura County (2023). South Environmental was retained to complete a Historic-Era Built Environment Survey Report for the Southern California Edison (SCE) Sespe Creek Pole Replacement Project (proposed project) located in Ventura County, California. The report included the results of an intensive-level pedestrian survey of all built environmental resources over 50 years old within the project's Area of Potential Effect (APE) by a qualified architectural historian; building development and archival research; and recordation and evaluation of the idle Saugus-Fillmore-Santa Clara-Wakefield 66kV subtransmission line, a Quonset hut, and a single-family residence for historical significance in consideration of federal, state, and local designation criteria and integrity requirements. The report was prepared in conformance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulation Title 36 Code of Federal Regulations (CFR) Part 800, the California Environmental Quality Act (CEQA) Section 15064.5 for historical resources, and in consideration of all applicable local guidelines and regulations concerning cultural resources. In conclusion, no historic properties/historical resources were identified within the project APE. Therefore, with respect to historic built environment resources, the proposed project would have no adverse effect on historic properties under Section 106 of the NHPA and a less than significant impact on historical resources under CEQA. Ms. Carías performed the site visit and served as co-author of the report.

Historic Property Survey and Recordation for 1306 Alameda Padre Serra, City of Santa Barbara, California (2022). South Environmental was retained by a private property owner to survey and research a 1920 residential property within the City of Santa Barbara. This project included an intensive-level, pedestrian survey of the project site by a qualified architectural historian, building development and archival research; coordination with the City; and recordation of one residential property. As a result of this property significance evaluation, the property was found not eligible for designation at the local level.

Historic Built Environment Assessment for Fairfield Justice Campus Asset Protection and Resiliency Project (2022) South Environmental was retained to prepare an historic built environment assessment report in support of the Fairfield Justice Campus Asset Protection and Resiliency Project (project) located in the City of Fairfield, Solano County, California. The purpose of this report is to determine if the proposed project will result in impacts to historic built environment resources located within or adjacent to the project site. This report was prepared in conformance with the requirements of the CEQA Guidelines § 15064.5 for historical resources, and the City of Fairfield Chapter 25, Article XIII, Historic Preservation Ordinance. No historical resources were identified within the project site as a result of this study. Therefore, with respect to built environment resources, the proposed project will have a less than significant impact on historical resources under CEQA.Ms. Carías served as senior architectural historian and author for the report.

Historical Resource Assessment Report for the Civic Center Master Plan Project, Moorpark, California (2022) South Environmental was retained to complete a Historical Resource Assessment Report for the Civic Center Master Plan Project located in the City of Moorpark in Ventura County, California. This study includes the results of a literature review, pedestrian survey of the project site by a qualified architectural historian; building development and archival research; and an assessment of potential impacts to historic built environment resources under CEQA. One historical resource was identified directly adjacent to the project site as a result of the background research and pedestrian survey: the CRHR-listed Tanner Corner building located at 601 Moorpark Avenue. Although the project does not propose any changes or direct impacts to this resource that would impair its major character-defining features, the building's proximity to proposed demolition and construction activities is considered a potentially significant impact. Ms. Carías served as architectural historian and author of the report.

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Samantha Murray, MA

CULTURAL RESOURCES DIRECTOR

Samantha Murray is the cultural resources director at South Environmental and a principal architectural historian and archaeologist with over 17 years' experience in all elements of cultural resources management, including project management, archaeology and architectural history studies, and historical significance evaluations in consideration of the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and local-level designation criteria. Ms. Murray has conducted thousands of historical resource evaluations and developed detailed historic context statements for a multitude of property types and architectural styles. She has also provided expertise on numerous projects requiring conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Ms. Murray meets the Secretary of the Interior's Professional Qualification Standards for both Archaeology and History. She is experienced managing multidisciplinary projects in the lines of private development, transportation, transmission and generation, federal land management, land development, and state and local government. She is an expert in preparation of cultural resources compliance documentation for projects that fall under the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and Sections 106 and 110 of the National Historic Preservation Act (NHPA). Ms. Murray has also served as an expert witness in legal proceedings concerning historical resources under CEQA and local ordinance protection.

EXPERTISE

- CEQA, NEPA, and Section 106 of the NHPA compliance documentation in consideration of impacts to historical, archaeological, and tribal cultural resources, and historic properties.
- Resource significance evaluations in consideration of NRHP, CRHR, and local designation criteria.
- Project design review for conformance with the Secretary of the Interior's Standards.
- Assistance with complex mitigation including HABS/HAER/HALS, salvage, and interpretive displays.
- Peer review.

EDUCATION

M.A., Anthropology, California State University, Los Angeles, 2013

B.A., Anthropology, California State University, Northridge, 2003

PROFESSIONAL AFFILIATIONS

California Preservation Foundation

National Trust for Historic Preservation

PROFESSIONAL CERTIFICATIONS

Registered Professional Archaeologist (Registrant I.D. 28686211)

RELEVANT PROJECT EXPERIENCE

Historical Resources Evaluation Report for the I-5 Improvement Project (San Diego County Line to Avenida Pico), City of San Clemente, Orange County, California (2022). South Environmental was retained to prepare a Historical Resource Evaluation Report in support of the I-5 Improvement Project in the City of San Clemente. South Environmental carried out a survey of the I-5 corridor from the San Diego County line to Avenida Pico in the City of San Clemente and identified six built environment resources over 45 years old. The resources were evaluated for historical significance in consideration of NRHP, CRHR and City designation criteria and integrity requirements and were found not eligible under all designation criteria and integrity requirements. The proposed project was found to have a less than significant impact on historical resources under CEQA. Ms. Murray served as the contract manager for this project and conducted quality assurance/quality control (QA/QC) of the final document.

Southern California Edison (SCE) Subconsultant Agreement for Capital Projects (2021-ongoing). South Environmental is a subconsultant on SCE's Environmental Clearance and Capital Projects contract and provides cultural resources services throughout SCE's service territory in Southern California. Ms. Murray functions as an Architectural History and Archaeological Principal Investigator and oversees both historic built environment and archaeological components of large-scale utility projects subcontracted to South Environmental, including NRHP/CRHR significance evaluations for a variety of electrical substations and transmission lines and large-scale archaeological field work and testing requiring multiple field technicians. Technical reports recently completed by South Environmental include the following:

- Historic-Era Built Environment Survey Report for the Del Valle Substation Project in Los Angeles and Ventura Counties
- Historic-Era Built Environment Survey Report for the Cal City 115 kv Upgrade Project in Los Angeles and Kern Counties

City of San Diego Source Water System Historic Context Statement, City of San Diego, California (2020). While working for her previous firm, Ms. Murray served as principal architectural historian, managed the task order, co-authored the report, and conducted QA/QC on the final document. The City of San Diego requested preparation of a detailed historic context statement built on extensive archival research on the City of San Diego Public Utilities Department's source water system, with particular focus on 11 major pieces of water infrastructure: Morena, Lower Otay, Upper Otay, Murray, Lake Hodges, Barrett, El Capitan, San Vicente, Sutherland, and Miramar Reservoir Complexes, and the Dulzura Conduit. These elements were subject to intensive-level survey and focused research by qualified architectural historians to facilitate preparation of a historical significance evaluation of the City of San Diego Source Water System and its contributing resources, as well as consideration of each resource's individual significance. The research and analysis conducted as part of this study will provide the City and its consultants with the foundation for assessing the historical significance of infrastructure identified throughout the City of San Diego Source Water System as part of future CEQA and NEPA projects. The project also included development of a pamphlet highlighting the history of the City's water system and a timeline of milestone events.

Los Angeles Department of Water and Power (LADWP) As-Needed Environmental Compliance Services (2016-2021). While working for her previous firm, Ms. Murray served as the cultural resources principal investigator, co-authored all technical reports, and provided quality assurance/quality control of numerous technical documents for a variety of projects. Ms. Murray prepared both CEQA and CEQA Plus cultural resources documentation for a wide range of water and electrical infrastructure projects throughout LADWP's service territory. When LADWP project funding sources included the State Water Resources Control Board's (SWRCB) Drinking Water State Revolving Fund, applications for funding must include proof of CEQA compliance and of compliance with federal requirements. CEQA Plus documentation typically includes development of an area of potential effects, completion of a CHRIS records search, Native American coordination, intensive pedestrian survey, identification of historical resources/historic properties, and an assessment of project-related impacts/effects to both archaeological and historic built environment resources.