COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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ALHAMBRA, CALIFORNIA 91803-1331

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GAIL FARBER, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

ADOPTED
BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES

29 July 14, 2015

PATRICK OGAWA
ACTING EXECUTIVE OFFICER

July 14, 2015

The Honorable Board of Supervisors
County of Los Angeles
383 Kenneth Hahn Hall of Administration
500 West Temple Street
Los Angeles, California 90012

Dear Supervisors:

CONSTRUCTION-RELATED CONTRACT
SANTA ANITA STORMWATER FLOOD MANAGEMENT AND SEISMIC STRENGTHENING PROJECT APPROVAL AND
CERTIFICATION OF FINAL INITIAL STUDY/MITIGATED NEGATIVE DECLARATION
(SUPERVISORIAL DISTRICT 5)
(3 VOTES)

SUBJECT

This action is to adopt the Mitigated Negative Declaration, approve the project, and authorize the Los Angeles County Flood Control District to proceed with preconstruction activities for specific improvements to the Santa Anita Dam, Santa Anita Debris Dam, and Santa Anita Headworks (collectively sharing one California Environmental Quality Act document under the title Santa Anita Stormwater Flood Management and Seismic Strengthening Project) in the Cities of Arcadia, Sierra Madre, and Monrovia.

IT IS RECOMMENDED THAT THE BOARD ACTING AS THE GOVERNING BODY OF THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT:

1. Consider the Mitigated Negative Declaration for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project together with all comments received during the public review process; find that the Mitigated Negative Declaration reflects the independent judgment and analysis of the Board; adopt the Mitigation Monitoring and Reporting Program, finding that the Mitigation Monitoring and Reporting Program is adequately designed to ensure compliance with the mitigation measures during implementation of the project; find on the basis of the whole record before the Board that there is no substantial evidence that the project will have a significant effect on the environment; and adopt the Mitigated Negative Declaration.

2. Approve the project and authorize the Los Angeles County Flood Control District to complete the preconstruction activities for the project, including finalizing the design and specifications for each component of the project and obtaining all necessary regulatory permits.

PURPOSE/JUSTIFICATION OF RECOMMENDED ACTION

The purpose of the recommended actions is to adopt the Mitigated Negative Declaration (MND) and Mitigation Monitoring and Reporting Plan for the project, approve the project and authorize the Los Angeles County Flood Control District (District) to complete preconstruction activities, including developing design plans and specifications and obtaining necessary permits. In turn, the resulting project will reduce flood risk to downstream communities, enhance sustainability of local water supply by increasing recharge to the groundwater basin by over 500 acre-feet per year, and improve all-weather and emergency access to the Santa Anita Headworks and the Arcadia Wilderness Park.

Implementation of Strategic Plan Goals

The Countywide Strategic Plan directs the provisions of Operational Effectiveness/Fiscal Sustainability (Goal 1). This action will improve the District's Operational Effectiveness by reducing flood risk to downstream communities, enhancing sustainability of local water supply by increasing recharge to the groundwater basin by over 500 acre-feet per year, and improving all-weather and emergency access to the Santa Anita Headworks and the Arcadia Wilderness Park. Additionally, this action is in line with Fiscal Sustainability through the use of grant funding and multiple local funding partners.

FISCAL IMPACT/FINANCING

There will be no impact to the County General Fund.

The estimated cost to complete the proposed project is $45,000,000. The proposed project was awarded a State of California Proposition 1E grant to reimburse $20,000,000 of the total cost. The remaining project cost will be funded by the District and through a cooperative cost-sharing agreement authorized by the Board on March 19, 2013, providing for $2,000,000 to be funded by the Cities of Arcadia and Sierra Madre and the Raymond Basin Management Board.

Funding will be made available in the Flood Control District Fund Budget through the annual budget process.

FACTS AND PROVISIONS/LEGAL REQUIREMENTS

The Santa Anita Dam is located within the Angeles National Forest and within the boundary of the City of Monrovia. The Santa Anita Debris Dam (SADD) is located downstream of Santa Anita Dam within the Cities of Arcadia and Monrovia. The project includes improvements to both facilities to bring them into conformance with current standards set by the California Department of Water Resources Division of Safety of Dams (DSOD).

The Santa Anita Dam will be structurally modified to accommodate a new spillway with sufficient capacity to safely pass the probable maximum flood and thereby reduce the risk of dam failure from uncontrolled overtopping during an extreme storm event. Additionally, the proposed project would make improvements to the dam's electrical, mechanical, potable water, and control systems; install a

new hardened access gate; construct a storage shed/garage; replace the existing Dam Operator's house with a helipad to provide aerial access to the dam in the event of an emergency; and re-armor the downstream canyon walls and the toe of the dam.

The proposed SADD upgrades include replacing the existing intake tower, improving the outlet works, reinforcing the spillway walls, and buttressing the dam embankment itself to withstand a major earthquake. These improvements would enable DSOD to remove operational restrictions previously placed on the facility, thus restoring 119 acre-feet of water conservation capacity. The SADD would also be enlarged by raising the existing spillway 4 feet, which creates 40 acre-feet of additional storage for a total of 159 acre-feet. A new automated outlet gate and control system would be constructed to modernize operations, enhance dam safety monitoring, and ensure compatibility with other proposed project components.

The Santa Anita Headworks is located downstream of the Santa Anita Dam and upstream of the SADD in the City of Arcadia. The proposed work at the Santa Anita Headworks will ensure the most reliable operations to divert stormwater for groundwater recharge and includes the widening and armoring of the small earthen levee to ensure it can withstand large flows during major storm events, replacement of the existing diversion gate, and reconstruction of the access road. The proposed improvements also include a new control house for operating the diversion structure, which would include remote operation capabilities to increase efficiency of water conservation operations and replacement of the culvert crossing that provides access to the Santa Anita Headworks and the City of Arcadia Wilderness Park such that all-weather and emergency access would be improved and larger flows can freely pass underneath.

Approval of necessary environmental documentation is required by the California Environmental Quality Act (CEQA) at the time of the Board's approval of the project and prior to issuance of certain necessary regulatory permits for the project. Following completion of the preconstruction activities, Public Works intends to return to the Board for approval to advertise the plans and specifications and call for construction bids.

ENVIRONMENTAL DOCUMENTATION

An Initial Study (IS) was prepared for the proposed project in compliance with CEQA. The IS identified potentially significant effects of the proposed project in the following environmental impact areas: aesthetics, biological resources, geology and soils, hazards and hazardous materials, and noise. Prior to the release of the MND and IS for public review, revisions to the proposed project were made or agreed to address each of the environmental impacts in the areas listed above, which would avoid the potentially significant effects or mitigate the effects to a point where clearly no significant effects would occur.

The IS and project revisions showed that there is no substantial evidence, in light of the whole record before the District, that the project, as revised, may have a significant effect on the environment. Based on the IS and project revisions, an MND was prepared for this project.

Public notice was posted by the County Clerk for 45 days, from October 20, 2014, through December 4, 2014, and also published in the Arcadia Weekly (October 20, 2014, through October 22, 2014), Los Angeles Times (October 20, 2014), and San Gabriel Valley Tribune (October 20, 2014, and October 24, 2014, through October 25, 2014) pursuant to Public Resources Code Section 21092 and posted pursuant to Section 21092.3. Additional notices were published in the online publications of Arcadia Weekly (October 23, 2014, through November 5, 2014) and the Mountain

View News (October 25, 2014, through October 31, 2014). The MND was made available for review at the County of Los Angeles Department of Public Works in Alhambra, Arcadia Public Library, Sierra Madre Public Library, and Monrovia Public Library during business hours and online at the project website (www.dpw.lacounty.gov/wrd/Projects/SantaAnita/). Six written comment letters were received and all were from public agencies. Responses to comments are contained in Section 2 of the Final MND, which was also posted on the project website.

Additional outreach related to the environmental review process for the project included 115 mailed flyers to property owners within 500 feet of the project; a public meeting on November 5, 2014, at the Arcadia City Council Chambers; regular e-mail updates to stakeholders; and presentations to Arcadia City Council, Sierra Madre City Council, Sierra Madre Energy, Environment, and Natural Resources Commission, and a combined group of leaders from the local Homeowners Associations.

The Mitigation Monitoring and Reporting Program identifies in detail the manner in which compliance with the mitigation measures will be ensured during project implementation.

The documents and other materials constituting the record of the proceedings upon which the Board's decision is based in this matter are located at Public Works, Water Resources Division, 900 South Fremont Avenue, 2nd Floor, Alhambra, CA 91803. The custodian of such documents and materials is Mr. Sterling Klippel.

The project is not exempt from payment of a fee to the California Department of Fish and Wildlife pursuant to Section 711.4 of the Fish and Game Code to defray the costs of fish and wildlife protection and management incurred by the Department of Fish and Wildlife. Upon the Board's adoption of the MND, Public Works will file a Notice of Determination in accordance with Section 21152(a) of the Public Resources Code and pay the required filing and processing fees with the County Clerk in the amount of $2,285.

The Final MND for the project, including the Mitigation Monitoring and Reporting Program, is enclosed and is also on file with the Clerk of the Board of Supervisors.

IMPACT ON CURRENT SERVICES (OR PROJECTS)

The recommended action will reduce flood risk to downstream communities, enhance sustainability of local water supply by increasing recharge to the groundwater basin by over 500 acre-feet per year, and improve all-weather and emergency access to the Santa Anita Headworks and the Arcadia Wilderness Park.

CONCLUSION

Please return one adopted copy of this letter to Public Works, Water Resources Division.

Respectfully submitted,

GAIL FARBER

Director

GF:CS:sh

Enclosure

c: Chief Executive Office (Rochelle Goff)
County Counsel (Lauren Dods, Mark Yanai)
Executive Office

Final Initial Study/
Mitigated Negative Declaration

Mitigation Monitoring and Reporting Program, Response to Comments, and Errata

Santa Anita Stormwater Flood Management and Seismic Strengthening Project
County of Los Angeles, California

SCH No. 2014101044

Prepared for
Los Angeles County Flood Control District
P.O. Box 1460
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April 2015

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SECTION 1.0 INTRODUCTION

Pursuant to the California Environmental Quality Act (CEQA), the potential environmental effects of the proposed Santa Anita Stormwater Flood Management and Seismic Strengthening Project (hereinafter referred to as the "Project") have been analyzed in a Draft Initial Study/Mitigated Negative Declaration (IS/MND) (SCH No. 2014101044) dated October 2014.

Section 15074(b) of the CEQA Guidelines states that, prior to approving a project, the lead agency must consider the proposed IS/MND together with any comments received during the public review process. The lead agency must adopt the proposed IS/MND, only if it finds on the basis of the whole record before it, that there is no substantial evidence that the project would have a significant effect on the environment and that the IS/MND reflects the lead agency's independent judgment and analysis. Section 2.0, Response to Comments, includes all letters received during and after the close of the 45-day public review period, as well as the Los Angeles County Flood Control District (LACFCD) written responses to all comments received. Section 3.0, Errata, includes revisions to the text of the IS/MND either in response to a comment or in order to clarify information.

Section 15074(d) of the CEQA Guidelines states that, when adopting an MND, the lead agency shall adopt a program for reporting on or monitoring the changes that it has either required in the project or made a condition of approval to reduce or avoid significant environmental effects. Section 4.0, Mitigation Monitoring and Reporting Program (MMRP), describes the mitigation program to be implemented by the LACFCD.

1.1 CEQA AND PUBLIC REVIEW OF THE IS/MND

In accordance with Section 15073 of the CEQA Guidelines, a Negative Declaration (ND) or MND must be subject to a 30-day public review period when submitted to the State Clearinghouse for review by state agencies. However, the LACFCD voluntarily established an extended 45-day public review period. As such, the Draft IS/MND was made available for public review from Monday, October 20, 2014 through Thursday, December 4, 2014. Consistent with Sections 15072(b) and 15072(d) of the CEQA Guidelines, the Notice of Intent to Adopt a Mitigated Negative Declaration (NOI) was published in the Arcadia Weekly, Los Angeles Times, and San Gabriel Valley Tribune and is on file at the Los Angeles County Registrar-Recorder/County Clerk in the City of Norwalk. The Draft IS/MND and NOI or the NOI only was provided to 26 responsible agencies and interested groups; and was made available for review at the Los Angeles County Department of Public Works (LACDPW) in Alhambra, Arcadia Public Library, Sierra Madre Public Library, and Monrovia Public Library during business hours and online at www.dpw.lacounty.gov/wrd/Projects/SantaAnita/. Also, a Public Information Meeting to discuss the Project was held on Wednesday, November 5, 2014, from 6:00 PM to 8:00 PM at the City of Arcadia City Hall (Council Chambers) at 240 West Huntington Drive, Arcadia, CA 91066.

The LACFCD has reviewed all comments received from agencies, organizations and/or individuals related to the subject IS/MND to determine whether any substantial new environmental issues have been raised. Based on the evaluation in the Draft IS/MND together with all comments received, the LACFCD has determined that no substantial new environmental issues have been raised and that all issues raised in the comments have been adequately addressed in the Draft IS/MND and/or in the Responses to Comments, Errata, and Mitigation Monitoring and Reporting Program. All potential impacts associated with the proposed Project were found to be less than significant with incorporation of relevant mitigation measures, where applicable. Therefore, the proposed Project would not result in any significant impacts, and a

Mitigated Negative Declaration in accordance with CEQA is the appropriate environmental document for the proposed Project.

This document, combined with the Draft IS/MND, constitutes the Final IS/MND for the proposed Santa Anita Stormwater Flood Management and Seismic Strengthening Project. This document includes all public comment letters; the LACFCD responses; and the State Clearinghouse letter that documents compliance with CEQA review requirements. The County of Los Angeles Board of Supervisors will consider the proposed IS/MND together with the comments received during the public review process, and can consider adoption of Santa Anita Stormwater Flood Management and Seismic Strengthening Project Final IS/MND and approval of the Project.

1.2 PROJECT DESCRIPTION SUMMARY

1.2.1 PROJECT LOCATION AND SETTING

The Project study area is located within the jurisdictions of the City of Arcadia, the City of Monrovia, a County-owned inholding within the United States Forest Service (USFS) boundary, and property within the USFS Angeles National Forest. The Project site is in the foothills of the San Gabriel Mountains in Los Angeles County, approximately 15 miles northeast of downtown Los Angeles.

The Dam is at the north end of the Project site, located in the Angeles National Forest and accessed via a private road off Chantry Flats Road, approximately 2.5 miles north of the City of Arcadia. The Headworks structure is located approximately 0.5 mile downstream of the Dam on the border of the Angeles National Forest and the City of Arcadia and accessed off Highland Oaks Drive. The Debris Dam is located approximately 0.5 mile downstream of the Headworks in the Cities of Arcadia and Monrovia, and can be accessed via a maintenance road that runs along the Santa Anita Wash.

Surface runoff from the Santa Anita Canyon Watershed drains along natural courses towards the Santa Anita Wash, which runs north-south beginning at the Dam. The purpose of the Dam is to decrease peak flood flow by retaining stormwater and discharging it at controlled release rates. The released flows continue downstream to the Headworks facility, which intercepts the creek flows and allows the flows to either continue downstream to the Debris Dam, to be diverted to the Sierra Madre Spreading Grounds, or to be diverted into the Santa Anita Spreading Grounds.

1.2.2 PROJECT COMPONENTS

Dam

The Dam is located within the Angeles National Forest and within the boundary of the City of Monrovia; however, the USFS has jurisdiction over activities at the Dam. The Dam would be structurally altered to accommodate a new spillway with sufficient capacity to pass the probable maximum flood (PMF) of 26,100 cubic feet per second (cfs) in order to reduce the risk of Dam failure from uncontrolled overtopping during major storm events. The proposed improvements to the Dam would not result in changes to the existing maximum water surface elevation restrictions (which are set in place by California Department of Water Resources, Division of Safety of Dams [DSOD]) at a maximum elevation of 1,230 feet above mean sea level (msl); therefore, the reservoir's operational capacity to retain water would not be altered by Project implementation.

The Dam's outdated electrical, mechanical, potable water, and control systems would be upgraded to ensure reliability and to modernize operations, allowing for the integrated control of the facilities to increase water conservation efficiency. Other ancillary facilities at the Dam would also be replaced or upgraded, including the secured access gate (including new power poles to supply electricity) and a storage shed/garage. The existing Dam Operator's house would be removed and a helipad would be constructed in its place to provide aerial access to the Dam in the event of an emergency.

The downstream canyon walls and the toe of the Dam would be re-armored with additional reinforced "gunite" or equivalent concrete erosion protection to dissipate the energy from the overtopping water as the flow cascades through the spillway and the orifice spillway or sluiceway. The flow would be directed onto the downstream armoring before flowing into the channel downstream of the Dam. The re-armoring would reinforce the existing armoring that extends approximately 100 feet downstream from the toe of the Dam. The re-armoring would be held in position with tie-back anchors to be drilled and grouted into the bedrock. The tie-ins for the re-armoring may include rock excavation, superficial grading, and subsurface pressure grouting.

Headworks and Wilderness Park Culvert Crossing

Redevelopment of the Headworks would include reconstruction of the small earthen levee to ensure it can withstand flows produced by the 25-year storm event and replacement of the existing tainter gate (used to divert flows) with a new rubber diversion structure. The rubber diversion structure is a pneumatically[1] operated, bottom-hinged, spillway gate system. The majority of the existing Headworks structure would be removed, including the tainter gate, supporting walls, catwalk, and keys. The new facility would extend beyond the width of the current structure by approximately 20 feet into the existing levee in order to house the new rubber diversion structure. The existing earthen levee would be reinforced and built up approximately five feet higher to match the height of the new Headworks structure. The top layer of disturbed soil on the levee would be removed to expose the underlying engineered fill; it would then be recompacted with additional engineered fill to the proposed height. The access road leading to the Headworks would be modified to match the height of the reinforced earthen levee. The improvements would also include a new control house for operating the rubber diversion structure, which would include remote operation capabilities to increase efficiency of water conservation operations.

In addition to the improvements at the Headworks, removal and replacement of the Culvert Crossing to the City of Arcadia's Wilderness Park is needed to ensure that the roadway and crossing can withstand flows generated by a larger storm event. The existing Wilderness Park Culvert Crossing is located approximately 450 feet downstream of the Headworks. The Culvert Crossing includes the concrete slab and corrugated metal culverts, and it would be removed and replaced with a similarly functioning Culvert Crossing structure that is better designed to withstand storm flows. Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing structure would be grubbed and graded to accommodate the new structure. In order to accommodate the new Culvert Crossing abutment, three sycamore trees along the eastern shore of the Wash may need to be removed (see Tree Numbers 220, 221, and 222 in Appendix B, see Tree Report). If possible, the design of the Culvert Crossing will not require the removal of the sycamore north of the culvert crossing, potentially through the means of a temporary closure of the access point into the Wilderness Park that is discussed later.

[1] Pnuematic means operated through the use of compressed air or compressed gas.

However, in order to provide a conservative analysis, this IS/MND assumes these sycamore trees would be removed.

The LACFCD may transplant the root balls of the sycamores to a suitable riparian location and/or utilize the woody debris from the sycamore to enhance habitat value at another nearby location, if determined to be feasible and if approved by the County and other appropriate parties. In addition, new sycamore trees will be planted in the vicinity of any removed existing trees.

The channel immediately downstream of the new Culvert Crossing would be armored with a riprap apron to dissipate water flow energy. The new Culvert Crossing would be approximately ten feet wider than the existing crossing, and it would be built on top of a new abutment with a supporting wing wall. It would be designed with a permanent guard rail and flexible pavement driving surface adequate for emergency vehicles. The elevation of the Culvert Crossing structure would be raised above the existing roadway elevation to accommodate higher flows. Approximately 1,800 square feet of the roadways leading to and from the Culvert Crossing would be repaved and sloped to join the existing grade.

Debris Dam

Remediation of the seismic deficiencies at the Debris Dam would involve a major reconfiguration of the existing structures, including the intake tower, spillway, and embankment. In 1995, following a seismic safety study of the Debris Dam, the DSOD determined that it did not meet standards for seismic safety and required the outlet gate to remain open at all times to prevent storage of water above an elevation of 761 feet above msl. Remediating the seismic deficiencies at the Debris Dam would result in DSOD removing the operational restrictions on the facility, thus restoring 119 acre-feet of water conservation capacity. The Debris Dam would also be enlarged by raising the existing spillway 4 feet, which would create 40 acre-feet of additional storage for a total of 159 acre-feet.

The intake tower located in the Debris Dam would be strengthened or replaced due to the inability of the existing tower to resist seismic loading. The intake tower would be connected to the existing diversion to the spillway channel or spreading grounds, which is a 48-inch outlet conduit that would be lined. In addition, portions of the Debris Dam embankment that are subject to potential liquefaction would be reinforced with structural buttressing. The top of the embankment ranges from an elevation of 796 feet above msl at its center to an elevation of 811 feet above msl at the western edge. The improvements would include removal of six non-native deodar cedar trees located at the toe of the downstream side of the embankment, as mandated by DSOD, to ensure the structural integrity of the Debris Dam. A new automated outlet gate and control system would be constructed to modernize operations and ensure compatibility with other Project components.

SECTION 2.0 RESPONSES TO COMMENTS

Letters commenting on the information and analysis in the Draft IS/MND were received from the parties listed below during the 45-day public review period (i.e., Monday, October 20, 2014 through Thursday, December 4, 2014), with the exception of the USFWS letter, which was received after the close of the public review period. The USFWS letter has been responded to in its entirety.

Federal Agencies

- Natural Resources Agency, U.S. Fish and Wildlife Service (USFWS), December 9, 2014

State Agencies

- California Department of Transportation, District 7 (Caltrans), November 18, 2014
- State Clearinghouse and Planning Unit (SCH), November 19, 2014
- Natural Resources Agency, Department of Fish and Wildlife (CDFW), December 3, 2014

Local Agencies

- County of Los Angeles, Fire Department (LACFD), November 14, 2014
- City of Arcadia, Public Works Services Department (Arcadia), December 3, 2014

Organizations

- None

Individuals

- None

Each letter listed above is included in this document, followed by the LACFCD response to each comment. Each comment letter has been divided into sequential numbered comments (e.g., 1, 2, 3), as shown on the enclosed letters. Each numbered comment corresponds to a matching numbered response.

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2.1 FEDERAL AGENCIES

- Natural Resources Agency, U.S. Fish and Wildlife Service (USFWS), December 9, 2014

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-LA-14B0376-15CPA0052

DEC 09 2014

County of Los Angeles Department of Public Works
Water Resources Division
P.O. Box 1460
Alhambra, California 91802-1460

Subject: Mitigated Negative Declaration for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project, Los Angeles County, California

To Whom It May Concern:

The U.S. Fish and Wildlife Service (Service) has reviewed the Mitigated Negative Declaration (MND) for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project located in Los Angeles County, California. The Los Angeles County Flood Control District (LACFCD) proposes to modify existing flood control and water conservation facilities in Santa Anita Canyon to reduce flood risk to downstream communities, enhance local water supply, and improve access to Arcadia Wilderness Park. The primary project components include modifications to the Santa Anita Dam (dam), Santa Anita Headworks (headworks), Wilderness Park Culvert Crossing (culvert crossing), and the Santa Anita Debris Dam (debris dam). Project construction is anticipated to occur between winter of 2015 and fall of 2016, with the majority of construction scheduled during the spring and summer months.

The primary concern and mandate of the Service is the protection of public fish and wildlife resources and their habitats. The Service has a legal responsibility for the welfare of migratory birds, anadromous fish, and endangered animals and plants occurring in the United States. Specifically, the Service administers the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*), the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et seq.*), and provides support to other Federal agencies in accordance with the provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Based on biological surveys conducted in the 115-acre study area,[1] vegetation primarily consists of native scrub, chaparral, riparian forest/woodland, and oak woodland, located in and adjacent to Angeles National Forest. These natural vegetation communities combined with the perennial source of water found in Santa Anita Creek support a wide variety of wildlife (104 animal species) and at

[1] The study area extends approximately 1,200 feet upstream from Santa Anita Dam to approximately 1,000 feet below Santa Anita Debris Dam.

County of Los Angeles Department of Public Works (FWS-LA-14B0376-15CPA0052) 2

least 12 special status species (MND Appendix B, Biological Technical Report). Approximately one third of the study area is mapped as disturbed or developed. Some portions of the study area were recently disturbed during implementation of the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project (LACFCD 2009). 1

Our primary concerns with respect to this project are the extent of impacts to biological resources in Santa Anita Canyon that may occur as a result of the proposed project and the fact that the MND does not fully address these potential impacts. The analysis in the MND focuses on the direct impact associated with project construction but does not address the substantial changes in the magnitude, timing, and distribution of water flows enabled by the proposed project in combination with the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project. Although the proposed project is anticipated to increase groundwater recharge by over 500-acre feet per year, the MND does not acknowledge any potential changes in the quality or extent of natural vegetation communities that will be inundated in water storage areas or dewatered downstream from water storage areas. While some plant species are tolerant to long periods of inundation, particularly outside of the growing season [e.g., black willow (*Salix gooddingii*)], evergreen riparian species [e.g., mulefat (*Baccharis salicifolia*)] can be severely impacted by long periods of inundation (Orange County Water District 2013), and upland vegetation communities (e.g., coastal sage scrub, chaparral) are likely to be impacted by even short periods of inundation. The extent of impacts to habitat in the study area will depend on the depth, duration, and timing of inundation but could include a reduction in the aerial extent, diversity, and structure (i.e., loss of understory) of the vegetation that reduces or eliminates its habitat value for wildlife. 2

We offer the following specific comments and recommendations regarding project-associated biological impacts based on our review of the MND and our knowledge of declining habitat types and species within Los Angeles County. These comments are provided in keeping with our agency's mission to "work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people."

1. **Dam Operations** – Modifications to the dam include but are not limited to: 1) constructing a new spillway to safely pass the probable maximum flood of 26,100 cubic feet per second; 2) plugging an auxiliary spillway located about 12 feet below the new spillway; 3) replacing existing valves to ensure the efficiency of operations; and 4) re-armoring the canyon walls and toe of the dam to provide protection from erosive flows. The LACFCD should provide the following additional information to clarify the changes in dam operations enabled by the proposed project and how the dam operations will impact natural vegetation communities and associated wildlife upstream and downstream from the dam.

   a. Provide a figure that delineates the maximum extent of the reservoir pool behind the dam based on the new spillway at 1,300 feet above mean sea level (msl) and the area anticipated to be inundated by water conservation to a maximum of 1,230 feet above mean sea level (msl). How many days per year, on average, is the water conservation pool anticipated to be at or above 1,230 feet? How does this compare to past operations? 3

County of Los Angeles Department of Public Works (FWS-LA-14B0376-15CPA0052) 3

b. The proposed additional protection of the toe of the dam and the canyon walls is an indication that erosive flows are anticipated due to the height of the new spillway and/or other modifications that will allow the dam to hold water at a higher elevation and for a longer period of time than was previously possible. How will the release rates during a 1-year, 5-year, 10-year, 25-year, and 100-year storm event change with proposed dam modifications? How will the anticipated storm flows affect natural vegetation communities and aquatic habitat below the dam? 4

c. What are the minimum flows that will be released from the dam with the new, more efficient valves and how does this compare with operation of the existing valves? How will the minimum flow releases with the new valves affect the quality and extent of natural vegetation communities and aquatic habitat below the dam? In particular, minimum flows should be adequate to continue to support the naturally reproducing rainbow trout (*Oncorhynchus mykiss*) found below the dam. 5

2. Headworks Operations – Currently, the headworks can divert flows up to 75 cubic feet per second (cfs) to downstream spreading grounds and will overtop during a 2-year storm event (300 cfs). The proposed headworks will include a new diversion structure that will allow water to be retained up to a 25-year storm event. Clarify how operation of the new headworks structure will affect the quality and extent of natural vegetation communities and aquatic habitat upstream and downstream from the structure. 6

a. What is the maximum flow that can be diverted by the new diversion structure and how will the reduction in flows to areas below the headworks impact the quality and extent of natural vegetation communities and aquatic habitat downstream from the structure? 7

b. Currently, water pools in the area upstream from the headworks. According to the MND, the pool created by the new structure will remain the same as the existing condition. Given that the height and width of the headworks structure will be increased and water may be retained up to a 25-year storm event it seems unlikely that the pool will remain the same size following completion of the project. Clarify the duration and extent of ponding and any changes in the surrounding vegetation communities that may occur as a result of the new headworks structure. 8

3. Debris Dam – The proposed modifications to the debris dam, including remediating seismic deficiencies and raising the spillway elevation by 4 feet, will increase the water storage capacity of the debris basin from 0 to 159 acre-feet. To address potential impacts associated with storing water behind the debris dam, the LACFCD proposes to monitor the health of 20 trees located in the additional water pool gained by the increase in spillway elevation (MM BIO–1D). This measure is inadequate to fully assess the potential impacts associated with operating the modified debris dam. Existing vegetation within the anticipated water storage area includes both riparian (areas mapped as southern cottonwood willow riparian forest and mule fat scrub) and upland (areas mapped as mixed coastal sage scrub, coast live oak woodland, oak woodland/southern mixed chaparral) vegetation communities. In addition, the monitoring program excludes portions of the water storage area that are most likely to be inundated for the longest period of time. The 9

monitoring program should be modified to address the entire inundation area and should include mitigation for impacts to all natural vegetation communities that may be affected by water storage. 9 cont.

4. **Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project** – The proposed project anticipates impacts to 11.14 acres of existing disturbed areas (excluding potential impacts associated with operation of the project, as discussed above). The LACFCD should clarify if impacts will occur to areas disturbed as part of the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project and if those impacts were considered permanent or temporary (i.e., anticipated to be restored following completion of that project). Similarly, the LACFCD should disclose if vegetated areas temporarily disturbed by Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project will remain unvegetated as a result operations associated with the proposed project (e.g., storing water). 10

5. **Invasive Species** – Disturbance associated with construction of the project will result in an increase in the extent of invasive plant species within the project area. To ensure the proposed project does not result in the spread of invasive plant species to adjacent undisturbed areas of native habitat in and adjacent to Angeles National Forest, temporary impacts to upland areas should be restored with native upland vegetation. Temporary impacts to riparian vegetation should be restored by maintaining impact areas free of non-native vegetation until native riparian species have reestablished in the impact areas. 11

6. **Federally Listed Species** – Protocol surveys were conducted in the study area for the federally listed least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and coastal California gnatcatcher (*Polioptila californica californica*) in 2012. Because the distribution of federally listed species can change from year to year, survey results are generally valid for one year. We recommend new surveys be conducted in suitable habitat prior to initiation of project construction. 12

We appreciate the opportunity to comment on the subject MND. If you have any questions regarding these comments, please contact Christine Medak of this office at 760-431-9440, extension 298.

Sincerely,

for Karen A. Goebel
Assistant Field Supervisor

cc:
Erinn Wilson, California Department of Fish and Wildlife
Daniel Swenson, U. S. Army Corps of Engineers

Literature Cited

LACFCD. 2009. Final EIR for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal. Los Angeles, CA: LACDPW.

Orange County Water District. 2013. Effects of reduced outflow from Prado Dam water conservation 2012. Prepared for Palm Springs Fish and Wildlife Office, Palm Springs, California. February 2013.

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2.1.1 U.S. FISH AND WILDLIFE SERVICE (USFWS)

December 9, 2014

Response USFWS-1

The only portion of the study area that was re-disturbed by the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project (LACFCD 2009) was the area where sediment was removed from bottom of Santa Anita Reservoir. However, this is a long-time disturbance area with much documentation prior to 2009. It should be noted that the Upper Sediment Placement Site that would be used as a source of sediment/fill material for the construction activities on the proposed Project is separate from the Lower Sediment Placement Site, which was used as a sediment placement site for the 2009 Dam Riser Modification and Reservoir Sediment Removal Project.

Response USFWS-2

As discussed in more detail in the responses below, the proposed Project would not change the magnitude, timing, or distribution of water flows; the operations of the Dam, Headworks, Culvert Crossing, and Debris Dam would remain the same as pre-project conditions. Flows and inundation are present when natural rainfall occurs, at which time the LACFCD moves the water into the spreading grounds as soon as capacity is available (i.e., once water has infiltrated and the spreading grounds can accept additional flows). The only portion of the proposed Project that would change the magnitude and distribution of water flows is the proposed raising of the Debris Dam spillway, which would allow for the basin to be inundated to a higher level; this change in operation is analyzed in Section 4.4, Biological Resources of the MND.

In their comment letter, the USFWS noted concerns regarding the inundation of mule fat (*Baccharis salicifolia*) within the Debris Dam. The USFWS had similar concerns on a previous LACDPW project, the San Gabriel River Rubber Dams Project. Therefore, permits for the Rubber Dams Project included a requirement for post-project monitoring of native riparian vegetation that would potentially undergo increased inundation as a result of the San Gabriel Rubber Dams Project. Five years of monitoring were conducted following completion of the project. As stated in the final annual report, “little change was detected in the structure, composition, or extent of the preserved riparian habitat upstream of Rubber Dams No. 2 and No. 3, as compared to baseline conditions that were measured in 2004...Inundation of the study area has generally been brief and infrequent. Therefore, little or no effect on vegetation health or extent was expected or observed.” (BonTerra Consulting 2013). It should be noted that one of the years included in the five-year monitoring period was a high rainfall year (2010-2011); therefore, even in a year with substantial water available, the inundation did not affect the extent of riparian vegetation.

As discussed further in Response USFWS-9, in a review of 14 years of runoff data (1996-2010), there were two years of extremely high rainfall (1997-1998 and 2004-2005). Of the remaining 12 years, six years had inundations levels at the Debris Dam of less than 761 feet, while six years had inundation levels of greater than 761 feet for 16 days or less for the year. In a review of 2-year, 5-year, and 10-year storms (based on inches of rain) during this time period, the maximum inundation was 11 days. Therefore, based on this data, inundation is generally expected to occur above 761 feet approximately every other year, and for a period of 10 days or less. During typical storms, two weeks of continuous impoundment are sufficient to allow LACDPW to capture storm runoff and conserve most of it within the local groundwater basin. It is important to note that the only new inundation area is that above 774 feet. As discussed on page 4-46 of the MND, the areas behind the Debris Dam where mule fat scrub and coastal sage scrub occur

are on the outer edge of the basin and would be inundated for the shortest duration, anticipated to be a few days at the most.

Response USFWS-3

As stated on page 3-1 of the MND, the Santa Anita Dam's reservoir capacity to retain water would not be altered by Project implementation. The Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project did not remove the seismic restriction, rather, it installed an ungated outlet that ensures that the reservoir pool behind the Dam stays in compliance by keeping the reservoir pool at 1,230 feet above mean seal level (msl). Operation of the Dam would not change due to the proposed Project; therefore, it is unnecessary to provide a figure showing the reservoir pool behind the Dam with the current seismic restriction (1,230 feet above msl) and the reservoir pool behind the Dam with the seismic restriction removed (1,300 feet above msl). Since January 1, 2000, the reservoir has been at 1,230 feet above msl for 78% of the time, which averages to 268 days per year. However, since the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project was completed (10/15/12), the reservoir has been at 1,230 feet above msl for 4% of the time, which averages to 16 days per year. This is likely due to the limited rainfall in the last few years, in addition to the new self-draining capability.

Response USFWS-4

The Project would repair and replace existing erosion protection within the same footprint as the existing erosion protection. The height of the spillway would be reduced where the notch is cut; therefore, the Dam would not be able to hold water as high as it can currently. The purpose of the modifications to the spillway (i.e., cutting a notch in the Dam) is to allow for a more controlled spill than simply overtopping of the Dam. Operations (i.e., the way that the Dam holds or releases flows) would be the same as the current conditions, which are dictated by annual rainfall. Large storms would continue to overtop the spillway and would not be controlled by the Dam. Release rates for smaller storms would be the same as they are currently. Therefore, no change to the natural vegetation communities and aquatic habitat below the Dam is anticipated.

Response USFWS-5

The purpose of replacing the valves is to ensure longevity and functionality of the valves; the new valves would not function differently and the size of the flows released would not change. Therefore, no change to the quantity and extent of natural communities and aquatic habitat below the Dam is anticipated. Flows are expected to continue to be adequate to support the naturally reproducing rainbow trout (*Oncorhynchus mykiss*) found below the Dam.

Response USFWS-6

The purpose of the improvements at the Headworks are to improve the strength of the structures. Under current conditions, flows resulting from a 2-year storm event or greater do not overtop the berm, but could damage the tainter gate and earthen berm. Installation of the rubber dam would replace the tainter gate at the Headworks. The new rubber dam structure could withstand flows up to a 25-year storm, but it would be operated the same as the tainter gate is currently operated (i.e., opening it when the Dam releases flows greater than 300 cfs). The new rubber dam structure would allow for more controlled flows because it would open by deflating, allowing water to flow over the top of the structure, while the tainter gate lifted up and water would flow under the gate through the opening and also over the gate structure. Additionally, under current conditions, the earthen berm needs to be repaired relatively frequently following

storms, but following the Project the berm will be reinforced so repairs would be needed less often.

It is important to note, that the height of the new rubber dam structure would be the same as the existing tainter gate; therefore, as stated on page 3-2 of the MND, the pool of water upstream of the Headworks would remain the same as under existing conditions. Because operations would remain the same, no change in the quality and extent of vegetation communities and aquatic habitat is anticipated either upstream or downstream from the structure.

Response USFWS-7

See Response USFWS-6. No reduction of flows to areas below the Headworks would occur as a result of Project implementation and no change in the quality and extent of vegetation communities and aquatic habitat is anticipated downstream from the structure.

Response USFWS-8

See Response USFWS-6. No change in the duration and extent of ponding is anticipated as a result of Project implementation and no change in the surrounding vegetation communities is anticipated downstream from the structure.

Response USFWS-9

See Response USFWS-2 for discussion of mule fat. DSOD requires that the Debris Dam gate remain open, even in the restricted condition. Under these conditions, the Debris Dam's basin can store water from 755 feet to the height of the gate at 761 feet; therefore, partial inundation of the basin is typical. Additionally, when the inflow to the Debris Dam exceeds the capacity of the outlet tower and outlet pipe (i.e., 94 cfs when the outlet is clear and slower when it is partially blocked with debris), a pool of water is impounded within the basin until it can drain from the basin. As a result, the entire 119-acre-foot capacity is currently utilized during and following storm events until flows subside. Because of this, the current inundation boundary utilized during storms is 774.7 feet, the height of the existing spillway. Raising the spillway by 4 feet would increase the inundation boundary to 778.7 (See Exhibit 4-3D in the MND). The four-foot increase was selected because it did not have substantial impacts on spillway capacity or the inundation area but still provided a substantial benefit for water conservation (i.e., over 40 acre-feet of additional water conservation capacity per storm event). It should be noted that inundation would only follow storm events or releases, as needed.

Inflow into the basin behind the Debris Dam can vary drastically from year to year, and even from beginning to end of a given storm season. Most years will not produce enough runoff to utilize the maximum capacity. Following implementation of the Project, impoundment above 768 feet (about halfway between current restriction and existing spillway) will be authorized for up to 30 days and for no more than a total of 60 days in a calendar year. Water would not be held in the basin any longer than necessary. The operational objective of the basin behind the Debris Dam is to send impounded waters into the spreading basins as soon as feasible to facilitate maximum groundwater infiltration and recharge. Generally, the entire basin can percolate into the spreading grounds in a period of approximately 2.5 days, assuming capacity exists. If capacity doesn't exist, the pool can be drained directly to the downstream channel in 5.5 hours assuming no additional inflow. The likelihood of using the full extent of the expanded inundation footprint is small in any given year. During extreme floods, no operations would be occurring under both current and future scenarios. The facility would fill up, spill, safely pass all flows, and then be drained as soon as practical.

In a review of 14 years of runoff data (1996-2010), there were two years of extremely high rainfall (1997-1998 and 2004-2005). Of the remaining 12 years, six years had inundations levels of less than 761 feet, while six years had inundation levels of greater than 761 feet for 16 days or less for the year. In a review of 2-year, 5-year, and 10-year storms (based on inches of rain) during this time period, the maximum inundation was 11 days. Therefore, based on this data, inundation is generally expected to occur above 761 feet approximately every other year, and for a period of 10 days or less. During typical storms, two weeks of continuous impoundment are sufficient to allow LACDPW to capture storm runoff and conserve most of it within the local groundwater basin.

During extreme floods, such as those during the large storms the very wet years of 1997-1998 and 2004-2005, no operations would be occurring, the facility would simply be allowed to spill and pass all flows. This is true of both current and future operations.

Because the basin currently operates with inundation up to 774.7 feet (as natural rainfall allows), the existing condition is that vegetation within the basin is currently inundated for up to 1-2 weeks duration. Therefore, the only areas that need to be monitored for changes due to increased inundation are the areas that would be within the additional inundation area as shown in Exhibit 4-3D in the MND.

Additionally, LACDPW currently holds permits that allow them to remove vegetation within a 16-foot area adjacent to the Debris Dam; a 15-foot radius around the outlet tower; and a 10-foot channel within the path of flow of water through the willows. The Flood Maintenance Division has already mitigated for ongoing maintenance impacts within these areas.

Approximately 0.58 acre of mixed coastal sage scrub would be potentially impacted by future inundation. As discussed on page 4-46 of the MND, these areas are along outer edge of the inundation footprint and would be expected to be inundated least frequently and for the least amount of time and therefore would not be expected to be significantly impacted by the inundation.

Response USFWS-10

See Response USFWS-1. The proposed Project would not affect any areas previously vegetated or assumed to be a “temporary” impact (i.e., anticipated to be restored) in the 2009 Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project.

Response USFWS-11

The following has been added to MM BIO-5 (see **bold** text) on pages 1-19 and 4-56 of the MND. These revisions result in mitigation with the same or more stringent requirements and would be equally or more effective in reducing the significant impact. These revisions are included in Section 4.0, Errata.

> **MM BIO-5:** Prior to initiation of Project activities, the Los Angeles County Flood Control District (LACFCD) shall obtain all necessary permits for impacts to U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CDFW jurisdictional areas. Mitigation for the loss of jurisdictional resources shall be negotiated with the resource agencies during the regulatory permitting process. Potential mitigation options shall include one or more of the following: (1) payment to a mitigation bank or regional riparian enhancement program (e.g., invasive plant or wildlife species removal) and/or (2) restoration of riparian habitat either on site or off site at a ratio of no less than 1:1, determined through consultation with the above-listed resource agencies. If in-lieu mitigation

fees are required, prior to the initiation of any construction-related activities, the LACFCD shall pay the in-lieu mitigation fee to a mitigation bank/enhancement program for the in-kind (equivalent vegetation type and acreage) replacement of impacted jurisdictional resources. If a Restoration Program is required, prior to the initiation of any construction-related activities, LACFCD shall prepare and submit a Riparian Habitat Mitigation and Monitoring Program (HMMP) for USACE and CDFW approval. If a Riparian HMMP is required, it shall contain the following items:

A. Responsibilities and qualifications of the personnel to implement and supervise the plan. The responsibilities of the Landowner, Specialists, and Maintenance Personnel that would supervise and implement the plan shall be specified.

B. Site selection. The mitigation site shall be determined in coordination with the USACE, CDFW, and RWQCB. The site shall either be located in a dedicated open space area on County land, USFS land, or off-site land shall be purchased.

C. Seed source. Seeds (or plantings) used shall be from local sources (within ten miles of the Project area) to ensure genetic integrity.

D. Site preparation and planting implementation. Site preparation shall include (1) protection of existing native species; (2) trash and weed removal; (3) native species salvage and reuse (i.e., duff); (4) soil treatments (i.e., imprinting, decompacting); (5) temporary irrigation installation; (6) erosion-control measures (i.e., rice or willow wattles); (7) seed mix application; and (8) container species planting.

E. Schedule. A schedule shall be developed which includes planting in late fall and early winter, between October 1 and January 30.

F. Maintenance Plan/Guidelines. The Maintenance Plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement planting.

G. Monitoring plan. The Monitoring Plan shall include (1) qualitative monitoring (i.e., photographs and general observations); (2) quantitative monitoring (i.e., randomly placed transects); (3) performance criteria, as approved by the above-listed resource agencies; (4) monthly reports for the first year and reports quarterly thereafter; and (5) annual reports for five years, which shall be submitted to the resource agencies on an annual basis. The site shall be monitored and maintained for five years to ensure successful establishment of riparian habitat within the restored and created areas.

H. Long-term preservation. Long-term preservation of the site shall also be outlined in the conceptual Mitigation Plan to ensure the mitigation site is not impacted by future development.

Any areas of native riparian vegetation that would be temporarily disturbed by the Project's construction activities shall be maintained free of non-native vegetation for a period of five years or until native riparian species have become reestablished in the impact area. Removal of non-native vegetation shall occur at least one time per year over the five-year period in order to facilitate the establishment of native species.

Upland vegetation that would be temporarily disturbed is limited in extent and surrounded by the Angeles National Forest, which is expected to provide seeds that would allow the area to restore naturally over time.

Response USFWS-12

As requested by the USFWS and CDFW, LACFCD will repeat focused surveys for least Bell's vireo and southwestern willow flycatcher in spring 2015. However, this additional survey is not required to respond to a new or more significant impact beyond what was discussed in the MND. The repeated focused surveys will be conducted to support the anticipated future issuance of regulatory permits.

An update of the coastal California gnatcatcher surveys is not considered necessary. As explained on pages 3-4 of the Coastal California Gnatcatcher Survey Report in Appendix G of the Biological Technical Report (Appendix B of the MND), "the only occurrence reported in the CNDDB was from 1928 in an area that is now completely developed in the City of Arcadia (CDFG 2012). Based on the following information, the California gnatcatcher is likely absent from the Project Site at this time and is unlikely to occur in the near future: (1) the negative survey results reported here; (2) the lack of recent sightings in the survey area; (3) the presence of only marginally suitable habitat; (4) absence of an extant population of California gnatcatcher within known dispersal distances; and (5) the professional judgment of and experience of the surveying Biologist".

2.2 STATE AGENCIES

- California Department of Transportation, District 7 (Caltrans), November 18, 2014
- Natural Resources Agency, Department of Fish and Wildlife (CDFW), December 3, 2014

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STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7-OFFICE OF TRANSPORTATION PLANNING
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
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FAX (213) 897-1337
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Serious drought.
Help save water!

November 18, 2014

Mr. Matthew Frary
Los Angeles County, Flood Control District
900 South Fremont Avenue
Alhambra, CA 91803

RE: Santa Anita Stormwater Flood Management
and Seismic Strengthening Project
Mitigated Negative Declaration
SCH#2014101044, IGR#141045FL
Vic. LA/ 210/ PM R31.9

Dear Mr. Frary:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed.

Caltrans acknowledge RR TRA-1 on page 4-112 that oversize-transport vehicles on State highways will require a Caltrans transportation permit. Also, we would like to remind you that any work to be performed within the State Right-of-way will need an Encroachment Permit. We recommend that large size truck trips be limited to off-peak commute periods. In addition, a truck/traffic construction management plan is needed for this project. 1

Storm water run-off is a sensitive issue for Los Angeles and Ventura counties. Please be mindful that projects need to be designed to discharge clean run-off water. Additionally storm water run-off is not permitted to discharge onto State highway facilities. 2

If you have any questions or concerns regarding these comments, please feel free to contact me at (213) 897 – 9140 or project coordinator Frances Lee at (213) 897-0673 or electronically at frances.lee@dot.ca.gov.

Sincerely,

DIANNA WATSON
Branch Chief, Community Planning & LD IGR Review

cc: Scott Morgan, State Clearinghouse

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

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2.2.1 CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)

November 18, 2014

Response CalTrans-1

The proposed Project does not anticipate any work within Caltrans right-of-way or any other impacts to Caltrans facilities; therefore, the Project does not require an Encroachment Permit. Regarding the Project's truck traffic, RR TRA-2 in the MND requires the implementation of temporary traffic control in accordance with the Standard Specifications for Public Works Construction (Greenbook). The Contractor shall provide temporary traffic control in accordance with the Greenbook during construction activities. Regarding the limitation of truck traffic to off-peak commute periods, RR TRA-1 currently states that the Project would be subject to a moving permit, and requires revision. Accordingly PDF TRA-1 and RR TRA-1 have been revised to clarify peak-hour travel for heavy-duty truck traffic. The following text has been revised (see **bold** and ~~strikeout~~ text) in the MND for clarification.

PDF TRA-1 Heavy-duty diesel truck vehicle (with a Gross Vehicle Weight Rating of 10,000 lbs. or heavier) trips shall be scheduled to avoid school crosswalks at Highland Oaks Elementary School during peak drop-off hours between 8:00 AM to 9:00 AM and pick-up hours between 2:00 PM to 3:00 PM. **Heavy-duty diesel truck vehicle trips will be scheduled to avoid peak hours and holidays.** As required by State Commercial Vehicle Idling Regulations, trucks shall be prohibited from idling for more than 5 minutes if queuing within 100 feet from any residential area.

RR TRA-1 The movement of large equipment on public roadways shall be made in compliance with the Los Angeles County Code (Title 16, Highway)~~, which requires a moving permit and which includes provisions regarding the size of vehicles/equipment; night moves; moving in inclement weather; parking on streets; travel outside peak hours and holidays; over-length, over-height, and over-width requirements; lighting; signs; and restricted routes~~. Oversized transport vehicles on State highways, if required, would need to obtain a transportation permit from the California Department of Transportation (Caltrans). Oversized transport vehicles on local roadways, if required, would need to obtain a transportation permit from the Cities of Arcadia and Sierra Madre.

Response CalTrans-2

The proposed Project would be implemented in compliance with all applicable regulations to ensure water quality, including RR HYD-1, with requires coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with the Construction and Land Disturbance Activities, and RR HYD-2, which compliance with all conditions of the Water Quality Certification issued by the Regional Water Quality Control Board (RWQCB) to ensure that any discharge from the Project does not conflict with the applicable provisions of Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, or any other applicable requirements of State law. Storm water runoff would not drain to State highway facilities.

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

December 3, 2014

Mr. Matthew Frary
County of Los Angeles
Department of Public Works, Water Resource Division
900 S. Freemont Ave.
Alhambra, CA 91803
mfrary@dpw.lacounty.gov

Subject: Comments on the Initial Study/Draft Mitigated Negative Declaration Santa Anita Stormwater Flood Management and Seismic Strengthening Project, Los Angeles County, (SCH# 2014101044)

Dear Mr. Frary

The Department of Fish and Wildlife (Department) has reviewed the Initial Study/Mitigated Negative Declaration (IS/MND) dated October 20, 2014, for the abovementioned Santa Anita Stormwater Flood Management and Seismic Strengthening Project (Project). The document was prepared by Los Angeles County Flood Control District (LACFCD) acting as the Lead Agency (CEQA Guidelines § 15051). The Project, once approved, would allow LACFCD to modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed including the Santa Anita Dam (Dam), Santa Anita Headworks (Headworks), the Santa Anita Debris Dam (Debris Dam), and Wilderness Park Culvert Crossing.

The Project is located in the foothills of the San Gabriel Mountains in Los Angeles County within the jurisdictions of the City of Arcadia, the City of Monrovia, County-owned land within the United States Forest Service (FS) boundary, and land located on the FS Angeles National Forest (ANF). The Dam is located at the northern most portion of the Project site on the ANF. The Dam is accessed via Chantry Flats Road, approximately 2.5 miles north of the City of Arcadia. The Headworks structure is located approximately 0.5 mile downstream of the Dam outside the ANF, and within the City of Arcadia just north of Highland Oaks Drive. The Wilderness Park Culvert Crossing is located approximately 450 feet downstream of the Headworks. The Debris Dam is located approximately 0.5 mile downstream of the Headworks within the cities of Arcadia and Monrovia, which is accessed via a maintenance road that runs along Santa Anita Wash. Released flow (during non-storm events) from the Dam runs downstream to the Headworks facility, which intercepts most of the flows and diverts them into an existing 30 inch reinforced concrete pipe diverting the flow to the Sierra Madre and Santa Anita Spreading Grounds. Water not taken in by the Headworks, continues downstream to the Debris Dam where it is diverted to the Santa Anita Spreading Grounds or released to the Santa Anita Channel downstream, which is tributary to the Rio Hondo and Los Angeles River.

The Dam, Headworks, and Debris Dam are operated and maintained by the LACFCD and serve to control and conserve the stormwater from the Santa Anita Canyon Watershed. The Project would improve the LACFCD's facilities ability to control and conserve water, and add an additional 518 acre-feet of additional water conservation capacity. The Project would be partially funded by a State of California Proposition 1E Stormwater Flood Management Grant

Conserving California's Wildlife Since 1870

Mr. Matthew Frary
County of Los Angeles
December 3, 2014
Page 2 of 7

and assistance from the City of Arcadia, the City of Sierra Madre, and the Raymond Basin Management Board. In addition to improving infrastructure for flood protection, the Project, as proposed, contributes to regional efforts to reduce dependence on imported water supplies by providing increased opportunities to recharge stormwater into the groundwater basin.

The Wilderness Park Culvert Crossing portion of the project includes the removal and replacement of the culvert located along the access road used to access the City of Arcadia's Wilderness Park and the Headworks. The upgrade of this crossing is proposed to ensure the roadway and crossing can withstand flows generated by a larger flood event. Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing structure would be graded and recountoured to accommodate the new structure.

The projected construction start dates and duration for the various Project components are detailed in the MND (see Table 3-1). Construction of the Project is anticipated to commence in the winter of 2015 and end in the fall of 2016. Certain elements of each Project component (the Dam, Headworks, Wilderness Park Culvert Crossing, and Debris Dam) would not be performed during the wet season (October to April) in order to ensure flood control and water conservation efforts proceed satisfactorily.

The area surrounding the Dam is undeveloped and comprised of natural vegetation types, including oak (*Quercus ssp.)*, sycamore (*Plantanus ssp.*), cottonwood (*Populus ssp.)*, and alder (*Alnus ssp.)* woodlands, southern mixed chaparral and mixed coastal sage scrub, as well as unvegetated cliff faces. The area along Santa Anita Canyon between the Dam and the Headworks consists of a canyon with vertical walls and very steep slopes that are either unvegetated or dominated by dense chaparral. Further downstream towards the Debris Dam, vegetation types include mixed coastal sage scrub, southern mixed chaparral, southern cottonwood willow riparian forest, southern sycamore alder riparian woodland, southern riparian forest, sycamore alluvial woodland, mule fat scrub, coast live oak woodland, mixed woodland, oak woodland, ornamental, and non-native annual grasses and forbs.

The Project covers an area of 115.50 acres (ac.), consisting of 14.09 ac. mixed coastal sage scrub, 4.99 ac. disturbed mixed coastal sage scrub, 9.08 ac. southern mixed chaparral, 12.72 ac. southern mixed chaparral/mixed coastal sage scrub, 0.50 ac. disturbed southern mixed chaparral/mixed coastal sage scrub, 1.15 ac. southern mixed chaparral/ rock outcroppings, 6.36 ac. southern cottonwood willow riparian forest, 1.80 ac. sycamore alluvial woodland/southern riparian forest, 3.83 ac. southern sycamore alder riparian woodland, 5.99 ac. mule fat scrub, 2.61 ac. coast live oak woodland, 0.55 ac. mixed woodland, 6.03 ac. oak woodland/southern 3.86 ac. ornamental, 3.38 ac. ornamental/coast live oak woodland, 0.63 ac. ruderal, 23.87 ac. disturbed, 8.90 ac. developed, 0.17 ac. rock outcroppings and 4.99 ac. open water (see *Biological Technical Report,* Table 4).

The Project, as proposed in the MND (see Table 4-8 for specific breakdown), would have permanent impacts to 2.32 ac. and temporary impacts to 17.60 ac. of abovementioned vegetation communities. The additional inundation area is not currently described as a permanent or temporary impact in the MND, but is disclosed as affecting an additional 3.10 acres above the existing condition where stormwater is temporarily impounded and returned to 761 feet above mean sea level as soon as practicable after each storm event (MND, pg. 2-5).

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The following statements and comments have been prepared pursuant to the Department's authority as Trustee Agency with jurisdiction over natural resources affected by the Project (California Environmental Quality Act [CEQA] Guidelines §15386) and pursuant to our authority as a Responsible Agency under CEQA Guidelines Section 15381 over those aspects of the proposed Project that come under the purview of the California Endangered Species Act (Fish and Game Code §2050 et seq.) and Fish and Game Code Section 1600 et seq.

1. **Project Description**. One goal for the Project is to improve the facilities to better manage stormwater runoff from the Santa Anita Canyon Watershed, and add a total of 518 acre-feet of water conservation capacity (pg. 2-3). As an example, the MND assumes impacts based on the original design build and not the current conditions. The Project Description and the impact analysis for the Debris Basin should more adequately reflect direct and indirect effects to the existing biological resources based on the current operations versus the 119 acre foot original design capacity (MND pg. 3-4)[1]. Because the MND does not completely describe current and future operating conditions, the MND provides an incomplete assessment of the significance of the Project's impacts as it relates to biological resources. The Department recommends the final MND include a complete Project Description of the current conditions and the anticipated operations along with an explanation as to why each Project-related impact (direct and indirect) is not significant or is mitigated to below a level of significance. 1

2. **Effect of Additional Inundation Behind Debris Dam.** The MND states seismic retrofit will result in a total of 159 acre-feet of water conservation storage capacity behind the Debris Dam when combining the re-establishment of design capacity of 119 acre-feet (last achieved in 1995) with the additional 40 acre-feet capacity gained from raising of the spillway. The MND concludes that the increased frequency of flooding and elevated standing water would increase the duration and depth of inundation, but would not substantially impact the riparian vegetation within the 159 acre-feet elevation limits (MND, pg. 4-45). While mulefat and willow riparian habitats can tolerate significant flooding and inundation, sage scrub and cottonwood/alders may not. Effects to less tolerant species may result in mortality, significantly stunted growth, or type conversion to more tolerant species. These effects would result in additional impacts to habitat not disclosed in MND. The Department recommends the final MND fully analyze the impacts associated with other non-riparian habitats, including sage scrub that would be impacted by the expansion of the inundation area. 2

3. **CESA**. The Department considers adverse impacts to a species protected by CESA, for the purposes of CEQA, to be significant without mitigation. As to CESA, take of any endangered, threatened, or candidate species that results from the Project is prohibited, except as authorized by state law (Fish and Game Code, §§ 2080, 2085.) Consequently, if the Project, Project construction, or any Project-related activity during the life of the Project will result in take of a species designated as endangered or threatened, or a candidate for listing under CESA, the Department recommends that the Project proponent seek appropriate take authorization under CESA prior to implementing

[1] Effects of a project considered under CEQA are defined in Guidelines Section 15358. A significant effect on the environment is generally defined as a substantial or potentially substantial adverse change in the physical environment at the time the Initial Study is prepared.

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the Project. Appropriate authorization from the Department may include an incidental take permit (ITP) or a consistency determination in certain circumstances, among other options (Fish and Game Code §§ 2080.1, 2081, subds. (b),(c)). Early consultation is encouraged, as significant modification to a project and mitigation measures may be required in order to obtain a CESA Permit. The issuance of an ITP by the Department is subject to CEQA. Revisions to the Fish and Game Code, effective January, 1998, may require that the Department issue a separate CEQA document for the issuance of an ITP unless a CEQA document that may be currently associated with the activity addresses all project impacts to CESA-listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of an ITP. For these reasons, biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA ITP.

a. **Riparian Bird Species.** The MND indicates that CESA or Federal Endangered Species Act (FESA) species are not expected to occur in the Project area based on negative survey results or lack of suitable habitat. Focused surveys for FESA- and CESA-listed least Bell's vireo (*Vireo bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii extimus*), were conducted in 2012. No observations were detected. To avoid impacts to these CESA-listed species, the Department recommends additional focused surveys occur for these species in suitable habitat, prior to construction, as these species may be absent one year and present the next. 3A

b. **Townsend's Big Eared Bat**. Focused surveys for CESA-listed (candidate species) Townsend's big eared bat, were conducted in July, 2014, and Townsend's big eared bat were detected. The MND states that although the roosting location was not definitively determined, it is assumed to be significantly distant from Study Area. The MND concludes substantial adverse effects to this species would be avoided because suitable roosting habitat is not present within or adjacent to project work areas, so direct impacts to individuals can be avoided. Townsend's big eared bat populations appear to be sedentary, and individuals are not known to move more than a few kilometers from their natal roost, and the species may use separate sites for night, day, hibernation, or maternity roosts (Harris 2000)[2]. 3B

The MND proposes MM BIO-4 to avoid direct impacts to individual bats by installing exclusionary devices. Because Townsends's big eared bat demonstrates high fidelity to roost sites and suitable roosts are limited for this species, the Department would consider this impact significant enough to cause mortality and requires consultation with the Department under CESA. The Department recommends the final MND commit to additional surveys to determine the use of the Project area by Townsend's big eared bat and coordinate survey results with the Department to determine if an ITP is necessary.

4. **Impacts to Streams.** The Project, as proposed, would have effects to streambeds in the Santa Anita Watershed. The Department has regulatory authority with regard to activities occurring in streams and/or lakes that could adversely affect any fish or wildlife 4

[2] Harris, J. 2000. *"Life History Account for Townsend's Big Eared Bat."* Updated by CWHR Program Staff, May 2000. California Wildlife Habitat Relationships System, California Department of Fish and Game Interagency Wildlife Task Group. Accessed November 24, 2014. https://nrmsecure.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=2347

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resource. For any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) or a river or stream or use material from a streambed, the Project applicant (or "entity") must provide written notification to the Department pursuant to Section 1600 *et seq.* of the Fish and Game Code. Based on this notification and other information, the Department then determines whether a LSAA Agreement is required. The Department's issuance of a LSAA may be a project that is subject to CEQA. To facilitate our issuance of the LSAA the Department as a Responsible Agency under CEQA may consider the local jurisdiction's (Lead Agency) document for the project. To minimize additional requirements by the Department under CEQA, the document should fully identify the potential impacts to all stream and riparian resources and any listed species and provide adequate avoidance, mitigation, monitoring, and reporting commitments for issuance of the LSAA. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources. The Department may condition further measures in the LSAA that are designed to mitigate for unavoidable project impacts to riparian resources. These measures may include on site or off site preservation and protection in perpetuity under a conservation easement of riparian habitat to be managed by a local land conservancy. 4 cont.

Further information on the Department's Lake and Streambed Alteration Program and initiating a Department streambed jurisdiction determination may be found at: http://www.dfg.ca.gov/habcon/1600/. LSAA Agreement Notification forms and form completion instructions may be found at: http://www.dfg.ca.gov/habcon/1600/forms.html.

5. **Inundation Effects on Nesting Birds**. Sudden changes to water levels during the avian nesting season may have a significant impact on breeding birds, in particular water fowl (protected by Fish and Game Code 3503), due to the sudden loss of ponded water or a sudden increase in water levels within nesting habitat. The Department recommends the MND include measures to minimize the effects of a sudden diversion of water that may be seasonally utilized by wildlife behind the Debris Dam. The Department recommends drastic surface water reductions be avoided, to the extent feasible from February 1 through August 31, to reduce impacts to nesting avian species. 5

6. **General Native Bird Avoidance**. MM BIO-3, MND page 4-53 describes measures to reduce impacts to nesting birds and describes the nesting season from March 15 to September 15 and for nesting raptors from February 1 to June 30. Migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section10.13). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA). 6

Proposed project construction activities (including, but not limited to, staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season, which generally runs from February 1-August 31 (as early as January 1 for some raptors) to avoid take of birds or their eggs. Take means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill (Fish and Game Code Section 86), and includes take of eggs and/or young resulting from disturbances that cause abandonment of active nests. Depending

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on the avian species present, a qualified biologist may determine that a change in the breeding season dates is warranted.

If avoidance of the avian breeding season is not feasible, the Department recommends that, beginning thirty days prior to the initiation of project activities, a qualified biologist with experience in conducting breeding bird surveys conduct weekly bird surveys to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300 feet of the disturbance area (within 500 feet for raptors). The surveys should continue on a weekly basis with the last survey being conducted no more than 3 days prior to the initiation of project activities. If a protected native bird is found, the Project proponent should delay all Project activities within 300 feet of on and off-site suitable nesting habitat (within 500 feet for suitable raptor nesting habitat) until August 31. Alternatively, the qualified biologist could continue the surveys in order to locate any nests. If an active nest is located, Project activities within 300 feet of the nest (within 500 feet for raptor nests), or as determined by a qualified biological monitor, must be postponed until the nest is vacated, juveniles have fledged, and there is no evidence of a second attempt at nesting. Flagging, stakes, and/or construction fencing should be used to demarcate the inside boundary of the buffer of 300 feet (or 500 feet) between the Project activities and the nest. Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. The LACFCD should retain the results of the recommended protective measures described above to document compliance with applicable State and Federal laws pertaining to the protection of native birds. 6 cont.

If the biological monitor determines that a narrower buffer between the Project activities and observed active nests is warranted, he/she should submit a written explanation as to why (e.g., species-specific information, ambient conditions and birds' habituation to them, and the terrain, vegetation, and birds' lines of sight between the Project activities and the nest and foraging areas) to the LACFCD project manager and, upon request, the Department. Based on the submitted information, the LACFCD Project manager should determine whether to allow a narrower buffer.

The Department recommends a biological monitor be present on site during all grubbing and clearing of vegetation to ensure that these activities remain within the Project footprint (i.e., outside the demarcated buffer) and that the flagging/stakes/fencing is being maintained, and to minimize the likelihood that active nests are abandoned or fail due to Project activities. The biological monitor should send weekly monitoring reports to the LACFCD during the grubbing and clearing of vegetation, and should notify the LACFCD immediately if Project activities damage active avian nests.

7. **General impacts to Bat Species.** The MND concludes that the Project has potential to directly impact roosting bats, (MND pg. 1-16) and considers this a significant impact requiring mitigation (see MND MM-BIO4). However, in regards to direct loss of roosting habitat from the Project, the MND considers this less than significant because other suitable roosting habitat is present in the vicinity of the Project. The MND should clarify how this conclusion was supported. The loss of roosting habitat is considered one of the primary conservation issues facing bat populations. Some populations may or may not have adequate alternative roosts. The Department would consider loss of a maternity roost a significant impact and recommend mitigation for the loss of maternal roosts. The 7

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importance of non-maternal roosts to health and survivorship should be evaluated by a qualified bat biologist based on the species being affected. The assessment of roost sensitivity and importance should consider scale of the impacts on site, regionally, and cumulatively at the species level by a qualified bat biologist.

The Department recommends the final MND modify MM BIO-4 to commit to applicable mitigation measures only after appropriate surveys are complete enough to provide the needed information on specific bat populations in the Project Area. This usually requires surveys conducted to locate day, night, and hibernating roosts along with foraging areas. MM BIO-4 should commit to mitigation for unavoidable loss of maternity/day roosts and avoid mortality of young unable to fly (spring) and adults in torpor (winter). The Project should exclude bats from directly affected work areas utilizing appropriate methods and exclusion devices, ideally installed between October 1 and November 30, within the twelve month period prior to construction when chances of directly impacting juveniles and individuals in hibernation are the lowest. The selection and installation of the devices should be under the direction of a qualified bat biologist. Exclusion should be done selectively, and only to the extent necessary, to prevent morbidity or mortality to the bats. Bat exclusion devices should be inspected at least weekly between March 1 and May 31 and monthly thereafter, and any deficiencies shall be corrected or devices shall be modified to function appropriately. The Department recommends LACFCD consult with Department if occupancy is noted during May inspections to determine if construction should proceed at that location. Exclusionary devices should be removed at the end of construction. The Department recommends a monthly report summarizing materials, methods, inspection results, and exclusionary device effectiveness be submitted to LACFCD's Project manager by a qualified bat biologist. 7 cont.

We appreciate the opportunity to comment on the MND for the project and to assist in further minimizing and mitigating project impacts to biological resources. If you have questions regarding this letter, please contact Mr. Matt Chirdon by telephone (805) 640-1165 or email at matthew.chirdon@wildlife.ca.gov.

Sincerely,

Christie Bond Jackson

for Betty J. Courtney
Environmental Program Manager I
South Coast Region

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2.2.2 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (CDFW)

December 3, 2014

Response CDFW-1

See Responses USFWS-2 through USFWS-9.

Response CDFW-2

See Response USFWS-2 and USFWS-9.

Response CDFW-3A

See Response USFWS-12.

Response CDFW-3B

The surveys that were conducted for bats were not focused surveys specifically for Townsend's big-eared bat, they were surveys for bat roost locations of any bat species in the Project Work Areas. The roosting bat survey methodology was approved by Matt Chirdon with CDFW prior to the surveys being conducted. The roosting bat methodology included exit counts (i.e., visual observation) and acoustical recording from prior to sunset to three hours after sunset.

Townsend's big-eared bat was detected more than an hour after sunset, which indicates that the individual(s) likely flew to the Santa Anita Dam's reservoir to forage from an offsite, but likely nearby (within one kilometer), roost in the surrounding forest lands. Townsend's big-eared bats typically roost in congregations in caves (or similar structures) that are subject to minimal human disturbance for day-roosting, maternity-roosting, and winter-torpor activities. Neither the Dam nor other structures within the Project Work Areas provide cave-like structures with minimal human disturbance. Additionally, no caves or cave-like structures were observed immediately adjacent to Project Work Areas during the roosting bat survey effort. However, suitable roosting habitat is likely present within the surrounding areas of Santa Anita Canyon where the canyon walls and associated rocky outcroppings support varying structural complexity and potentially cave-like features. These canyon walls and outcroppings were not surveyed in detail as part of the roosting bat survey effort, however, the abundance of large, isolated, open, rocky features in the surrounding vicinity was noted during the roosting bat survey. Thus, the Biologist that conducted the surveys concluded that the Townsend's big-eared bat individual(s) detected during the survey forage at the reservoir, but likely roost somewhere within the surrounding forest lands. It is not considered necessary to determine exactly where the Townsend's big-eared bat is roosting, as long as it is not roosting within the Project Work Area, as appears to be the case.

The following text has been revised (see **bold** and ~~strikeout~~ text) on page 4-42 of the MND to clarify this finding. These revisions result in the same finding as was originally made in the MND, but provides more background and justification to address the CDFW comment. These revisions are included in Section 4.0, Errata.

> Townsend's big-eared bat typically roosts in caves **or similar structures that are subject to minimal human disturbance. No caves or cave-like structures that would be subject to minimal human disturbance were observed in Project Work Areas;** ~~and is~~ therefore**, Townsend's big-eared bat is** not expected to roost in the Dam or other structures **in Project Work Areas**. **While suitable roosting habitat is likely**

> **present within the surrounding areas of Santa Anita Canyon where the canyon walls and rocky outcroppings provide cave-like features,** ~~Additionally,~~ no caves **or cave-like structures** were observed immediately adjacent to Project Work Areas during the roosting bat survey**.** ~~and the~~ **Based on the lack of suitable roosting habitat on the Dam and the timing of the first recorded call (i.e., more than one hour after sunset),** ~~acoustical surveys indicated that~~ the Townsend's big-eared bat **that was** observed ~~foraging~~ at the Dam likely roosted ~~some distance from~~ **outside of** the Project Work Area**, somewhere within the surrounding forest,** ~~based on the timing of the first recorded call after dusk~~ **and traveled to Dam to forage**. Therefore, the Project is not expected to impact roosting Townsend's big-eared bat or any of its roosts.

The MND includes the requirement for pre-construction surveys and exclusionary measures to ensure that no roosting bats or maternal roosts are directly impacted by Project activities (MM BIO-4). MM BIO-4 is revised per CDFW comments under Response CDFW-7 below and in the Errata. Based on the findings of the surveys for bat roost locations in the Project Work Areas conducted to support the analysis within the MND, and with the incorporation of MM BIO-4, no additional surveys were determined to be necessary. However, CDFW has requested the conduct of an additional survey to confirm the absence of Townsend's big-eared bat roosting in Project Work Areas. Because there is no adopted CDFW protocol survey standards for Townsend's big-eared bat, LACFCD will coordinate directly with CDFW to determine acceptable survey site-specific protocols, which will be completed prior to the commencement of construction activities at the Santa Anita Dam.

Response CDFW-4

The MND analyzes impacts on stream and riparian resources and any listed species (see pages 4-45 through 4-49 and 4-40 through 4-44, respectively). MM BIO-5 of the MND requires that the LACFCD obtain a Lake and Streambed Alteration Agreement (LSAA).

Response CDFW-5

See Response USFWS-9. The Debris Dam would continue to operate as it currently does; inundation would occur primarily during the storm season (i.e., October to April) for periods of ten days or less depending on the size of the storm. Inundation events would occur when storms occur, primarily during the storm season, which is mostly outside the breeding season; however, there may be some late season storms at the beginning of the breeding season (i.e., March/April) that could affect nesting as noted on page 4-46 of the MND. Since the Debris Dam's basin typically doesn't pond water for an extended period of time during the beginning of the breeding season, waterfowl that prefer nesting near ponds would be unlikely to choose to nest in the Debris Dam's basin. If they did, they would be unlikely to be affected by a "drastic surface water reduction" because water percolates into the Debris Dam's basin or is released to the spreading grounds gradually over a period of a few days; releasing the water gradually maximizes water conservation.

Response CDFW-6

The following has been added to MM BIO-3 (see **bold** and ~~strikeout~~ text) on pages 1-14 to 1-15 and 4-54 to 4-55 of the MND. These revisions result in mitigation with the same or more stringent requirements and would be equally or more effective in reducing the significant impact. These revisions are included in Section 4.0, Errata.

> **MM BIO-3:** The Project shall be conducted in compliance with the conditions set forth in the Migratory Bird Treaty Act (MBTA) and *California Fish and Game Code* with methods

approved by USFWS and CDFW to protect active bird/raptor nests. The nature of the Project requires that work would be initiated during the breeding season for nesting birds ~~(March 15–September 15)~~ and ~~nesting~~ raptors (February 1~~–June 30~~**August 31**). The LACFCD, in consultation with a qualified Biologist, may employ bird exclusionary measures (e.g., mylar flagging) prior to the start of bird breeding season to minimize opportunities for birds to nest within established boundaries of the Project. In order to avoid direct impacts on active nests, a pre-construction survey **for nesting birds and raptors** shall be conducted by a qualified Biologist **(i.e. one with experience conducting nesting bird surveys)** ~~for nesting birds and/or raptors~~ within 3 days prior to clearing of any vegetation or any work near existing structures (i.e., within 50 feet for nesting birds**, within 300 feet for nesting special status birds,** and within 500 feet for nesting raptors). If the Biologist does not find any active nests within or immediately adjacent to the impact area, the vegetation clearing/construction work shall be allowed to proceed. **A letter report shall be prepared and submitted to LACFCD to document the survey findings and recommended protective measures.**

If the Biologist finds an active nest within or immediately adjacent to the construction area and determines that the nest may be impacted or breeding activities substantially disrupted, the Biologist shall delineate an appropriate buffer zone (at a minimum of 25 feet **for common birds, 300 feet for special status birds, and 500 feet for nesting raptors**) around the nest depending on the sensitivity of the species and the nature of the construction activity. **If the Biologist determines that a narrower buffer area is warranted, he/she shall submit a written explanation as to why (e.g., species-specific information, ambient conditions and birds' habituation to them, and the terrain, vegetation, and birds' line of sight between the Project and the nest/foraging areas) to the LACFCD Project Manager, and upon request to CDFW. Based on the submitted information, the LACFCD Project Manager shall determine whether to allow a narrower buffer. A letter report or memorandum shall be prepared by the Biologist to document the protective measures and to document compliance with applicable federal and State laws pertaining to the protection of nesting birds.**

Any nest found during survey efforts shall be mapped on the construction plans. The active nest shall be protected until nesting activity has ended. To protect any nest site, the following restrictions to construction activities shall be required until nests are no longer active, as determined by a qualified Biologist: (1) clearing limits shall be established within a buffer around any occupied nest (the buffer shall be 25–100 feet for nesting birds**,** ~~and~~ 300 **feet for special status birds, and** 500 feet for nesting raptors), unless otherwise determined by a qualified Biologist and (2) access and surveying shall be restricted within the buffer of any occupied nest, unless otherwise determined by a qualified Biologist. Encroachment into the buffer area around a known nest shall only be allowed if the Biologist determines that the proposed activity would not disturb the nest occupants. **Flagging, stakes, and/or construction fencing shall be used to demarcate the buffer around the nest and construction personnel shall be instructed as to the sensitivity of the area.** Construction can proceed when the qualified Biologist has determined that fledglings have left the nest or the nest has failed.

The following has been added to PDF BIO-1 (see **bold** text) on pages 1-5 and 4-39 of the MND. These revisions result in mitigation with the same or more stringent requirements and would be equally or more effective in reducing the significant impact. These revisions are included in Section 4.0, Errata.

> **PDF BIO-1:** A Biological Monitor will be on site during vegetation clearing in Project Work Areas (e.g., limits of disturbance). The Biological Monitor will confirm that the limits of Project Work Areas **and any Environmentally Sensitive Areas (e.g., nesting birds)** are clearly marked. The Biological Monitor shall provide environmental awareness training to the Contractor; the training will include a discussion of native habitat types, special status species that may occur in the Project Work Areas, direction for what to do if a special status species is observed, and an overview of applicable permit conditions. Prior to construction, the Biological Monitor will conduct a pre-clearing sweep of the Project Work Area and will flush or move wildlife outside the Project Work Area to the extent practicable. **The Biological Monitor shall send weekly monitoring reports to the LACFCD during vegetation clearing and shall notify LACFCD immediately if construction damages any active nests and/or if any Best Management Practices (BMPs) to protect biological resources require repair.**

Response CDFW-7

The Project Study Area consists of a total of 115.50 acres, of which approximately 25.88 acres is considered woodland or rocky outcroppings that would be potentially utilized by roosting bats. It should be noted that the study area has been arbitrarily defined to include a suitable buffer around Project Work Areas to evaluate indirect effects; however, the Project Study Area is surrounded by the Angeles National Forest. Page 4-43 of the MND evaluates the loss of 0.57 acre of roosting habitat as a result of the Project. This is a 2% loss of habitat within the Project Study Area and a vastly smaller fraction when considering the amount of suitable roosting habitat throughout the Angeles National Forest. No maternal roosts were detected during the roosting bat survey, which was conducted during the breeding season. The assessment described within the MND was made by a qualified bat Biologist. Additionally, the MND includes pre-construction surveys and exclusionary measures to ensure that no roosting bats or maternal roosts are directly impacted by Project activities (MM BIO-4).

Upon review of this section of the MND, it was discovered that the loss of roosting habitat calculation should be 0.61 acre of habitat, as shown below. This revision (on page 4-43 of the MND) results in the same finding (i.e., 2% loss of roosting habitat in the study area and less regionally). Additionally, Townsend's big-eared bat should not have been included in this list of roosting species since it is not expected to roost on the Dam as explained under Response CDFW-3; this was not appropriately revised after the Project Work Areas were evaluated by a qualified bat Biologist. These revisions (see **bold** and ~~strikeout~~ text) are included in Section 4.0, Errata.

> As shown in Table 4-8 and mapped on Exhibit 4-3, the total combined loss of ~~0.57~~**0.61** acre of southern cottonwood willow riparian forest, sycamore alluvial woodland/southern riparian forest, and coast live oak woodland would remove potential roosting habitat for bat species that roost in trees (i.e., silver-haired bat, western red bat, and hoary bat); bat species that roost on cliffs and rocky outcroppings could be affected by repair of gunite adjacent to the Dam and/or construction on structures at the Dam and Headworks (i.e., pallid bat, ~~Townsend's big-eared bat,~~ fringed myotis, western mastiff bat, pocketed free-tailed bat, and big free-tailed bat).

LACFCD has incorporated recommended language into MM BIO-4 as follows (see **bold** and ~~strikeout~~ text) on pages 1-16 and 4-55 of the MND. These revisions result in mitigation with the same or more stringent requirements and would be equally or more effective in reducing the significant impact. These revisions are included in Section 4.0, Errata.

> **MM BIO-4:** Water shall be drained or re-routed around Project Work Areas at least one month prior to construction to deter bats from roosting in the vicinity of the Work Areas.
>
> ~~If exclusionary measures have not already been installed on all potential roost structures within the Project Work Area, a~~ **A** pre-construction ~~follow-up~~ roosting bat survey (including both day and evening efforts) shall be conducted by a qualified Biologist ~~within two weeks~~ prior to **installation of exclusionary measures** ~~the initiation of construction~~ to ensure that no active day-roosts would be impacted. The day survey will involve inspecting the structures for sign of bat roosting. The evening survey will involve monitoring each potential roost site for evening emergence, conducting exit counts, and acoustic monitoring (from a half an hour before sunset to at least ~~one~~ **three** hour**s** after sunset) near potential roost~~s~~ **locations**. If active bat day-roosts**, maternity-roosts, or hibernating-roosts** occur within the Project Work Area, bat exclusion devices shall be installed under the supervision of a qualified biologist **between October 1 and November 30 (when the chance of impacting juveniles and individuals in hibernation is the lowest) within the 12-month period** prior to the start of construction. **Exclusion shall be done selectively, and only to the extent necessary to prevent bat injury and mortality.**
>
> If active bat ~~day~~ roosts occur within structures proposed for removal/repair (including gunite repair on hill slopes), **or within an area that would be indirectly impacted by Project activities,** then exclusionary measures, such as barriers with one-way doors or ~~permanent~~ **other** exclusion (e.g., caulking or wire mesh), shall be installed under the supervision of a qualified Biologist. **Bat exclusion devices shall be inspected weekly by a qualified bat Biologist from March 1 through May 31 and monthly thereafter; any deficiencies shall be corrected or devices shall be modified to function appropriately. The Biologist shall prepare monthly reports to summarize the inspections and to report on the effectiveness of the exclusionary measures; the reports shall be submitted to LACFCD's Project Manager. If roosting bats are noted within any of the Project Work Areas during the breeding season, LACFCD shall contact CDFW to determine whether construction should proceed in that area. Temporary exclusionary measures shall be removed at the completion of construction.**
>
> If active bat day-roosts occur within trees proposed for removal, then either tree removal shall be conducted between ~~September~~ **October 1** and November **30** (to avoid the bat maternity and the bat hibernation season), or the tree removal will occur under the supervision of a qualified Biologist and will utilize phased tree trimming. If avoidance of bat hibernation and bat maternity season is not feasible, then exclusionary measures, such as netting or phased tree trimming, shall be implemented after the evening roost emergence under the supervision of a qualified Biologist. Once bats have been excluded from the trees to be removed, then tree removal can proceed.

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STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Edmund G. Brown Jr.
Governor

Ken Alex
Director

November 19, 2014

Matthew Frary
Los Angeles County Flood Control District
900 South Fremont Avenue
Alhambra, CA 91803

Subject: Santa Anita Stormwater Flood Management and Seismic Strengthening Project
SCH#: 2014101044

Dear Matthew Frary:

The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on November 18, 2014, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. 1

Sincerely,

Scott Morgan
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# **2014101044**
Project Title Santa Anita Stormwater Flood Management and Seismic Strengthening Project
Lead Agency Los Angeles County Flood Control District

Type **MND** Mitigated Negative Declaration

Description The Project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, including the Santa Anita Dam, the Santa Anita Headworks, the Wilderness Park Culvert Crossing, and the Santa Anita Debris Dam. The LACFCD facility improvements would: (1) reduce flood risk to downstream communities; (2) enhance sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre-feet per year; (3) improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing.

Lead Agency Contact

Name Matthew Frary
Agency Los Angeles County Flood Control District
Phone 626 458 6111 ***Fax***
email
Address 900 South Fremont Avenue
City Alhambra ***State*** CA ***Zip*** 91803

Project Location

County Los Angeles
City Arcadia, Monrovia
Region
Lat / Long 34° 10' 16.03" N / 118° 1' 21.96" W
Cross Streets Elkins Ave. and Lower Clamshell Truck Route
Parcel No. 5765-001-900
Township 1N ***Range*** 11W ***Section*** 15 ***Base***

Proximity to:

Highways I-210
Airports No
Railways No
Waterways Santa Anita Canyon Wash
Schools Highland Oaks ES
Land Use USFS - Back Country Motorized Use Restricted; Arcadia - Residential Mountainous; Monrovia-Hillside Wilderness Preserve

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Economics/Jobs; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Landuse; Cumulative Effects; Other Issues

Reviewing Agencies Resources Agency; Department of Conservation; Department of Fish and Wildlife, Region 5; Department of Parks and Recreation; Department of Water Resources; Caltrans, District 7; Air Resources Board; State Water Resources Control Board, Division of Water Quality; Regional Water Quality Control Board, Region 4; Department of Toxic Substances Control; Native American Heritage Commission

Date Received 10/17/2014 ***Start of Review*** 10/20/2014 ***End of Review*** 11/18/2014

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7-OFFICE OF TRANSPORTATION PLANNING
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
PHONE (213) 897-9140
FAX (213) 897-1337
www.dot.ca.gov

CLEAR
11-18-14
E

Serious drought.
Help save water!

RECEIVED
NOV 18 2014
STATE CLEARING HOUSE

November 18, 2014

Mr. Matthew Frary
Los Angeles County, Flood Control District
900 South Fremont Avenue
Alhambra, CA 91803

RE: Santa Anita Stormwater Flood Management
and Seismic Strengthening Project
Mitigated Negative Declaration
SCH#2014101044, IGR#141045FL
Vic. LA/ 210/ PM R31.9

Dear Mr. Frary:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed.

Caltrans acknowledge RR TRA-1 on page 4-112 that oversize-transport vehicles on State highways will require a Caltrans transportation permit. Also, we would like to remind you that any work to be performed within the State Right-of-way will need an Encroachment Permit. We recommend that large size truck trips be limited to off-peak commute periods. In addition, a truck/traffic construction management plan is needed for this project.

Storm water run-off is a sensitive issue for Los Angeles and Ventura counties. Please be mindful that projects need to be designed to discharge clean run-off water. Additionally storm water run-off is not permitted to discharge onto State highway facilities.

If you have any questions or concerns regarding these comments, please feel free to contact me at (213) 897 – 9140 or project coordinator Frances Lee at (213) 897-0673 or electronically at frances.lee@dot.ca.gov.

Sincerely,

DIANNA WATSON
Branch Chief, Community Planning & LD IGR Review

cc: Scott Morgan, State Clearinghouse

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

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2.2.3 STATE CLEARINGHOUSE AND PLANNING UNIT (SCH)

November 19, 2014

Response SCH-1

This comment letter acknowledges the receipt of MND and confirms that the LACFCD has complied with the SCH review requirements. The attached letter from the Department of Transportation- District 7 is addressed in Section 2.2.1 of this document.

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2.3 LOCAL AGENCIES

- County of Los Angeles, Fire Department (LACFD), November 14, 2014
- City of Arcadia, Public Works Services Department (Arcadia), December 3, 2014

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COUNTY OF LOS ANGELES
FIRE DEPARTMENT
1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

DARYL L. OSBY
FIRE CHIEF
FORESTER & FIRE WARDEN

November 14, 2014

Jemellee Cruz, Staff Member
Department of Public Works
Water Resources Division
P.O. Box 1460
Alhambra, CA 91802-1460

Dear Jemellee Cruz:

MITIGATED NEGATIVE DECLARATION, "SANTA ANITA STORMWATER FLOOD MANAGEMENT AND SEISMIC STRENGTHENING PROJECT," IT WOULD MODIFY EXISTING FLOOD MANAGEMENT AND WATER CONSERVATION FACILITIES ALONG THE SANTA ANITA CANYON WATERSHED, ANGELES NATIONAL FOREST, LOS ANGELES COUNTY (FFER #201400199)

The Mitigated Negative Declaration has been reviewed by the Planning Division, Land Development Unit, Forestry Division, and Health Hazardous Materials Division of the County of Los Angeles Fire Department. The following are their comments:

PLANNING DIVISION:

1. The subject property is not within the Los Angeles County Fire Department (also known as the Consolidated Fire Protection District of Los Angeles County) jurisdictional boundaries; therefore, this project does not appear to have any impact on the emergency responsibilities of this Department. } 1

SERVING THE UNINCORPORATED AREAS OF LOS ANGELES COUNTY AND THE CITIES OF:

AGOURA HILLS	CALABASAS	DIAMOND BAR	HIDDEN HILLS	LA MIRADA	MALIBU	POMONA	SIGNAL HILL
ARTESIA	CARSON	DUARTE	HUNTINGTON PARK	LA PUENTE	MAYWOOD	RANCHO PALOS VERDES	SOUTH EL MONTE
AZUSA	CERRITOS	EL MONTE	INDUSTRY	LAKEWOOD	NORWALK	ROLLING HILLS	SOUTH GATE
BALDWIN PARK	CLAREMONT	GARDENA	INGLEWOOD	LANCASTER	PALMDALE	ROLLING HILLS ESTATES	TEMPLE CITY
BELL	COMMERCE	GLENDORA	IRWINDALE	LAWNDALE	PALOS VERDES ESTATES	ROSEMEAD	WALNUT
BELL GARDENS	COVINA	HAWAIIAN GARDENS	LA CANADA FLINTRIDGE	LOMITA	PARAMOUNT	SAN DIMAS	WEST HOLLYWOOD
BELLFLOWER	CUDAHY	HAWTHORNE	LA HABRA	LYNWOOD	PICO RIVERA	SANTA CLARITA	WESTLAKE VILLAGE
BRADBURY							WHITTIER

Jemellee Cruz, Staff Member
November 14, 2014
Page 2

LAND DEVELOPMENT UNIT:

1. The Land Development Unit does not have any comments at this time for this project. If there are any questions regarding the Land Development Unit's response, please contact FPEA Wally Collins at (323) 890-4243 or wally.collins@fire.lacounty.gov. 2

FORESTRY DIVISION – OTHER ENVIRONMENTAL CONCERNS:

1. The statutory responsibilities of the County of Los Angeles Fire Department's Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and the County Oak Tree Ordinance. 3

HEALTH HAZARDOUS MATERIALS DIVISION:

1. The Health Hazardous Materials Division has no objection to the proposed project. 4

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

FRANK VIDALES, CHIEF, FORESTRY DIVISION
PREVENTION SERVICES BUREAU

FV:jl

2.3.1 COUNTY OF LOS ANGELES FIRE DEPARTMENT (LACFD)

November 14, 2014

Response LACFD-1

As stated on page 4-106 of the MND, fire protection for the Project area is currently provided by the City of Arcadia Fire Department and the U.S. Forest Service (USFS). The LACFD's concurrence with the MND is noted.

Response LACFD-2

The LACFD's concurrence with the MND is noted.

Response LACFD-3

As stated in the MND, compliance with RR HYD-1 and RR HYD-2 would prevent erosion and ensure that any discharge from the Project would not conflict with the applicable water quality standards or requirements. All potentially significant impacts related to biological resources, including oak trees, are adequately addressed through MMs BIO-1 through BIO-5, including revisions set forth in the Errata. Project implementation would not affect fuel modification, as the locations of the Project improvements would be within the same development area as the current facilities. As stated in the MND, compliance with RR CUL-1 and RR CUL-2 would prevent impacts to cultural resources.

Response LACFD-4

The LACFD's concurrence with the MND is noted.

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City of Arcadia

Public Works Services Department

Tom Tait
Public Works Services Director

December 3, 2014

Mr. Matthew Frary, P.E.
Los Angeles County Flood Control District
Water Resources Division
900 South Fremont Avenue
Alhambra, California 91803-1331

RE: Santa Anita Stormwater Flood Management and Seismic Strengthening Project

Dear Mr. Frary:

The City of Arcadia thanks you for the opportunity to comment on the Draft Initial Study and Mitigated Negative Declaration for the proposed Santa Anita Stormwater Flood Management and Seismic Strengthening Project (Project). The document has been circulated to all applicable City Departments for their comments. It is our understanding that the proposed project would modify three existing flood management and water conservation facilities along the Santa Anita Canyon Watershed which are operated and maintained by the Los Angeles County Flood Control District (LACFCD).These facilities include the Dam, the Headworks, and the Debris Dam, which serve to control and conserve the stormwaters of the Santa Anita Canyon Watershed.

The City agrees that the Project is both timely and necessary, and acknowledges that the construction of the Project has the potential to produce certain environmental challenges. The City agrees with the determination that these challenges can be properly mitigated as identified and detailed in the Draft Initial Study/Mitigated Negative Declaration and would therefore have less than a significant impact. However, the City would like the following comments to be considered in the final preparation of this document.

COMMENTS

Section 1.1.2 PROJECT COMPONENTS – Headworks

1. City requests the County review proposed alternative temporary access road alignments at the culvert crossing to avoid removing the two sycamore trees downstream of the crossing. } 1

2. It is the City's understanding that the sewer forced main and water main will need to be realigned both horizontally and vertically to accommodate the raising of the culvert crossing and that this work will be included as part of the Project. } 2

11800 Goldring Road
Post Office Box 60021
Arcadia, CA 91066-6021
(626) 256-6554
(626) 359-7028 Fax
www.ci.arcadia.ca.us

Santa Anita Stormwater Flood Management
and Seismic Strengthening Project
Page 2 of 2

Section 1.3.1 PROJECT DESIGN FEATURES

PDF-AES-1	City recommends using existing rocks stored at the Santa Anita SPS in order to reduce the need to import material through local streets.	3
PDF-TRA-1	City requests that the queuing of all trucks on residential streets be minimized to every extent possible	4
RR-NOI-1	The City of Arcadia Municipal Code (4261) limits the hours of work to the hours of 7:00 AM - 6:00 PM on weekdays and 8:00 AM - 5:00 PM on Saturdays (see also Section 3.2 PROJECT CONSTRUCTION)	5

1.3.3 MITIGATION MEASURES

MM-AES-1	Replacement of trees shall utilize 36" boxed trees	6
MM-BIO-1	The City requests that the Public Works Services Department be included in the protection and monitoring of oak trees in the Project area	7

Section 2.2.2 PROJECT BACKGROUND AND NEED

1. It should be noted that the Project will benefit the cities of Sierra Madre and Arcadia by providing increased groundwater recharge to the East Raymond Basin — 8

Section 3.2 PROJECT CONSTRUCTION – Dam, Headworks and Wilderness Park Culvert Crossing, and Debris Dam

1. The City strongly encourages that materials removed in the course of excavations and demolition should be recycled onsite to every extent practicable in order to reduce the number of truck trips required to export and import materials used in construction. This includes, but is not limited to, soil and backfill material, concrete, crushed miscellaneous base, boulders, and rip-rap. — 9

Thank you again for the opportunity to review and comment on this document. If you have any questions regarding the comments provided, please feel free to contact me at 626-305-1386.

Sincerely,

Tom Tait
Public Works Services Director

c: Jason Kruckeberg, Assistant City Manager/Development Services Director

2.3.2 CITY OF ARCADIA, PUBLIC WORKS SERVICES DEPARTMENT (ARCADIA)

December 3, 2014

Response Arcadia-1

As stated on pages 3-3 and 3-4 of the MND, the assembly of a temporary bypass crossing located north of the existing Culvert Crossing could require the removal of a sycamore tree located on the eastern shore of the Wash (north of the Culvert Crossing). In order to provide a conservative analysis for impacts to Biological Resources in the MND, the removal of this tree has been assumed and assessed, to account for the event that the temporary crossing is used.

The two sycamore trees located south of the crossing are also conservatively assessed in the MND as being removed to accommodate the new Culvert Crossing. Any changes to the alignment of the Culvert Crossing in order to avoid sycamore trees would require engineering considerations at the discretion of LACFCD. The LACFCD is committed to minimizing impacts to the sycamore trees and has therefore considered multiple alternatives, but has anticipated potential impacts of their removal in the MND to be conservative in the case that avoidance is not possible.

Response Arcadia-2

As stated on page 3-4 of the MND, in the Project Description, the existing water and sewer lines that run through the current Culvert Crossing would need to be relocated to the new height and alignment of the structure. Additionally, the fire hydrant, vault, water valve and standpipe would be demolished and relocated approximately 15 feet to the north in the case that the temporary bypass crossing is utilized. These improvements are included as a part of the proposed Project.

Response Arcadia-3

PDF AES-1 as currently written pertains only to work at the Dam for the purposes of aesthetics. The City's suggestion to use existing rocks from the Santa Anita Sediment Placement Site (SPS) to reduce the need for imported materials is in accordance with the LACFCD's intent to utilize materials from the SPS. As stated on page 3-7 of the MND, it is anticipated that approximately half of the 65,000 cubic yards of fill material used for the structural buttressing at the Debris Dam will be obtained from the adjacent Santa Anita SPS, thereby reducing the number of trucks needed for the import of fill material.

Response Arcadia-4

RR TRA-2 in the MND requires the implementation of temporary traffic control in accordance with the Standard Specifications for Public Works Construction (Greenbook). The Contractor shall provide temporary traffic control in accordance with the Greenbook during construction activities. PDF TRA-1, which requires that heavy-duty diesel trucks avoid school crosswalks at Highland Oaks Elementary School during peak drop-off hours between 8:00 AM to 9:00 AM and pick-up hours between 2:00 PM to 3:00 PM and also be scheduled to avoid peak hours and holidays, would also reduce queuing of trucks on residential streets.

Response Arcadia-5

The City's Noise Ordinance regarding nighttime construction (Arcadia Municipal Code, Article IV, Chapter 2, Part 6) was amended on May 6, 2014, which is after the commencement of the preparation of the MND. As such, the text referring to the City's noise standards refers to the

previous standards. RR NOI-1 and associated text has been revised accordingly (see **bold** and ~~strikeout~~ text) on pages 4-93, and 4-94 of the MND.

4261. PROHIBITED HOURS DEFINED.

The term "prohibited hours" as used in this Part shall mean any time after the hour of ~~7:00~~ **6:00** p.m. of any **week**day; **any time after the hour of 5:00 p.m. of any Saturday;** any time before the hour of ~~7:00~~ **8:00** a.m. of any ~~Sunday~~ **Saturday**; any time on any Sunday; and any time on any of the following holidays: ~~January 1~~ New Year's Day; ~~May 30~~ Memorial Day; ~~July 4;~~ **Independence Day;** Labor Day; ~~November 11~~ Veteran's Day; Thanksgiving Day; and ~~December 25~~ Christmas Day; provided that if in any calendar year any such holiday falls on a Sunday, the following Monday shall constitute the holiday.

RR NOI-1 In compliance with the County Code and consistent with the **more restrictive** City of Arcadia Municipal Code, Project construction activities at the ~~Dam,~~ Headworks, Wilderness Park Culvert Crossing, and Debris Dam that generate substantial noise, such as the operation of construction equipment and mechanical equipment, shall be limited to the hours of 7:00 AM to ~~7:00~~ **6:00** PM Monday through ~~Saturday~~ **Friday, and 8:00 AM to 5:00 PM on Saturday. Construction at the Dam shall be in compliance with the County Code, which prohibits construction noise between the hours of 7:00 PM and 7:00 AM on weekdays (including Saturday).**

Response Arcadia-6

MM AES-1 and associated text has been revised accordingly (see **bold** and ~~strikeout~~ text) on pages 4-9 of the MND.

MM AES-1 Any removal of sycamore trees located at the Wilderness Park Culvert Crossing shall be replaced at a minimum 1:1 ratio with a minimum box size of ~~24~~ **36** inches, within a 100-foot radius of their original location.

Response Arcadia-7

Per the City's request, in the Project's Mitigation Monitoring and Reporting Program included in Section 3 of this document, the City of Arcadia has been included as a "Monitoring Party" for overseeing the implementation of MM BIO-1, with shared responsibility for monitoring along with the LACFCD and CDFW.

Response Arcadia-8

The Project's benefits for groundwater recharge into the East Raymond Basin (that supplies the cities of Sierra Madre and Arcadia) is noted. The benefits of the Project are outlined in Section 1-1 of the MND, which includes a summary of groundwater supply benefits.

Response Arcadia-9

As stated on page 3-7 of the MND, removal of the existing outlet tower would result in 80 cubic yards of concrete export, but most of the concrete from the tower would be reused on site. As stated on page 4-113 of the MND, in order to minimize the export of waste, it is anticipated that most of the excavated material and demolished concrete would be reused/recycled on site as backfill at the Debris Dam. Additionally RR UTL-1 requires that construction activities are conducted in compliance with Chapter 20.87 (Construction and Demolition Debris Recycling

and Reuse) of the Los Angeles County Code, which requires at least 50 percent of all Collection and Demolition (C&D) debris, soil, rock, and gravel removed from the Project site to be recycled or reused unless a lower percentage is approved by the Los Angeles County Director of Public Works.

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SECTION 3.0 MITIGATION MONITORING AND REPORTING PROGRAM

Section 21081.6 of CEQA and Section 15097 of the CEQA Guidelines require a public agency to adopt a Mitigation Monitoring and Reporting Program (MMRP) for assessing and ensuring the implementation of required mitigation measures applied to proposed projects. Specific reporting and/or monitoring requirements that will be enforced during project implementation shall be adopted simultaneously with final Project approval by the responsible decision making body.

The MMRP for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project consists of Project Design Features (PDFs) that would be incorporated into the Project and would avoid or minimize environmental impacts, and Mitigation Measures (MMs) that are required to reduce or avoid significant environmental effects associated with Project implementation. The PDFs and MMs presented in the MMRP reflect any errata presented in Section 4.0 of this Final MND. The PDFs and MMs for the Project are listed in the first column in Table 3-1, with the applicable Project component in the second column; the timeframe for implementation in the third column; the agency or party with primary responsibility for implementation in the fourth column; and the agency or party with responsibility for monitoring compliance in the last column. Compliance monitoring of the MMRP would primarily be the responsibility of the Los Angeles County Flood Control District (LACFCD), as the Lead Agency under CEQA.

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TABLE 3-1
MITIGATION MONITORING AND REPORTING PROGRAM

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
Project Design Features – Independent commitments during the design phase that are not a part of the mitigation requirements necessary to reduce project impacts to less than significant levels				
PDF AES-1: The material used to re-armor the downstream canyon walls and the toe of the Dam will match the color of the existing armoring.	Santa Anita Dam	Prior to commencement of gunite application and repair.	LACFCD's Construction Manager/Contractor	LACFCD
PDF BIO-1: A Biological Monitor will be on site during vegetation clearing in Project Work Areas (e.g., limits of disturbance). The Biological Monitor will confirm that the limits of Project Work Areas and any Environmentally Sensitive Areas (e.g., nesting birds) are clearly marked. The Biological Monitor shall provide environmental awareness training to the Contractor; the training will include a discussion of native habitat types, special status species that may occur in the Project Work Areas, direction for what to do if a special status species is observed, and an overview of applicable permit conditions. Prior to construction, the Biological Monitor will conduct a pre-clearing sweep of the Project Work Area and will flush or move wildlife outside the Project Work Area to the extent practicable. The Biological Monitor shall send weekly monitoring reports to the LACFCD during vegetation clearing and shall notify LACFCD immediately if construction damages any active nests and/or if any Best Management Practices (BMPs) to protect biological resources require repair.	All Project Components	During construction activities	LACFCD's Construction Manager/Contractor	LACFCD
PDF GEO-1: The Project shall be designed and constructed in compliance with the Standard Specifications For Public Works Construction (Greenbook), Construction Specifications Institute, and DSOD guidelines for seismic stability to ensure the structural integrity of proposed site improvements against seismic shaking.	All Project Components	Prior to commencement of construction activities	LACFCD and LACFCD's Construction Manager/Contractor	LACFCD
PDF GEO-2: A detailed geotechnical investigation shall be conducted to assess potential geotechnical issues at the Debris Dam. This investigation shall conform with all applicable County requirements and other pertinent criteria, including DSOD and Greenbook standards. Specific issues to be evaluated in the Project geotechnical investigation shall include seismic-related ground rupture, ground acceleration, and liquefaction, as well as	Debris Dam	Prior to commencement of construction activities	LACFCD and LACFCD's Construction Manager/Contractor	LACFCD

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
expansive/corrosive soils; other types of soil/geologic instability (including subsidence, oversized materials and excavations); and any other issues deemed appropriate by the LACFCD and/or the Geotechnical Engineer. The geotechnical investigation shall be submitted to the LACFCD for review and approval prior to commencement of construction. All applicable requirements and recommendations identified in the approved geotechnical investigation shall be incorporated into the Project design and/or construction specifications as appropriate.				
PDF TRA-1: Heavy-duty diesel truck vehicle (with a Gross Vehicle Weight Rating of 10,000 lbs. or heavier) trips shall be scheduled to avoid school crosswalks at Highland Oaks Elementary School during peak drop-off hours between 8:00 AM to 9:00 AM and pick-up hours between 2:00 PM to 3:00 PM. Heavy-duty diesel truck vehicle trips will be scheduled to avoid peak hours and holidays. As required by State Commercial Vehicle Idling Regulations, trucks shall be prohibited from idling for more than 5 minutes if queuing within 100 feet from any residential area.	All Project Components	Ongoing throughout construction activities	LACFCD's Construction Manager/Contractor	LACFCD
Mitigation Measures				
MM AES-1: Any removal of sycamore trees located at the Wilderness Park Culvert Crossing shall be replaced at a minimum 1:1 ratio with a minimum box size of 36 inches, within a 100-foot radius of their original location.	Wilderness Park Culvert Crossing	Within 6 months of the completion of the Culvert Crossing.	LACFCD's Construction Manager/Contractor	LACFCD
MM BIO-1: **A.** Replacement shall occur for the western sycamores (Tree Numbers 220-222) that are removed by construction of the Wilderness Park Culvert Crossing. At a minimum, impacted sycamore trees at the Culvert Crossing shall be replaced at no less than a 1:1 ratio, and the minimum box size of replacement trees shall be 24 inches. The replacement trees shall be incorporated into the Riparian Habitat Mitigation and Monitoring Plan (HMMP), as set forth in MM BIO-5, or a separate Tree HMMP shall be prepared and shall contain the same required components. **B.** The oak tree adjacent to the Wilderness Park Culvert	All Project Components	Prior to the initiation of construction activities	LACFCD's Construction Manager/Contractor	LACFCD, City of Arcadia, and CDFW

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
Crossing (Tree Number 219) shall not be removed. This tree shall be protected as described in subsection "C" below. However, the protective fencing for this tree shall be placed at the edge of the canopy to allow for construction to occur immediately outside its canopy. When initial vegetation removal/ground disturbance is occurring within 1.5 times the dripline/root protection zone, the work shall be monitored by a Certified Arborist who shall oversee any removal/cutting of roots necessary and shall determine if trimming of the canopy is necessary to protect the health of the tree. The Certified Arborist shall monitor the health of this tree a minimum of once per month during construction of the Wilderness Park Culvert Crossing and once per month for a period of six-months following completion of construction. Photographs shall be taken monthly to compare the overall vigor of the tree over time. The tree shall be considered "impacted" if its health rating declines two or more rating levels as referenced in the Biological Technical Report (Appendix B, see Tree Survey Report). If this occurs, in coordination with CDFW and the City of Arcadia, the tree shall be mitigated at no less than a 1:1 ratio, and the minimum box size of replacement trees shall be 24 inches. If Tree Number 220 is also preserved, protection shall follow the same requirements that are specified herein for Tree Number 219. **C.** To protect native trees adjacent to Project Work Areas, the following shall be implemented within each Project Work Area: • Brightly-colored construction fencing shall be placed around all native trees to be preserved that are located within 50 feet of Project Work Areas. The fencing shall be placed at 1.5 times the dripline/root protection zone (defined as the outer canopy edge, at least 15 feet from the trunk). These areas shall be labeled as "Tree Protection Areas" and shall be regarded as Environmentally Sensitive Areas on construction plans. If an existing access road is within the Tree Protection Area, the Tree Protection Area may be adjusted to allow for access along the existing roadway. • Stockpiling of materials or vehicle operation shall be prohibited within the Tree Protection Areas. If a Tree				

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
Protection Area has been adjusted to allow for an existing access road, no stockpiles or materials shall be allowed within 1.5 times the dripline/root protection zone of the native tree. • Limbs of native trees can be pruned if necessary to allow construction equipment access. Small branches (less than three inches diameter) can be trimmed without the supervision of a Certified Arborist if less than ten percent of the total canopy is removed. If larger branches need to be removed or if more than ten percent of the total canopy would be affected, these activities shall be supervised by a Certified Arborist. • Changes to the grade or drainage patterns in the areas surrounding a Tree Protection Area shall be avoided so that excess water does not drain to native trees, unless otherwise approved by a Certified Arborist. • Any activities (e.g., vehicle operation) occurring within a Tree Protection Area shall be coordinated with a Certified Arborist to ensure that activities would not affect the health of the tree(s). If construction would damage or remove any trees, the Certified Arborist shall contact the appropriate jurisdiction(s) to determine mitigation and permitting requirements before the tree is impacted. • An on-site pre-construction field meeting shall be held to inform all construction personnel of tree restrictions prior the initiation of work. **D.** A subset of the 20 native trees located within the increased inundation area shall be monitored for health over the course of 5 years following completion of the Debris Dam construction. A Certified Arborist shall monitor these trees annually each spring following the rainy season for a period of 5 years for signs of any potential negative health effects from flooding (e.g., yellowing leaves, lack of new growth, trunk decay, etc.) using the same health rating scale described to evaluate baseline conditions. Monitoring will distinguish if any changes in health may be from other outside factors. Each monitoring event shall measure and track the dbh of the trees				

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
to determine growth patterns, and other trees outside of the future inundation areas shall also be measured to compare growth rates. Photographs shall be taken annually to compare the overall vigor of each tree's crown over time. Monitoring events shall assess whether a tree has been "affected" by determining if a tree's health rating declines two or more rating levels. Any affected trees shall be monitored for a two year period, which may be in addition to the original 5 year monitoring period, to determine if their health condition subsequently improves. If an affected tree shows improvement in the health rating during this two year period, it shall be considered a "recovered" tree and would not require mitigation. If an affected tree's health condition does not improve during this 2-year period, then the tree would be considered "impacted" and would require mitigation. If this occurs, in coordination with CDFW, the tree shall be mitigated at no less than a 1:1 ratio. The replacement trees shall be incorporated into the Riparian HMMP, as set forth in MM BIO-5, or a separate Tree HMMP shall be prepared and shall contain the same required components.				
MM BIO-2: At least 7 days prior to the initiation of the lowering of the water surface at the Dam and Headworks (and Debris Dam if ponded water is present at the time of construction), a five-day/four-night pre-construction trapping for the Pacific pond turtle shall be conducted by a qualified Biologist. Concurrently with the trapping effort, the Biologist shall also visually search for and capture two-striped garter snakes and any other special status species in the Project Work Areas. If any Pacific pond turtles, two-striped garter snakes, or other special status species are captured, they shall be relocated to a suitable site along Santa Anita Wash outside of the construction area. Prior to relocating any of these species, the USFS and the CDFW shall approve the potential relocation site(s) and methods for transferring the turtles/snakes to the relocation sites. Any non-native animal species encountered during pre-construction surveys shall be permanently removed from the reservoir. Additionally, a qualified Biologist shall be present during the latter stages of dewatering of the reservoir to ensure that no Pacific pond turtles, two-striped garter snakes, or other special status species are stranded. If any of these species are observed during monitoring, they shall be captured by a qualified Biologist (i.e., one with the necessary approvals to handle these species) and released at the	Dam, Headworks, and Debris Dam	Prior to the initiation of dewatering and construction activities at the Dam and Headworks	LACFCD's Construction Manager/Contractor	LACFCD, USFS, CDFW

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
approved relocation site. Any non-native animal species encountered during dewatering of the reservoir shall be permanently removed from the reservoir. A Letter Report shall be prepared to document the results of the pre-construction surveys and monitoring; the Report shall be provided to the USFS and the CDFW within 30 days of conclusion of the survey effort.				
MM BIO-3: The Project shall be conducted in compliance with the conditions set forth in the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code with methods approved by USFWS and CDFW to protect active bird/raptor nests. The nature of the Project requires that work would be initiated during the breeding season for nesting birds and raptors (February 1 to August 31). The LACFCD, in consultation with a qualified Biologist, may employ bird exclusionary measures (e.g., mylar flagging) prior to the start of bird breeding season to minimize opportunities for birds to nest within established boundaries of the Project. In order to avoid direct impacts on active nests, a pre-construction survey for nesting birds and raptors shall be conducted by a qualified Biologist (i.e. one with experience conducting nesting bird surveys) within 3 days prior to clearing of any vegetation or any work near existing structures (i.e., within 50 feet for nesting birds, within 300 feet for nesting special status birds, and within 500 feet for nesting raptors). If the Biologist does not find any active nests within or immediately adjacent to the impact area, the vegetation clearing/construction work shall be allowed to proceed. A letter report shall be prepared and submitted to LACFCD to document the survey findings and recommended protective measures. If the Biologist finds an active nest within or immediately adjacent to the construction area and determines that the nest may be impacted or breeding activities substantially disrupted, the Biologist shall delineate an appropriate buffer zone (at a minimum of 25 feet for common birds, 300 feet for special status birds, and 500 feet for nesting raptors) around the nest depending on the sensitivity of the species and the nature of the construction activity. If the Biologist determines that a narrower buffer area is warranted, he/she shall submit a written explanation as to why (e.g., species-specific information, ambient conditions and birds' habituation to them, and the terrain, vegetation, and birds' line of sight between the Project and the nest/foraging areas) to the LACFCD Project Manager, and upon request to CDFW. Based on the submitted information, the LACFCD Project Manager shall determine whether to allow a	All Project Components	During the breeding season for nesting birds (March 15–September 15) and nesting raptors (February 1–June 30), surveys shall occur within 7 days prior to clearing of any vegetation or any work near existing structures (i.e., within 50 feet for nesting birds and within 500 feet for nesting raptors)	LACFCD's Construction Manager/Contractor	LACFCD, CDFW

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
narrower buffer. A letter report or memorandum shall be prepared by the Biologist to document the protective measures and to document compliance with applicable federal and State laws pertaining to the protection of nesting birds. Any nest found during survey efforts shall be mapped on the construction plans. The active nest shall be protected until nesting activity has ended. To protect any nest site, the following restrictions to construction activities shall be required until nests are no longer active, as determined by a qualified Biologist: (1) clearing limits shall be established within a buffer around any occupied nest (the buffer shall be 25–100 feet for nesting birds, and 300 feet for special status birds, and 500 feet for nesting raptors), unless otherwise determined by a qualified Biologist and (2) access and surveying shall be restricted within the buffer of any occupied nest, unless otherwise determined by a qualified Biologist. Encroachment into the buffer area around a known nest shall only be allowed if the Biologist determines that the proposed activity would not disturb the nest occupants. Flagging, stakes, and/or construction fencing shall be used to demarcate the buffer around the nest and construction personnel shall be instructed as to the sensitivity of the area. Construction can proceed when the qualified Biologist has determined that fledglings have left the nest or the nest has failed.				
MM BIO-4: Water shall be lowered or re-routed around Project Work Areas at least one month prior to construction to deter bats from roosting in the vicinity of the Work Areas. A pre-construction roosting bat survey (including both day and evening efforts) shall be conducted by a qualified Biologist prior to installation of exclusionary measures to ensure that no active day-roosts would be impacted. The day survey will involve inspecting the structures for sign of bat roosting. The evening survey will involve monitoring each potential roost site for evening emergence, conducting exit counts, and acoustic monitoring (from a half an hour before sunset to at least three hours after sunset) near potential roosts locations. If active bat day-roosts, maternity-roosts, or hibernating-roosts occur within the Project Work Area, bat exclusion devices shall be installed under the supervision of a qualified biologist between October 1 and November 30 (when the chance of impacting juveniles and individuals in hibernation is the lowest) within the 12-month period prior to the start of construction. Exclusion shall be done selectively, and only to the extent necessary	All Project Components	Prior to habitat removal during bat hibernation (generally December through February) or the bat maternity season (April through August)	LACFCD's Construction Manager/Contractor	LACFCD, CDFW

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
to prevent bat injury and mortality. If active bat roosts occur within structures proposed for removal/repair (including gunite repair on hill slopes), or within an area that would be indirectly impacted by Project activities, then exclusionary measures, such as barriers with one-way doors or other exclusion (e.g., caulking or wire mesh), shall be installed under the supervision of a qualified Biologist. Bat exclusion devices shall be inspected weekly by a qualified bat Biologist from March 1 through May 31 and monthly thereafter; any deficiencies shall be corrected or devices shall be modified to function appropriately. The Biologist shall prepare monthly reports to summarize the inspections and to report on the effectiveness of the exclusionary measures; the reports shall be submitted to LACFCD's Project Manager. If roosting bats are noted within any of the Project Work Areas during the breeding season, LACFCD shall contact CDFW to determine whether construction should proceed in that area. Temporary exclusionary measures shall be removed at the completion of construction. If active bat day-roosts occur within trees proposed for removal, then either tree removal shall be conducted between October 1 and November 30 (to avoid the bat maternity and the bat hibernation season), or the tree removal will occur under the supervision of a qualified Biologist and will utilize phased tree trimming. If avoidance of bat hibernation and bat maternity season is not feasible, then exclusionary measures, such as netting or phased tree trimming, shall be implemented after the evening roost emergence under the supervision of a qualified Biologist. Once bats have been excluded from the trees to be removed, then tree removal can proceed.				
MM BIO-5: Prior to initiation of Project activities, the Los Angeles County Flood Control District (LACFCD) shall obtain all necessary permits for impacts to U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CDFW jurisdictional areas. Mitigation for the loss of jurisdictional resources shall be negotiated with the resource agencies during the regulatory permitting process. Potential mitigation options shall include one or more of the following: (1) payment to a mitigation bank or regional riparian enhancement program (e.g., invasive plant or wildlife species removal) and/or (2) restoration of riparian habitat either on site or off site at a ratio of no less than 1:1, determined through consultation with the above-listed resource agencies. If in-lieu	All Project Components	Prior to the initiation of construction activities	LACFCD	LACFCD, USACE, CDFW, RWQCB

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
mitigation fees are required, prior to the initiation of any construction-related activities, the LACFCD shall pay the in-lieu mitigation fee to a mitigation bank/enhancement program for the in-kind (equivalent vegetation type and acreage) replacement of impacted jurisdictional resources. If a Restoration Program is required, prior to the initiation of any construction-related activities, LACFCD shall prepare and submit a Riparian Habitat Mitigation and Monitoring Program (HMMP) for USACE and CDFW approval. If a Riparian HMMP is required, it shall contain the following items: **I.** Responsibilities and qualifications of the personnel to implement and supervise the plan. The responsibilities of the Landowner, Specialists, and Maintenance Personnel that would supervise and implement the plan shall be specified. **J.** Site selection. The mitigation site shall be determined in coordination with the USACE, CDFW, and RWQCB. The site shall either be located in a dedicated open space area on County land, USFS land, or off-site land shall be purchased. **K.** Seed source. Seeds (or plantings) used shall be from local sources (within ten miles of the Project area) to ensure genetic integrity. **L.** Site preparation and planting implementation. Site preparation shall include (1) protection of existing native species; (2) trash and weed removal; (3) native species salvage and reuse (i.e., duff); (4) soil treatments (i.e., imprinting, decompacting); (5) temporary irrigation installation; (6) erosion-control measures (i.e., rice or willow wattles); (7) seed mix application; and (8) container species planting. **M.** Schedule. A schedule shall be developed which includes planting in late fall and early winter, between October 1 and January 30. **N.** Maintenance Plan/Guidelines. The Maintenance Plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement planting. **O.** Monitoring plan. The Monitoring Plan shall include (1) qualitative monitoring (i.e., photographs and general				

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
observations); (2) quantitative monitoring (i.e., randomly placed transects); (3) performance criteria, as approved by the above-listed resource agencies; (4) monthly reports for the first year and reports quarterly thereafter; and (5) annual reports for five years, which shall be submitted to the resource agencies on an annual basis. The site shall be monitored and maintained for five years to ensure successful establishment of riparian habitat within the restored and created areas. **P.** Long-term preservation. Long-term preservation of the site shall also be outlined in the conceptual Mitigation Plan to ensure the mitigation site is not impacted by future development. Any areas of native riparian vegetation that would be temporarily disturbed by the Project's construction activities shall be maintained free of non-native vegetation for a period of five years or until native riparian species have become reestablished in the impact area. Removal of non-native vegetation shall occur at least one time per year over the five-year period in order to facilitate the establishment of native species.				
MM HAZ-1: Prior to commencement of any construction activities, the LACFCD shall require that the Contractor prepare a Site-Specific Health and Safety Plan for review and approval. The Plan shall be implemented throughout the construction activities. The Site-Specific Health and Safety Plan shall be prepared in accordance with the Occupational Safety and Health Administration's (OSHA's) Safety and Health Regulations for Construction (29 Code of Federal Regulations 1926) and shall include a Site Health and Safety Officer; an Access and Evacuation Plan; identification of site hazards; and response protocols in the event of an earthquake or landslide.	All Project Components	Prior to the initiation of construction activities	LACFCD's Construction Manager/Contractor	LACFCD
MM HAZ-2: Prior to commencement of any construction activities, a Fire Protection Plan shall be prepared that includes emergency reporting procedures; emergency notification, evacuation, and/or relocation of all persons on site; procedures for "hot work" operations; management of hazardous materials and removal of combustible debris; maintenance of emergency access roads; identification of exit routes and assembly areas; and identification of fire apparatus. The Fire Protection Plan shall be distributed to involved parties at least two weeks prior to commencement of any	All Project Components	Prior to the initiation of construction activities	LACFCD's Construction Manager/Contractor	LACFCD, USFS, and City of Arcadia

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
construction activities.				
MM NOI-1: Even though measures set forth in this mitigation are not required to reduce noise to less than significant levels at either the Culvert Crossing or the Debris Dam, these measures will be implemented at these construction sites to further reduce noise impacts. • The construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. • The construction contractors shall place all stationary construction equipment so that the equipment is as far as feasible from the noise-sensitive receptors and so that emitted noise is directed away from the noise-sensitive receptors. • The construction contractors shall locate equipment staging in areas that will create the greatest distance between staging area noise sources and noise-sensitive receptors during all Project construction. • The construction contractors shall limit haul truck deliveries to the same hours specified for operation of construction equipment.	Culvert Crossing and the Debris Dam	Prior to the initiation of construction activities and during construction activities	LACFCD's Construction Manager/Contractor	LACFCD
MM NOI-2: Even though measures set forth in this mitigation are not required to reduce noise to less than significant levels at either the Culvert Crossing or the Debris Dam, these measures will be implemented at these construction sites to further reduce noise impacts. At least two weeks before, but not more than one month prior to the start of noise-generating construction activities, notification shall be mailed to owners and occupants of all developed land uses within 300 feet of the Culvert Crossing and Debris Dam providing a schedule for major construction activities that will occur through the duration of the construction period. The notification shall include the identification and contact number for a designated Construction Manager that would be available on site to monitor construction activities. Contact information for the Construction Manager shall also be located at the Arcadia City Hall and the Arcadia Police Department.	Culvert Crossing and the Debris Dam	Prior to the initiation of construction activities and during construction activities	LACFCD's Construction Manager/Contractor	LACFCD

Project Design Features and Mitigation Measures	Applicable Project Component	Timing	Implementing Party	Monitoring Party
Complaints may be made during construction hours and a response shall be made within one work day. The Construction Manager shall document all complaints and resolutions and shall provide copies to the LACFCD within three working days of the complaint. The Construction Manager, upon observation of excessive noise occurring near adjacent homes or upon receipt of a complaint about excessive noise shall do the following: • Ensure that construction equipment is properly muffled according to industry standards, and • Modify operations to reduce the number of pieces of equipment operating near noise sensitive receptors or operating concurrently, unless the modification would prevent completion of the task, or • Implement corrective or additional noise-attenuation measures considered appropriate to address the complaint, which may include, but are not limited to, noise barriers or noise blankets.				
MM NOI-3: Prior to the start of grading or similar heavy equipment operation on the downstream side of the Debris Dam, the County shall erect a temporary noise barrier between the structural buttressing work area and the residences to the southwest. The barrier shall be located along the southwest edge of the site access road, but the horizontal location may be adjusted as necessitated by geographical or topographical constraints or to avoid trees. The barrier shall be 16 feet high and solid from the ground to the top. The barrier shall be plywood of at least 0.75-inch thickness or other material with a noise transmission loss of 22 dBA or more. When equipment is working on the downstream site of the Debris Dam within 50 feet of residences, only one piece of equipment shall be at full power at any time; other equipment shall be shut down or at low idle.	Debris Dam	Prior to the initiation of construction activities	LACFCD's Construction Manager/Contractor	LACFCD
MM NOI-4: Large bulldozers and large loaded trucks shall not be operated on the Project site within 140 feet of an occupied residence. Consistent with the County Code, this restriction does not apply to trucks on a public right-of-way.	All Project Components	During construction activities	LACFCD's Construction Manager/Contractor	LACFCD

SECTION 4.0 ERRATA

The following text changes are made to the Initial Study and incorporated as part of the Final IS/MND. These changes further substantiate conclusions and/or clarify aspects of the previously circulated document. None of these changes reflect a determination of a new or more significant environmental impact than disclosed in the Draft IS/MND. Pursuant to Section 15073.5 of the CEQA Guidelines, no changes are included in this Errata that would constitute a "substantial revision" to the Draft IS/MND or otherwise require recirculation of the Draft IS/MND. Additionally, pursuant to Section 15074.1 of the CEQA Guidelines, the revisions to mitigation measures set forth below do not constitute deletions or substitutions of mitigation measures that would require a public hearing. Changes to the text are noted with **bold** (for added text) or ~~strikeout~~ type (for deleted text).

MM AES-1 on pages 4-9 of the MND has been revised as follows:

> MM AES-1 Any removal of sycamore trees located at the Wilderness Park Culvert Crossing shall be replaced at a minimum 1:1 ratio with a minimum box size of ~~24~~ **36** inches, within a 100-foot radius of their original location.

PDF BIO-1 on pages 1-5 and 4-39 of the MND has been revised as follows.

> **PDF BIO-1:** A Biological Monitor will be on site during vegetation clearing in Project Work Areas (e.g., limits of disturbance). The Biological Monitor will confirm that the limits of Project Work Areas **and any Environmentally Sensitive Areas (e.g., nesting birds)** are clearly marked. The Biological Monitor shall provide environmental awareness training to the Contractor; the training will include a discussion of native habitat types, special status species that may occur in the Project Work Areas, direction for what to do if a special status species is observed, and an overview of applicable permit conditions. Prior to construction, the Biological Monitor will conduct a pre-clearing sweep of the Project Work Area and will flush or move wildlife outside the Project Work Area to the extent practicable. **The Biological Monitor shall send weekly monitoring reports to the LACFCD during vegetation clearing and shall notify LACFCD immediately if construction damages any active nests and/or if any Best Management Practices (BMPs) to protect biological resources require repair.**

The first paragraph of MM BIO-2 on pages 1-13 and 4-53 of the MND has been revised as follows.

> **MM BIO-2** At least 7 days prior to the initiation of ~~dewatering/**construction**~~ **the lowering of the water surface** at the Dam and Headworks (and Debris Dam if ponded water is present at the time of construction), a five-day/four-night pre-construction trapping for the Pacific pond turtle shall be conducted by a qualified Biologist. Concurrently with the trapping effort, the Biologist shall also visually search for and capture two-striped garter snakes and any other special status species in the Project Work Areas. If any Pacific pond turtles, two-striped garter snakes, or other special status species are captured, they shall be relocated to a suitable site along Santa Anita Wash outside of the construction area. Prior to relocating any of these species, the USFS and the CDFW shall approve the potential relocation site(s) and methods for transferring the turtles/snakes to the relocation sites. Any non-native animal species encountered during pre-construction surveys shall be permanently removed from the reservoir.

MM BIO-3 on pages 1-14 to 1-15 and 4-54 to 4-55 of the MND has been revised as follows.

MM BIO-3: The Project shall be conducted in compliance with the conditions set forth in the Migratory Bird Treaty Act (MBTA) and *California Fish and Game Code* with methods approved by USFWS and CDFW to protect active bird/raptor nests. The nature of the Project requires that work would be initiated during the breeding season for nesting birds ~~(March 15–September 15)~~ and ~~nesting~~ raptors (February 1~~–June 30~~**August 31**). The LACFCD, in consultation with a qualified Biologist, may employ bird exclusionary measures (e.g., mylar flagging) prior to the start of bird breeding season to minimize opportunities for birds to nest within established boundaries of the Project. In order to avoid direct impacts on active nests, a pre-construction survey **for nesting birds and raptors** shall be conducted by a qualified Biologist **(i.e. one with experience conducting nesting bird surveys)** ~~for nesting birds and/or raptors~~ within 3 days prior to clearing of any vegetation or any work near existing structures (i.e., within 50 feet for nesting birds**, within 300 feet for nesting special status birds,** and within 500 feet for nesting raptors). If the Biologist does not find any active nests within or immediately adjacent to the impact area, the vegetation clearing/construction work shall be allowed to proceed. **A letter report shall be prepared and submitted to LACFCD to document the survey findings and recommended protective measures.**

If the Biologist finds an active nest within or immediately adjacent to the construction area and determines that the nest may be impacted or breeding activities substantially disrupted, the Biologist shall delineate an appropriate buffer zone (at a minimum of 25 feet **for common birds, 300 feet for special status birds, and 500 feet for nesting raptors**) around the nest depending on the sensitivity of the species and the nature of the construction activity. **If the Biologist determines that a narrower buffer area is warranted, he/she shall submit a written explanation as to why (e.g., species-specific information, ambient conditions and birds' habituation to them, and the terrain, vegetation, and birds' line of sight between the Project and the nest/foraging areas) to the LACFCD Project Manager, and upon request to CDFW. Based on the submitted information, the LACFCD Project Manager shall determine whether to allow a narrower buffer. A letter report or memorandum shall be prepared by the Biologist to document the protective measures and to document compliance with applicable federal and State laws pertaining to the protection of nesting birds.**

Any nest found during survey efforts shall be mapped on the construction plans. The active nest shall be protected until nesting activity has ended. To protect any nest site, the following restrictions to construction activities shall be required until nests are no longer active, as determined by a qualified Biologist: (1) clearing limits shall be established within a buffer around any occupied nest (the buffer shall be 25–100 feet for nesting birds**,** ~~and~~ 300 **feet for special status birds, and** 500 feet for nesting raptors), unless otherwise determined by a qualified Biologist and (2) access and surveying shall be restricted within the buffer of any occupied nest, unless otherwise determined by a qualified Biologist. Encroachment into the buffer area around a known nest shall only be allowed if the Biologist determines that the proposed activity would not disturb the nest occupants. **Flagging, stakes, and/or construction fencing shall be used to demarcate the buffer around the nest and construction personnel shall be instructed as to the sensitivity of the area.** Construction can proceed when the qualified Biologist has determined that fledglings have left the nest or the nest has failed.

MM BIO-4 has been revised on pages 1-16 and 4-55 of the MND as follows:

> **MM BIO-4:** Water shall be ~~drained~~ **lowered** or re-routed around Project Work Areas at least one month prior to construction to deter bats from roosting in the vicinity of the Work Areas.
>
> ~~If exclusionary measures have not already been installed on all potential roost structures within the Project Work Area, a~~ **A** pre-construction ~~follow-up~~ roosting bat survey (including both day and evening efforts) shall be conducted by a qualified Biologist ~~within two weeks~~ prior to **installation of exclusionary measures** ~~the initiation of construction~~ to ensure that no active day-roosts would be impacted. The day survey will involve inspecting the structures for sign of bat roosting. The evening survey will involve monitoring each potential roost site for evening emergence, conducting exit counts, and acoustic monitoring (from a half an hour before sunset to at least ~~one~~ **three** hour**s** after sunset) near potential roost~~s~~ **locations**. If active bat day-roosts**, maternity-roosts, or hibernating-roosts** occur within the Project Work Area, bat exclusion devices shall be installed under the supervision of a qualified biologist **between October 1 and November 30 (when the chance of impacting juveniles and individuals in hibernation is the lowest) within the 12-month period** prior to the start of construction. **Exclusion shall be done selectively, and only to the extent necessary to prevent bat injury and mortality.**
>
> If active bat ~~day-~~roosts occur within structures proposed for removal/repair (including gunite repair on hill slopes), **or within an area that would be indirectly impacted by Project activities,** then exclusionary measures, such as barriers with one-way doors or ~~permanent~~ **other** exclusion (e.g., caulking or wire mesh), shall be installed under the supervision of a qualified Biologist. **Bat exclusion devices shall be inspected weekly by a qualified bat Biologist from March 1 through May 31 and monthly thereafter; any deficiencies shall be corrected or devices shall be modified to function appropriately. The Biologist shall prepare monthly reports to summarize the inspections and to report on the effectiveness of the exclusionary measures; the reports shall be submitted to LACFCD's Project Manager. If roosting bats are noted within any of the Project Work Areas during the breeding season, LACFCD shall contact CDFW to determine whether construction should proceed in that area. Temporary exclusionary measures shall be removed at the completion of construction.**
>
> If active bat day-roosts occur within trees proposed for removal, then either tree removal shall be conducted between ~~September~~ **October 1** and November **30** (to avoid the bat maternity and the bat hibernation season), or the tree removal will occur under the supervision of a qualified Biologist and will utilize phased tree trimming. If avoidance of bat hibernation and bat maternity season is not feasible, then exclusionary measures, such as netting or phased tree trimming, shall be implemented after the evening roost emergence under the supervision of a qualified Biologist. Once bats have been excluded from the trees to be removed, then tree removal can proceed.

The following has been added to MM BIO-5 on pages 1-19 and 4-56 of the MND:

> **MM BIO-5:** Prior to initiation of Project activities, the Los Angeles County Flood Control District (LACFCD) shall obtain all necessary permits for impacts to U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CDFW jurisdictional areas. Mitigation for the loss of jurisdictional resources shall be negotiated with the resource agencies during the regulatory permitting process. Potential mitigation

options shall include one or more of the following: (1) payment to a mitigation bank or regional riparian enhancement program (e.g., invasive plant or wildlife species removal) and/or (2) restoration of riparian habitat either on site or off site at a ratio of no less than 1:1, determined through consultation with the above-listed resource agencies. If in-lieu mitigation fees are required, prior to the initiation of any construction-related activities, the LACFCD shall pay the in-lieu mitigation fee to a mitigation bank/enhancement program for the in-kind (equivalent vegetation type and acreage) replacement of impacted jurisdictional resources. If a Restoration Program is required, prior to the initiation of any construction-related activities, LACFCD shall prepare and submit a Riparian Habitat Mitigation and Monitoring Program (HMMP) for USACE and CDFW approval. If a Riparian HMMP is required, it shall contain the following items:

Q. Responsibilities and qualifications of the personnel to implement and supervise the plan. The responsibilities of the Landowner, Specialists, and Maintenance Personnel that would supervise and implement the plan shall be specified.

R. Site selection. The mitigation site shall be determined in coordination with the USACE, CDFW, and RWQCB. The site shall either be located in a dedicated open space area on County land, USFS land, or off-site land shall be purchased.

S. Seed source. Seeds (or plantings) used shall be from local sources (within ten miles of the Project area) to ensure genetic integrity.

T. Site preparation and planting implementation. Site preparation shall include (1) protection of existing native species; (2) trash and weed removal; (3) native species salvage and reuse (i.e., duff); (4) soil treatments (i.e., imprinting, decompacting); (5) temporary irrigation installation; (6) erosion-control measures (i.e., rice or willow wattles); (7) seed mix application; and (8) container species planting.

U. Schedule. A schedule shall be developed which includes planting in late fall and early winter, between October 1 and January 30.

V. Maintenance Plan/Guidelines. The Maintenance Plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement planting.

W. Monitoring plan. The Monitoring Plan shall include (1) qualitative monitoring (i.e., photographs and general observations); (2) quantitative monitoring (i.e., randomly placed transects); (3) performance criteria, as approved by the above-listed resource agencies; (4) monthly reports for the first year and reports quarterly thereafter; and (5) annual reports for five years, which shall be submitted to the resource agencies on an annual basis. The site shall be monitored and maintained for five years to ensure successful establishment of riparian habitat within the restored and created areas.

X. Long-term preservation. Long-term preservation of the site shall also be outlined in the conceptual Mitigation Plan to ensure the mitigation site is not impacted by future development.

Any areas of native riparian vegetation that would be temporarily disturbed by the Project's construction activities shall be maintained free of non-native vegetation for a period of five years or until native riparian species have become reestablished in the impact area. Removal of non-native vegetation shall occur at least one time per year over the five-year period in order to facilitate the establishment of native species.

The following text has been revised on page 4-42 of the MND to clarify this finding:

> Townsend's big-eared bat typically roosts in caves **or similar structures that are subject to minimal human disturbance. No caves or cave-like structures that would be subject to minimal human disturbance were observed in Project Work Areas;** ~~and is~~ therefore**, Townsend's big-eared bat is** not expected to roost in the Dam or other structures **in Project Work Areas**. **While suitable roosting habitat is likely present within the surrounding areas of Santa Anita Canyon where the canyon walls and rocky outcroppings provide cave-like features,** ~~Additionally,~~ no caves **or cave-like structures** were observed immediately adjacent to Project Work Areas during the roosting bat survey**.** ~~and the~~ **Based on the lack of suitable roosting habitat on the Dam and the timing of the first recorded call (i.e., more than one hour after sunset),** ~~acoustical surveys indicated that~~ the Townsend's big-eared bat **that was** observed ~~foraging~~ at the Dam likely roosted ~~some distance from~~ **outside of** the Project Work Area**, somewhere within the surrounding forest,** ~~based on the timing of the first recorded call after dusk~~ **and traveled to Dam to forage**. Therefore, the Project is not expected to impact roosting Townsend's big-eared bat.

Page 4-43 of the MND has been revised as follows:

> As shown in Table 4-8 and mapped on Exhibit 4-3, the total combined loss of ~~0.57~~**0.61** acre of southern cottonwood willow riparian forest, sycamore alluvial woodland/southern riparian forest, and coast live oak woodland would remove potential roosting habitat for bat species that roost in trees (i.e., silver-haired bat, western red bat, and hoary bat); bat species that roost on cliffs and rocky outcroppings could be affected by repair of gunite adjacent to the Dam and/or construction on structures at the Dam and Headworks (i.e., pallid bat, ~~Townsend's big-eared bat,~~ fringed myotis, western mastiff bat, pocketed free-tailed bat, and big free-tailed bat).

Page 4-93 and 4-94 of the MND has been revised as follows:

4261. PROHIBITED HOURS DEFINED.

The term "prohibited hours" as used in this Part shall mean any time after the hour of ~~7:00~~ **6:00** p.m. of any **week**day; **any time after the hour of 5:00 p.m. of any Saturday;** any time before the hour of ~~7:00~~ **8:00** a.m. of any ~~Sunday~~ **Saturday**; any time on any Sunday; and any time on any of the following holidays: ~~January 1~~ New Year's Day; ~~May 30~~ Memorial Day; ~~July 4;~~ **Independence Day;** Labor Day; ~~November 11~~ Veteran's Day; Thanksgiving Day; and ~~December 25~~ Christmas Day; provided that if in any calendar year any such holiday falls on a Sunday, the following Monday shall constitute the holiday.

RR NOI-1 In compliance with the County Code and consistent with the **more restrictive** City of Arcadia Municipal Code, Project construction activities at the ~~Dam,~~ Headworks, Wilderness Park Culvert Crossing, and Debris Dam that generate substantial noise, such as the operation of construction equipment and mechanical equipment, shall be limited to the hours of 7:00 AM to ~~7:00~~ **6:00** PM Monday through ~~Saturday~~ **Friday, and 8:00 AM to 5:00 PM on Saturday. Construction at the Dam shall be in compliance with the County Code, which prohibits construction noise between the hours of 7:00 PM and 7:00 AM on weekdays (including Saturday).**

Page 4-112 of the MND has been revised as follows:

PDF TRA-1 Heavy-duty diesel truck vehicle (with a Gross Vehicle Weight Rating of 10,000 lbs. or heavier) trips shall be scheduled to avoid school crosswalks at Highland Oaks Elementary School during peak drop-off hours between 8:00 AM to 9:00 AM and pick-up hours between 2:00 PM to 3:00 PM. **Heavy-duty diesel truck vehicle trips will be scheduled to avoid peak hours and holidays.** As required by State Commercial Vehicle Idling Regulations, trucks shall be prohibited from idling for more than 5 minutes if queuing within 100 feet from any residential area.

RR TRA-1 The movement of large equipment on public roadways shall be made in compliance with the Los Angeles County Code (Title 16, Highway)~~, which requires a moving permit and which includes provisions regarding the size of vehicles/equipment; night moves; moving in inclement weather; parking on streets; travel outside peak hours and holidays; over-length, over-height, and over-width requirements; lighting; signs; and restricted routes~~. Oversized transport vehicles on State highways, if required, would need to obtain a transportation permit from the California Department of Transportation (Caltrans). Oversized transport vehicles on local roadways, if required, would need to obtain a transportation permit from the Cities of Arcadia and Sierra Madre.

Initial Study/
Mitigated Negative Declaration

Santa Anita Stormwater Flood Management and Seismic Strengthening Project
County of Los Angeles, California

Prepared for

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October 2014

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Acronym and Abbreviation Description
A	
AAQS	ambient air quality standards
AAM	Annual Arithmetic Mean
AB	Assembly Bill
ABIH	American Board of Industrial Hygiene
afy	acre-feet per year
APE	Area of Potential Effects
AQMD	Air Quality Management District
B	
BMPs	Best Management Practices (or Programs)
C	
C&D	construction and demolition
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCAR	California Climate Action Registry
CDFW	California Department of Fish and Wildlife
CDMG	California Department of Mines and Geology
CEQA	California Environmental Quality Act of 1970
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	methane
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Rank
CSP	Certified Safety Professional
CUP	Conditional Use Permit
CUPA	Certified Unified Program Agency
CWA	Clean Water Act, Federal (1977)
cy	cubic yards

Acronym	Acronym and Abbreviation Description
D	
dB	Decibel
dBA	decibel, A-weighted
dBC	C-weighted decibels
DSOD	Division of Safety of Dams, State of California
DTSC	Department of Toxic Substances Control, State of California
E	
EA	Environmental Assessment (NEPA)
EIR	Environmental Impact Report (CEQA)
F	
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
G	
GHG	Greenhouse Gas
GWP	Global warming potential
H	
HFC	hydrofluorocarbon
HOV	high-occupancy vehicle lane
HP	Horsepower
Hz	Hertz
I	
I	Interstate
IBC	International Building Code
in/sec	Inches per second
IRWMP	Integrated Regional Water Management Plan
IS	Initial Study (CEQA)
K	
km	Kilometer
Kva	Kilovoltamps
L	
LACFCD	Los Angeles County Flood Control District
LACDPW	Los Angeles Department of Public Works, County of
lbs/day	Pounds per day

Acronym	Acronym and Abbreviation Description
LD 831	Larson Davis Laboratories Model 831 integrating sound level meter
LF	Load factor
L_{eq}	average noise level
L_{max}	maximum noise level
L_{min}	minimum noise level
L_{peak}	peak sound level
LOS	Level of Service (traffic flow rating)
LST	Localized significance threshold
M	
MBTA	Migratory Bird Treaty Act
mg/m^3	milligrams per cubic meter
MLD	Most Likely Descendent
MM	mitigation measure
MMRP	Mitigation Monitoring and Reporting Program
MND	Mitigated Negative Declaration (CEQA)
mph	miles per hour
MRZ	Mineral Resource Zone
msl	mean sea level
$MTCO_2e$	metric tons of carbon dioxide equivalent
N	
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act (of 1969)
NO_2	nitrogen dioxide
N_2O	nitrous oxide
NOx	oxides of nitrogen (nitric oxide and nitrogen dioxide)
NOI	Notice of Intent (NEPA)
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O	
O_3	Ozone
OSHA	Occupational Safety and Health Administration
OSM	Office of Surface Mining Reclamation and Enforcement
OWHMP	Oak Woodland Habitat Revegetation/Mitigation Program
P	
P	Public Facilities and Grounds
PDF	Project Design Feature

Acronym	Acronym and Abbreviation Description
PFC	perfluorocarbon
PGA	peak ground acceleration
PM2.5	respirable particulate matter less than 2.5 micrometers in diameter
PM10	respirable particulate matter less than 10 micrometers in diameter
PMF	probable maximum flood
ppv	Peak particle velocity
PRC	Public Resources Code
PRD	Permit Registration Document
PSHA	Probabilistic Seismic Hazard Analysis
R	
RCP	reinforced concrete pipe
R-M	Residential Mountains
RRs	Regulatory Requirements
RRP	Recycling and Reuse Plan
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
S	
SCAG	Southern California Association of Governments
SCCIC	South Central Coastal Information Center
SCS	Soil Conservation Service
SEA	Significant Ecological Area
SF_6	sulfur hexaflouride
SIP	Standard Individual Permit
SO_2	sulfur dioxide
SOx	sulfur oxides
SoCAB	South Coast Air Basin
SPS	Sediment Placement Site
SR	State Route
SUP	Special Use Permit
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
T	
TAC	toxic air contaminant
TIA	Traffic Impact Analysis
TNT	Trinitrotoluene
tpd	Tons per day

Acronym	Acronym and Abbreviation Description
U	
USACE	U.S. Army Corps of Engineers
USBM	U.S. Bureau of Mines
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
V	
VHFHSZ	Very High Fire Hazard Severity Zone
Vmax	Maximum allowable peak particle velocity
VOC	volatile organic compounds
Symbols	
$\mu g/m^3$	micrograms per cubic meter

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SECTION 1.0 EXECUTIVE SUMMARY

The California Environmental Quality Act (CEQA) requires that local government agencies, prior to taking action on projects requiring discretionary approval, consider the environmental consequences of such projects. An Initial Study/Mitigated Negative Declaration (IS/MND) is a public document designed to provide the public, responsible/trustee agencies, and other local and State governmental agencies with an analysis of the potential environmental consequences of a project's implementation. This IS/MND has been prepared in accordance with CEQA and the State CEQA Guidelines for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project (Project).

The Los Angeles County Flood Control District (LACFCD), as lead agency, has authorized the preparation of this IS/MND pursuant to CEQA. The IS/MND indicates that, while the Project would have environmental impacts, modifications and/or mitigation measures have been incorporated into the Project to reduce its potentially adverse impacts to levels considered less than significant (State CEQA Guidelines §15070).

This Executive Summary presents a brief overview of the Project; a tabular summary of the potential environmental effects of the Project; and the recommended mitigation program that would reduce potential impacts to a less than significant level. The reader is referred to the full text of this IS/MND and the technical appendices for a complete description and analysis of the potential environmental effects of the Project.

1.1 PROJECT DESCRIPTION SUMMARY

The Project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, including the Santa Anita Dam, Santa Anita Headworks, Wilderness Park Culvert Crossing, and the Santa Anita Debris Dam. The Project benefits and the contributing LACFCD facility improvements are as follows:

- Reduce flood risk to downstream communities by:
    - Modifying the Santa Anita Dam spillway to safely pass the Probable Maximum Flood
    - Remediating seismic safety issues at the Santa Anita Dam and Debris Dam
- Enhance sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre-feet per year by:
    - Restoring storage capacity at Santa Anita Debris Dam
    - Rehabilitating the Santa Anita Headworks for more reliable diversion of stormwater runoff to the spreading grounds
    - Modernizing facilities and implementing new monitoring and control systems
- Improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing

1.1.1 PROJECT LOCATION AND SETTING

The Project study area is located within the jurisdictions of the City of Arcadia, the City of Monrovia, a County-owned inholding within the United States Forest Service (USFS) boundary, and property within the USFS Angeles National Forest. The Project site is in the foothills of the San Gabriel Mountains in Los Angeles County, approximately 15 miles northeast of downtown Los Angeles.

The Dam is at the north end of the Project site, located in the Angeles National Forest and accessed via a private road off Chantry Flats Road, approximately 2.5 miles north of the City of Arcadia. The Headworks structure is located approximately 0.5 mile downstream of the Dam on the border of the Angeles National Forest and the City of Arcadia and accessed off Highland Oaks Drive. The Debris Dam is located approximately 0.5 mile downstream of the Headworks in the Cities of Arcadia and Monrovia, and can be accessed via a maintenance road that runs along the Santa Anita Wash.

Surface runoff from the Santa Anita Canyon Watershed drains along natural courses towards the Santa Anita Wash, which runs north-south beginning at the Dam. The purpose of the Dam is to decrease peak flood flow by retaining stormwater and discharging it at controlled release rates. The released flows continue downstream to the Headworks facility, which intercepts the creek flows and allows the flows to continue downstream to the Debris Dam, to be diverted to the Sierra Madre Spreading Grounds, or to be diverted into the Santa Anita Spreading Grounds.

1.1.2 PROJECT COMPONENTS

Dam

The Dam is located within the Angeles National Forest and within the boundary of the City of Monrovia; however, the USFS has jurisdiction over activities at the Dam. The Dam would be structurally altered to accommodate a new spillway with sufficient capacity to pass the probable maximum flood (PMF) of 26,100 cubic feet per second (cfs) in order to reduce the risk of Dam failure from uncontrolled overtopping during major storm events. The proposed improvements to the Dam would not result in changes to the existing maximum water surface elevation restrictions (which are set in place by California Department of Water Resources, Division of Safety of Dams [DSOD]) at a maximum elevation of 1,230 feet above mean sea level (msl); therefore, the reservoir's operational capacity to retain water would not be altered by Project implementation.

The Dam's outdated electrical, mechanical, potable water, and control systems would be upgraded to ensure reliability and to modernize operations, allowing for the integrated control of the facilities to increase water conservation efficiency. The Dam's structural concrete would be repaired to ensure that the concrete meets acceptable standards consistent with the required seismic performance of the Dam. Other ancilliary facilities at the Dam would also be replaced or upgraded, including the secured access gate (including new power poles to supply electricity) and a storage shed/garage. The existing Dam Operator's house would be removed and a helipad would be constructed in its place to provide aerial access to the Dam in the event of an emergency.

The downstream canyon walls and the toe of the Dam would be re-armored with additional reinforced "gunite" or equivalent concrete erosion protection to dissipate the energy from the overtopping water as the flow cascades through the spillway and the orifice spillway or sluiceway. The flow would be directed onto the downstream armoring before flowing into the channel downstream of the Dam. The re-armoring would reinforce the existing armoring that extends approximately 100 feet downstream from the toe of the Dam. The re-armoring would be held in position with tie-back anchors to be drilled and grouted into the bedrock. The tie-ins for the re-armoring may include rock excavation, superficial grading, and subsurface pressure grouting.

Headworks and Wilderness Park Culvert Crossing

Redevelopment of the Headworks would include reconstruction of the small earthen levee to ensure it can withstand flows produced by the 25-year storm event and replacement of the existing tainter gate (used to divert flows) with a new rubber diversion structure. The rubber diversion structure is a pneumatically[1] operated, bottom-hinged, spillway gate system. The majority of the existing Headworks structure would be removed, including the tainter gate, supporting walls, catwalk, and keys. The new facility would extend beyond the width of the current structure by approximately 20 feet into the existing levee in order to house the new rubber diversion structure. The existing earthen levee would be reinforced and built up approximately five feet higher to match the height of the new Headworks structure. The top layer of disturbed soil on the levee would be removed to expose the underlying engineered fill; it would then be recompacted with additional engineered fill to the proposed height. The access road leading to the Headworks would be modified to match the height of the reinforced earthen levee. The improvements would also include a new control house for operating the rubber diversion structure, which would include remote operation capabilities to increase efficiency of water conservation operations.

In addition to the improvements at the Headworks, removal and replacement of the Culvert Crossing to the City of Arcadia's Wilderness Park is needed to ensure that the roadway and crossing can withstand flows generated by a larger storm event. The existing Wilderness Park Culvert Crossing is located approximately 450 feet downstream of the Headworks. The Culvert Crossing includes the concrete slab and corrugated metal culverts, and it would be removed and replaced with a similarly functioning Culvert Crossing structure that is better designed to withstand storm flows. Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing structure would be grubbed and graded to accommodate the new structure. In order to accommodate the new Culvert Crossing abutment, three sycamore trees along the eastern shore of the Wash may need to be removed (see Tree Numbers 220, 221, and 222 in Appendix B, see Tree Report). If possible, the design of the Culvert Crossing will not require the removal of the sycamore north of the culvert crossing, potentially through the means of a temporary closure of the access point into the Wilderness Park that is discussed later. However, in order to provide a conservative analysis, this IS/MND assumes these sycamore trees would be removed.

The LACFCD may transplant the root balls of the sycamores to a suitable riparian location and/or utilize the woody debris from the sycamore to enhance habitat value at another nearby location, if determined to be feasible and if approved by the County and other appropriate parties. In addition, new sycamore trees will be planted in the vicinity of any removed existing trees.

The channel immediately downstream of the new Culvert Crossing would be armored with a riprap apron to dissipate water flow energy. The new Culvert Crossing would be approximately ten feet wider than the existing crossing, and it would be built on top of a new abutment with a supporting wing wall. It would be designed with a permanent guard rail and flexible pavement driving surface adequate for emergency vehicles. The elevation of the Culvert Crossing structure would be raised above the existing roadway elevation to accommodate higher flows. Approximately 1,800 square feet of the roadways leading to and from the Culvert Crossing would be repaved and sloped to join the existing grade.

Debris Dam

Remediation of the seismic deficiencies at the Debris Dam would involve a major reconfiguration of the existing structures, including the intake tower, spillway, and embankment. In 1995, following a seismic safety study of the Debris Dam, the DSOD determined that it did not meet standards for

[1] Pnuematic means operated through the use of compressed air or compressed gas.

seismic safety and required the outlet gate to remain open at all times to prevent storage of water above an elevation of 761 feet above msl. Remediating the seismic deficiencies at the Debris Dam would result in DSOD removing the operational restrictions on the facility, thus restoring 119 acre-feet of water conservation capacity. The Debris Dam would also be enlarged by raising the existing spillway 4 feet, which would create 40 acre-feet of additional storage for a total of 159 acre-feet.

The intake tower located in the Debris Dam would be strengthened or replaced due to the inability of the existing tower to resist seismic loading. The intake tower would be connected to the existing diversion to the spillway channel or spreading grounds, which is a 48-inch outlet conduit that would be lined. In addition, portions of the Debris Dam embankment that are subject to potential liquefaction would be reinforced with structural buttressing. The top of the embankment ranges from an elevation of 796 feet above msl at its center to an elevation of 811 feet above msl at the western edge. The improvements would include removal of six non-native deodar cedar trees located at the toe of the downstream side of the embankment, as mandated by DSOD, to ensure the structural integrity of the Debris Dam. A new automated outlet gate and control system would be constructed to modernize operations and ensure compatibility with other Project components.

1.2 ORGANIZATION OF THE IS/MND

This IS/MND is organized into the following sections:

Section 1, Executive Summary: This section provides a summary of the Project description, Project impacts, and mitigation measures (MMs) required to reduce any potentially significant impacts to less than significant levels.

Section 2, Introduction and Environmental Setting: This section provides an introduction to the purpose of an IS/MND; a brief summary of relevant previous CEQA/National Environmental Policy Act (NEPA) documents; an outline of the IS/MND organization; and a description of the Project's location and existing environmental setting.

Section 3, Project Description: This section provides a description of the proposed Project components and the associated short-term construction activities required for implementation. The section discusses the construction schedule and estimated equipment needs, the ongoing operational and maintenance needs, and require Project-related approvals.

Section 4, Environmental Checklist Form and Assessment: The completed CEQA checklist form provides an overview of the potential impacts that may result from Project implementation. The environmental checklist form also includes "mandatory findings of significance", per CEQA requirements. This section contains the analysis of environmental impacts identified in the environmental checklist and identifies mitigation measures to eliminate potential significant effects or reduce them to a less than significant level.

Section 5, Document Preparers and Contributors: This section includes a list of those persons who participated in writing this document.

Section 6, References: This section identifies the references used in preparation of the IS/MND.

1.3 PROJECT-RELATED ACTIONS

The analysis in Section 4.0 of this IS/MND evaluates the impacts associated with Project implementation. The Project Design Features (PDFs) and Regulatory Requirements (RRs) associated with the Project are summarized below. The nature of the Project itself along with

implementation of the PDFs and compliance with RRs would result in the Project having no impact or less than significant impacts on Agriculture and Forest Resources, Air Quality, Cultural Resources, Greenhouse Gas Emissions, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, Traffic/Transportation, and Utilities and Service Systems.

The LACFCD will confirm that these PDFs and RRs are included in the Contractor Specifications and bid documents, as appropriate, and verified as part of the Mitigation Monitoring and Reporting Program (MMRP). These PDFs and RRs shall be implemented to the satisfaction of the LACFCD and are listed below.

1.3.1 PROJECT DESIGN FEATURES

PDF AES-1 The material used to re-armor the downstream canyon walls and the toe of the Dam will match the color of the existing armoring.

PDF BIO-1 A Biological Monitor will be on site during vegetation clearing in Project Work Areas (e.g., limits of disturbance). The Biological Monitor will confirm that the limits of Project Work Areas are clearly marked. The Biological Monitor shall provide environmental awareness training to the Contractor; the training will include a discussion of native habitat types, special status species that may occur in the Project Work Areas, direction for what to do if a special status species is observed, and an overview of applicable permit conditions. Prior to construction, the Biological Monitor will conduct a pre-clearing sweep of the Project Work Area and will flush or move wildlife outside the Project Work Area to the extent practicable.

PDF GEO-1 The Project shall be designed and constructed in compliance with the *Standard Specifications For Public Works Construction* (Greenbook), Construction Specifications Institute, and DSOD guidelines for seismic stability to ensure the structural integrity of proposed site improvements against seismic shaking. In case of conflict between two specifications, the stricter specification shall apply.

PDF GEO-2 A detailed geotechnical investigation shall be conducted to assess potential geotechnical issues at the Debris Dam. This investigation shall conform with all applicable County requirements and other pertinent criteria, including DSOD and Greenbook standards. Specific issues to be evaluated in the Project geotechnical investigation shall include seismic-related ground rupture, ground acceleration, and liquefaction, as well as expansive/corrosive soils; other types of soil/geologic instability (including subsidence, oversized materials and excavations); and any other issues deemed appropriate by the LACFCD and/or the Geotechnical Engineer. The geotechnical investigation shall be submitted to the LACFCD for review and approval prior to commencement of construction. All applicable requirements and recommendations identified in the approved geotechnical investigation shall be incorporated into the Project design and/or construction specifications as appropriate.

PDF TRA-1 Heavy-duty diesel truck vehicle (with a Gross Vehicle Weight Rating of 10,000 lbs. or heavier) trips shall be scheduled to avoid school crosswalks at Highland Oaks Elementary School during peak drop-off hours between 8:00 AM to 9:00 AM and pick-up hours between 2:00 PM to 3:00 PM. As required by State Commercial Vehicle Idling Regulations, trucks shall be prohibited from idling for more than 5 minutes if queuing within 100 feet from any residential area.

1.3.2 REGULATORY REQUIREMENTS

RR AQ-1 All construction activities shall be conducted in compliance with South Coast Air Quality Management District Rule 403, Fugitive Dust, for controlling fugitive dust and avoiding nuisance. Compliance with this rule will reduce short-term particulate pollutant emissions. Contractor compliance with Rule 403 requirements shall be mandated in the contractor's specifications.

RR AQ-2 All construction activities shall be conducted in compliance with South Coast Air Quality Management District Rule 402, Nuisance, which states that a Project shall not "discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property".

RR CUL-1 Should archaeological resources be found during ground-disturbing activities for the Project, an Archaeologist shall be hired to first determine whether it is a "unique archaeological resource" pursuant to Section 21083.2(g) of the *California Public Resources Code* (PRC) or a "historical resource" pursuant to Section 15064.5(a) of the State CEQA Guidelines. If the archaeological resource is determined to be a "unique archaeological resource" or a "historical resource", the Archaeologist shall formulate a mitigation plan in consultation with the LACFCD that satisfies the requirements of the above-referenced sections. If the Archaeologist determines that the archaeological resource is not a "unique archaeological resource" or "historical resource", s/he may record the site and submit the recordation form to the California Historic Resources Information System at the South Central Coastal Information Center at California State University, Fullerton.

RR CUL-2 If human remains are encountered during excavation activities, all work shall halt in the immediate vicinity of the discovery and the County Coroner shall be notified (*California Public Resources Code* §5097.98). The Coroner shall determine whether the remains are of forensic interest. If the Coroner, with the aid of the Archaeologist approved by the LACFCD, determines that the remains are prehistoric, s/he will contact the Native American Heritage Commission (NAHC). The NAHC shall be responsible for designating the most likely descendant (MLD), who will be responsible for the ultimate disposition of the remains, as required by Section 7050.5 of the *California Health and Safety Code.* The MLD shall make his/her recommendation within 48 hours of being granted access to the site. The MLD's recommendation shall be followed if feasible, and may include scientific removal and non-destructive analysis of the human remains and any items associated with Native American burials (*California Health and Safety Code* §7050.5). If the landowner rejects the MLD's recommendations, the landowner shall rebury the remains with appropriate dignity on the property in a location that will not be subject to further subsurface disturbance (*California Public Resources Code* §5097.98).

RR HAZ-1 Activities at the Project site shall comply with existing federal, State, and local regulations regarding hazardous material use, storage, disposal, and transport to prevent Project-related risks to public health and safety. All on-site generated waste that meets hazardous waste criteria shall be stored, manifested, transported, and disposed of in accordance with the *California Code of Regulations* (Title 22) and in a manner to the satisfaction of the local Certified Unified Program Agency (CUPA) and the U.S. Forest Service, as applicable.

RR HYD-1 Prior to the start of construction activities, the LACFCD shall file a Permit Registration Document (PRD) with the State Water Resources Control Board (SWRCB) in order to obtain coverage under that National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with the Construction and Land Disturbance Activities (Order No. 2009-009-DWQ, NPDES No. CAS000002) or the latest approved general permit. This permit is required for construction activities (including demolition, clearing, grading, and excavation) and other land disturbance activities that result in the disturbance of one acre or more of total land area. The PRD consists of a Notice of Intent (NOI); Risk Assessment; Site Map; Storm Water Pollution Prevention Program (SWPPP); annual fee; and a signed certification statement. Pursuant to permit requirements, the Contractor shall develop and incorporate Best Management Practices (BMPs) for reducing or eliminating construction-related pollutants in site runoff.

In addition, during construction, the LACFCD shall comply with the appropriate requirements listed in the adopted Municipal Separate Storm Sewer System (MS4) Permit (Order No. R4-2012-0175, NPDES No. CAS004001), which regulates municipal discharges of stormwater and non-stormwater.

RR HYD -2 Discharges during construction are regulated under SWRCB Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification", which requires compliance with all conditions of the Water Quality Certification issued by the Regional Water Quality Control Board (RWQCB). Compliance with the Water Quality Certification issued by the RWQCB would ensure that any discharge from the Project does not conflict with the applicable provisions of Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, or any other applicable requirements of State law.

RR USE-1 Prior to commencement of any construction activities at the Dam, the LACFCD shall submit plans to the USFS to obtain written approval for the construction at the Dam in accordance with the existing USFS SUP (Provision Number 3). The application and all supporting technical information shall be completed to the satisfaction of the USFS, which is subject to review in compliance with the National Environmental Policy Act (NEPA).

RR NOI-1 In compliance with the County Code and consistent with the City of Arcadia Municipal Code, Project construction activities at the Dam, Headworks, Wilderness Park Culvert Crossing, and Debris Dam that generate substantial noise, such as the operation of construction equipment and mechanical equipment, shall be limited to the hours of 7:00 AM to 7:00 PM Monday through Saturday.

RR TRA-1 The movement of large equipment on public roadways shall be made in compliance with the Los Angeles County Code (Title 16, Highway), which requires a moving permit and which includes provisions regarding the size of vehicles/equipment; night moves; moving in inclement weather; parking on streets; travel outside peak hours and holidays; over-length, over-height, and over-width requirements; lighting; signs; and restricted routes. Oversized transport vehicles on State highways, if required, would need to obtain a transportation permit from the California Department of Transportation (Caltrans). Oversized transport vehicles on local roadways, if

required, would need to obtain a transportation permit from the Cities of Arcadia and Sierra Madre.

RR TRA-2 The County's general construction requirements require the implementation of temporary traffic control in accordance with the *Standard Specifications for Public Works Construction* (Greenbook), which contains standards for traffic and access (i.e., maintenance of access, traffic control, and notification of emergency personnel). The Contractor shall provide temporary traffic control in accordance with the Greenbook during construction activities.

RR TRA-3 Design, construction, and operation of the helipad at the Santa Anita Dam shall comply with the requirements of all regulatory and oversight agencies including, but not limited to, the FAA, Caltrans, and Los Angeles County Department of Regional Planning Airport Land Use Commission.

RR UTL-1 Construction activities on the Project site shall be conducted in compliance with Chapter 20.87 (Construction and Demolition Debris Recycling and Reuse) of the Los Angeles County Code, which requires at least 50 percent of all Collection and Demolition (C&D) debris, soil, rock, and gravel removed from the Project site to be recycled or reused unless a lower percentage is approved by the Los Angeles County Director of Public Works. A Recycling and Reuse Plan (RRP) must be submitted by the Contractor to the Los Angeles County Department of Public Works, Environmental Programs Division. The RRP must contain a Project description and the estimated total weight of the project C&D debris, with separate estimates for (1) soil, rock, and gravel; (2) other inert materials; and (3) all other project C&D debris. The ordinance also requires that annual progress reports be submitted to the LACFCD for review.

1.3.3 MITIGATION MEASURES

Prior to mitigation, Project implementation would result in potentially significant impacts to Aesthetics, Biological Resources, Geology and Soils, Hazards/Hazardous Materials, and Noise. However, mitigation measures (MMs) have been developed to avoid or reduce these impacts to levels considered less than significant. These MMs would be included in the Contractor Specifications and bid documents, as appropriate, and verified as part of the MMRP. These MMs shall be implemented to the satisfaction of the LACFCD and are listed below in Table 1-1, Mitigation Measures to Avoid Potentially Significant Environmental Impacts, along with the assigned responsibility for implementation and compliance monitoring.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
Aesthetics					
Project implementation has the potential to substantially damage scenic resources (removal of sycamore trees).	**MM AES-1:** Any removal of sycamore trees located at the Wilderness Park Culvert Crossing shall be replaced at a minimum 1:1 ratio with a minimum box size of 24 inches, within a 100-foot radius of their original location.	Wilderness Park Culvert Crossing	Within 6 months of the completion of the Culvert Crossing.	LACFCD	Less than significant.
Biological Resources					
Project implementation has the potential to impact sycamore trees, oak trees, and other native trees.	**MM BIO-1:** **A.** Replacement shall occur for the western sycamores (Tree Numbers 220-222) that are removed by construction of the Wilderness Park Culvert Crossing. At a minimum, impacted sycamore trees at the Culvert Crossing shall be replaced at no less than a 1:1 ratio, and the minimum box size of replacement trees shall be 24 inches. The replacement trees shall be incorporated into the Riparian Habitat Mitigation and Monitoring Plan (HMMP), as set forth in MM BIO-5, or a separate Tree HMMP shall be prepared and shall contain the same required components. **B.** The oak tree adjacent to the Wilderness Park Culvert Crossing (Tree Number 219) shall not be removed. This tree shall be protected as described in subsection "C" below. However, the protective fencing for this tree shall be placed at the edge of the canopy to allow for construction to occur immediately outside its canopy. When initial vegetation removal/ground disturbance is occurring within 1.5 times the dripline/root protection zone, the work shall be monitored by a Certified Arborist who shall oversee any removal/cutting of roots necessary and shall determine if trimming of	All Project Components	Prior to the initiation of construction activities	LACFCD	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	the canopy is necessary to protect the health of the tree. The Certified Arborist shall monitor the health of this tree a minimum of once per month during construction of the Wilderness Park Culvert Crossing and once per month for a period of six-months following completion of construction. Photographs shall be taken monthly to compare the overall vigor of the tree over time. The tree shall be considered "impacted" if its health rating declines two or more rating levels as referenced in the Biological Technical Report (Appendix B, see Tree Survey Report). If this occurs, in coordination with CDFW and the City of Arcadia, the tree shall be mitigated at no less than a 1:1 ratio, and the minimum box size of replacement trees shall be 24 inches. If Tree Number 220 is also preserved, protection shall follow the same requirements that are specified herein for Tree Number 219. **C.** To protect native trees adjacent to Project Work Areas, the following shall be implemented within each Project Work Area: • Brightly-colored construction fencing shall be placed around all native trees to be preserved that are located within 50 feet of Project Work Areas. The fencing shall be placed at 1.5 times the dripline/root protection zone (defined as the outer canopy edge, at least 15 feet from the trunk). These areas shall be labeled as "Tree Protection Areas" and shall be regarded as Environmentally Sensitive Areas on construction plans. If an existing access road is				

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	within the Tree Protection Area, the Tree Protection Area may be adjusted to allow for access along the existing roadway. • Stockpiling of materials or vehicle operation shall be prohibited within the Tree Protection Areas. If a Tree Protection Area has been adjusted to allow for an existing access road, no stockpiles or materials shall be allowed within 1.5 times the dripline/root protection zone of the native tree. • Limbs of native trees can be pruned if necessary to allow construction equipment access. Small branches (less than three inches diameter) can be trimmed without the supervision of a Certified Arborist if less than ten percent of the total canopy is removed. If larger branches need to be removed or if more than ten percent of the total canopy would be affected, these activities shall be supervised by a Certified Arborist. • Changes to the grade or drainage patterns in the areas surrounding a Tree Protection Area shall be avoided so that excess water does not drain to native trees, unless otherwise approved by a Certified Arborist. • Any activities (e.g., vehicle operation) occurring within a Tree Protection Area shall be coordinated with a Certified Arborist to ensure that				

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	activities would not affect the health of the tree(s). If construction would damage or remove any trees, the Certified Arborist shall contact the appropriate jurisdiction(s) to determine mitigation and permitting requirements before the tree is impacted. • An on-site pre-construction field meeting shall be held to inform all construction personnel of tree restrictions prior the initiation of work. **D.** A subset of the 20 native trees located within the increased inundation area shall be monitored for health over the course of 5 years following completion of the Debris Dam construction. A Certified Arborist shall monitor these trees annually each spring following the rainy season for a period of 5 years for signs of any potential negative health effects from flooding (e.g., yellowing leaves, lack of new growth, trunk decay, etc.) using the same health rating scale described to evaluate baseline conditions. Monitoring will distinguish if any changes in health may be from other outside factors. Each monitoring event shall measure and track the dbh of the trees to determine growth patterns, and other trees outside of the future inundation areas shall also be measured to compare growth rates. Photographs shall be taken annually to compare the overall vigor of each tree's crown over time. Monitoring events shall assess whether a tree has been "affected" by determining if a tree's health rating declines two or more rating levels. Any affected trees				

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	shall be monitored for a two year period, which may be in addition to the original 5 year monitoring period, to determine if their health condition subsequently improves. If an affected tree shows improvement in the health rating during this two year period, it shall be considered a "recovered" tree and would not require mitigation. If an affected tree's health condition does not improve during this 2-year period, then the tree would be considered "impacted" and would require mitigation. If this occurs, in coordination with CDFW, the tree shall be mitigated at no less than a 1:1 ratio. The replacement trees shall be incorporated into the Riparian HMMP, as set forth in MM BIO-5, or a separate Tree HMMP shall be prepared and shall contain the same required components.				
Project implementation has the potential to impact Pacific pond turtles and two-striped garter snakes.	**MM BIO-2:** At least 7 days prior to the initiation of dewatering/construction at the Dam and Headworks (and Debris Dam if ponded water is present at the time of construction), a five-day/four-night pre-construction trapping for the Pacific pond turtle shall be conducted by a qualified Biologist. Concurrently with the trapping effort, the Biologist shall also visually search for and capture two-striped garter snakes and any other special status species in the Project Work Areas. If any Pacific pond turtles, two-striped garter snakes, or other special status species are captured, they shall be relocated to a suitable site along Santa Anita Wash outside of the construction area. Prior to relocating any of these species, the USFS and the CDFW shall approve the potential relocation site(s) and methods for transferring the turtles/snakes to the relocation sites. Any non-native animal species encountered during pre-construction surveys shall be permanently removed from the reservoir.	Dam, Headworks, and Debris Dam	Prior to the initiation of dewatering/construction activities at the Dam and Headworks	LACFCD	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	Additionally, a qualified Biologist shall be present during the latter stages of dewatering of the reservoir to ensure that no Pacific pond turtles, two-striped garter snakes, or other special status species are stranded. If any of these species are observed during monitoring, they shall be captured by a qualified Biologist (i.e., one with the necessary approvals to handle these species) and released at the approved relocation site. Any non-native animal species encountered during dewatering of the reservoir shall be permanently removed from the reservoir. A Letter Report shall be prepared to document the results of the pre-construction surveys and monitoring; the Report shall be provided to the USFS and the CDFW within 30 days of conclusion of the survey effort.				
Project implementation has the potential to impact nesting birds and raptors.	**MM BIO-3:** The Project shall be conducted in compliance with the conditions set forth in the Migratory Bird Treaty Act (MBTA) and *California Fish and Game Code* with methods approved by USFWS and CDFW to protect active bird/raptor nests. The nature of the Project requires that work would be initiated during the breeding season for nesting birds (March 15–September 15) and nesting raptors (February 1–June 30). The LACFCD, in consultation with a qualified Biologist, may employ bird exclusionary measures (e.g., mylar flagging) prior to the start of bird breeding season to minimize opportunities for birds to nest within established boundaries of the Project. In order to avoid direct impacts on active nests, a pre-construction survey shall be conducted by a qualified Biologist for nesting birds and/or raptors within 3 days prior to clearing of any vegetation or any work near existing structures (i.e., within 50 feet for nesting birds and within 500 feet for nesting raptors). If the Biologist does not find any active nests within or immediately adjacent to the	All Project Components	During the breeding season for nesting birds (March 15–September 15) and nesting raptors (February 1–June 30), surveys shall occur within 7 days prior to clearing of any vegetation or any work near existing structures (i.e., within 50 feet for nesting birds and within 500 feet for nesting raptors)	LACFCD	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	impact area, the vegetation clearing/construction work shall be allowed to proceed. If the Biologist finds an active nest within or immediately adjacent to the construction area and determines that the nest may be impacted or breeding activities substantially disrupted, the Biologist shall delineate an appropriate buffer zone (at a minimum of 25 feet) around the nest depending on the sensitivity of the species and the nature of the construction activity. Any nest found during survey efforts shall be mapped on the construction plans. The active nest shall be protected until nesting activity has ended. To protect any nest site, the following restrictions to construction activities shall be required until nests are no longer active, as determined by a qualified Biologist: (1) clearing limits shall be established within a buffer around any occupied nest (the buffer shall be 25–100 feet for nesting birds and 300–500 feet for nesting raptors), unless otherwise determined by a qualified Biologist and (2) access and surveying shall be restricted within the buffer of any occupied nest, unless otherwise determined by a qualified Biologist. Encroachment into the buffer area around a known nest shall only be allowed if the Biologist determines that the proposed activity would not disturb the nest occupants. Construction can proceed when the qualified Biologist has determined that fledglings have left the nest or the nest has failed.				

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
Project implementation has the potential to impact bats.	**MM BIO-4:** Water shall be drained or re-routed around Project Work Areas at least one month prior to construction to deter bats from roosting in the vicinity of the Work Areas. If exclusionary measures have not already been installed on all potential roost structures within the Project Work Area, a pre-construction follow-up roosting bat survey (including both day and evening efforts) shall be conducted by a qualified Biologist within two weeks prior to the initiation of construction to ensure that no active day-roosts would be impacted. The day survey will involve inspecting the structures for sign of bat roosting. The evening survey will involve monitoring each potential roost site for evening emergence, conducting exit counts, and acoustic monitoring (from a half an hour before sunset to at least one hour after sunset) near potential roosts. If active bat day-roosts occur within the Project Work Area, bat exclusion devices shall be installed under the supervision of a qualified biologist prior to the start of construction. If active bat day-roosts occur within structures proposed for removal/repair (including gunite repair on hill slopes), then exclusionary measures, such as barriers with one-way doors or permanent exclusion (e.g., caulking or wire mesh), shall be installed under the supervision of a qualified Biologist. If active bat day-roosts occur within trees proposed for removal, then either tree removal shall be conducted between September and November (to avoid the bat maternity and the bat hibernation season), or the tree removal will occur under the supervision of a qualified Biologist and will utilize phased tree trimming. If avoidance of bat hibernation and bat maternity season is not feasible, then exclusionary measures,	All Project Components	Prior to habitat removal during bat hibernation (generally December through February) or the bat maternity season (April through August)	LACFCD	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	such as netting or phased tree trimming, shall be implemented after the evening roost emergence under the supervision of a qualified Biologist. Once bats have been excluded from the trees to be removed, then tree removal can proceed.				
Project implementation has the potential to impact jurisdictional resources.	**MM BIO-5:** Prior to initiation of Project activities, the Los Angeles County Flood Control District (LACFCD) shall obtain all necessary permits for impacts to U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CDFW jurisdictional areas. Mitigation for the loss of jurisdictional resources shall be negotiated with the resource agencies during the regulatory permitting process. Potential mitigation options shall include one or more of the following: (1) payment to a mitigation bank or regional riparian enhancement program (e.g., invasive plant or wildlife species removal) and/or (2) restoration of riparian habitat either on site or off site at a ratio of no less than 1:1, determined through consultation with the above-listed resource agencies. If in-lieu mitigation fees are required, prior to the initiation of any construction-related activities, the LACFCD shall pay the in-lieu mitigation fee to a mitigation bank/enhancement program for the in-kind (equivalent vegetation type and acreage) replacement of impacted jurisdictional resources. If a Restoration Program is required, prior to the initiation of any construction-related activities, LACFCD shall prepare and submit a Riparian Habitat Mitigation and Monitoring Program (HMMP) for USACE and CDFW approval. If a Riparian HMMP is required, it shall contain the following items: **A.** Responsibilities and qualifications of the personnel to implement and supervise the plan. The responsibilities of the Landowner, Specialists, and Maintenance Personnel that	All Project Components	Prior to the initiation of construction activities	LACFCD	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	would supervise and implement the plan shall be specified. **B.** Site selection. The mitigation site shall be determined in coordination with the USACE, CDFW, and RWQCB. The site shall either be located in a dedicated open space area on County land, USFS land, or off-site land shall be purchased. **C.** Seed source. Seeds (or plantings) used shall be from local sources (within ten miles of the Project area) to ensure genetic integrity. **D.** Site preparation and planting implementation. Site preparation shall include (1) protection of existing native species; (2) trash and weed removal; (3) native species salvage and reuse (i.e., duff); (4) soil treatments (i.e., imprinting, decompacting); (5) temporary irrigation installation; (6) erosion-control measures (i.e., rice or willow wattles); (7) seed mix application; and (8) container species planting. **E.** Schedule. A schedule shall be developed which includes planting in late fall and early winter, between October 1 and January 30. **F.** Maintenance Plan/Guidelines. The Maintenance Plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement planting. **G.** Monitoring plan. The Monitoring Plan shall include (1) qualitative monitoring (i.e., photographs and general observations); (2)				

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	quantitative monitoring (i.e., randomly placed transects); (3) performance criteria, as approved by the above-listed resource agencies; (4) monthly reports for the first year and reports quarterly thereafter; and (5) annual reports for five years, which shall be submitted to the resource agencies on an annual basis. The site shall be monitored and maintained for five years to ensure successful establishment of riparian habitat within the restored and created areas. **H.** Long-term preservation. Long-term preservation of the site shall also be outlined in the conceptual Mitigation Plan to ensure the mitigation site is not impacted by future development.				
Geology and Soils					
Project implementation has the potential to expose people to increased risk of loss, injury, or death involving seismic-related ground failure, including liquefaction and landslides.	**See MM HAZ-1.**	All Project Components	Prior to the initiation of construction activities	The LACFCD shall ensure the measure is included in contractor's specifications and shall monitor compliance	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
Hazards and Hazardous Materials					
Project implementation has the potential to result in the increased risks of site hazards.	**MM HAZ-1:** Prior to commencement of any construction activities, the LACFCD shall require that the Contractor prepare a Site-Specific Health and Safety Plan for review and approval. The Plan shall be implemented throughout the construction activities. The Site-Specific Health and Safety Plan shall be prepared in accordance with the Occupational Safety and Health Administration's (OSHA's) Safety and Health Regulations for Construction (29 Code of Federal Regulations 1926) and shall include a Site Health and Safety Officer; an Access and Evacuation Plan; identification of site hazards; and response protocols in the event of an earthquake or landslide.	All Project Components	Prior to the initiation of construction activities	The LACFCD shall ensure the measure is included in contractor's specifications and shall monitor compliance	Less than significant.
Project implementation has the potential to result in the increased risks of wildland fires.	**MM HAZ-2:** Prior to commencement of any construction activities, a Fire Protection Plan shall be prepared that includes emergency reporting procedures; emergency notification, evacuation, and/or relocation of all persons on site; procedures for "hot work" operations; management of hazardous materials and removal of combustible debris; maintenance of emergency access roads; identification of exit routes and assembly areas; and identification of fire apparatus. The Fire Protection Plan shall be distributed to involved parties at least two weeks prior to commencement of any construction activities.	All Project Components	Prior to the initiation of construction activities	The USFS, the LACFCD, and the City of Arcadia	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
Noise					
Although impacts would not be significant, the Project has the potential to generate construction noise impacts at the Culvert Crossing and the Debris Dam.	**MM NOI-1:** Even though measures set forth in this mitigation are not required to reduce noise to less than significant levels at either the Culvert Crossing or the Debris Dam, these measures will be implemented at these construction sites to further reduce noise impacts. • The construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. • The construction contractors shall place all stationary construction equipment so that the equipment is as far as feasible from the noise-sensitive receptors and so that emitted noise is directed away from the noise-sensitive receptors. • The construction contractors shall locate equipment staging in areas that will create the greatest distance between staging area noise sources and noise-sensitive receptors during all Project construction. • The construction contractors shall limit haul truck deliveries to the same hours specified for operation of construction equipment.	Culvert Crossing and the Debris Dam	Prior to the initiation of construction activities and during construction activities	The LACFCD shall ensure the measure is included in contractor's specifications and shall monitor compliance	Less than significant.
Although impacts would not be significant, the Project has the potential to generate construction noise impacts at the Culvert Crossing and the Debris Dam.	**MM NOI-2:** Even though measures set forth in this mitigation are not required to reduce noise to less than significant levels at either the Culvert Crossing or the Debris Dam, these measures will be implemented at these construction sites to further reduce noise impacts. At least two weeks before, but not more than one month prior to the start of noise-generating	Culvert Crossing and the Debris Dam	Prior to the initiation of construction activities and during construction activities	The LACFCD shall ensure the measure is included in contractor's specifications and shall monitor compliance	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
	construction activities, notification shall be mailed to owners and occupants of all developed land uses within 300 feet of the Culvert Crossing and Debris Dam providing a schedule for major construction activities that will occur through the duration of the construction period. The notification shall include the identification and contact number for a designated Construction Manager that would be available on site to monitor construction activities. Contact information for the Construction Manager shall also be located at the Arcadia City Hall and the Arcadia Police Department. Complaints may be made during construction hours and a response shall be made within one work day. The Construction Manager shall document all complaints and resolutions and shall provide copies to the LACFCD within three working days of the complaint. The Construction Manager, upon observation of excessive noise occurring near adjacent homes or upon receipt of a complaint about excessive noise shall do the following: • Ensure that construction equipment is properly muffled according to industry standards, and • Modify operations to reduce the number of pieces of equipment operating near noise sensitive receptors or operating concurrently, unless the modification would prevent completion of the task, or • Implement corrective or additional noise-attenuation measures considered appropriate to address the complaint, which may include, but are not limited to, noise barriers or noise blankets.				

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
Project implementation has the potential to generate construction noise impacts.	**MM NOI-3:** Prior to the start of grading or similar heavy equipment operation on the downstream side of the Debris Dam, the County shall erect a temporary noise barrier between the structural buttressing work area and the residences to the southwest. The barrier shall be located along the southwest edge of the site access road, but the horizontal location may be adjusted as necessitated by geographical or topographical constraints or to avoid trees. The barrier shall be 16 feet high and solid from the ground to the top. The barrier shall be plywood of at least 0.75-inch thickness or other material with a noise transmission loss of 22 dBA or more. When equipment is working on the downstream site of the Debris Dam within 50 feet of residences, only one piece of equipment shall be at full power at any time; other equipment shall be shut down or at low idle.	Debris Dam	Prior to the initiation of construction activities	The LACFCD shall ensure the measure is included in contractor's specifications and shall monitor compliance	Less than significant.
Project implementation has the potential to generate vibration noise impacts.	**MM NOI-4:** Large bulldozers and large loaded trucks shall not be operated on the Project site within 140 feet of an occupied residence. Consistent with the County Code, this restriction does not apply to trucks on a public right-of-way.	All Project Components	During construction activities	The LACFCD shall ensure the measure is included in contractor's specifications and shall monitor compliance	Less than significant.

TABLE 1-1
MITIGATION MEASURES TO AVOID
POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Potential Impact	Mitigation Measures	Applicable Project Component	Timing	Responsible Party	Level of Significance After Mitigation
Mandatory Findings of Significance					
Project implementation has the potential to result in environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly, as they relate to Geology and Soils (landslide hazards during construction), Hazards and Hazardous Materials (emergency response and wildfire risk), and Noise.	**See MMs HAZ-1, HAZ-2, and NOI-1 through NOI-4**	All Project Components	Prior to the initiation of construction activities	The LACFCD shall ensure the measure is included in contractor's specifications and shall monitor compliance	Less than significant.

SECTION 2.0 INTRODUCTION AND ENVIRONMENTAL SETTING

2.1 INTRODUCTION

2.1.1 PURPOSE OF THE INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

In accordance with the California Environmental Quality Act (CEQA) (*California Public Resources Code* §21000 et seq.) and the State CEQA Guidelines (*California Code of Regulations,* Title 14, §15000 et seq.), this Initial Study (IS) has been prepared as documentation for a Mitigated Negative Declaration (MND) for the proposed Los Angeles County Flood Control District (LACFCD) Santa Anita Stormwater Flood Management and Seismic Strengthening Project (Project). This IS/MND includes a description of the Project; location of the Project site; evaluation of the potential environmental impacts of Project implementation; and recommended mitigation measures to lessen or avoid impacts on the environment.

Pursuant to Section 15367 of the State CEQA Guidelines, the LACFCD is the Lead Agency for the Project. The Lead Agency is the public agency that has the principal responsibility for carrying out a project and also has the authority to approve the Project and its accompanying environmental documentation. In addition to addressing the potential environmental impacts that would result from the Project, this IS/MND serves as the primary environmental document for future activities associated with the Project, including discretionary approvals requested or required for Project implementation.

The LACFCD, as the Lead Agency, has reviewed and revised, as necessary, all submitted drafts and technical studies and has commissioned the preparation of this IS/MND to reflect its independent judgment, including reliance on applicable LACFCD technical personnel and review of all technical subconsultant reports. Data for this IS/MND was obtained from on-site field observations; discussions with affected agencies; review of available technical studies, reports, guidelines, and data; and review of specialized environmental assessments prepared for the Project. The LACFCD has the authority for Project approval and adoption of this IS/MND.

This IS/MND evaluates the potential environmental impacts of Project implementation; it includes significance determinations from the environmental analyses; it identifies project design features (PDFs) and regulatory requirements (RRs) to be incorporated into the Project; and it sets forth mitigation measures (MMs) that will lessen or avoid potentially significant Project impacts on the environment.

2.1.2 PREVIOUS ENVIRONMENTAL DOCUMENTATION

An Environmental Impact Report (EIR) was prepared in 2009 for structural modifications to the Dam's inlet/outlet works, construction of a new riser, and the corresponding removal and disposal of sediment from the Santa Anita Reservoir. The EIR evaluated the environmental impacts of all the necessary elements to complete the structural modifications, including draining the Santa Anita Reservoir; removing approximately 500,000 cubic yards of sediment and debris from the reservoir by dry excavation; transporting the sediment from the reservoir via conveyor belt system; and placing it in the Santa Anita Sediment Placement Site (SPS). (LACDPW 2009).

A corresponding Environmental Assessment (EA) was prepared pursuant to the National Environmental Policy Act (NEPA) in 2008. The EA was used by the U.S. Army Corps of Engineers (USACE) to issue a permit pursuant to Section 404 of the Clean Water Act of 1972 (United States Code, Title 33, §1344) (USACE 2008).

2.1.3 PROJECT APPROVAL

The IS/MND has been submitted to potentially affected agencies. A Notice of Intent to Adopt an MND (NOI) was mailed to affected agencies and interested organizations and individuals, and is on file at the Los Angeles County Registrar-Recorder/County Clerk in the City of Norwalk. A summary of the NOI was published in the *Los Angeles Times,* the *San Gabriel Valley Tribune,* and the *Arcadia Weekly* to announce the public review period. The IS/MND and associated technical reports are available online at www.dpw.lacounty.gov/wrd/Projects/SantaAnita. Hard copies are available for public review during business hours at the LACDPW Headquarters (900 South Fremont Avenue, 2nd Floor in Alhambra, California) and at the Arcadia Public Library, located at 20 West Duarte Road in Arcadia, California during business hours.

In accordance with Section 15073 of the State CEQA Guidelines, a Mitigated Negative Declaration must be subject to a 30-day public review period when submitted to the State Clearinghouse for review by State agencies. However, the LACFCD has voluntarily established a 45-day public review period for this IS/MND, beginning on Monday, October 20, 2014, and extending through Thursday, December 4, 2014. In reviewing the IS/MND, the reviewer should focus on the sufficiency of the document in identifying and analyzing the potential impacts on the environment and ways in which the potentially significant effects of the Project are avoided or mitigated. Comments or questions on this IS/MND, postmarked by 5:00 PM on Thursday, December 4, 2014, can be sent in writing by mail to LACFCD at the address below, via email to damprojects@dpw.lacounty.gov, or by fax to (626) 979-5436. Include "Santa Anita Stormwater Flood Management and Seismic Strengthening Project" in the subject line. Comments can also be mailed to the following address:

Los Angeles County Flood Control District
Water Resources Division
900 South Fremont Avenue
Alhambra, California 91803-1331
Attn: Santa Anita Stormwater Flood Management and Seismic Strengthening Project

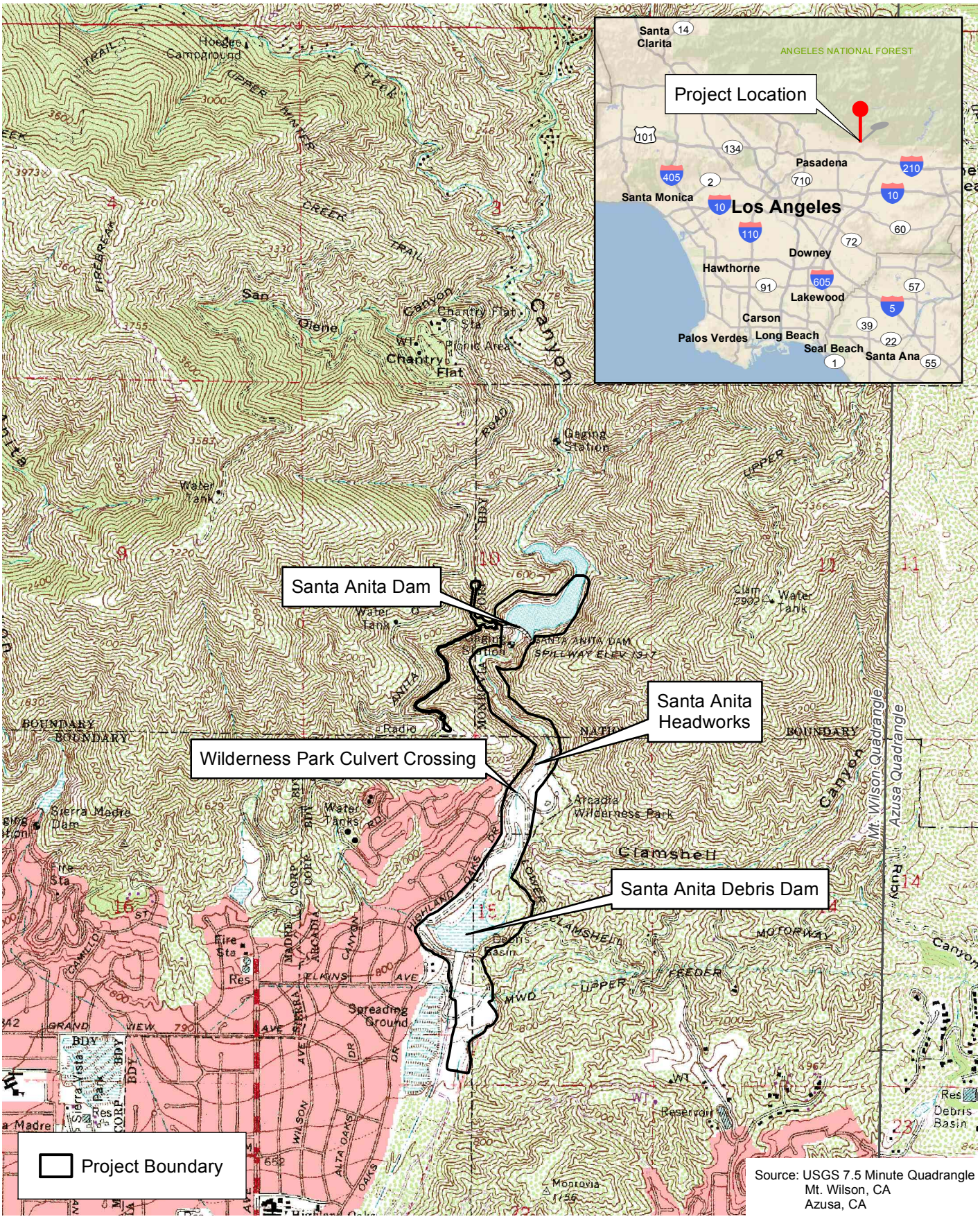
In accordance with Section 15074 of the State CEQA Guidelines, prior to approving the Project, the Los Angeles County Board of Supervisors (Board), acting as governing body of the LACFCD, will consider the proposed IS/MND together with any comments received during the public review process. The Board will adopt the proposed MND only if it finds that that there is no substantial evidence that the Project will have a significant effect on the environment and that the MND reflects the independent judgment and analysis of the Board.

2.2 ENVIRONMENTAL SETTING

The Project involves improvements to three existing flood management and water conservation facilities along the Santa Anita Canyon Watershed: the Dam, the Headworks, and the Debris Dam. This section presents a brief overview of the existing conditions within and surrounding the Project site, as well as the Project need and background. The information provided in this section is used as the "baseline" condition from which Project-related impacts are assessed.

2.2.1 PROJECT LOCATION

The Project is located within the jurisdictions of the City of Arcadia, the City of Monrovia, and the United States Forest Service (USFS). The Project site is in the foothills of the San Gabriel Mountains in Los Angeles County, approximately 15 miles northeast of downtown Los Angeles, as depicted in Exhibit 2-1, Regional Location and Local Vicinity. Primary access to the Project site is via the Santa Anita Avenue exit from Interstate (I) 210.



Source: USGS 7.5 Minute Quadrangle
Mt. Wilson, CA
Azusa, CA

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Regional Location and Local Vicinity Map

Exhibit 2-1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

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2,000 1,000 0 2,000 Feet

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Exhibit 2-1 also shows the existing locations of the various Project components, which are located within Santa Anita Canyon. The Dam is at the north end of the Project site, located in the Angeles National Forest and accessed via a private road off Chantry Flats Road, approximately 2.5 miles north of the City of Arcadia. The Headworks structure is located approximately 0.5 mile downstream of the Dam on the border of the Angeles National Forest and the City of Arcadia and accessed off Highland Oaks Drive. The Debris Dam is located approximately 0.5 mile downstream of the Headworks in the Cities of Arcadia and Monrovia, and can be accessed via a maintenance road that runs along the Santa Anita Wash.

2.2.2 PROJECT BACKGROUND AND NEED

The Project would modify three existing flood management and water conservation facilities along the Santa Anita Canyon Watershed: the Dam, the Headworks, and the Debris Dam. These facilities, which are described in further detail below, are operated and maintained by the LACFCD and serve to control and conserve the stormwaters of the Santa Anita Canyon Watershed.

The Project would improve the LACFCD's facilities to better manage stormwater runoff from the Santa Anita Canyon Watershed, including 518 acre-feet of additional water conservation capacity; improve public safety by addressing seismic safety and other structural issues at the Dam, Headworks, and Debris Dam; and prevent flood damage to downstream communities. The Project would be partially funded by a State of California Proposition 1E Stormwater Flood Management Grant and would also be funded by assistance from the City of Arcadia, the City of Sierra Madre, and the Raymond Basin Management Board.

In addition to improving infrastructure for flood protection, the Project would contribute to regional efforts to reduce dependence on imported water supplies by providing increased opportunities to infiltrate storm flows emanating from the Santa Anita Canyon Watershed into the groundwater basin. The Metropolitan Water District of Southern California has estimated that Southern California could face a potential gap between water demand and supply of up to 1,300,000 acre-feet per year (afy) by the year 2025 if new water supply projects are not developed (LACFCD 2011).

The Greater Los Angeles County Integrated Regional Water Management Plan (IRWMP) includes regional objectives to promote an integrated, multi-benefit, inter-regional approach to water management and planning. Objectives of the IRWMP include (1) sustaining infrastructure for local communities to maintain and enhance public infrastructure related to flood protection, water resources, and water quality and (2) improving water supply to optimize local water resources to reduce the Greater Los Angeles Region's reliance on imported water. The Project had been identified in the IRWMP as one of the regional-level projects that could help to increase recharge of the local groundwater basin and thereby increase local water supplies (IWRMP 2006).

2.3 <u>EXISTING OPERATIONS</u>

2.3.1 DAM

The Dam, completed in 1927, is located within the Angeles National Forest and was designed to capture stormwater runoff and associated debris and to attenuate (reduce) peak runoff flow rates from the upper 10.8 square miles of the Santa Anita Canyon Watershed. The Dam is a constant-angle concrete arch dam located 2.5 miles north of the City of Arcadia in the San Gabriel Mountains. The Dam is 225 feet high and 612 feet long and has a sluice gate, 3 outlet control valves, and 3 uncontrolled (i.e., ungated) spillways. The Dam was originally designed to hold a maximum reservoir pool of water at a surface elevation of approximately 1,316 feet above mean sea level (msl). As shown in Exhibit 2-2, Project Site Aerial and Watershed, the Dam and the

facilities immediately adjacent to the Dam (including the existing Dam Operator's house and storage shed) are located on land owned by, and within the jurisdiction of, the USFS. The area to the west of the Dam (including most of the access road, upper and lower water tanks) is located in an inholding area,[2] which is not under the jurisdiction of the USFS.

In addition to the dual purposes of the Dam noted above, the Dam also serves as a settling pool to remove sediment from inflows to ensure that the water quality is adequate for the downstream spreading grounds, which are described below. The Dam, which is under the jurisdiction of the California Department of Water Resources Division of Safety of Dams (DSOD), provides flood protection to the Cities of Arcadia, Monrovia, Temple City, El Monte, and unincorporated areas of Los Angeles County.

Since 1979, the DSOD has restricted long-term water storage in the reservoir behind the Dam to ensure the facility's compliance with the agency's seismic stability requirements since the Dam does not meet current standards for withstanding a maximum credible earthquake (MCE) or safely passing a probable maximum flood (PMF). In 2006, the DSOD established restrictions limiting the maximum reservoir pool to a surface elevation of 1,230 feet above msl but with a temporary maximum water surface elevation of 1,258 feet above msl until the completion of the sediment removal project and new riser construction (which would free drain the reservoir's water surface elevation to 1,230 feet above msl).

The LACDPW initiated the sediment removal project in the summer of 2009. Approximately 330,000 cubic yards of sediment were removed from the reservoir to maintain functionality to the Dam's valves and to meet DSOD's requirements for drawing down the reservoir to the restricted level after storms and during an emergency. The sediment removal was completed in fall 2012.

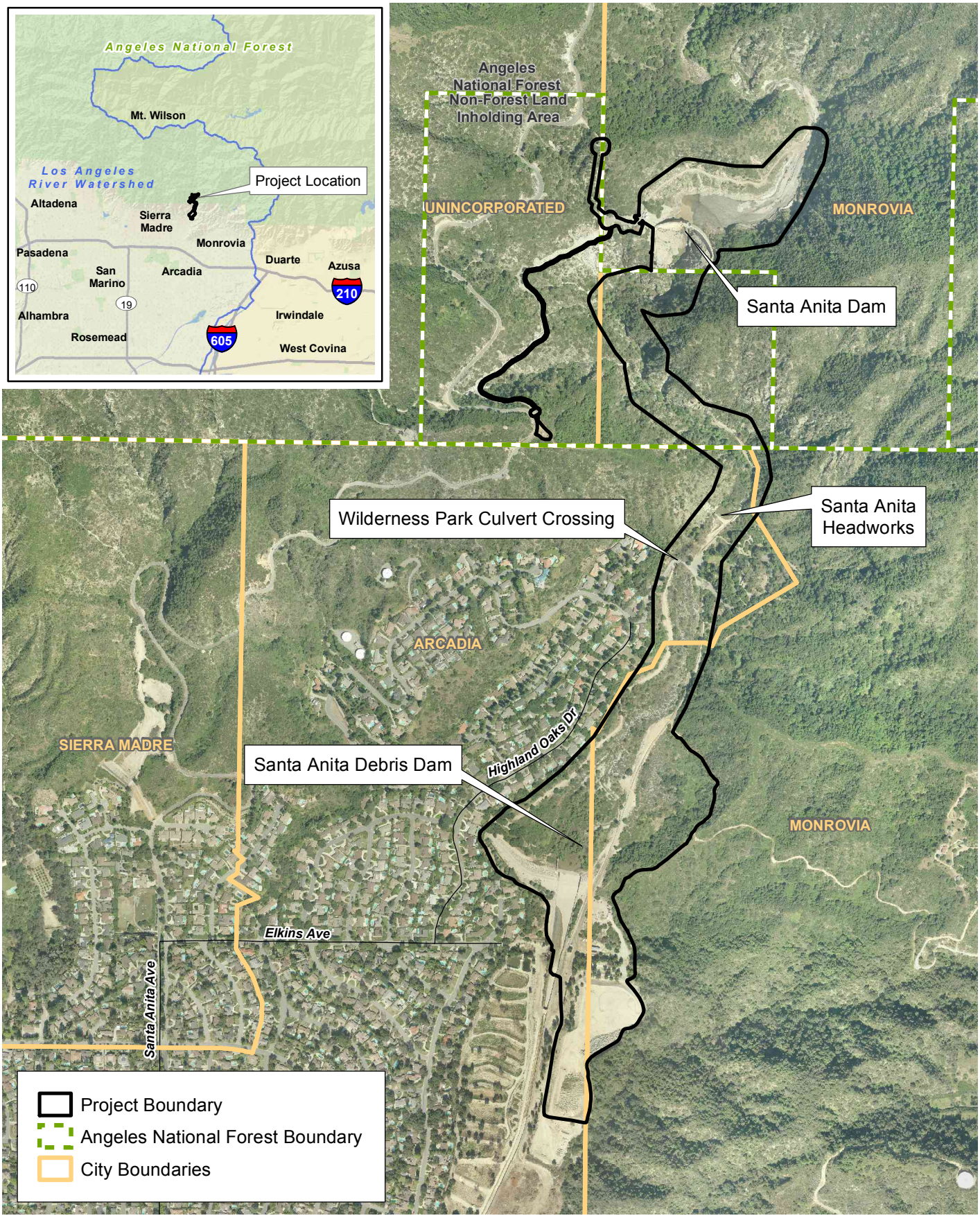
Concurrent with the sediment removal activities, the LACDPW modified the riser on the Dam's sluice gate to allow water above an elevation of 1,230 feet above msl to freely pass through the Dam, thus ensuring that DSOD's seismic requirements could be met. To make use of the impounded water below an elevation of 1,230 feet above msl, when conditions allow, the LACDPW also installed additional slide gates on the existing risers for the valves.

2.3.2 HEADWORKS

The Headworks structure is located downstream of the Dam, just south of and outside of the Angeles National Forest boundary, and upstream of the Debris Dam in the City of Arcadia. The Headworks intercepts flows released from the Dam and can redirect portions of those flows through a single 30-inch diameter reinforced concrete pipe (RCP) and into the Santa Anita Spreading Grounds and/or the Sierra Madre Spreading Grounds, where the water can be recharged into the local groundwater basin (Raymond Basin). The Santa Anita Spreading Grounds are located just downstream of the Debris Dam, approximately 0.75 mile south of the Headworks. The Sierra Madre Spreading Grounds are located approximately 1.5 miles southwest of the Headworks. The Headworks primarily consists of an earthen levee; a bypass channel with a tainter gate; and two 4-foot electric motor-operated slide gates. Although there are 2 slide gates at the Headworks, they both flow into the single 30-inch diameter RCP.

The RCP runs along the channel and then heads west along Grandview Avenue. Flows diverted by the Headworks into the 30-inch diameter RCP continue downstream toward the Sierra Madre Spreading Grounds. Along the way, there is a lateral "tee" structure near the Santa Anita

[2] Inholdings are lands located within the boundaries of national forests held by private or other non-USFS landowners. Inholdings may be managed by other federal agencies; State, County, local, or tribal governments; private individuals; or corporate entities.



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Project Site Aerial and Watershed

Exhibit 2-2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

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Spreading Grounds where two manually operated valves can allow regulated water into Santa Anita Spreading Grounds. However, flows that are not diverted into the 30-inch diameter RCP at the Headworks continue through to the Debris Dam downstream. Once the water is at the Debris Dam, it can be sent to the Santa Anita Spreading Grounds or released into Santa Anita Wash.

The operation of the Headworks is impeded when the Dam outflow exceeds 75 cubic feet per second (cfs), which is the maximum capacity of the Headworks' tainter gate. Any flow not diverted to the spreading grounds continues past the tainter gate downstream past the Wilderness Park to the Debris Dam. Currently, whenever changes to the flows to be delivered to either of the spreading grounds are needed, field crews must be contacted and dispatched to make manual adjustments to the gates.

As flows approach 75 cfs, the tainter gate must be fully opened to prevent damage, which prevents flows from reaching the Sierra Madre Spreading Grounds; in this situation, the flows continue downstream into the Debris Dam. This occurs several times annually and prevents water-conservation activities at the Sierra Madre Spreading Grounds. As flows recede, the tainter gate can again be operated, allowing water conservation activities to resume. When flows exceeding 300 cfs are released from the Dam, the Headworks' earthen levee can be overtopped and potentially lead to the levee's failure. Flows of this magnitude are expected to occur during a two-year storm event (a storm event likely to occur every two years); when this does occur, water can no longer be diverted by the Headworks to the spreading grounds until repairs are made to the levee. Repairs to the levee usually take a few days or several weeks depending on the amount of residual flows and stormwater runoff required to be released from the Dam. This delay results in further loss of groundwater recharge opportunities at the spreading grounds. When the levee washes out, the flows can also wash out the road and Wilderness Park Culvert Crossing that provides access to the Wilderness Park, located approximately 450 feet downstream of the Headworks.

2.3.3 DEBRIS DAM

The Debris Dam is formed by a 56-foot-high earth embankment dam that was constructed in 1960 by the U.S. Army Corps of Engineers (USACE) for flood control, debris control, and water conservation purposes. The majority of the Debris Dam facility is located within the City of Arcadia, with a small portion located within the City of Monrovia city limit.

The Debris Dam, whose original design capacity is 119 acre-feet, is located just over 1 mile downstream of the Dam. The Debris Dam has a spillway consisting of an ungated, concrete-lined rectangular open channel, located within the embankment near the east abutment. The spillway is approximately 160 feet wide and has a capacity of 38,000 cfs, which is adequate to pass the PMF. The outlet works allow water that is below the spillway elevation to be sent from the Debris Dam to the Santa Anita Spreading Grounds or into the Santa Anita Wash below the Debris Dam. After its completion, the Debris Dam was transferred from the USACE to the LACFCD for operation and maintenance. The Debris Dam became subject to jurisdiction of DSOD in 1982.

In 1995, following a seismic safety study, the DSOD determined that the Debris Dam did not meet standards for seismic safety and required the outlet gate to remain open at all times to limit storage of water above 761 feet above msl. Since then, regular water conservation activities involving long term reservoir storage at the Debris Dam have ceased and it serves primarily to capture debris flows from the portion of the watershed between the Dam and the Debris Dam. The seismic constraint, however, allows for the temporary impoundment of storm inflows up to the capacity of the reservoir, with the water level to be returned to an elevation of 761 feet above msl as soon as practicable after each storm event. This return to the restricted elevation is accomplished gradually.

The Debris Dam provides flood protection by capturing sediment-laden stormwater runoff, allowing sediment to settle out in the Debris Dam, and discharging clear stormwater runoff to the channel downstream or into the Santa Anita Spreading Grounds. If the Debris Dam were to sustain damage or to fail as a result of seismic activity, debris would be released and deposited in the downstream channel, reducing its ability to safely convey subsequent storm flows in the channel; this could result in flood damage to downstream communities. In addition, a Debris Dam failure would wash out the Santa Anita Spreading Grounds and render them incapable of recharging stormwater runoff into the underlying groundwater basin.

2.3.4 PROJECT SITE AND SURROUNDING AREA CHARACTERISTICS

Land Uses

The Santa Anita Canyon Watershed, which contains the Project site, is mostly undeveloped. The majority of the watershed is located in the Angeles National Forest within the San Gabriel Mountains, which are very steep and among the most highly erosive mountains in the world. This watershed is also susceptible to wildfires, which can result in substantial debris flows during subsequent storm events. Land uses adjacent to the Project area include the natural open space and mountains in the Angeles National Forest (i.e., San Gabriel Mountains) to the north; the recreational and open space uses associated with the Wilderness Park and City of Monrovia to the east; and City of Arcadia single-family residential uses to the south and west.

The USFS Chantry Flats Recreation Area is located approximately one mile above the Dam north on Chantry Flats Road. This recreation area contains a large picnic area and trailheads for many popular hiking trails. The gate on Chantry Flats Road, which leads to Chantry Flat Recreation Area, is open daily from 6:00 AM to 10:00 PM, and a U.S. Forest Adventure Pass is required for parking and day use in this area. The Santa Anita Reservoir and Dam can be viewed from some of the hiking trails that are located above the Reservoir and Dam.

The Dam is located within the Angeles National Forest and is zoned as “Back Country Motorized Use Restricted” by the USFS Land Management Plan (USFS 2005b). The portions of the Project located within the City of Arcadia, including the Headworks and the Debris Dam, are designated by the *Arcadia General Plan* as Public Facilities and Grounds (P) (Arcadia 2010b). Current zoning for the site is Residential Mountainous (R-M), as defined by the City of Arcadia Zoning Code (Arcadia 2010a). The eastern slope of the Debris Dam that is located in the City of Monrovia is designated Hillside Wilderness Area in the General Plan and zoned as Hillside Wilderness Preserve (Monrovia 2012).

Exhibit 2-2, Project Site Aerial and Watershed, provides an aerial depiction of the locations of notable features of the Project site. The Dam is located at the southern margin of the San Gabriel Mountains. There are no residential land uses adjacent to the Dam, with exception of the home of the Dam Operator, an LACFCD employee. The nearest residences to the Dam are located approximately 0.4 mile to the south on Highland Vista Drive. The Dam site has an office building/relief quarters, control house, parking lot, and a paved road that serves as the primary access road to the Dam site off Chantry Flats Road, and continues to run along the west side of the reservoir down to the reservoir floor. Running from the base of the reservoir through approximately 1,500 feet of solid rock is a tunnel used for sediment removal via a conveyor belt system.

The Headworks structure is located approximately 0.5-mile downstream of the Dam on the border of the Angeles National Forest and the City of Arcadia and is accessed off Highland Oaks Drive through the adjacent Wilderness Park. The Wilderness Park is a 120-acre nature preserve located below Big Santa Anita Canyon, which is owned and managed by the City of Arcadia. Park access

is provided by the Wilderness Park Culvert Crossing downstream of the Headworks. The Park consists of a passive recreation area on 8.5 acres, and the balance of the preserve remains in its natural state. The park includes a Nature Center, a multi-purpose field, nature trails, a stream, picnic and barbeque areas, a fire circle, and restrooms. The nearest residences to the Headworks are approximately 0.2 mile to the southwest of the Headworks, along Highland Oaks Drive. To the east and south of the park is City of Arcadia open space.

The Debris Dam is located approximately 0.5 mile downstream of the Headworks in the Cities of Arcadia and Monrovia, and can be accessed via a maintenance road that runs along the channel. Single-family residences line the western edge of the Debris Basin and Debris Dam, with the nearest home approximately 200 to 400 feet away from the Debris Dam spillway, where most of the construction will take place. To the east of the Debris Dam is City of Monrovia open space.

Topography and Geology

Santa Anita Canyon is located at the southern margin of the San Gabriel Mountains, which is part of Southern California's Transverse Ranges physiographic and geologic province. The crest of the Dam is located at an elevation of approximately 1,325 feet above msl. Further downstream, the Headworks and Wilderness Park Culvert Crossing are at approximately 870 feet above msl and the Debris Dam is at approximately 774 feet above msl.

The Dam is located at the upper end of the Santa Anita Canyon. The canyon walls are composed of granitic bedrock. Near-surface bedrock is moderately to highly weathered and very closely fractured by joint sets and numerous minor shears. Alluvial materials overlie the granitic bedrock along the canyon floor and consist of older terrace deposits and recent streambed deposits of the Santa Anita Wash.

This province is one of the most seismically active regions in California. The Sierra Madre Fault, a reverse fault that is considered capable of producing an earthquake with a probable magnitude of 6.0 to 7.5 on the Richter Scale, runs through the Project site approximately 1,000 feet (300 meters) south of the Dam and near the Headworks. The Raymond Fault is predominantly a left-lateral strike-slip fault and is thought to be capable of a 6.5 magnitude earthquake. The San Andreas Fault, a strike-slip fault that is considered capable of producing an earthquake with a probable magnitude of 6.8 to 8.0 on the Richter Scale, is located about 20.5 miles northeast of the Dam (SCEDC 2013). These and other active faults near the Dam are considered capable of producing significant seismic shaking at the site.

Hydrology and Drainage

As shown on Exhibit 2-2, Project Site Aerial and Watershed, the Project site is located within the 834-square-mile Los Angeles River Watershed. The upper 360-square-mile portion is covered by forest or open space, and the remaining 474 square miles are developed with highly urbanized land uses (LACDPW 2013).

Surface runoff from the Santa Anita Canyon Watershed drains along natural courses towards the Santa Anita Wash, which runs north-south beginning at Dam. The purpose of the Dam is to decrease peak flood flow by retaining stormwater and discharging it at controlled release rates. The released flows continue downstream to the Headworks facility, which intercepts the creek flows and either allows the flows to continue downstream to the Debris Dam; to be diverted to the Sierra Madre Spreading Grounds; or to be diverted to into the Santa Anita Spreading Grounds.

Flows into the Debris Dam can be temporarily retained to allow for the deposition of sediment and debris. Flows can be diverted to the Santa Anita Spreading Grounds, where the water is then recharged into the Raymond Basin, or flows can be released to the Santa Anita Wash Channel. The Raymond Basin stretches 41 square miles and is bound by the City of La Cañada Flintridge and the San Rafael Hills on the west; Santa Anita Canyon on the east; the San Gabriel Mountains on the north; and the Raymond Fault on the south. Recharge to the Raymond Basin mainly occurs from direct percolation of precipitation and percolation of ephemeral creek flow from the San Gabriel Mountains. Historic high groundwater levels in the Project area range from less than 40 feet below ground surface in the lower portion of the project area to greater than 100 feet below ground surface in the upper portion of the Project area (DWR 2004).

Water that is not diverted to the Santa Anita Spreading Grounds and which overtops the Debris Dam spillway during storm events is conveyed in a concrete-lined channel that is a tributary of the Rio Hondo, which hydraulically connects the Los Angeles and San Gabriel River Watersheds through the Whittier Narrows Reservoir. Water in the Rio Hondo eventually flows to the Los Angeles River near the City of Downey.

The Federal Emergency Management Agency Flood Insurance Rate Map indicates that the Project site is located in Flood Zone D, which means there are possible but undetermined flood hazards. The majority of the Project area is located within the inundation hazard area of the Dam (Arcadia 2010b).

Biological Resources

Exhibit 4-1 from Section 4.4, Biological Resources, depicts the vegetation communities in the Project area. The area surrounding the Dam is undeveloped and comprised of natural vegetation types, including southern mixed chaparral and mixed coastal sage scrub, as well as unvegetated cliff faces. The area along Santa Anita Canyon between the Dam and the Headworks consists of a canyon with vertical walls or very steep slopes that are either unvegetated or dominated by dense chaparral. Further downstream towards the Debris Dam, vegetation types include mixed coastal sage scrub, southern mixed chaparral, southern cottonwood willow riparian forest, southern sycamore alder riparian woodland, southern riparian forest, sycamore alluvial woodland, mule fat scrub, coast live oak woodland, mixed woodland, oak woodland, ornamental, and ruderal (weedy) vegetation (BonTerra 2014b).

The Project area is comprised primarily of native habitats and provides suitable habitat for a number of special status plant and wildlife species. A full list of all special status plant and wildlife species that have been reported on the site, as well as a summary of their potential to occur in the Project area and whether or not they were observed during focused surveys, is provided in Section 4.4, Biological Resources.

Two special status plant species were observed in the Project area during the 2012–2013 surveys: Engelmann oak (*Quercus engelmannii*) and Coulter's matilija poppy (*Romneya coulteri*). No other special status plant species are expected to occur in the Project area either due to lack of suitable habitat or based on the results of the 2012–2013 focused surveys.

Special status wildlife species observed in the study area during the 2009 or 2012 focused surveys included coastal whiptail (*Aspidoscelis tigris stejnegeri*), two-striped garter snake (*Thamnophis hammondii*), yellow warbler (*Setophaga petechia*), yellow-breated chat (*Icteria virens*), and Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*). Additionally, 24 special status wildlife species have potential to occur in the Project area based on the presence of suitable habitat.

Project Site Photographs

Existing facilities on the Project site are identified in Exhibit 2-3A, Site Photographs – Dam; Exhibit 2-3B, Site Photographs – Headworks; Exhibit 2-3C, Site Photographs – Wilderness Park Culvert Crossing; and Exhibit 2-3D, Site Photographs – Debris Dam. A description of each photo is provided in the caption.

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Photo 1: This photograph depicts the Dam structure looking north, taken from the private access road that leads to the Dam. As shown, the Dam is surrounded by steep rocky slopes, with the downstream slopes armored in concrete. Also shown are the Dam Keepers house and other accessory structures on the western edge of the Dam.

Photo 2: This photograph is a close up of the Dam structure looking east. It depicts the downstream side of the Dam, and the concrete armored east slope, as well as the upstream side of the Dam, which was dewatered at the time the photograph was taken for the sediment removal project. At the center of the Dam is the existing spillway crest and Hydraulic Power Unit. The control house is shown at the bottom of the picture.

Photo 3: This photograph depicts the plunge pool south of the Dam structure. The flow continues downstream towards the Headworks and Debris Dam. As shown, both sides of the canyon are armored in concrete. The access staircase that allows for the periodic maintenance is also depicted.

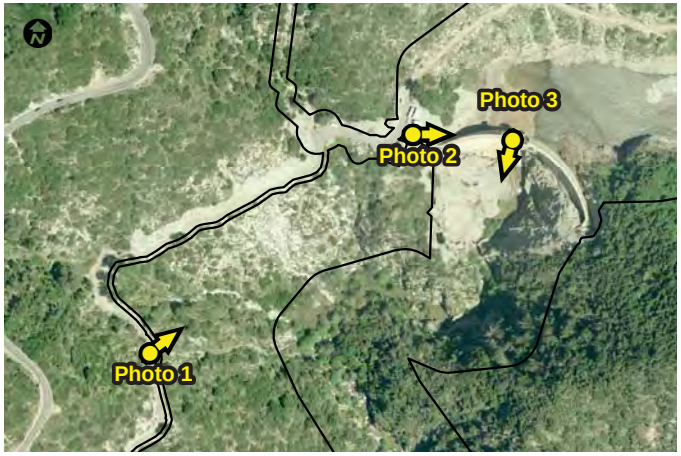

Photo location map.

Photo Location and Direction
Project Boundary

Site Photographs – Dam

Exhibit 2-3A

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

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Photo 4: This photograph depicts the Headworks structure looking west from the adjacent access road. As shown, the Headworks primarily consists of an earthen levee, a bypass channel with a tainter gate, and two 4-foot, electric motor operated slide gates that divert flow to the spreading grounds. Also depicted is the steep vertical canyon wall, which is armored with concrete, as well as the vegetation that lines the watershed.

Photo 5: This photograph is a close up of the existing tainter gate within the Headworks structure. As shown, the tainter gate is open, allowing for flows to continue downstream toward the Debris Dam.

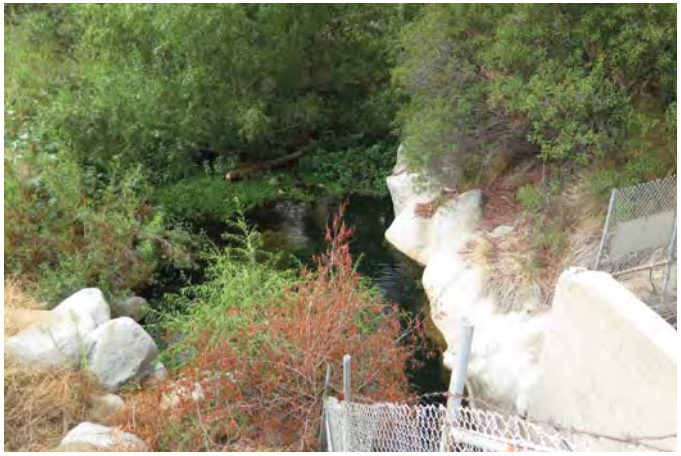

Photo 6: This photograph depicts the downstream side of the Headworks structure. As shown, the flow continues downstream past the Wilderness Park Bridge and towards the Debris Dam.

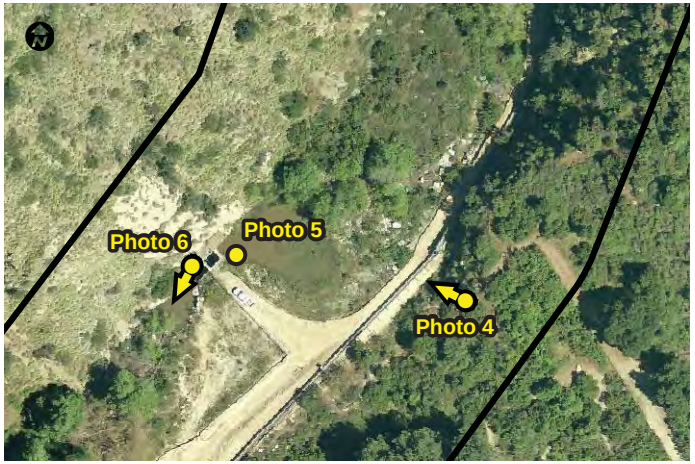

Photo location map.

Photo Location and Direction
Project Boundary

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Site Photographs – Headworks

Exhibit 2-3B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(Rev: 04/17/2014 CJS) H:\PAS\Projects\CoLADPW\J166\Graphics\MND\Ex2-3B_SP.pdf

Photo 7: This photograph depicts the Wilderness Park Bridge that connects to the Wilderness Park looking west from the parking lot. This bridge provides the only public access to the Park. Immediately downstream of the bridge is a large sycamore tree.

Photo 8: This photograph is a close up of the Wilderness Park Bridge looking west. Shown are the removable guardrail and corrugated metal culverts that run under the bridge. Also shown is the sewer line that runs along the side of the bridge.

Photo 9: This photograph depicts the Wilderness Park Bridge looking east. The bridge leads directly to the Wilderness Park parking lot. To the north of the parking lot is the gated access road that leads to the Headworks (not shown). To the south of the parking lot is Clamshell Truck Trail, which provides private access to the Debris Dam (not shown).

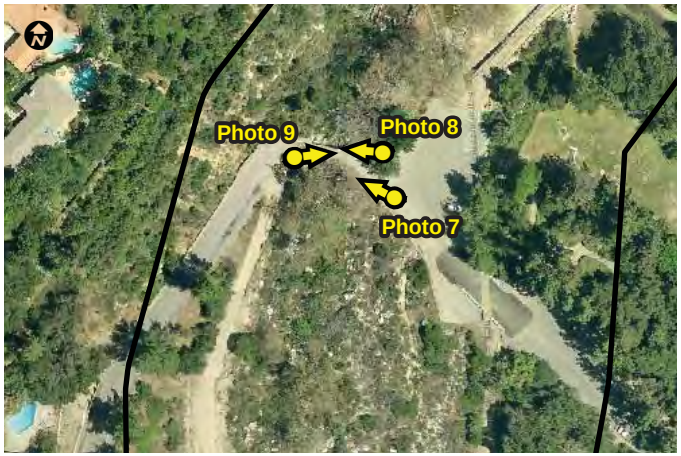

Photo location map.

Photo Location and Direction
Project Boundary

Site Photographs – Wilderness Park Culvert Crossing

Exhibit 2-3C

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(Rev: 04/17/14 CJS) H:\PAS\Projects\CoLADPW\J166\Graphics\MND\Ex2-3C_SP.pdf

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Photo 10: This photograph depicts the Debris Dam embankment looking west. The Debris Dam allows for the temporary impoundment of storm inflows up to the capacity of the reservoir. Also shown are the City of Arcadia residences that line the western edge of the Debris Basin.

Photo 11: This photograph depicts the existing spillway located on the eastern side of the Debris Dam. The spillway consists of an un-gated, concrete-lined rectangular open channel that is approximately 160 feet wide. Also shown is the eastern abutment of the Debris Dam, which is a hillside vegetated with Coast Live Oak Woodland/Southern Mixed Chaparral.

Photo 12: This photograph depicts the Debris Dam looking north. As shown, the spillway continues into a concrete-lined channel that is a tributary of the Rio Hondo, which hydraulically connects the Los Angeles and San Gabriel River Watersheds through the Whittier Narrows Reservoir. A maintenance road runs along the western edge of the spillway and continues to the spreading grounds to the south. Also shown is the hillside on the eastern abutment of the spillway.

Photo location map.

Photo Location and Direction
Project Boundary

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Site Photographs – Debris Dam

Exhibit 2-3D

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

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SECTION 3.0 PROJECT DESCRIPTION

3.1 PROJECT COMPONENTS

3.1.1 DAM

The Dam would be structurally altered to accommodate a new spillway with sufficient capacity to pass the PMF of 26,100 cfs in order to reduce the risk of Dam failure from uncontrolled overtopping during major storm events. The proposed improvements to the Dam would not result in changes to the existing maximum water surface elevation restrictions; therefore, the reservoir's capacity to retain water would not be altered by Project implementation.

The spillway modification would consist of cutting a "notch" in the Dam crest to allow the PMF to overtop in a controlled manner. An overview of the design concept is illustrated on Exhibit 3-1, Dam Spillway Modification Plan. This exhibit provides a "bird's eye" view of the Dam structure, the existing spillway, and the slope armoring on the downstream side. The existing auxiliary spillway bowl and trash rack and existing emergency crest spillway would be removed. As shown on Exhibit 3-2, Dam Spillway Modification Cross-Section and Profile, the proposed notch would be centered on the crest of the Dam, similar to the existing emergency crest spillway, and would require concrete removal from the Dam. An existing spillway on the far western edge of the Dam would remain and be unaltered by the Project; however, the existing auxiliary orifice spillway beneath the proposed new spillway would be removed.

A new pedestrian bridge would be constructed over the notch and the existing hoist system would be upgraded to have a higher load capacity and re-aligned to accommodate the new spillway. The upgrade work includes the relocation of the lower hoist tower along the Dam crest (and potentially cantilevered of the back side, if necessary). The proposed improvements would not change the height of the Dam; the crest of the Dam would remain at an elevation of 1,325 feet above msl and the parapet wall would remain at an elevation of 1,328 feet above msl.

To better manage stormwater runoff and to ensure reliability and efficiency of operations, six of the existing valves would be replaced (three control valves and three backup valves, see the downstream elevation in Exhibit 3-2), along with new electrical and control systems. The Dam's structural concrete would be repaired to ensure that it meets acceptable standards consistent with the required seismic performance of the Dam.

As shown on Exhibits 3-1 and 3-2, the downstream canyon walls and the toe of the Dam would be re-armored with additional reinforced gunite or equivalent concrete erosion protection to dissipate the energy from the potential overtopping water as the flow cascades through the spillway notch and the orifice spillway or sluiceway. The flow would be directed onto the downstream armoring before flowing into the channel downstream of the Dam. The new re-armoring would reinforce the existing armoring that extends approximately 100 feet downstream from the toe of the Dam. The re-armoring would be held in position with tie-back anchors to be drilled and grouted into the bedrock. The tie-ins for the re-armoring may include superficial rock excavation, grading, and subsurface pressure grouting. The color of the material used for re-armoring would be the same as the existing concrete.

The Project would also include improvements to ancillary facilities of the Dam, as shown on Exhibit 3-3A and Exhibit 3-3B, Dam Ancillary Facilities Improvements. The existing garage/storage shed would be demolished and replaced with a new three-bay garage (the third bay would house a new back-up generator). Additionally, the existing Dam Operator's house would be removed and replaced with a helipad to provide aerial access to the Dam in the event

of an emergency. It is anticipated that the helipad would only be used one or two times per year. The addition of a helipad would allow for improved emergency access to the Dam, as well as the other facilties downstream, especially if access roads get obstructed. The existing relief quarters and control house would remain to serve as an office. Although the Dam Operator would no longer reside at the Dam, he/she would still be on-site daily and available on-call after hours. The Project would include remote control capabilities that provide redundant control options from multiple off-site locations. The Dam also has a built-in safety mechanism to automatically pass water through the Dam once the reservoir surface level reaches the DSOD restriction.

The existing potable water system that serves the Dam site would be replaced. The water system currently consists of a 60,000-gallon upper tank located off Chantry Flats Road that connects to two 5,000-gallon lower tanks located near the Dam access road via a pipeline that runs down the mountainside. The slope adjacent to the upper tank has erosion damage and would be repaired as part of the Project. To repair the slope, an approximate 216-square-foot eroded gully located near the tank's foundation would be grubbed and stabilized with engineered fill and geotextile fabric or with support piles. The exposed portions of the existing water pipeline would be removed while any underground portions would be capped and abandoned in place. The replacement pipeline would run along the same general alignment as the existing pipeline. The two lower tanks would be removed and would not require replacement.

The existing manual swing gate at Chantry Flats Road that provides secured entry to the Dam access road would be replaced with a new electric slide gate. In order to provide electricity to the gate and new lighting/intercom systems, a power line would be strung on up to seven new power poles to be installed along the outer edge of the Dam's access road, or where possible, in conduit along the inner slope of the access road. The proposed locations of these power poles are shown on Exhibit 3-3A.

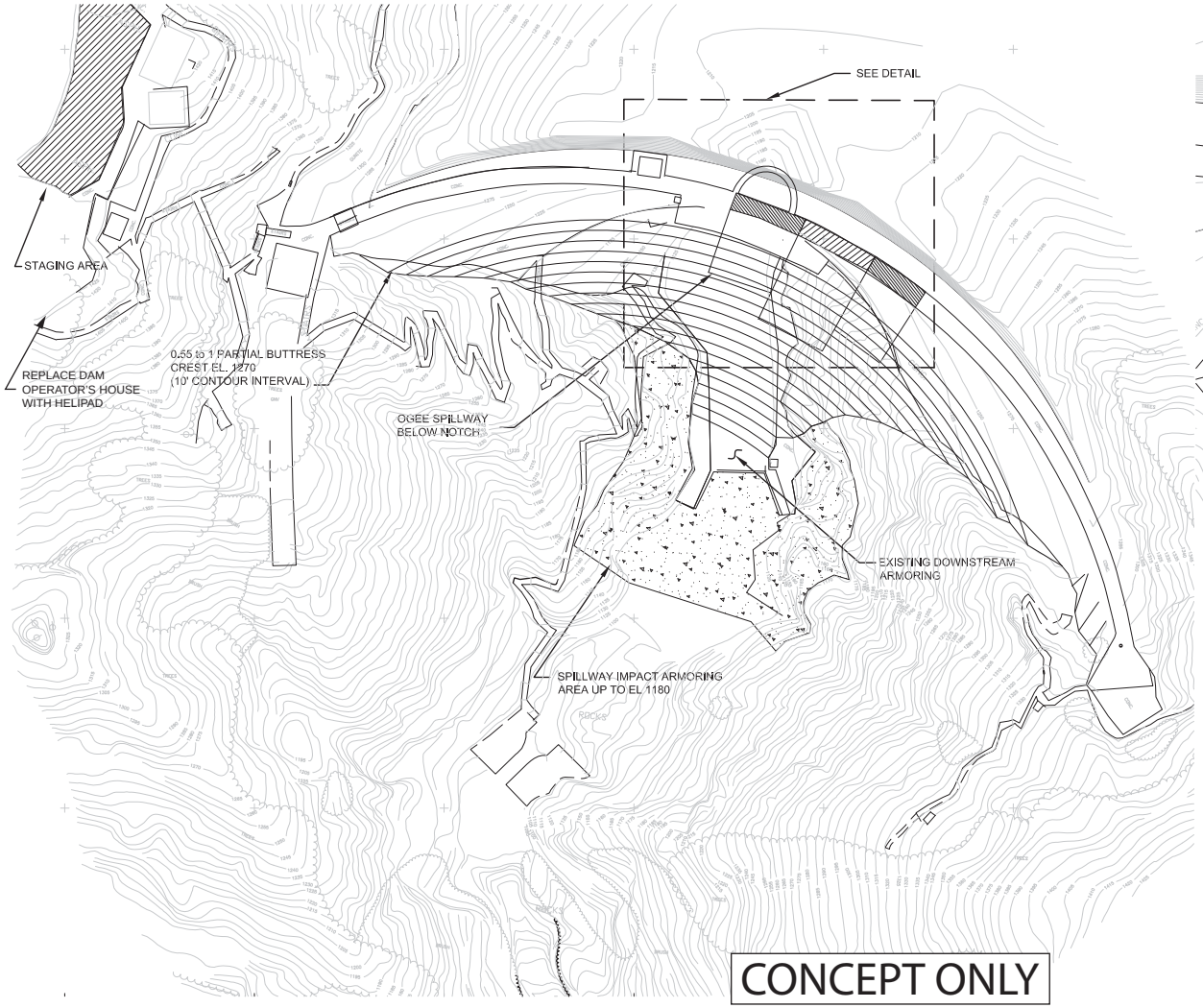
3.1.2 HEADWORKS AND WILDERNESS PARK CULVERT CROSSING

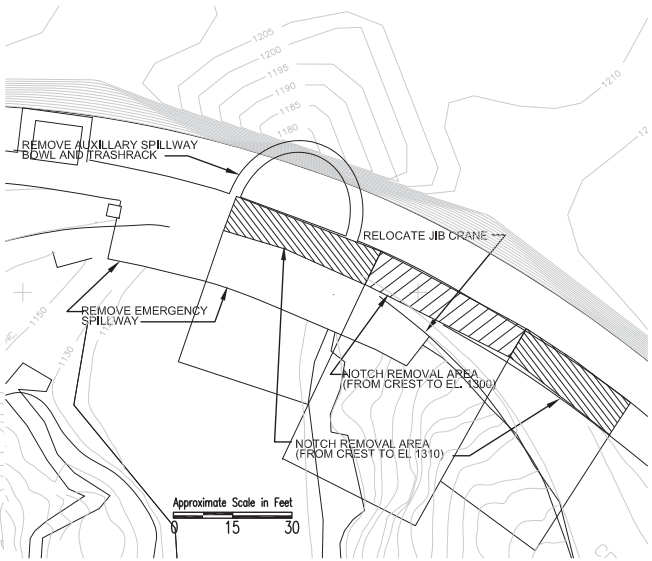
Headworks

The Headworks structure would be replaced and the associated earthen levee would be partially reconstructed to better manage the diversion of flows to the downstream spreading grounds and the downstream Debris Dam. A rehabilitation of the Headworks is needed to protect facilities from stormwater damage and to direct stormwater runoff to the spreading grounds for groundwater recharge.

Redevelopment of the Headworks would include reconstruction of the levee to ensure it can withstand flows produced by a 25-year storm event and replacement of the existing tainter gate (used to divert flows) with a new rubber diversion structure. The new rubber diversion structure would be a pneumatically operated, bottom hinged, spillway gate system. Exhibit 3-4, Headworks Modification Plan and Detail, depicts the proposed improvements superimposed over the existing facility design and two cross-sections of the proposed improvements.

The majority of the existing Headworks structure would be demolished and removed, including the tainter gate, supporting walls, catwalk, and keys. The new facility would increase the width of the structure by approximately 20 feet in order to house the 34-foot rubber diversion structure. Operation of the rubber diversion structure would result in the retention of waters behind the levee to allow for the diversion of flows through the intake gates and into the existing 30-inch RCP leading to the Santa Anita Spreading Grounds and/or Sierra Madre Spreading Grounds. The pool created by the new rubber diversion structure would remain the same as under existing conditions. Construction of the new diversion structure would require work in the creekbed





DETAIL 1

APPROXIMATE SCALE IN FEET
0 60 120

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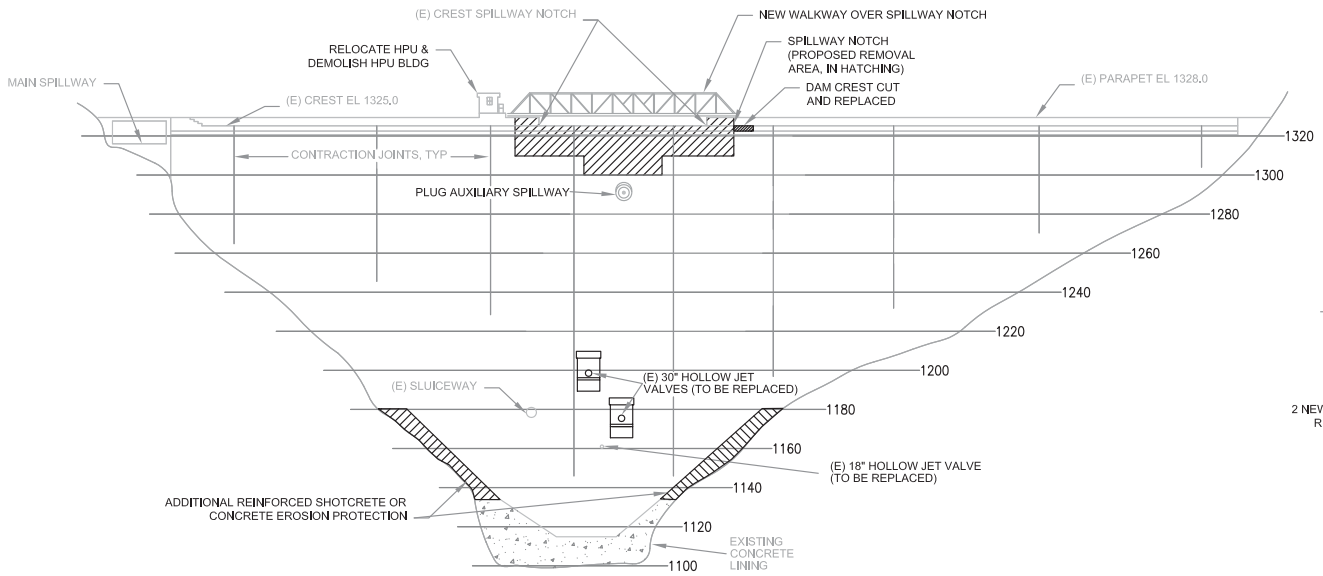
Dam Spillway Modification Plan

Exhibit 3-1

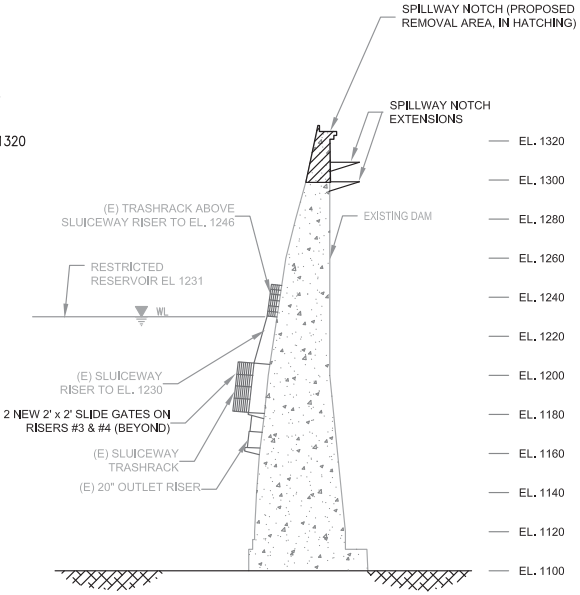
Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(Rev 05/17/13 MMD) Projects\CoLADPW\J166\Graphics\MND\ex_dam_mod_plan.pdf



DOWNSTREAM ELEVATION (DEVELOPED)



CROWN SECTION

CONCEPT ONLY

Note:
The proposed buttress shown on this conceptual plan is not a part of this Project.

APPROXIMATE SCALE IN FEET
0 60 120

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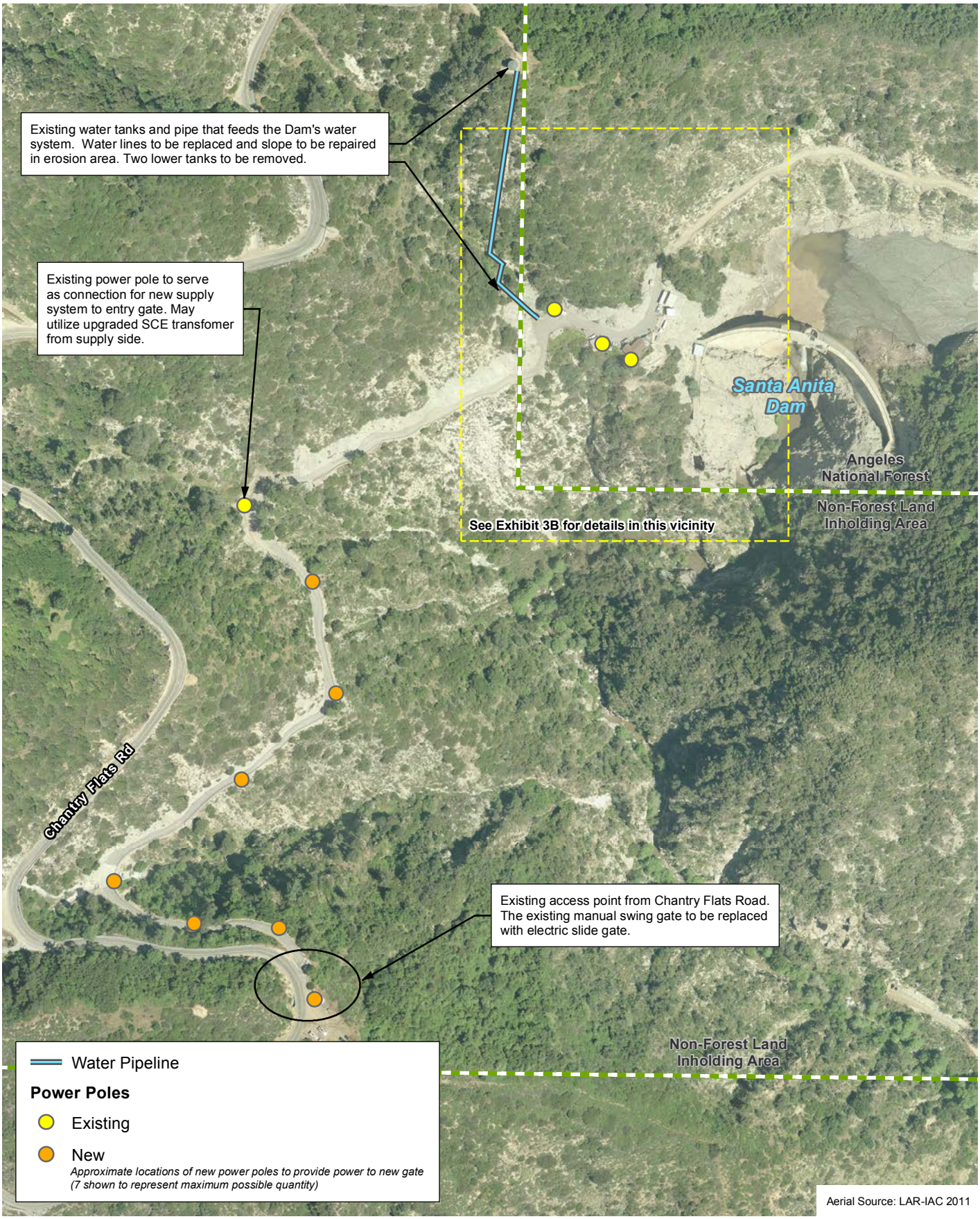
Dam Spillway Modification Cross-Section and Profile

Exhibit 3-2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(Rev 04/17/14 CJS) Projects\CoLADPW\J166\Graphics\MND\ex_dam_rehab_cross.pdf



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Dam Ancillary Facilities Improvements

Exhibit 3-3A

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

300 150 0 300 Feet

BonTerra PSOMAS

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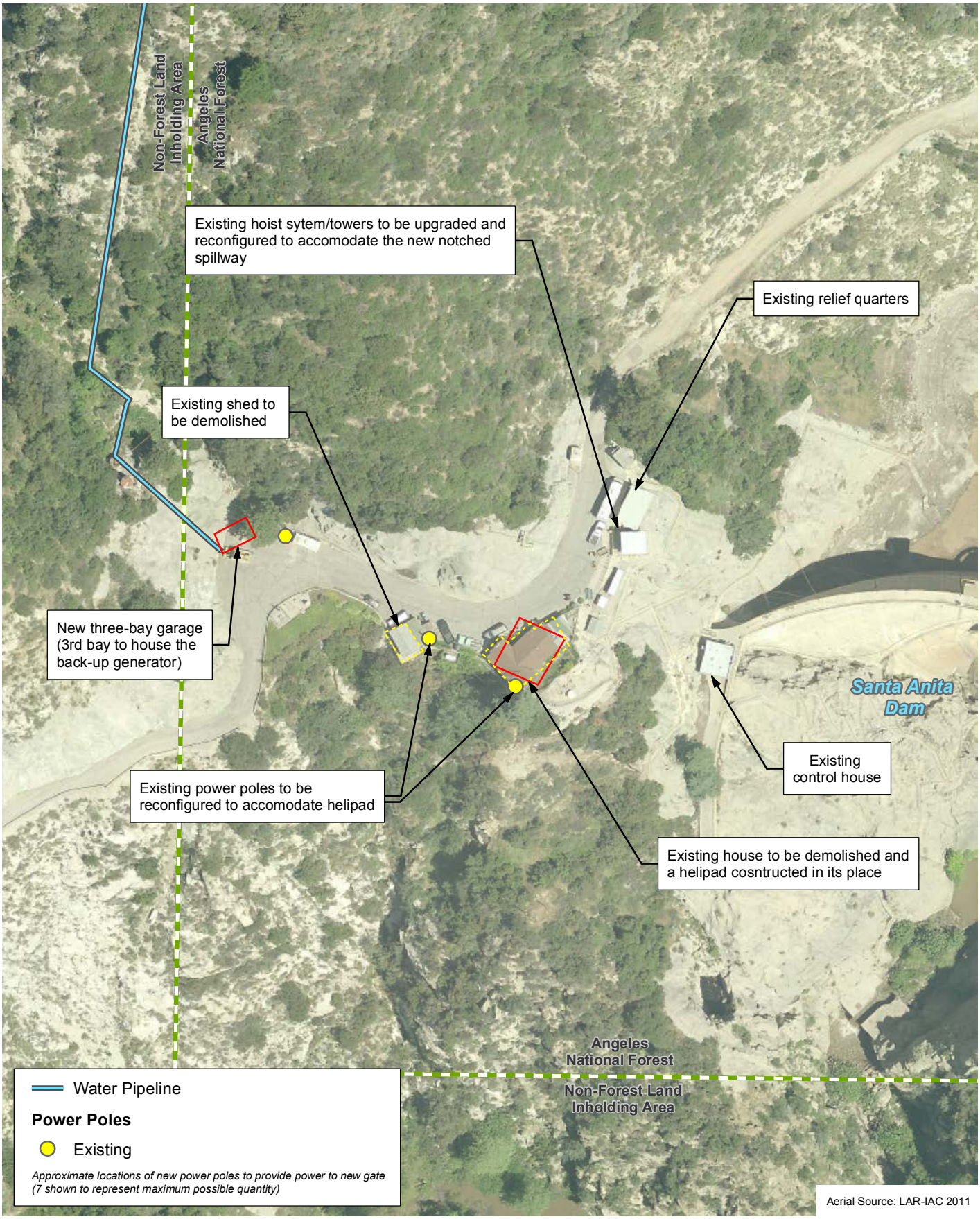

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Dam Ancillary Facilities Improvements

Exhibit 3-3B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

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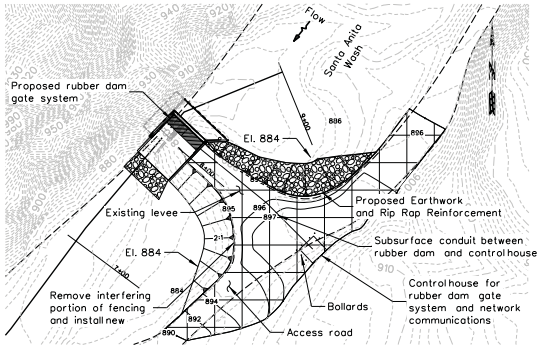
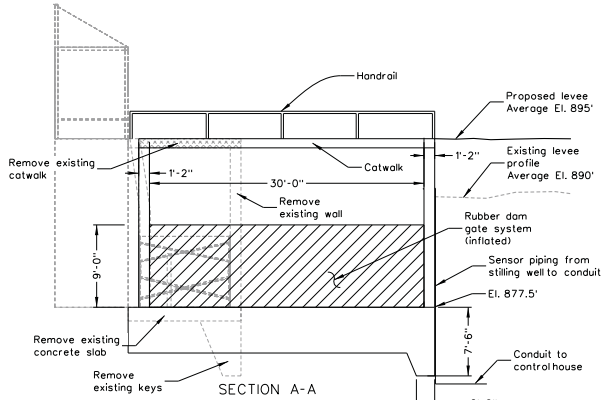
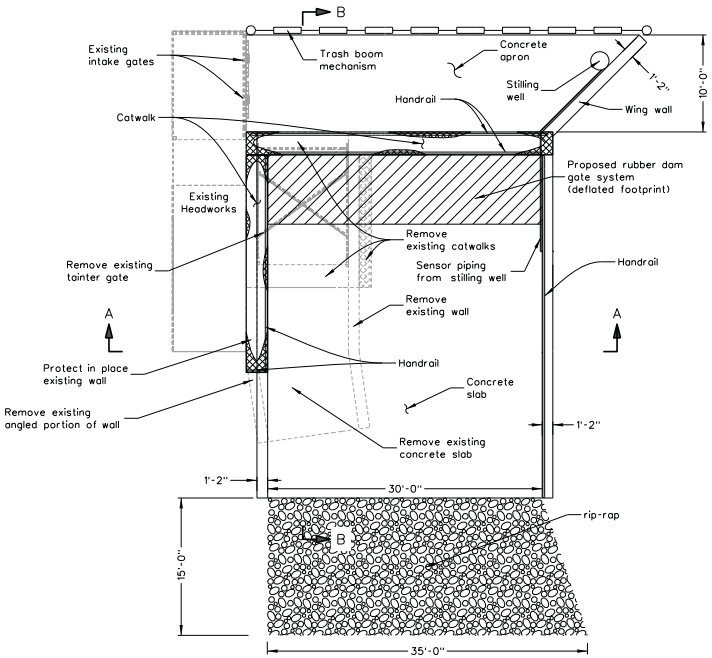


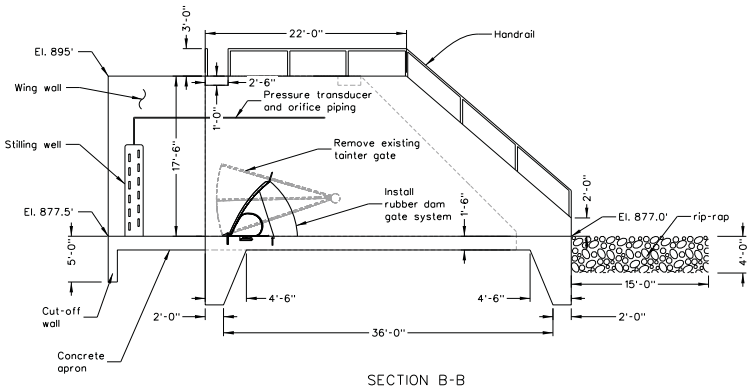
HEADWORK VICINITY AREA
SCALE: 1" = 40'



SECTION A-A
RUBBER DAM GATE SYSTEM
SCALE: 1" = 6'



HEADWORK PLAN VIEW
RUBBER DAM GATE SYSTEM
SCALE: 1" = 6'



SECTION B-B
RUBBER DAM GATE SYSTEM
SCALE: 1" = 6'

CONCEPT ONLY

Headworks Modification Plan and Detail

Exhibit 3-4

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(Rev 09/23/14 JAZ) Projects\CoLADPW\J166\Graphics\MND\ex_headworks_mod_plan.pdf

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extending approximately 25 feet downstream of the Headworks, including the placement of new riprap on the downstream side.

The rehabilitation of the Headworks would also include a new control system, including remote operation capabilities, to increase efficiency of water conservation operations. Currently, the response time required for County personnel to drive to the Headworks and manually operate the tainter gate, along with the limited flow rates that can be bypassed, results in the loss of a water conservation opportunity. A new control system integrated with the control system of the other Project components would optimize water conservation. A control house for the rubber diversion structure would be constructed on the other side of the channel next to the access road.

The earthen levee would be reinforced and raised approximately five feet higher to match the height of the Headworks structure by removing and under-excavating the existing levee and rebuilding the new levee using a combination of imported fill and suitable material from the existing levee. It would then be recompacted to the proposed height. The access road leading to the facility would be modified to match the height of the reinforced earthen levee. The existing riprap on the upstream side of the levee would be reinforced. A subsurface conduit would be installed along the length of the levee to connect the rubber diversion structure to the control house on the other side.

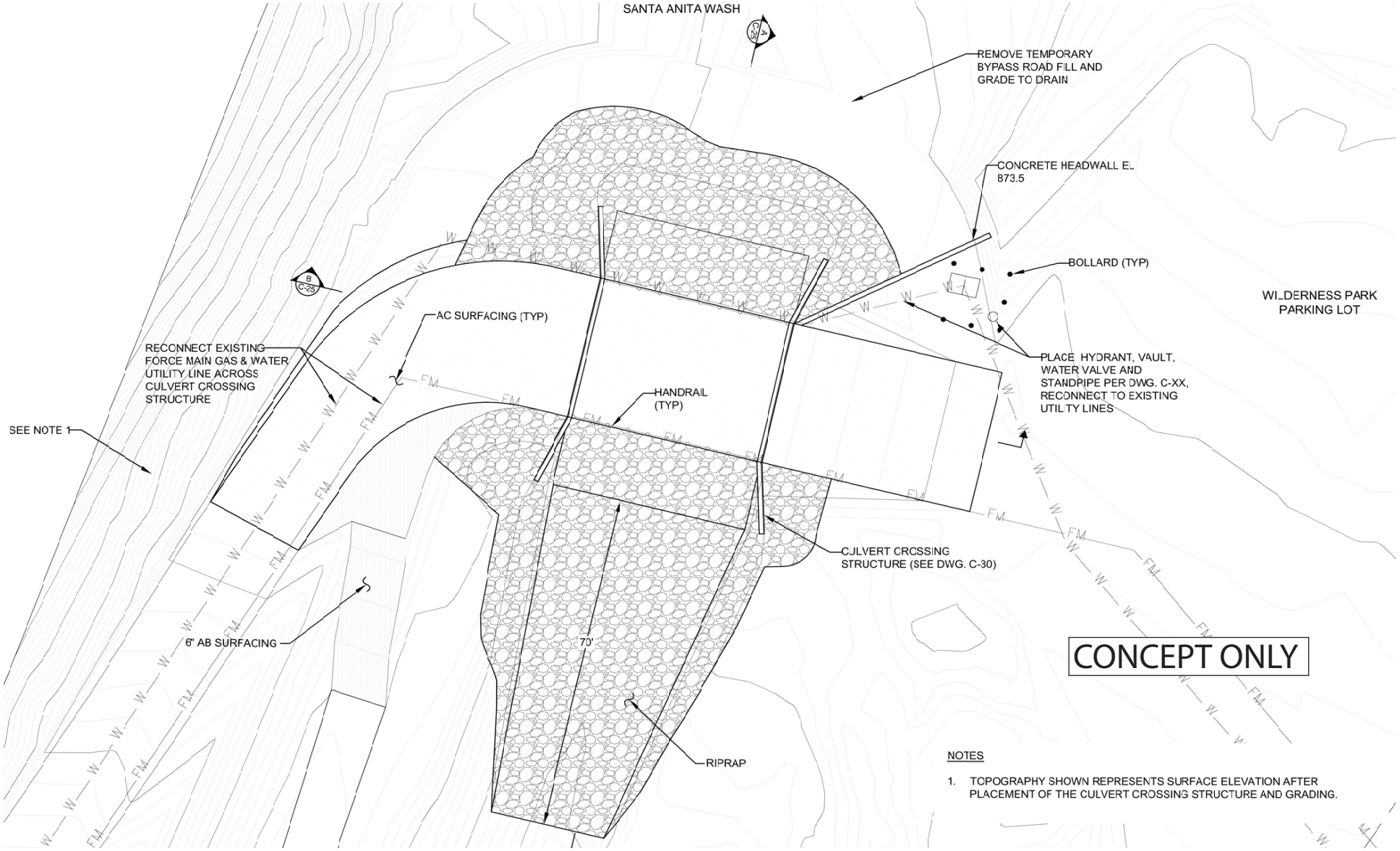
Wilderness Park Culvert Crossing

In addition to the improvements at the Headworks, armoring of the roadway and construction of a replacement Culvert Crossing to the Wilderness Park is needed to ensure that the structure can withstand flows produced by a larger storm event. The existing Culvert Crossing located approximately 450 feet downstream of the Headworks, including the concrete slab and corrugated metal culverts, would be removed and replaced with a new crossing structure.

Exhibit 3-5, Culvert Crossing Plan, depicts the preliminary engineering design for the proposed Culvert Crossing. As depicted, the Culvert Crossing would be approximately 30 feet wide on the deck plate, allowing for two-way traffic. The new Culvert Crossing would be built on top of a new abutment and would be designed with a permanent guard rail and flexible pavement driving surface adequate for emergency vehicles. The new roadway elevation of the Culvert Crossing would be raised above the existing roadway elevation by approximately 4.5 feet to accommodate higher flows. Approximately 1,800 square feet of the roadways leading to and from the Culvert Crossing would be repaved and sloped to join the existing grade.

Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing would be grubbed and graded to accommodate the new Culvert Crossing. It is anticipated that adequate vehicular and pedestrian access could be provided to the Arcadia Wilderness Park for the majority of the construction period for the Culvert Crossing, with only occasional closures required for periods of about a week or less at any given time during construction. Notification of any temporary closures would be posted at the entrance to the Wilderness Park. Those brief closures would avoid important events at the Wilderness Park, such as the overnight Boy Scout campouts every Friday and Saturday and youth day camps every weekday between mid-June to late-August. However, in order to provide a conservative analysis for impacts to Biological Resources (see Section 4.4 of this MND), the assembly of a temporary bypass crossing located north of the existing Culvert Crossing, which could require removal of a sycamore tree, has been assumed and assessed, to account for the event that the temporary crossing is used.

Therefore, access to the Wilderness Park would be maintained throughout construction with minimal interruptions to access. Two existing sycamore trees located adjacent to the crossing on the eastern shore of the Wash, south of the Culvert Crossing, would need to be removed. One



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Culvert Crossing Plan

Exhibit 3-5

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(09/30/14 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\MND\ex3-5_CulvertCrossingPlan.pdf

sycamore located on the eastern shore of the Wash, north of the Culvert Crossing, may need to be removed, depending on whether or not the temporary bypass crossing is installed. In order to provide a conservative analysis, this IS/MND assumes that all three upstream and downstream sycamore trees would be removed.

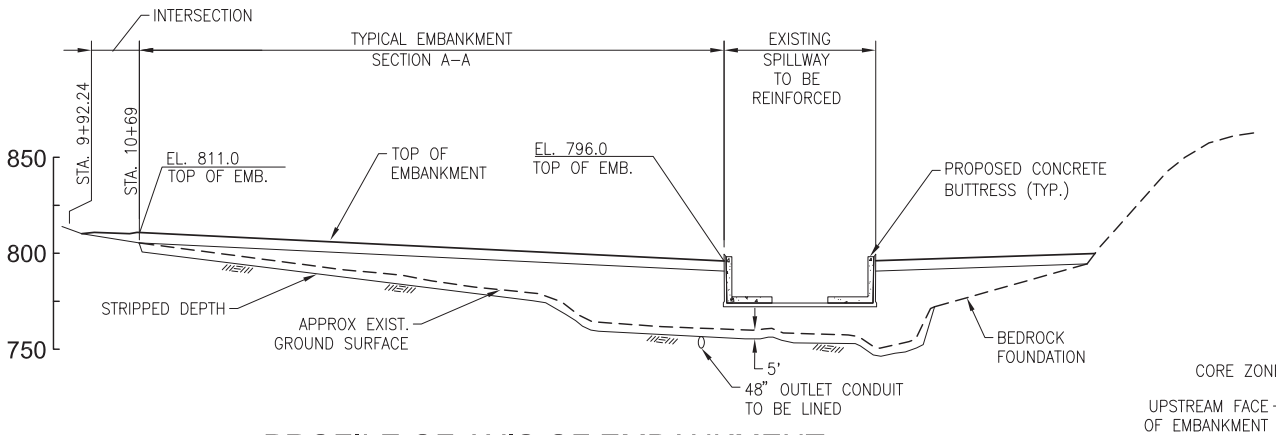
The LACFCD may transplant the root ball(s) of the sycamores to a suitable riparian location, and/or utilize the woody debris from the sycamore to enhance habitat value at another nearby location, if determined to be feasible and if approved by the County and other appropriate parties. In addition, new sycamore trees would be planted within a 100-foot radius of the original location of any removed existing trees (see MM AES-1).

New riprap would be installed upstream and downstream of the Culvert Crossing. The roadways leading to and from the Culvert Crossing would be armored, 36 feet on the upstream side and 84 feet on the downstream side, to withstand flows and sloped to join the existing grade. The existing water and sewer lines that run through the current Culvert Crossing would need to be relocated to the new height and alignment of the structure. The sewer force main is on the downstream surface of the Culvert Crossing and the water line is on the upstream surface of the Culvert Crossing. Additionally, the fire hydrant, vault, water valve and standpipe would be demolished and relocated approximately 15 feet to the north in the case that the temporary bypass crossing is utilized. All utility trenching and relocations would remain within the area anticipated for impacts by the Culvert Crossing construction activities, and there would be no changes in water/sewer quantities or demands as a result of the Project.

3.1.3 DEBRIS DAM

Remediation of the seismic deficiencies at the Debris Dam would involve improvements to the existing structures, including the intake tower and embankment. Exhibit 3-6, Debris Dam Rehabilitation, shows an overview of the various modifications that would be required. As a result of the loss of water conservation capacity from the DSOD restrictions on the Dam, there is an increased need to capture as much stormwater runoff as possible in facilities below the Dam. As a result, the Debris Dam would also be enlarged by raising the existing spillway by four feet. Remediating the seismic deficiencies at the Debris Dam would result in the DSOD removing the operational restrictions on the facility, thereby restoring 119 acre-feet of water conservation capacity. Enlarging the Debris Dam would create an additional 40 acre-feet of additional storage capacity, for a total of 159 acre-feet. When captured stormwater is released from the Dam to the spreading grounds for groundwater recharge, the Debris Dam can then capture more runoff, which would allow for water storage capacity multiple times in a single season depending on the frequency, duration, and intensity of storm events.

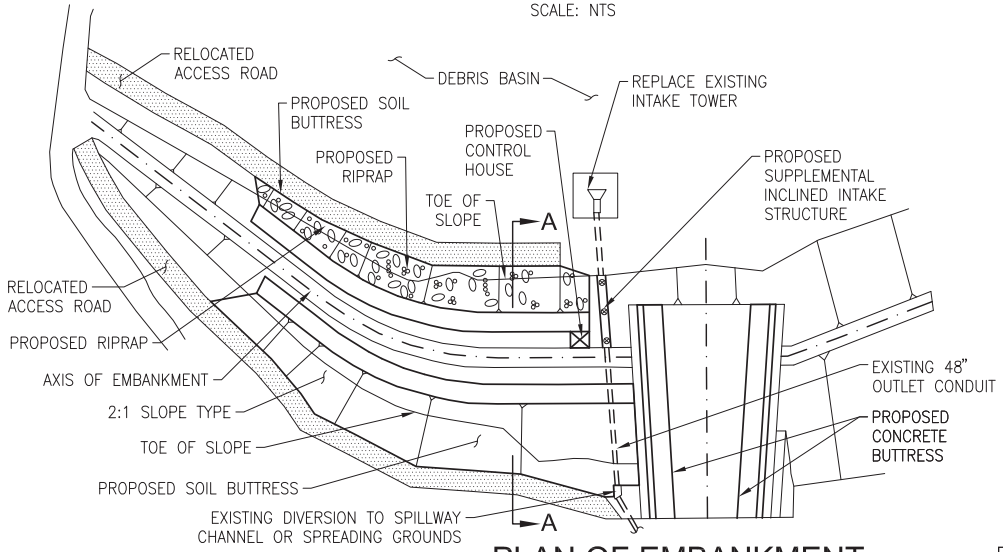
The intake tower located in the Debris Dam is unable to resist seismic loading and would be strengthened or replaced. The improved intake tower would be connected to the existing 48-inch outlet pipe (being lined as part of this Project). The outlet pipe has an existing junction box, which is used to deliver water either into the spillway channel or into the spreading grounds. The upstream and downstream portions of the Debris Dam embankment and alluvial foundation material that are subject to potential liquefaction would be reinforced with structural buttressing. Currently, a cross-section of the Debris Dam resembles a triangle (e.g., sloped sides on the upstream and downstream sides of the dam) with a flat top (e.g., flattened to accommodate vehicular access). The top of the embankment ranges from an elevation of 796 feet above msl at its center to an elevation of 811 feet above msl at the western edge. The construction activities would involve the removal of the existing riprap exterior surface on portions of both the upstream (approximately 0.69 acre) and downstream (approximately 0.89 acre) slopes. Engineered fill materials beneath the riprap would be excavated and removed, and an engineered buttress would be constructed. Upon completion of construction activities, the sloped upstream and downstream



PROFILE OF AXIS OF EMBANKMENT

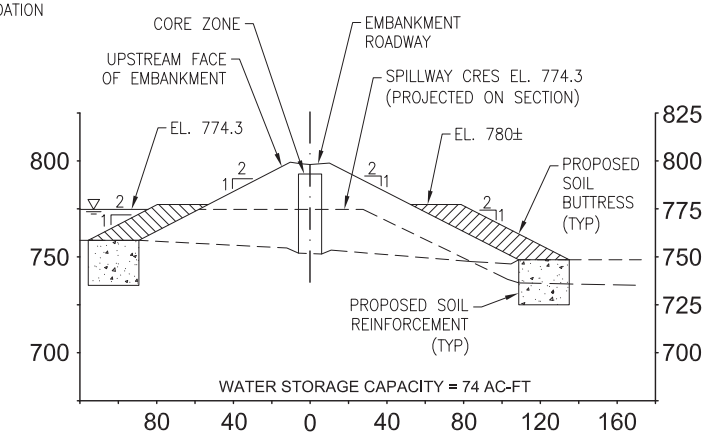
(LOOKING UPSTREAM: TOP OF EMBANKMENT ELEVATIONS ARE HIGHEST ELEVATIONS ON CREST)

SCALE: NTS



PLAN OF EMBANKMENT

SCALE: NTS



SECTION A-A

SCALE: NTS

CONCEPT ONLY

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Debris Dam Rehabilitation

Exhibit 3-6

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(Rev 06/02/14 MMD) Projects\CoLADPW\J166\Graphics\MND\ex_debris_dam_rehab_plan.pdf

surfaces of the Debris Dam would be reconfigured into a single stair-stepped terrace. The surface of the Debris Dam would be completed with a riprap similar to the existing condition.

As part of the improvements, six non-native deodar cedar trees located at the downstream toe of the embankment would be removed as mandated by the DSOD to ensure the structural integrity of the Debris Dam.

A new automated outlet gate and control system would be constructed to modernize operations and to ensure compatibility with other Project components. Upon completion of these improvements, the DSOD would issue a new certificate for the facility and remove the current operating restriction on the Debris Dam, which would increase the Debris Dam's available and allowable water conservation storage capacity from 0 acre-feet to 159 acre-feet.

In addition to the DSOD design approval requirements, modification of the Debris Dam requires approval under 33 United States Code (USC) Section 408 (hereafter referred to as Section 408), which requires obtaining a permit from the USACE. Under the terms of Section 408, any proposed modification to a USACE facility requires a determination that the proposed alterations are not injurious to the public interest and will not impair the usefulness of the facility. Consultation with the USACE will be required to determine whether the modifications would be considered a "Minor" (Minor 408) or "Major" (Major 408) Modification.

3.2 PROJECT CONSTRUCTION

Project construction would include several components that would occur in phases with some overlap in schedules. Each component of the Project is not dependent on the implementation of other components. Each component can operate on a fully functional stand-alone basis. While each component has its own benefits, the overall Project is designed to maximize those benefits by integrating the operation and functioning of the components so they work together more efficiently.

In compliance with the County Code and consistent with the City of Arcadia Municipal Code, all construction activity must be limited to the hours of 7:00 AM to 7:00 PM Monday through Saturday. However, in order to reduce construction-related impacts to nearby residences, the Project will only be under construction during the weekdays (Monday through Friday) and work would not occur on Saturdays.

3.2.1 CONSTRUCTION PHASING AND SCHEDULE

Table 3-1, Project Construction Schedule, shows the projected construction start dates and duration for the various Project components. As shown in Table 3-1, construction of the Project is anticipated to commence in the winter of 2015 and end in the fall of 2016. Certain elements of each Project component would likely not be performed during the wet season (October to April) in order to ensure flood control and water conservation efforts can proceed satisfactorily. While the schedule may be modified due to the date of Project approval and receipt of required permits, this table illustrates the approximate duration of major Project activities. As shown, it is anticipated that work would proceed at multiple facilities at one time. This estimated schedule is the basis for the impact analyses contained within Sections 4.3, Air Quality; 4.7, Greenhouse Gas; 4.12, Noise, and 4.16, Transportation and Traffic.

It is possible that the Debris Dam construction would require longer than the 6-month time period shown in Table 3-1. If the construction period of the Debris Dam were to be extended, this would spread out the construction activities over a longer period of time, resulting in less "intensity" of impacts. All Project-related impacts would be less than significant (some requiring mitigation),

and extending the duration of construction activities at the Debris Dam would not increase the level of significance. Decreasing the intensity and spreading out construction activities would generally reduce impacts to the topical sections listed above. Therefore, in order to provide a more conservative impact analysis, the more condensed construction period for the Debris Dam, as shown in Table 3-1, has been assumed throughout this MND.

TABLE 3-1
PROJECT CONSTRUCTION SCHEDULE

Construction Phase	Estimated Construction Start	Anticipated Duration
Dam	**December 2015**	**10 months**
Armor Canyon/Dam	December 2015	2 weeks
Garage, Helipad, Water System	December 2015	6 weeks
Remove/Replace Jib Crane	February 2016	2 weeks
Repair Concrete	February 2016	2 weeks
Hoist	March 2016	4 weeks
Construct New Spillway	April 2016	6 months
Install Valves	April 2016	2 weeks
Electrical	April 2016	4 weeks
Headworks and Wilderness Park Culvert Crossing	**March 2016**	**6 months**
Headworks Demolition	March 2016	1 week
Rubber Dam	March 2016	1 week
Construct Levee	March 2016	2 weeks
Culvert Crossing Demolition	April 2016	2 weeks
Site Clear/Grub	April 2016	4 weeks
Grading/ Implement Temporary Access	May 2016	2 weeks
Abutments and Wing Walls	June 2016	4 weeks
Construct Culvert Crossing Deck	July 2016	6 weeks
Paving Culvert Crossing	August 2016	2 weeks
Debris Dam	**April 2016**	**6 months**
Modify Spillway	April 2016	2 months
Construct Buttresses	June 2016	2.5 months
Construct New Subdrain	August 2016	1 month
Remove/Construct Outlet Tower(s)	September 2016	2 weeks

Dam

Improvements at the Dam would include construction of a new spillway; removal and relocation of the jib crane and hoist; installation of new valves; installation of new electrical and control systems; reinforcement of the existing armoring at the toe of the Dam and downstream canyon walls; construction of the helipad; repair of concrete; improvements to the water distribution system; and installation of a new secured access gate and associated electrical connection. For the notch option, including demolition of the Dam Operators house and garage, site preparation and demolition would result in approximately 894 cubic yards of concrete export. Construction of the notch option and the helipad would require approximately 4,130 cubic yards of concrete import. The majority of the work on the actual Dam structure would be performed during the dry season (i.e., April 16 through October 15) when the water level is at the lowest, but dewatering of the reservoir is anticipated. A small coffer dam would be constructed within the Reservoir, where a temporary plastic bypass pipeline (sized to accommodate a certain flow dependent on the time

of year) would carry water around the work and into the sluiceway tunnel so that it can proceed downstream. The coffer dam would be approximately 50 feet wide, 8 feet high, and would span from bank to bank. If any construction activity coincides with rain events, small collection points may be required within the reservoir area footprint to ensure all water is diverted around the Dam during construction activities.

Headworks and Wilderness Park Culvert Crossing

Construction activities for the Headworks improvements would include demolition and removal of the existing facilities (i.e., concrete slab, wall, keys, catwalk, and tainter gate); installation of the rubber diversion structure; and reconstruction of the levee. Demolition of the existing facilities would result in approximately 73 cubic yards of concrete export. Approximately five cubic yards of metal would need to be removed as well. Reconstruction of the Headworks and installation of the new rubber diversion structure would require approximately 155 cubic yards of concrete import. Construction of the Wilderness Park Culvert Crossing would generate approximately 215 cubic yards of export materials and would require approximately 508 cubic yards of import material. While work at the Headworks would occur during the dry season, dewatering is anticipated. A small cofferdam would be constructed at the uppermost bounds of the existing impact area and a temporary plastic bypass pipeline (sized to accommodate a certain flow dependent on the time of year) would carry water either into the permanent diversion pipes or around the site to be discharged at the downstream limits of the Wilderness Park Culvert Crossing work area.

Debris Dam

Rehabilitation of the Debris Dam would include repair or replacement of the outlet tower; construction of new structural buttresses on both upstream and downstream sides of the embankment; and installation of a new outlet pipe under the new spillway. Site preparation would include demolition of the existing outlet tower and removal of the existing riprap exterior surface on portions of both the upstream and downstream slopes as well as the underlying engineered fill. Removal of the existing outlet tower would result in 80 cubic yards of concrete export, but most of the concrete from the tower would be reused on site. Approximately 65,000 cubic yards of fill material would be required for the new structural buttressing, as well as 1,000 cubic yards of concrete import for the new spillway buttress and outlet tower, and 2,500 cubic yards of base material import for the new subdrain system. It is anticipated that approximately half of the 65,000 cubic yards of fill material used for the structural buttressing will be obtained from the adjacent Santa Anita SPS, thereby reducing the number of trucks needed for the import of fill material.

Due to the proximity of residential homes, dust, erosion, and noise mitigation measures would be implemented to minimize adverse impacts. While the majority of work at the Debris Dam would occur during the dry season, dewatering is anticipated. A small cofferdam would be constructed within the Debris Basin and a temporary plastic bypass pipeline (sized to accommodate a certain flow dependent on the time of year) would carry water around the work to be discharged into the outlet pipe so that it can proceed downstream.

No construction activities are expected to occur within the City of Monrovia. However, temporary access/impact areas would be located within the City of Monrovia, including areas that may be subject to traversing vehicles or other mobile equipment, staging of equipment, placing stockpiles of soil, and excavating soil from the adjacent Sediment Placement Site for use in the buttressing backfill for the Debris Dam. No vegetation or tree removal would occur within the City of Monrovia. All of these activities would be limited to the LACFCD fee-owned right-of-way.

Construction Equipment and Workforce

Vehicular trips for workers and delivery trucks would vary depending on the phase of construction. During the peak of construction, a typical day would include the transportation of workers; movement of heavy equipment; and transportation of materials. An estimation of the construction worker and truck trips, broken down by construction phase, are shown in Table 3-2, Estimated Project Construction Equipment and Trip Generation.

TABLE 3-2
ESTIMATED PROJECT CONSTRUCTION EQUIPMENT AND TRIP GENERATION

Construction Phase	Off-Road Equipment	Worker Trips[a]	Truck Trips[a]
Dam			
Armor Canyon/Dam	1 Concrete Pump	3	500
Garage, Helipad, Water System	1 Concrete Pump, 1 Loader/Backhoe	5	10
Remove/Replace Jib Crane	1 Crane	3	5
Repair Concrete	1 Concrete Pump	3	5
Hoist	1 Crane	3	10
Construct New Spillway	1 Backhoe, 1 Concrete Pump, 1, Crane, 1 Loader, 1 Concrete Saw	8	56
Install Valves	1 Crane	3	5
Electrical	1 Crane	3	10
Headworks and Wilderness Park Culvert Crossing			
Headworks Demolition	1 Concrete Saw, 1 Excavator, 1 Backhoe	5	10
Rubber Dam	2 Backhoes	3	3
Construct Levee	1 Backhoe, 1 Concrete Pump	3	19
Culvert Crossing Demolition	1 Concrete Saw, 1 Excavator, 1 Backhoe	5	14
Site Clear/Grub	1 Backhoe	3	210
Grading/ Implement Temporary Access	2 Backhoes	5	--
Abutments and Wing Walls	2 Concrete Pumps	4	46
Construct Culvert Crossing Deck	1 Concrete Pump	3	18
Paving Culvert Crossing	1 Roller	3	15
Debris Dam			
Modify Spillway	1 Concrete Pump, 1 Concrete Saw, 1 Drilling Rig	4	63
Construct Buttresses[b]	1 Excavator, 1 Dozer, 1 Backhoe, 1 Loader, 1 Water Truck	5	4,063
Construct New Subdrain	2 Loaders	3	157
Remove Outlet Tower	2 Backhoes, 1 Water Truck	3	5

[a] All trips are round trips.
[b] The 4,063 number of trips was estimated based on 65,000 cubic yards of material required for the buttressing, assuming use of 16 cubic yard trucks occurring over 55 workdays (i.e. 2.5 months). Approximately half of this material (32,500 cubic yards) is estimated to be harvested from the adjacent Sediment Placement Site (SPS); therefore, the first 27 workdays (i.e. 5 weeks) of the sediment/fill truck trips would occur on-site between the SPS and the Debris Dam, and would not affect local residential roadways. Once fill from the SPS is exhausted, the remaining fill amount would be imported to the Debris Dam site, requiring off-site trucking for approximately 5 weeks.

3.3 PROJECT OPERATIONS AND MAINTENANCE

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Santa Anita Dam, Headworks, or Debris Dam.

3.4 AGENCY APPROVALS AND PERMITS

3.4.1 REQUIRED APPROVALS AND PERMITS

This IS/MND is intended to serve as the primary environmental document pursuant to CEQA for actions associated with the Project, including discretionary approvals requested or required to implement the Project. In addition, this is the primary reference document for the formulation and implementation of a mitigation monitoring program for the Project. The Board, acting on behalf of the LACFCD, may adopt the IS/MND if it finds, on the basis of the whole Project record, that there is no substantial evidence the Project would have a significant effect on the environment. Table 3-3, Other Agency Approvals and Requirements, lists all agencies with permit or approval authority over the Project.

TABLE 3-3
OTHER AGENCY APPROVALS AND REQUIREMENTS

Agency	Approval Required	Applicable Project Component	Purpose
FAA	Heliport Certification	Dam	To authorize helipad at the Dam.
USACE	Section 404 Permit	All Project Components	To allow the discharge of dredge and fill material into “waters of the U.S.”.
USACE	Section 408 Permit	Dam	To authorize alteration/modification to an existing USACE project.
USFS	Approval in accordance with Provision 3 of existing SUP	Dam	To authorize activities at the Dam within the Angeles National Forest.
CDFW	Section 1600 SAA	All Project Components	To authorize changes to the natural flow or bed, channel, or bank of any river, stream, or lake and associated impacts to biological resources.
Caltrans	Heliport Site Approval Permit	Dam	To authorize helipad at the Dam.
DSOD	Design Approval	Dam and Debris Dam	To ensure that the proposed improvements meet DSOD standards.
SWRCB	Construction General Permit	All Project Components	For coverage under the Construction General Permit.
RWQCB	Section 401 Water Quality Certification	All Project Components	To protect water quality within “waters of the U.S.”.
Los Angeles County Department of Regional Planning – Airport Land Use Commission	Aviation Permit	Dam	To authorize helipad at the Dam.
City of Arcadia	Right of Entry	All Project Components	To access public property rather than just public right-of-way.

TABLE 3-3
OTHER AGENCY APPROVALS AND REQUIREMENTS

Agency	Approval Required	Applicable Project Component	Purpose
City of Arcadia	Oversized Load Permit	All Project Components	To allow for oversized trucks and equipment to be transported through City streets, if required.
City of Sierra Madre	Oversized Load Permit	All Project Components	To allow for oversized trucks and equipment to be transported through City streets, if required.
USACE: U.S. Army Corps of Engineers; USFS: U.S. Forest Service; SUP: Special Use Permit; FAA: Federal Aviation Administration; SWRCB: State Water Resources Control Board; DSOD: California Department of Water Resources, Division of Safety of Dams; RWQCB: Regional Water Quality Control Board; Caltrans: California Department of Transportation; CDFW: California Department of Fish and Wildlife; SAA: Streambed Alteration Agreement.			

SECTION 4.0 ENVIRONMENTAL CHECKLIST FORM AND ASSESSMENT

This section includes the completed CEQA environmental checklist form, as provided in Appendix G of the State CEQA Guidelines, as well as substantiation and clarification for each checklist response. The checklist form is used to assist in evaluating the potential environmental impacts of the Santa Anita Stormwater Flood Management and Seismic Strengthening Project and identifies whether the Project is expected to have potential significant impacts.

1. Project Title:	Santa Anita Stormwater Flood Management and Seismic Strengthening Project
2. Lead Agency Name and Address:	Los Angeles County Flood Control District 900 South Fremont Avenue Alhambra, California 91803
3. Contact Person:	Mr. Matthew Frary, P.E. Water Resources Division damprojects@dpw.lacounty.org
4. Project Location:	The Project study area includes portions of the City of Arcadia, City of Monrovia, and U.S. Forest Service (USFS) land in the Western San Gabriel Valley in Los Angeles County, approximately 15 miles northeast of downtown Los Angeles.
5. Project Sponsor's Name and Address:	Los Angeles County Flood Control District 900 South Fremont Avenue Alhambra, California 91803
6. General Plan Designation/Zoning:	*USFS:* Back Country Motorized Use Restricted *City of Arcadia:* Public Facilities & Grounds/ Residential Mountainous *City of Monrovia:* Hillside Wilderness Area/Hillside Wilderness Preserve

7. Description of Project: The Project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, including the Santa Anita Dam, the Santa Anita Headworks, the Wilderness Park Culvert Crossing, and the Santa Anita Debris Dam. The LACFCD facility improvements would: (1) reduce flood risk to downstream communities; (2) enhance sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre-feet per year; (3) improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing.

8. Surrounding land uses and setting: The Project area is located in Santa Anita Canyon at the southern margin of the San Gabriel Mountains. The Dam is at the north end of the Project area and is located within the Angeles National Forest. The Headworks structure is located approximately 0.5 mile downstream of the Dam on the border of the Angeles National Forest and the City of Arcadia. The Debris Dam is located approximately 0.5 mile downstream of the Headworks in the Cities of Arcadia and Monrovia. Land uses adjacent to the Project area include natural open space and the mountains within the Angeles National Forest (i.e., San Gabriel Mountains) to the north; the recreational and open space uses associated with the

City of Arcadia Wilderness Park and City of Monrovia to the east; and City of Arcadia single-family residential uses to the south and west.

9. Other public agencies whose approval may be required:

- Federal Aviation Administration (FAA)
- U.S. Army Corps of Engineers (USACE)
- U.S. Forest Service (USFS)
- California Department of Fish and Wildlife (CDFW)
- California Department of Transportation (Caltrans)
- California Department of Water Resources, Division of Safety of Dams (DSOD)
- California Water Resources Control Board (SWRCB)
- Los Angeles Regional Water Quality Control Board (RWQCB)
- Los Angeles County Department of Regional Planning - Airport Land Use Commission (ALUC)
- City of Arcadia
- City of Sierra Madre

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Less Than Significant with Mitigation", as indicated on the following pages.

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

DETERMINATION:

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

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

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

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

Signature of Lead Agency Representative — Date: 10/15/14

Printed name: Matthew J Frary — Agency: Los Angeles County Flood Control District

4.1 AESTHETICS	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☒	☐	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

4.1.1 EXISTING CONDITIONS

The Project area is located in the Santa Anita Canyon at the southern margin of the San Gabriel Mountains. The Dam is at the north end of the Project area and is located within the Angeles National Forest. The Headworks structure is located approximately 0.5 mile downstream of the Dam on the border of the Angeles National Forest and the City of Arcadia. The Debris Dam is located approximately 0.5 mile downstream of the Headworks in the Cities of Arcadia and Monrovia.

The Dam is accessed via a private road off Chantry Flats Road, approximately 2.5 miles north of the City of Arcadia. The Dam and Santa Anita Reservoir (Reservoir) can be viewed from portions of the Chantry Flats Road; from some hiking trails of the Angeles National Forest; and from publically accessible areas that are located above the Dam and Reservoir. The vegetation adjacent to the Reservoir contains chaparral and scrub that is characteristic of the foothills to the mountains in the Project vicinity. The downstream canyon walls are steep and armored with concrete. The area downstream of the Dam is a rocky creekbed with riparian habitat with scrub and willow species. An existing tunnel runs from the base of the reservoir through approximately 1,500 feet of a hillside to the east of the dam. The tunnel was installed in 1968 to accommodate a conveyor belt system to remove accumulated sediment from the bottom of Reservoir.

The Headworks structure is located approximately 0.5 mile downstream of the Dam on the border of the Angeles National Forest and the City of Arcadia and is accessed off Highland Oaks Drive and through the adjacent Wilderness Park. The Wilderness Park is a 120-acre nature preserve located below Big Santa Anita Canyon, which is owned and managed by the City of Arcadia. The Wilderness Park consists of an 8.5-acre passive recreation area, and the balance of the preserve remains in its natural state. The park includes a nature center, multi-purpose field, nature trails, a stream, picnic and barbeque areas, fire circle, and restrooms. The Headworks is generally not visible from the Wilderness Park due to a locked gate that prevents public access to the facility.

The Debris Dam embankment itself allows for vehicular access up to the spillway and can be accessed via a maintenance road that runs along the west side of the channel. The backyards of single-family residences located on Highland Oaks Drive line the western edge of the Debris Dam and basin, with the nearest property boundary approximately 200 to 400 feet away from the Debris

Dam spillway, where most of the construction will take place. To the east of the Debris Dam is City of Monrovia open space and to the south are the Santa Anita Spreading Grounds.

The *Arcadia General Plan* serves as the primary document regulating land use across the Project site. However, it does not contain specific goals or policies with regard to aesthetics of the LACFCD flood-control facilities that are associated with the Project. The General Plan recognizes LACFCD facilities in Arcadia south of the Wilderness Park as a "197-acre area for flood-control and debris disposal purposes that provides an important function in the region for water conservation". Chapter 6, Implementation and Monitoring, of the *Arcadia General Plan* includes a goal under the header "Respect Existing Views and Vistas" which states that "view corridors oriented toward existing or proposed community amenities, such as park, open space, or natural features, are to be enhanced" (Arcadia 2010b).

The *County of Los Angeles General Plan's* Conservation and Open Space Element describes various scenic resources that "contribute to tourism and the intellectual and emotional development of local inhabitants". These resources include the peaks of the San Gabriel and Santa Monica Mountains; the Antelope Valley floor; stands of trees that cover the higher slopes of the mountains; waters and beaches of the Pacific Ocean; historical and distinctive architecture; the downtown skyline; residential enclaves; and scenic drives. Policy 16 in this Element calls for the protection of the visual quality of scenic areas, including ridgelines and scenic views from public roads, trails, and key vantage points (LACDRP 1980).

The County's Scenic Highway Element calls for the development of a scenic highway system in the County through a corridor protection program and the design of roadways. The nearest adopted scenic highway is the Angeles Crest Highway (State Route [SR] 2), located approximately six miles north of the Dam (LACDRP 1980). SR-2 is also an "Officially Designated Scenic Highway" designated by the California Scenic Highway Mapping System (Caltrans 2012). The Project area is not visible from SR-2.

Under the Angeles National Forest's Land Management Plan (Forest Plan), the Dam is located in an area designated to have High Scenic Integrity Objectives. The Scenic Integrity Objectives relate to the natural appearance of an area. Areas with High Scenic Integrity include those where the natural landscape appears unaltered and human disturbance is not evident. Scenic integrity objectives can be achieved through the use of best environmental design practices to harmonize changes in the landscape and advance environmentally sustainable design solutions and by mitigating ground disturbance to maintain scenic integrity (USFS 2005b).

4.1.2 IMPACT ANALYSIS

Project Design Features

PDF AES-1 The material used to re-armor the downstream canyon walls and the toe of the Dam will match the color of the existing armoring.

Regulatory Requirements

None required.

Impact Discussion

a) Would the project have a substantial adverse effect on a scenic vista?

Less than Significant Impact. The Project site is not designated as a scenic vista in the General Plans for the City of Arcadia or the County of Los Angeles. According to the USFS Land Management Plan for the Angeles National Forest, the Dam is located within "The Front Country" of the forest, which is intended to be maintained as a "natural appearing landscape that functions as a first impression scenic backdrop for the Los Angeles/San Bernardino metropolitan area" (USFS 2005b). The Dam is not specifically discussed as a scenic resource. While the Project would not affect a designated scenic vista, public views of the Project site are available from portions of the Angeles National Forest, the Wilderness Park, and City of Monrovia open space to the east. Portions of the Project site are also visible from private residences along the western edge of the Debris Dam.

The short-term aesthetic impacts during construction due to temporary views of construction equipment and activities would be minimal. The Project involves improvements to existing stormwater flood-control facilities, and views into the Project site from public vantage points would not substantively change because the improvements would occur on existing facilities. Improvements would not result in substantially larger, taller, or substantively different flood-control facilities that could impact views of the surrounding natural hillsides or vegetation. Therefore, impacts to a scenic vista would be less than significant and no mitigation is required.

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

Less than Significant With Mitigation. As discussed, the nearest designated State scenic highway is SR-2, and the Project site would not be visible from SR-2 due to distance and the presence of intervening trees and mountainsides. However, the natural areas of the Project site, including the naturally vegetated open space areas and waters associated with Santa Anita Wash, would generally be considered scenic resources at the Project site and would be visible to the public at certain locations.

Based on site reconnaissance, topography/elevations, and review of aerial photographs, construction activities at the Dam have the potential to be visible from limited public locations along Santa Anita Canyon/Chantry Flats Road and hiking trails of the Angeles National Forest. The proposed improvements to the Dam would result in a temporary visual change to the existing conditions due to construction equipment and activities, and dewatering and elimination of the water body behind the Dam. The majority of the work would be performed during the dry season when the water level is at the lowest, but draining of the Reservoir is still anticipated. Dewatering of the Reservoir would temporarily expose underlying soils and allow for views of construction equipment. Public views of the Dam would be fleeting or partial views due to the fact that motorists would be driving and views from hiking trails at elevations above the Project construction area could be obstructed by vegetation and topography. Construction activities on the Dam, the helipad, and the dewatered Reservoir would be temporary visual impacts. The slightly altered configuration of the Dam spillway would be aesthetically consistent with the original visual character upon completion of the Project. As required by PDF AES-1, the material used to re-armor the downstream canyon walls and toe of the Dam would match the existing concrete to retain the visual character of the Dam.

Improvements to ancillary facilities at the Dam would also have visual impacts. The elimination of the Dam Operator's house and replacement with a helipad would result in a slight change to the buildings on the site, but would have no impact on scenic resources. The helipad would be

completely flat and elevated above grade by approximately four feet, but would not obscure any surrounding hillside views. Repair of the eroded slope near the upper tank would require grubbing of the existing vegetation. Removal of this approximately 216-square-foot (sf) area of vegetation would expose soils that are currently covered by dense vegetation and would result in a visual impact to anyone with a direct line of sight. However, the property is gated and not accessible to the general public. Additionally, views of this area from Chantry Flats Road are obscured by the topography and surrounding vegetation and the slope repair area is not anticipated to be visible to nearby viewers. Importantly, it is expected that the area would naturally revegetate over time through the geotextile fabric, which is designed to facilitate soil stability and vegetation establishment.

The installation of up to seven new power poles and attached power lines along the Dam access road would result in a visual change; however, the access road is not publically accessible and is located at a lower elevation than Chantry Flats Road, largely outside of the viewshed of passing motorists. The removal and replacement of the water lines at the Dam would generally follow the same alignment of the existing pipelines and there would be no visual change. While the existing swing gate would be replaced with a new sliding gate, the general size and visual form of the gate would remain the same. Therefore, impacts to scenic resources near the Dam would be less than significant.

The proposed improvements at the Headworks would not be visible from any public viewsheds, with the exception of a portion of the parking lot associated with the Wilderness Park. Reconstruction of the Headworks involves replacement of an existing structure in the same location and improvements to the associated levee and roadway. Although the new Headworks facility would be larger to accommodate the rubber diversion structure and small control house, no additional visually intrusive facilities would be constructed, and impacts to the scenic nature of the surrounding creek and vegetated areas would be negligible.

The construction activities associated with the replacement of the Wilderness Park Culvert Crossing would not be visible to visitors at the Wilderness Park because the park would be temporarily closed during construction. Therefore, there would be no public views of this construction activity. However, the replacement Wilderness Park Culvert Crossing would be viewed and used by visitors to the Wilderness Park. In order to accommodate the new Culvert Crossing structure, which would be wider than the existing crossing by approximately ten feet to better accommodate vehicular traffic, two existing sycamore trees located to the south and to the north of the Culvert Crossing on the eastern bank of the Wash may be removed. In order to provide a conservative analysis, this IS/MND assumes the removal of these trees. These trees are approximately 50 feet tall with large canopies that span portions of the Wash. Removal of these trees would result in an aesthetic change to the viewshed of visitors using the Culvert Crossing. This visual change includes a loss of the aesthetic of the mature trees and a reduction in shade along the Wash and the Wilderness Park Culvert Crossing; however, there are numerous mature trees surrounding the parking lot area and within the Wash. Although the sycamore trees are not protected by the City of Arcadia's Oak Tree Regulations, loss of these trees would constitute "substantial damage" to a scenic resource and would therefore be considered a significant impact.

As discussed in Section 3.4, Biological Resources, MM BIO-5 requires that impacts to jurisdictional resources be permitted through the applicable resource agencies. Because the sycamore trees are hydrologically connected to the creek, they would be subject to CDFW jurisdiction. CDFW requires mitigation for impacts to biological resources within their jurisdiction through a Streambed Alteration Agreement (SAA), which would include the vegetation and trees associated with the Wash. However, the SAA may not necessarily require on-site replacement of trees as part of the mitigation. In order to ensure that the two sycamore trees would be replaced

on site, MM AES-1 requires a minimum of 1:1 replacement of the trees within a 100-foot radius of the original location. Although any replacement trees associated with restoration and/or jurisdictional mitigation efforts would take years to reach the size and height of the existing trees, the long-term aesthetic benefit of these replacement trees would benefit the Project site in the future. Implementation of MM AES-1 would reduce potentially significant aesthetic impacts due to the loss of sycamore trees along the Wash to a less than significant level.

As part of the improvements at the Debris Dam, six existing, non-native deodar cedar trees located at the downstream toe of the embankment would need to be removed as mandated by DSOD to ensure the structural integrity of the Debris Dam. The DSOD cannot issue a new certificate for operation of the facility unless the trees are removed. The removal of these trees would result in a permanent visual change and affect views from the adjacent residences closest to the Debris Dam. The trees currently provide a visual buffer between the residences and the Debris Dam, which would be removed due to Project implementation. However, because these trees are not a prominent visual feature from public viewsheds, the removal of these trees would not constitute “substantial damage” to a scenic resource. Additionally, these trees are not protected species and the removal of these trees would not require any permits or replacement.

The scale and profile of the Debris Dam itself would be slightly altered due to the increased height of the spillway by four feet and the new structural buttressing along the upstream and downstream sides of the embankment. These changes to the Debris Dam may be visible from the backyards of the homes along the western edge of the Debris Dam, but are only alterations of the existing structure that will maintain the same function and aesthetic character. Reconstruction of the intake structure involves replacement of an existing structure in the same location and would have no long-term visual impact. Therefore, impacts associated with the loss of non-native, ornamental trees at the Debris Dam, improvements to the Debris Dam, and replacement of the intake structure would be less than significant and no mitigation is required.

c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

Less Than Significant Impact. The overall visual character of the Project site would remain unchanged from the existing condition. This area has been historically used by the LACFCD for flood-control purposes and would continue to do so after implementation of the Project. The visual character of the site would not substantively change because the improvements would occur on existing facilities. Improvements would not result in significantly larger, taller, or substantively different flood-control facilities that could impact views of the surrounding natural hillsides or vegetation. Removal of select trees as discussed above would not constitute a substantial degradation to the visual character or quality of the site because the Project area’s land uses and naturally vegetated character would not be substantively altered. Therefore, impacts to the existing visual character or quality of the site and its surroundings would be less than significant and no mitigation is required.

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

Less Than Significant Impact. Project-related activities would not introduce new sources of light or glare to the Project site or the surrounding area, with the exception of motion-sensor lighting at the new Dam entrance gate. No construction activities are proposed during the nighttime hours. The new lights on the Dam entrance gate would be compliant with the Dark Skies initiative, and no reflective paints or glare-inducing materials would be used. Therefore, impacts related to light and glare would be less than significant and no mitigation is required.

4.1.3 MITIGATION MEASURES

MM AES-1 Any removal of sycamore trees located at the Wilderness Park Culvert Crossing shall be replaced at a minimum 1:1 ratio with a minimum box size of 24 inches, within a 100-foot radius of their original location.

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

4.2.1 EXISTING CONDITIONS

The Dam is located within the Angeles National Forest and is zoned as "Back Country Motorized Use Restricted" by the USFS Land Management Plan (USFS 2005b). The portions of the Project located within the City of Arcadia, including the Headworks and the Debris Dam, are designated by the *Arcadia General Plan* as Public Facilities and Grounds (P) (Arcadia 2010b). Current zoning for the site is Residential Mountainous (R-M), as defined by the City of Arcadia Zoning Code (Arcadia 2010a). The eastern slope of the Debris Dam that is located in the City of Monrovia is designated Hillside Wilderness Area in the General Plan and zoned as Hillside Wilderness Preserve (Monrovia 2012a).

The Project site does not currently support any agricultural uses or activities. Review of maps by the California Department of Conservation Farmland Mapping and Monitoring Program shows that the site is not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, and there are no farmlands in the immediate Project area (FMMP 2011). In addition, there are no Williamson Act[3] contracts applicable to the Project site.

[3] The California Land Conservation Act of 1965 – commonly referred to as the Williamson Act – enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

4.2.2 IMPACT ANALYSIS

Regulatory Requirements

None required.

Impact Discussion

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

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. As discussed above, there are no agricultural activities or designated Farmland within or near the Project site. No farmland conversion or impacts to agricultural uses would occur with the Project. Also, the Project area is not zoned for agricultural use and there are no Williamson Act Contracts. Thus, no impacts on agricultural resources would occur.

c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code, Section 12220[g]), timberland (as defined by Public Resources Code, Section 4526), or timberland zoned Timberland Production (as defined by Government Code, Section 51104[g])?

d) Would the project result in the loss of forest land or conversion of forest land to non-forest use?

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

No Impact. As discussed above, the Dam is located within the Angeles National Forest and is zoned as “Back Country Motorized Use Restricted” by the USFS Land Management Plan (USFS 2005b). The Dam is operated under a Special Use Permit (SUP) from the USFS. As stated in RR USE-1, Provision 3 of the SUP states that any reconstruction plans to the Dam requires approval from the USFS to authorize the proposed improvements, but Project implementation would not conflict with forest lands or the forest uses in the surrounding area because all construction activities at the Dam would occur on the Dam structure and surrounding rock near the plunge pool area.

The Project would not change the use of the existing flood-control facilities and would not conflict with the natural character of this zone, as discussed in Section 4.10, Land Use and Planning. No conversion of forest land to non-forest use is proposed with the Project. Sediment removal would not induce the conversion of forest land to other uses because it is not a growth-inducing activity. The Project would comply with the conditions of the existing SUP issued by the USFS for the continued use of these LACFCD facilities. Thus, no impacts on forest resources would occur.

4.2.3 MITIGATION MEASURES

There would be no impacts to agriculture and forest resources; therefore, no mitigation measures are required.

4.3 AIR QUALITY	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or Projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Information in this section is derived from the *Air Quality and Greenhouse Gas Emissions Impact Analysis for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California* dated October 2014 and prepared by BonTerra Psomas. This report is provided in its entirety in Appendix A.

4.3.1 EXISTING CONDITIONS

The Project site is located within the Los Angeles County portion of the South Coast Air Basin (SoCAB) and, for air quality regulation and permitting, is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Both the State of California (State) and the U.S. Environmental Protection Agency (USEPA) have established health-based Ambient Air Quality Standards (AAQS) for air pollutants, which are known as “criteria pollutants”. The AAQS are designed to protect the health and welfare of the populace within a reasonable margin of safety. The federal and State AAQS are shown in Table 4-1.

TABLE 4-1
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary[a]	Secondary[b]
O_3	1 Hour	0.09 ppm (180 µg/m^3)	–	–
	8 Hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as Primary
PM10	24 Hour	50 µg/m^3	150 µg/m^3	Same as Primary
	AAM	20 µg/m^3	–	Same as Primary
PM2.5	24 Hour	–	35 µg/m^3	Same as Primary
	AAM	12 µg/m^3	12 µg/m^3	Same as Primary
CO	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
NO_2	AAM	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
	1 Hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	–
SO_2	24 Hour	0.04 ppm (105 µg/m^3)	–	–
	3 Hour	–	–	0.5 ppm (1,300 µg/m^3)
	1 Hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	–
Lead	30-day Avg.	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3	Same as Primary
	Rolling 3-month Avg.	–	0.15 µg/m^3	
Visibility Reducing Particles	8 hour	Extinction coefficient of 0.23 per km – visibility ≥ 10 miles (0.07 per km – ≥30 miles for Lake Tahoe)	**No Federal Standards**	
Sulfates	24 Hour	25 µg/m^3		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)		

O_3: ozone; ppm: parts per million; µg/m^3: micrograms per cubic meter; PM10: respirable particulate matter with a diameter of 10 microns or less; AAM: Annual Arithmetic Mean; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; CO: carbon monoxide; mg/m^3: milligrams per cubic meter; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; km: kilometer; –: No Standard.

[a] *National Primary Standards:* The levels of air quality necessary, within an adequate margin of safety, to protect the public health.
[b] *National Secondary Standards:* The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Note: More detailed information in the data presented in this table can be found at the CARB website (www.arb.ca.gov).

Source: BonTerra Psomas 2014a (Appendix A).

Regional air quality is defined by whether the area has attained or not attained State and federal air quality standards, as determined by air quality data from various monitoring stations. Areas that are considered in “nonattainment” are required to prepare plans and implement measures that will bring the region into “attainment”. When an area has been reclassified from nonattainment

to attainment for a federal standard, the status is identified as "maintenance", and there must be a plan and measures established that will keep the region in attainment for the following ten years.

For the California Air Resources Board (CARB), an "Unclassified" designation indicates that the air quality data for the area are incomplete and there are no standards to support a designation of attainment or nonattainment. Table 4-2 summarizes the attainment status of the SoCAB for the criteria pollutants.

TABLE 4-2
DESIGNATIONS OF CRITERIA POLLUTANTS IN THE SOUTH COAST AIR BASIN

Pollutant	State	Federal
O_3 (1-hour)	Nonattainment	No Standard
O_3 (8-hour)		Extreme Nonattainment
PM10	Nonattainment	Attainment/Maintenance[a]
PM2.5	Nonattainment	Nonattainment
CO	Attainment	Attainment/Maintenance
NO_2	Attainment[b]	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment[b]	Nonattainment/Attainment[c]
All others	Attainment/Unclassified	No Standards

O_3: ozone; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; CO: carbon monoxide; NO_2: nitrogen dioxide; SO_2: sulfur dioxide.

[a] Federal standard: The SoCAB was redesignated for PM10 from nonattainment to attainment-maintenance effective July 26, 2013.
[b] State standard: CARB Executive Order R-14-001 of February 25, 2014 reclassified the SoCAB to Attainment for NO_2 and Los Angeles County to Attainment for Lead effective July 1, 2014.
[c.] Federal Standard: Los Angeles County is classified as nonattainment for lead; the remainder of the SoCAB is in attainment.

Source: BonTerra Psomas 2014a (Appendix A).

4.3.2 IMPACT ANALYSIS

Regulatory Requirements

RR AQ-1 All construction activities shall be conducted in compliance with South Coast Air Quality Management District Rule 403, Fugitive Dust, for controlling fugitive dust and avoiding nuisance. Compliance with this rule will reduce short-term particulate pollutant emissions. Contractor compliance with Rule 403 requirements shall be mandated in the contractor's specifications.

RR AQ-2 All construction activities shall be conducted in compliance with South Coast Air Quality Management District Rule 402, Nuisance, which states that a Project shall not "discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property".

Impact Discussion

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

No Impact. The project is located in Los Angeles County, in the South Coast Air Basin (SoCAB), where the South Coast Air Quality Management District (SCAQMD) is the agency principally responsible for comprehensive air pollution control. A regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), County transportation commissions, and local governments, and cooperates actively with all federal and State government agencies. The SCAQMD develops rules and regulations; establishes permitting requirements for stationary sources; inspects emissions sources; and enforces such measures through educational programs or fines, when necessary.

The SCAQMD is directly responsible for reducing emissions from stationary (area and point), mobile, and indirect sources. It has responded to this requirement by preparing a sequence of Air Quality Management Plans (AQMPs). An AQMP establishes a program of rules and regulations directed at attaining the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The regional plan applicable to the Project is the SCAQMD's AQMP.

On December 7, 2012, the SCAQMD adopted the 2012 AQMP, which is a regional and multi-agency effort (SCAQMD, CARB, SCAG, and USEPA). The 2012 AQMP incorporates the latest scientific and technical information and planning assumptions, including the 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS); updated emission inventory methodologies for various source categories; and SCAG's latest growth forecasts (SCAQMD 2013a). On December 20, 2012, the 2012 AQMP was submitted to CARB and the USEPA for concurrent review and approval for inclusion in the SIP (SCAQMD 2013a). The 2012 AQMP was approved by the CARB on January 25, 2013 (CARB 2013).

The main purpose of an AQMP is to bring an area into compliance with the requirements of federal and State air quality standards. For a project to be consistent with the AQMP, the pollutants emitted from the project should not (1) exceed the SCAQMD CEQA air quality significance thresholds or (2) conflict with or exceed the assumptions in the AQMP. As shown in Threshold 4.3(b) below, pollutant emissions from the Project would be less than the SCAQMD thresholds and would not result in a significant impact. Further, the Project, being structural improvements to existing facilities without changes in operations, would not result in development that may not have been anticipated in the AQMP. No conflict with the 2012 AQMP would occur with the Project (BonTerra Psomas 2014a).

b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less than Significant Impact. The SCAQMD establishes significance thresholds to assess the regional impact of Project-related air pollutant emissions in the SCAQMD. Table 4-3, SCAQMD Criteria Pollutant Mass Emissions Significance Thresholds, summarizes the SCAQMD's mass emissions thresholds, which are presented for both long-term operational and short-term construction emissions. A Project with emissions rates below these thresholds is considered to have a less than significant effect on air quality.

TABLE 4-3
SCAQMD CRITERIA POLLUTANT SIGNIFICANT MASS EMISSIONS SIGNIFICANCE THRESHOLDS (LBS/DAY)

Criteria Pollutant	Construction	Operation
Volatile Organic Compounds (VOC)	75	55
Oxides of Nitrogen (NOx)	100	55
Carbon Monoxide (CO)	550	550
Oxides of Sulfur (Sox)	150	150
Particulate Matter (PM10)	150	150
Particulate Matter (PM2.5)	55	55
Source: BonTerra Psomas 2014a (Appendix A).		

Regional Construction Impacts

The SCAQMD has established methodologies to quantify air emissions associated with construction activities such as air pollutant emissions generated by operation of on-site construction equipment; fugitive dust emissions related to trenching and earthwork activities; and mobile (tailpipe) emissions from construction worker vehicles and haul/delivery truck trips. Emissions would vary from day to day, depending on the level of activity; the specific type of construction activity occurring; and, for fugitive dust, prevailing weather conditions.

A construction-period mass emissions inventory was compiled based on an estimate of construction equipment as well as scheduling and Project phasing assumptions. More specifically, the mass emissions analysis takes into account the following:

- Combustion emissions from operating on-site stationary and mobile construction equipment;
- Fugitive dust emissions from demolition, site preparation, and grading phases; and
- Mobile-source combustion emissions and fugitive dust from worker commute and truck travel.

For the purposes of estimating emissions associated with construction activities, a timeframe of December 2015 through October 2016 was applied to the analysis. Emissions were calculated using the California Emissions Estimator Model (CalEEMod) emissions inventory model (SCAQMD 2013b). CalEEMod is a computer program accepted by the SCAQMD that can be used to estimate anticipated emissions associated with land development projects in California. CalEEMod has separate databases for specific counties and air districts, and the Los Angeles County database was used for the Project. Dust control by watering was assumed, consistent with the requirements of SCAQMD Rule 403 (RR AQ-1).

The mass emissions thresholds (see Table 4-3) are based on the rate of emissions (i.e., pounds of pollutants emitted per day). Therefore, the quantity, duration, and the intensity of construction activity are important in assuring analysis of worst case (i.e., maximum daily emissions) scenarios. The Project activities (e.g., demolition, grading, building) are identified by start date and duration, as described in Table 3-1. Each activity has associated off-road equipment (e.g., dozers, backhoes, cranes) and on-road vehicles (e.g., haul trucks, concrete trucks, worker commute vehicles), as described in Table 3-2. Maximum daily emissions for the peak work day are shown in Table 4-4, Estimated Maximum Daily Construction Emissions.

TABLE 4-4
ESTIMATED MAXIMUM DAILY CONSTRUCTION EMISSIONS
(LBS/DAY)

	VOC	NOx	CO	SOx	PM10	PM2.5
Maximum daily emissions in 2015	4	46	35	<0.5	3	2
Maximum daily emissions in 2016	8	92	73	<0.5	9	5
SCAQMD Daily Thresholds	***75***	***100***	***550***	***150***	***150***	***55***
Exceeds SCAQMD Thresholds?	**No**	**No**	**No**	**No**	**No**	**No**

lbs/day: pounds per day; VOC: volatile organic compound(s); NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less

Source: BonTerra Psomas 2014a (Appendix A).

Based on the anticipated Project phasing and equipment, the estimated peak day (worst case) emissions of all pollutants—VOC, NOx, CO, PM10, and PM2.5—would occur during the approximate one month period in 2016 when construction of the Dam spillway is assumed to be concurrent with construction of the Debris Dam buttresses and the construction of the Culvert Crossing abutments and wing walls. This scenario, which represents the overlap of activities that would result in the reasonably worst case for NOx emissions, is detailed below:

Dam Spillway

- *Off-road equipment:* 1, backhoe, 1 concrete pump, 1 crane, 1 loader, 1 concrete saw
- *On-road equipment:* 56 concrete/material truck round trips over a 6-month period
- *Worker trips:* 8 daily round trips

Culvert Crossing Abutments and Wing Walls

- *Off-road equipment:* 2 concrete pumps
- *On-road equipment:* 46 material truck round trips in a one month period
- *Worker trips:* 4 daily round trips

Debris Dam Buttresses

- *Off-road equipment:* 1 excavator, 1 dozer, 1 backhoe, 1 loader, 1 water truck
- *On-road equipment:* 4,063 material truck round trips over a 2 ½ month period
- *Worker trips:* 5 daily round trips

Actual emissions could be less than shown in Table 4-4 if construction activities are delayed or occur over a longer durations than planned, because of (1) a more modern and cleaner-burning construction equipment fleet mix and/or (2) a less intensive buildout schedule (e.g., fewer daily emissions if truck trips occur over a longer time interval). As shown in Table 4-4, all criteria pollutant emissions would be less than their respective thresholds. Thus, impacts would be less than significant and no mitigation is required.

Localized Construction Impacts

The localized effects from the on-site portion of daily emissions were evaluated at sensitive receptor locations potentially impacted by the Project according to the SCAQMD's localized significance threshold (LST) methodology, which utilizes on-site mass emissions rate look up tables and Project-specific modeling, where appropriate. LSTs are applicable to the following criteria pollutants: NO_2, CO, PM10, and PM2.5.[4] LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor. For PM10 and PM2.5, LSTs were derived based on requirements in SCAQMD Rule 403, Fugitive Dust (RR AQ-1). The mass rate look-up tables were developed for each source receptor area and can be used to determine whether or not a project may generate significant adverse localized air quality impacts. The SCAQMD provides LST mass rate look-up tables for projects that are less than or equal to five acres. For projects that exceed five acres, the five-acre LST look-up values can be used as a screening tool to determine which pollutants require detailed analysis. This approach is conservative as it assumes that all on-site emissions would occur within a five-acre area and would over predict potential localized impacts (i.e., more pollutant emissions occurring within a smaller area and within closer proximity to potential sensitive receptors).

When quantifying mass emissions for localized analysis, only emissions that occur on site are considered. Consistent with the SCAQMD's LST methodology guidelines, emissions related to off-site delivery/haul truck activity and employee trips are not considered in the evaluation of localized impacts. For the Project, localized impacts are not analyzed for the Dam because it is in a remote location with no off-site receptors in the vicinity. Localized impacts are not evaluated for the Headworks since the nearest residences are approximately 550 feet southwest of the Headworks; since there is no line of sight from the Headworks to these residences because of steep cliffs adjacent to the west and southwest of the Headworks; and since there is substantial vegetative growth between the Headworks and these homes. Localized impacts are analyzed separately for the Wilderness Park Culvert Crossing and the Debris Dam because they are geographically separate and because pollutants would not impact common receptors.

Maximum local emissions would occur during the peak on-site activity. At the Wilderness Park Culvert Crossing, the peak on-site activity would occur during the removal of the existing crossing. At the Debris Dam, the peak on-site activity would occur during construction of the embankment buttressing. The LSTs for a 1-acre site with receptors at a distance of 25 meters were used; these are the most conservative thresholds. The results of the LST analysis are in Table 4-5, Maximum Localized Construction Pollutant Emissions. As shown in Table 4-5, localized emissions for all criteria pollutants would be less than their respective SCAQMD LSTs for all pollutants. Thus, impacts would be less than significant and no mitigation is required.

[4] NO_2 impacts are addressed by evaluating nitrogen oxide (NOx) emissions.

TABLE 4-5
MAXIMUM LOCALIZED CONSTRUCTION POLLUTANT EMISSIONS (LBS/DAY)

	NOx	CO	PM10	PM2.5
Wilderness Park Culvert Crossing	11	8	1	1
Debris Dam	19	14	3	2
SCAQMD LSTs	***89***	***623***	***5***	***3***
Exceeds SCAQMD Thresholds?	**No**	**No**	**No**	**No**

lbs/day: pounds per day; NOx: nitrogen oxides; CO: carbon monoxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less;

Source: BonTerra Psomas 2014a (Appendix A).

Toxic Air Contaminants Impacts

The greatest potential for toxic air contaminant (TAC) emissions during construction would be related to diesel particulate emissions associated with heavy equipment operations during site grading activities. The SCAQMD does not consider diesel-related cancer risks from construction equipment to be an issue due to the short-term nature of construction activities. Construction activities associated with the Project would be short term (no more than 1.5 years). The assessment of cancer risk is typically based on a 70-year exposure period. Because exposure to diesel exhaust would be well below the 70-year exposure period, construction of the Project is not anticipated to result in an elevated cancer risk to exposed persons due to the short-term nature of construction. As such, Project-related toxic emission impacts during construction would be less than significant and no mitigation is required (BonTerra Psomas 2014a).

Regional and Local Operational Impacts

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Dam, Headworks, or Debris Dam. The helipad at the Dam would be used only in the event of an emergency. It is expected that helipad operations would only result in one or two helicopter trips per year. Therefore, any Project-generated change in emissions would be nominal. Impacts from regional mass emissions and local on-site emissions would be less than significant (BonTerra Psomas 2014a).

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

Less than Significant Impact. The SCAQMD's approach for assessing cumulative impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the Federal and State Clean Air Acts. As discussed earlier in Threshold 4.3(a), the Project would be consistent with the AQMP, which is intended to bring the SoCAB into attainment for all criteria pollutants.[5] In addition, the mass regional emissions calculated for the

[5] Section 15064(h)(3) of the State CEQA Guidelines states "A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program which provides specific requirements that will avoid or substantially lessen the cumulative problem (e.g., water quality control plan, air quality plan, integrated waste management plan) within the geographic area in which the project is located. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency".

Project (Table 4-5) would be lower than the applicable SCAQMD daily significance thresholds that are designed to assist the region in attaining the applicable State and national ambient air quality standards. With regard to cumulative local impacts due to concurrent construction activities of related projects, there are no projects currently active or proposed within the local vicinity, as described in Section 4.17, Mandatory Findings of Significance. As such, cumulative impacts would be less than significant and no mitigation is required.

d) Would the project expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact. As described in Threshold 4.3(b), the Project would not result in any substantial TAC air pollution impacts, and construction criteria pollutant emissions would be less than the conservative LST. Therefore, Project construction would not expose any nearby sensitive receptors to substantial pollutant concentrations. As such, the Project would have a less than significant impact no mitigation is required.

A CO hotspot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. If a project increases average delay at signalized intersections operating at level of service (LOS) E or F or causes an intersection that would operate at LOS D or better without the project to operate at LOS E or F with the project, there is a potential for a CO hotspot. The Project is not expected to generate new traffic during construction or operations that would exceed LOS E of F along the primary haul routes (see Section 4.16). Therefore, the Project would not increase congestion at major signalized intersections. There would be no impact and no exposure of sensitive receptors to Project-generated local CO emissions (BonTerra Psomas 2014a).

e) Would the project create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. According to the SCAQMD's *CEQA Air Quality Handbook,* land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding (SCAQMD 1993). The Project does not include any uses identified by the SCAQMD as being associated with odors and therefore would not produce objectionable long-term operational odors.

Short-term Project construction equipment and activities would generate odors. Potential construction odors include diesel exhaust emissions, and paving activities. There may be situations where construction activity odors will be noticeable by persons working at or visiting nearby facilities, but these odors would not be unfamiliar or necessarily objectionable. The odors would be temporary and would dissipate rapidly from the source with an increase in distance. Therefore, the impacts would be short-term; would not be objectionable to a substantial number of people; and would be less than significant. All Project-related actions are construction related and short-term, and no long-term operational odors would be created. As such, the Project would have no impact in regards to objectionable odors.

4.3.3 MITIGATION MEASURES

There would be no significant adverse impacts relating to air quality; therefore, no mitigation measures are required.

4.4 BIOLOGICAL RESOURCES	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Information in this section is derived from the *Biological Technical Report for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California* dated October 2014 and prepared by BonTerra Psomas. This report, along with all focused survey reports, Tree Survey Report, and the Jurisdictional Delineation Report, is provided in its entirety in Appendix B.

4.4.1 EXISTING CONDITIONS

The study area for the Project extends from the Dam along Santa Anita Canyon downstream to the Debris Dam. The study area supports a variety of plant and wildlife species that are described below.

Vegetation Types

Twenty vegetation types and other areas (i.e., unvegetated areas that were mapped) occur in the study area and are described in Exhibit 4-1, Vegetation Map. Where vegetation overlaps another type of mapping unit (e.g., a tree canopy over water or roads), the area was mapped according to the uppermost canopy of vegetation. Nomenclature for vegetation types generally follows that of *The Vegetation Classification and Mapping Program: List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*.

Mixed Coastal Sage Scrub: Mixed coastal sage scrub occurs in the northern portion of the study area above the Dam, in the upper portion of the Debris Dam, and east of the Debris Dam. This vegetation type is dominated by California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*) in most areas with a diversity of shrub species varying from the northern portion of the study area to the southern portion of the study area. The variation is due to the elevation range and steepness of the slopes in which the vegetation is growing. In the large wash area below the Wilderness Park, the mixed sage scrub also contains components that could fit in an alluvial sage scrub category and includes western sycamore and scale-broom (*Lepidospartum squamatum*).

Disturbed Mixed Coastal Sage Scrub: Disturbed mixed coastal sage scrub occurs in the northern portion of the study area along the spur road to the Dam, downslope of the spur road, and along the dirt road south of the Wilderness Park. These areas have been disturbed by their proximity to the road (e.g., non-native species are sometimes spread by vehicles, or non-native species become established at the disturbed edge of the roadway and spread into the adjacent vegetation). These areas are dominated by shrub species similar to those described above under mixed coastal sage scrub; however there is a large percentage of non-native species present, including crimson fountain grass (*Pennisetum setaceum*), shortpod mustard (*Hirschfeldia incana*), and ripgut brome (*Bromus diandrus*).

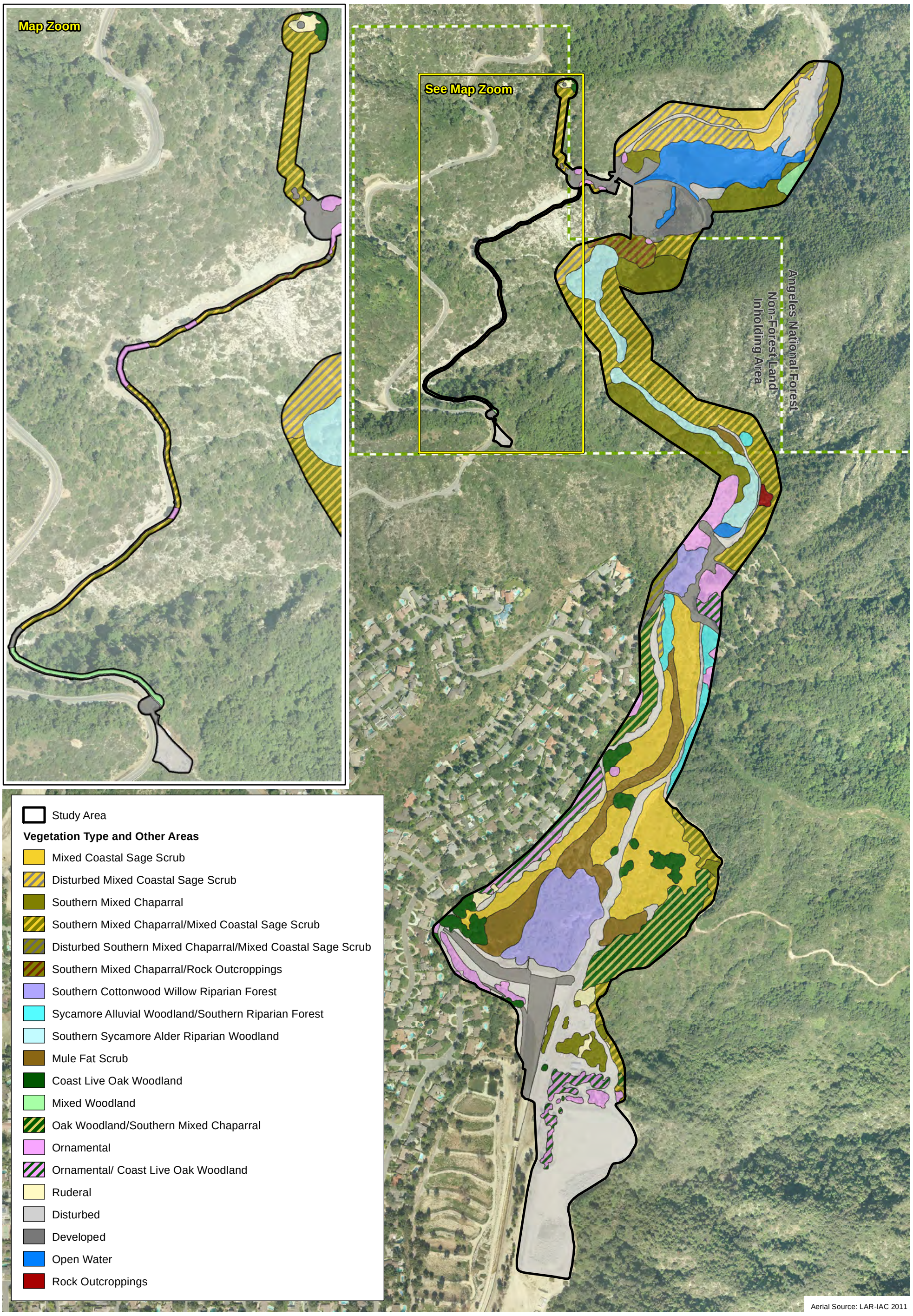
Southern Mixed Chaparral: Southern mixed chaparral occurs throughout the steep slopes of the study area mostly north of the Headworks facility and the Wilderness Park; it also occurs east of the Debris Dam. This vegetation is dominated by larger evergreen native shrubs, including laurel sumac (*Malosma laurina*), sugar bush (*Rhus ovata*), birch-leaved mountain mahogany (*Cercocarpus betuloides*), holly-leaved redberry (*Rhamnus crocea*), blue elderberry (*Sambucus nigra* ssp. *caerulea* [*S. mexicana*]), holly-leaved cherry (*Prunus ilicifolia*), Our Lord's candle (*Hesperoyucca whipplei* [*Yucca whipplei*]), toyon (*Heteromeles arbutifolia*), and heart-leaved penstemmon (*Keckiella cordifolia*). A few areas also contain chamise (*Adenostoma fasciculatum*), coast live oak (*Quercus agrifolia*), and canyon live oak (*Quercus chrysolepis*).

Southern Mixed Chaparral/Mixed Coastal Sage Scrub: Southern mixed chaparral/mixed coastal sage scrub occurs primarily on the steep slopes along Santa Anita Canyon between the Dam and the Headworks facility, and east of the Debris Dam. This vegetation type is a mixture of native species described above in southern mixed chaparral and mixed coastal sage scrub. The dominant species include laurel sumac, California sagebrush, sugar bush, California buckwheat, black sage (*Salvia mellifera*), white sage (*Salvia apiana*), and Our Lord's candle.

Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub: Disturbed southern mixed chaparral/mixed coastal sage scrub occurs in an area just south of the Headworks facility. This area is dominated by shrub species similar to those mentioned for southern mixed chaparral/mixed coastal sage scrub, including laurel sumac, California sagebrush, California buckwheat, black sage, and white sage. However, there is a large percentage of non-native species present, including crimson fountain grass, shortpod mustard, and ripgut grass.

Southern Mixed Chaparral/Rock Outcroppings: The southern mixed chaparral/rock outcroppings vegetation type occurs in an area just downstream of the Dam along Santa Anita Canyon. These areas are very steep with large rock outcroppings and cliff faces and contain an open mixed chaparral comprised of toyon, sugar bush, and chamise. There are club mosses and dudleyas (*Dudleya* spp.) present on these cliff faces.

Southern Cottonwood Willow Riparian Forest: The southern cottonwood willow riparian forest occurs downstream of the Headworks facility and in the Debris Dam. This vegetation type is dominated by a mix of arroyo willow (*Salix lasiolepis*) and Goodding's black willow (*Salix*



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Vegetation Map

Exhibit 4-1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

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gooddingii). A few scattered white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) are also present.

Sycamore Alluvial Woodland/Southern Riparian Forest: Sycamore alluvial woodland/southern riparian forest occurs in the southern portion of the study area south of the Wilderness Park and on the northeastern edge of the Debris Dam. These areas are fed by the creek, but are drier and more upland in composition. The species present include large western sycamore, mule fat (*Baccharis salicifolia*), California buckwheat, and California sagebrush.

Southern Sycamore Alder Riparian Woodland: Southern sycamore alder riparian woodland is the dominant riparian vegetation type along Santa Anita Canyon between the Dam and the Headworks facility. This area is dominated by a mix of mature trees, including California sycamore and white alder.

Mule Fat Scrub: Mule fat scrub occurs primarily along the active channel in the upper and middle portions of the Debris Dam, at the lower end of the basin, and on the terrace east of the Debris Dam. Large boulders are present within this vegetation type along the upper portion of the basin.

Coast Live Oak Woodland: Stands of coast live oak and Engelmann oak (*Quercus engelmannii*) individuals occur in on the outer edges of the Debris Dam in the study area.

Mixed Woodland: Mixed woodland occurs north of the Dam on a steep east-facing slope. This area is comprised of large native trees including California bay (*Umbellularia californica*) and big-leafed maple (*Acer macrophyllum*), with a chaparral species in the understory.

Oak Woodland/Southern Mixed Chaparral: Oak woodland/southern mixed chaparral occurs on the northwest (adjacent to the homes) and southeast sides of the Debris Dam. This vegetation type consists of coast live oak, Engelmann oak, and scrub oak (*Quercus berberidifolia*) trees with a diverse mix of species in the understory. Chaparral species present in the understory commonly include laurel sumac, blue elderberry, and toyon.

Ornamental: Ornamental vegetation occurs primarily near the Headworks facility and adjacent to the residential areas and maintenance facilities in the Wilderness Park. These areas contain non-native species planted for aesthetic purposes. The slope near the Headworks facility is dominated by crimson fountain grass. Dominant planted species in this vegetation type include oleander (*Nerium oleander*), gum (*Eucalyptu*s sp.), and Canary Island pine (*Pinus canariensis).*

Ornamental/Coast Live Oak Woodland: Ornamental/coast live oak woodland occurs in the Wilderness Park, along the residences west of the Debris Dam, and north and west of the Sediment Placement Site. In these areas, ornamental species (e.g., Canary Island pine) are planted among the existing native coast live oak.

Ruderal: Ruderal vegetation occurs in a few small areas north of the Santa Anita Reservoir and in the upland areas east and west of the Debris Dam. These areas are dominated by non-native vegetation, predominantly comprised of short-pod mustard with scattered non-native grasses including ripgut grass.

Disturbed: Disturbed areas occur throughout the study area and consist of dirt roads around the Dam, Headworks facility, Debris Dam, and Sediment Placement Site. These areas also include the area that recently underwent sediment removal within the upper portion of Santa Anita Reservoir. Disturbed areas consist of bare ground and contain little to no vegetation.

Developed: Developed areas occur at the Dam, Headworks facility, and Debris Dam. These areas include paved roads, residential areas, dams, and other structures. These areas do not contain vegetation or other landscaping (developed areas that contain landscaping were mapped as "ornamental").

Open Water: Open water is mapped within Santa Anita Reservoir, at the base of the Dam and adjacent to the Headworks facility. It should be noted that open water also occurs along Santa Anita Canyon, but is a component of the other riparian vegetation types mapped along the canyon. Open water is mapped in areas that do not contain emergent vegetation or a tree canopy. The extent of open water varies based on the rainfall conditions of the year, time of year, and (in the lower portions of the study area) the amount of water being released from the Dam. The mapping represents the extent on the day the vegetation was mapped in April 2012; the extent of open water in recent years is less than shown on the map since the area has received lower than average rainfall in 2013 and 2014.

Rock Outcroppings: Rock outcroppings occur in an area along Santa Anita Canyon, upstream of the Headworks facility. The rock outcroppings are on cliff faces or are at the base of the cliffs. They generally lack vegetation, likely due to the steep cliff slopes and continuous erosion of the rock faces; however, a few of the rock outcroppings contain dudleyas.

Wildlife

The Project area is comprised primarily of native habitats and provides suitable habitat for several wildlife species. Common wildlife species observed or expected to occur in the study area are discussed below.

Two fish species were observed in the study area during the surveys: rainbow trout (*Onocorhynchus mykiss*), a native game fish, and green sunfish (*Lepomis cyanellus*), a non-native species. Four rainbow trout, averaging approximately 6 inches in length, were observed in the large pool (15 feet wide by 30 feet long by 6 feet deep) below the Headworks facility. Rainbow trout were stocked in this stream system from 1930 to 1945, and likely continue to reproduce when conditions are favorable. Approximately ten green sunfish were also observed in the pool below the Headworks facility; a range of size classes were observed, indicating that the species is actively reproducing.

Suitable habitat for amphibians is present throughout the Project area. Three native amphibian species were observed during the surveys, including California [western] toad (*Anaxyrus boreas halophilus* [*Bufo boreas*]), California treefrog (*Pseudacris* [*Hyla*] *cadaverina*), and Baja California treefrog (*Pseudacris hypochondriaca* [*Hyla regilla*]).

Reptile species observed in the study area include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus tigris*), southern alligator lizard (*Elgaria multicarinata*), two-striped garter snake, gopher snake (*Pituophis catenifer*), and western rattlesnake (*Crotalus viridis*).

The following resident bird species were observed: great blue heron (*Ardea herodias*), killdeer (*Charadrius vociferus*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), bushtit (*Psaltriparus minimus*), house wren (*Troglodytes aedon*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), common yellowthroat (*Geothlypis trichas*), spotted towhee (*Pipilo maculatus*), California towhee (*Melozone* [*Pipilo*] *crissalis*), song sparrow (*Melospiza melodia*), house finch (*Carpodacus mexicanus*), and lesser goldfinch (*Spinus* [*Carduelis*] *psaltria*).

Bird species that are present in the region during the nesting season include black-chinned hummingbird (*Archilochus alexandri*), Pacific-slope flycatcher (*Empidonax difficilis*), ash-throated flycatcher (*Myiarchus cinerascens*), phainopepla (*Phainopepla nitens*), western tanager (*Piranga ludoviciana*), black-headed grosbeak (*Pheucticus melanocephalus*), hooded oriole (*Icterus cucullatus*), and Bullock's oriole (*Icterus bullockii*). Wintering species that would be expected to occur include ruby-crowned kinglet (*Regulus calendula*), cedar waxwing (*Bombycilla cedrorum*), yellow-rumped warbler (*Setophaga coronata* [*Dendroica coronata*]), Townsend's warbler (*Setophaga townsendi* [*Dendroica townsendi*]), and white-crowned sparrow.

Raptors (birds of prey) observed in the study area include Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), barn owl (*Tyto alba*), and great horned owl (*Bubo virginianus*). The turkey vulture (*Cathartes aura*), a scavenger, was observed in the study area. These raptor species are expected to nest in large oak or sycamore trees, or on rocky cliff ledges. A red-tailed hawk was observed nesting on the cliff face east of Santa Anita Reservoir during the surveys.

Small-sized mammals observed in the study area include western gray squirrel (*Sciurus griseus*), California ground squirrel (*Spermophilus beecheyi*), Merriam's chipmunk (*Neotamius* [*Tamias*] *merriami*), and Botta's pocket gopher (*Thomomys bottae*). Medium-sized mammals observed in the study area include desert cottontail (*Sylvilagus audubonii*), coyote (*Canis latrans*), and striped skunk (*Mephitis mephitis*). Large-sized mammals observed or detected in the study area include black bear (*Ursus americanus*) and mule deer (*Odocoileus hemionus*); mountain lion (*Puma concolour*) would also be expected.

Bats occur throughout most of Southern California and may use any portion of the study area as foraging habitat. Most of the bats that could potentially occur in the study area are inactive during the winter and either hibernate or migrate, depending on the species. An acoustical survey was conducted to determine which bats occur within or adjacent to Project Work Areas (Attachment I). The following common bat species were observed: big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), canyon bat (*Parastrellus hesperus*), hoary bat (*Lasiurus cinereus*), yuma myotis (*Myotis yumanensis*), little brown bat (*Myotis lucifigus*), and California myotis (*Myotis californicus*). Bats may roost in the rocky outcroppings along Santa Anita Canyon, in crevices of structures, or in large oak or sycamore trees in the study area. Acoustical surveys are initiated before dusk and record sonar calls of bats as they emerge from their roosts; it is assumed that bats that are recorded within the first hour are roosting in or around the recording site while those that first appear over an hour into the recording are assumed to have traveled to the area to forage from a roost site out of the immediate area. Based on the acoustical recordings, the big brown bat, Brazilian free-tailed bat, canyon bat, yuma myotis, little brown bat, and California myotis have a moderate to high potential to roost in crevices and structures in and around Project Work Areas.

Wildlife Movement

Wildlife corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because they prohibit the infusion of new individuals and genetic information. Corridors mitigate the effects of this fragmentation by (1) allowing animals to move between remaining habitats, thereby permitting depleted populations to be replenished and promoting genetic exchange; (2) providing routes for wildlife to escape from fire, predators and human disturbances, thus reducing the risk that catastrophic events (such as fire

or disease) will result in population or local species extinction; and (3) serving as travel routes for individual animals as they move in their home ranges in search of food, water, mates, and other necessary resources.

A number of terms such as “wildlife corridor”, “travel route”, “habitat linkage”, and “wildlife crossing” have been used in various wildlife movement studies to refer to areas in which wildlife move from one area to another. To clarify the meaning of these terms and to facilitate the discussion on wildlife movement in this analysis, these terms are defined as follows:

- **Travel Route –** a landscape feature (such as a ridgeline, drainage, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and to provide access to necessary resources (e.g., water, food, cover, den sites). The travel route is generally preferred because it provides the least amount of topographic resistance in moving from one area to another. It contains adequate food, water, and/or cover while moving between habitat areas and it provides a relatively direct link between target habitat areas.
- **Wildlife Corridor –** a piece of habitat, usually linear in nature, which connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bound by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, and/or water to support species and to facilitate movement while in the corridor. Larger, landscape-level corridors (often referred to as “habitat linkages” or “landscape linkages”) can provide both transitory and resident habitat for a variety of species.
- **Wildlife Crossing –** a small, narrow area, relatively short in length and generally constricted in nature that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. Crossings typically are man-made and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These often represent “choke points” along a movement corridor, which may impede wildlife movement and increase the risk of predation.

It is important to note that, in a large open space area where there are few or no man-made or naturally occurring physical constraints to wildlife movement, wildlife corridors (as defined above) may not yet exist. Given an open space area that is both large enough to maintain viable populations of species and to provide a variety of travel routes (e.g., canyons, ridgelines, trails, riverbeds, and others), wildlife will use these “local” routes while searching for food, water, shelter, and mates and will not need to cross into other large open space areas. Based on their size, location, vegetative composition and availability of food, some of these movement areas (e.g., large drainages and canyons) are used for longer lengths of time and serve as source areas for food, water and cover, particularly for small- and medium-sized animals. This is especially true if the travel route is within a larger open space area. However, once open space areas become constrained and/or fragmented as a result of urban development or construction of physical obstacles (such as roads and highways), the remaining landscape features or travel routes that connect the larger open space areas become corridors as long as they provide adequate space, cover, food and water, and do not contain obstacles or distractions (e.g., man-made noise, lighting) that would generally hinder wildlife movement.

The Dam is located adjacent to the southern edge of the Angeles National Forest. Development is located to the west and south of the Debris Dam, and Santa Anita Wash is channelized downstream of the Project area. Therefore wildlife is expected to move relatively freely between the Project area and open space areas to the north, but are not expected to move regularly into

the developed areas south of the Project area (with exception of urban-tolerant species such as coyotes and striped skunks).

Santa Anita Canyon is naturally very steep sided and restricts many species to traveling either up the canyon bottom or along the ridgelines. For species that travel along riparian corridors, the Dam is a barrier to movement between the Reservoir and Santa Anita Canyon below. However, the ridgelines adjacent to the Dam are undeveloped and would allow species to move around the Dam if they could travel in upland habitats. Aquatic species would either be restricted to Santa Anita Reservoir or Santa Anita Canyon from below the Dam to the northern end of Debris Dam (where the stream dries).

Special Status Biological Resources

A literature review was performed prior to the initiation of surveys to identify special status plants, wildlife, and habitats known to occur (or that historically occurred) in the vicinity of the Project study area. These searches included a review of the USGS' Mt. Wilson, Azusa, El Monte, Pasadena, and Baldwin Park 7.5-minute quadrangles[6] in the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California and the CDFW's California Natural Diversity Database (CNDDB). A review of Federal Endangered Species Act (FESA) critical habitat documents was used to identify any portions of the study area occurring within proposed or designated critical habitat. The literature review also included a review of the Angeles National Forest Threatened, Endangered, Proposed, Candidate, and Forest Service Sensitive Plants and Animals. Additionally, all previous biological documentation completed for the Santa Anita Dam Riser and Sediment Removal Project, including a Biological Technical Report, an Environmental Impact Report, and various focused survey reports were reviewed prior to the field surveys (LACDPW 2009).

Special Status Vegetation Types

The CNDDB provides an inventory of vegetation types that are considered special status by the State and federal resource agencies, academic institutions, and various conservation groups (such as the CNPS). Determination of the level of imperilment is based on the NatureServe Heritage Program Status Ranks that rank both species and vegetation types on a global (**G**) and statewide (**S**) basis according to their rarity; trend in population size or area; and recognized threats (e.g., proposed developments, habitat degradation, and non-native species invasion). All vegetation alliances[7] that have State ranks of S1 to S3 are considered to be highly imperiled. Three vegetation types in the study area would be considered special status: southern mixed chaparral/rock outcroppings, southern cottonwood willow riparian forest, and sycamore alluvial woodland/southern riparian forest

Special Status Plant Species

Ninety-six special status plant species have been reported from the Project area based on the results of the literature review described above. These names of these species, their listing status, potential to occur in each portion of the study area, and whether or not they were observed during focused surveys are detailed in Appendix B. No Threatened or Endangered plant species are expected to occur in the study area due to lack of suitable habitat or based on the results of focused surveys. The two special status plant species observed in the study area during the

6 These quadrangles were selected based on their proximity and topographic similarity to the project study area. Additional quadrangles were not considered necessary as they would provide minimal additional value.

7 A vegetation alliance is "a classification unit of vegetation, containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover" (Sawyer et al. 2009).

2012–2013 surveys are listed in Table 4-6, Special Status Plant Species Known to Occur in the Project Area, and include Engelmann oak (*Quercus engelmannii*) and Coulter's matilija poppy (*Romneya coulteri*). The locations of these plants are mapped in Exhibit 4-2, Special Status Species Observed. No other special status plant species are expected to occur either due to lack of suitable habitat or based on the results of the 2012 focused surveys.

TABLE 4-6
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Quercus engelmannii Engelmann oak	Occurs in chaparral, cismontane woodland, riparian woodland, and valley and foothill grasslands in Los Angeles, Orange, and Riverside counties and in Baja California, Mexico between sea level and 4,200 feet above msl.	–	–	4.2	–	–	Engelmann oaks were observed during the 2012 focused plant surveys and 2014 tree survey. 5 trees were recorded near the Debris Dam Work Area.
Romneya coulteri Coulter's matilija poppy	Inhabits dry washes and canyons in coastal sage scrub and chaparral away from the immediate coast between sea level and 4,000 feet above msl.	–	–	4.2	–	–	17 clumps of poppy were observed during the 2012 focused plant surveys. The species was observed west of the Debris Dam. This species spreads by rhizomes and it is difficult to identify individual plants.

USFWS: United States Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; CRPR: California Rare Plant Rank; USFS: United States Forest Service; –: no status for this agency; msl: mean sea level.

CRPR List Categories

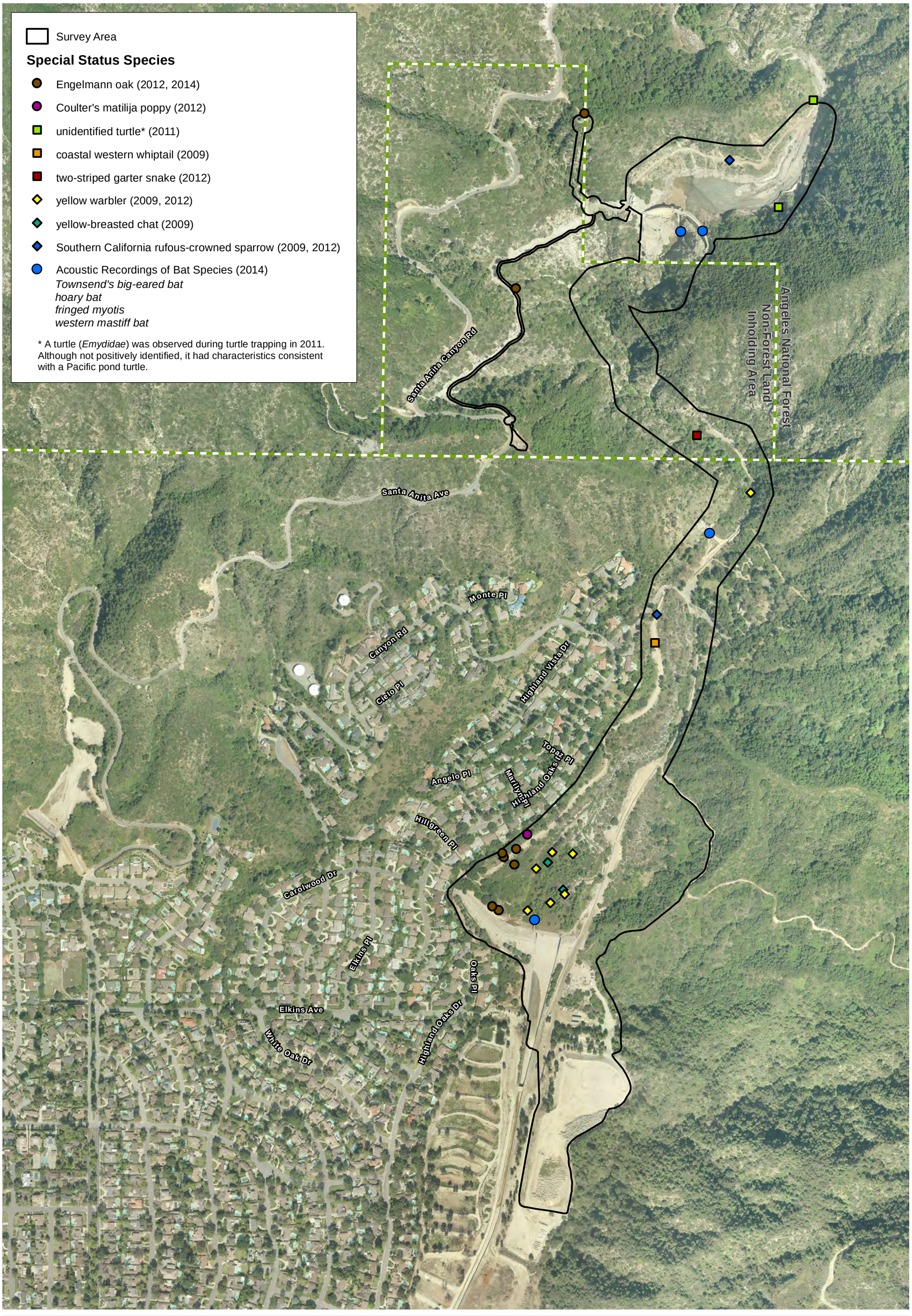
List 4 Plants of Limited Distribution – A Watch List

CRPR Threat Code Extensions

.2 Fairly Endangered in California (20–80% of occurrences threatened)

[a] Source for General Habitat/Range Descriptions: Allen et al.1995.
[b] Critical Habitat only applies to USFWS-listed species. As such, any species without a USFWS listing, will have a "–".
[c] All previous biological documentation for the study area including a Biological Technical Report, an Environmental Impact Report, and various focused survey reports were reviewed to compile this table (see the Biological Technical Report for a complete list of sources used). Results of previous surveys are only listed for species for which the respective report specifically mentioned that species. The targets of each survey may vary based on the habitats present in each respective survey area. Also, the CRPR ranking changes with time and these surveys typically focus on the species with the highest rankings at the time of the survey. Additionally, it should be noted that while the survey areas for previous surveys partially overlapped with the study area for this report, the boundaries varied from project to project. Repeated negative survey results contribute to increasing the strength of an absence finding.

Source: BonTerra Psomas 2014b (Appendix B).



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Special Status Species Observed

Exhibit 4-2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

600 300 0 600 Feet

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Special Status Wildlife

Sixty-four special status wildlife species have been reported from the Project area based on the results of the literature review described above. The names of the species, their listing status, potential to occur in each portion of the study area, and whether or not they were observed during focused surveys is detailed in the Biological Technical Report (Appendix B). Special status wildlife species observed in the study area during the 2009 - 2014 focused surveys are listed in Table 4-7, Special Status Wildlife Species Observed in the Project Area, and include coastal western whiptail (*Aspidoscelis tigris stejnegeri*), two-striped garter snake, Cooper's hawk, yellow warbler (*Setophaga petechia*), yellow-breasted chat (*Icteria virens*), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Townsend's big-eared bat (*Corynorhinus townsendii*), hoary bat (*Lasiurus cinereus*), fringed myotis (*Myotis thysanodes*), and western mastiff bat (*Eumops perotis californicus*). The locations of these species are mapped in Exhibit 4-2. Additionally, 20 special status wildlife species have potential to occur in the study area based on the presence of suitable habitat and are listed in Table 4-7.

TABLE 4-7
SPECIAL STATUS WILDLIFE SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Reptiles						
Emys [*Actinemys*] *marmorata* [*pallida*] Pacific [western] pond turtle	Occurs in ponds, lakes, marshes, rivers, streams, and irrigation ditches with a rocky or muddy bottom and aquatic vegetation at elevations from sea level to approximately 6,696 feet above msl.	–	SSC	FSS	–	Not expected to occur along Santa Anita Canyon because not observed during 2012 focused turtle trapping; previously observed in Santa Anita Reservoir during focused turtle trapping in 2011.
Phrynosoma blainvillii coast horned lizard	Occurs in scrubland, grassland, coniferous forests, and broadleaf woodland vegetation types.	–	SSC	–	–	May occur; suitable habitat; not observed during 2007 or 2012 focused surveys.
Aspidoscelis tigris stejnegeri **coastal western whiptail**	**Occurs in hot and dry areas with sparse foliage and open areas. Found in forests, woodland, chaparral, and riparian areas.**	**–**	**–**	**–**	**–**	**Observed; suitable habitat; incidentally observed during 2012 surveys; previously observed during 2009 surveys.**
Diadophis punctatus modestus San Bernardino ringneck snake	Occurs in moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, and woodlands.	–	–	FSS	–	May occur; potentially suitable habitat.
Lampropeltis zonata parvirubra San Bernardino Mountain kingsnake	Occurs in diverse habitats including coniferous forest, oak-pine woodlands, riparian woodland, chaparral, manzanita, and coastal sage scrub from 800 to 9,000 feet above msl.	–	–	FSS	–	May occur; potentially suitable habitat.
Lichanura orcutti [*Charina trivirgata roseofusca]* Northern three-lined boa [coastal rosy boa]	Inhabits arid scrublands, semi-arid shrublands, rocky shrublands, rocky deserts, canyons, and other rocky areas. May be common in riparian areas, but does not require permanent water.	–	–	FSS	–	May occur; potentially suitable habitat.
Salvadora hexalepis virgultea coast patch-nosed snake	Occurs in semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains at elevations from sea level to around 7,000 feet above msl.	–	SSC	–	–	May occur; potentially suitable habitat.

TABLE 4-7
SPECIAL STATUS WILDLIFE SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Thamnophis hammondii **two-striped garter snake**	**Occurs in wetlands, freshwater marsh, and riparian habitats with perennial water.**	**–**	**SSC**	**FSS**	**–**	**Observed during 2012 focused surveys; suitable habitat.**
Birds						
Accipiter cooperii **Cooper's hawk (nesting)**	**Preferred nesting habitats are oak and riparian woodlands dominated by sycamores and willows.**	**–**	**WL**	**–**	**–**	**Observed foraging during 2012 focused surveys; previously observed foraging during 2009 focused surveys; suitable nesting habitat.**
Elanus leucurus white-tailed kite (nesting)	Occurs in savanna, open woodlands, marshes, desert grassland, partially cleared lands, and cultivated fields.	–	FP	–	–	Limited potential to occur; not observed during focused bird surveys in 2012 or in 2009; marginally suitable foraging and nesting habitat.
Falco columbarius merlin (wintering)	Winters in open woodland, grasslands, open cultivated fields, marshes, estuaries, and seacoasts. Does not breed locally; breeds in the boreal forests.	–	WL	–	–	Limited potential to occur in winter; marginally suitable foraging habitat.
Falco mexicanus prairie falcon	Occurs in grasslands, shrub-steppe, deserts, and other open areas up to about 10,000 feet above msl. In the winter, they also occur in cultivated fields, lakeshores, and desert scrub.	–	WL	–	–	Limited potential to occur; limited suitable foraging habitat; potentially suitable nesting habitat.
Falco peregrinus anatum American peregrine falcon (nesting)	Nests in inaccessible areas such as cliffs, high building ledges, bridges, or other such structures.	Delisted	Delisted/FP	–	–	May occur; limited suitable foraging and nesting habitat.
Asio otus long-eared owl	Occurs in dense vegetation adjacent to open grassland or shrubland, and open forests.	–	SSC	–	–	May occur; suitable foraging and nesting habitat.

TABLE 4-7
SPECIAL STATUS WILDLIFE SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Cypseloides niger black swift	Nesting typically occurs in a moist crevice or cave on a sea cliff above the surf or on cliffs behind or adjacent to waterfalls in deep canyons.	–	SSC	–	–	May occur for foraging only; no suitable nesting habitat.
Lanius ludovicianus loggerhead shrike	Occurs in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground.	–	SSC	–	–	May occur; suitable habitat.
***Setophaga petechia* [*Dendroica petechia*] yellow warbler**	**Riparian habitats dominated by willows with dense understory vegetation between sea level and 9,000 feet above msl.**	**–**	**SSC**	**–**	**–**	**Observed during 2012 focused surveys; previously observed during 2009 focused surveys; suitable habitat.**
***Icteria virens* yellow-breasted chat**	**For nesting, this species requires dense, brushy tangles near water and riparian woodlands that support a thick understory.**	**–**	**SSC**	**–**	**–**	**May occur; not observed during 2012 surveys; previously observed during 2009 focused surveys; suitable habitat.**
***Aimophila ruficeps canescens* Southern California rufous-crowned sparrow**	**Occurs in shrublands on hillsides and in canyons with rocky, dry slopes.**	**–**	**WL**	**–**	**–**	**Observed during 2012 focused surveys; previously observed during 2009 focused surveys; suitable habitat.**
Mammals						
Antrozous pallidus pallid bat	Occurs in grasslands, shrublands, and woodlands and in open habitats with rocky areas for roosting.	–	SSC	FSS	–	May occur; potentially suitable foraging and roosting habitat; one unidentified acoustical recording may have been pallid bat.

TABLE 4-7
SPECIAL STATUS WILDLIFE SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Corynorhinus townsendii **Townsend's big-eared bat**	**Occurs in oak woodlands, arid deserts, grasslands, and high-elevation forests and meadows. Roosts in limestone caves, lava tubes, and man-made structures.**	**–**	**SC/SSC**	**FSS**	**–**	**Observed foraging at the Dam (acoustical analysis results); not expected to roost at the Dam (first observation recorded over an hour into the survey so bat likely traveled to the Dam from its roosting location); potentially suitable foraging and roosting habitat (prefers caves; would not be expected to roost on the structures).**
Lasionycteris noctivagans silver-haired bat	Typically hibernates in small tree hollows, beneath sections of tree bark, in buildings, rock crevices, in wood piles, and on cliff faces. Occasionally will hibernate in the entrances to caves, especially in northern regions of their range.	–	SA	–	–	May occur; potentially suitable foraging and roosting habitat; not observed during acoustical surveys.
Lasiurus blossevillii western red bat	Occurs in riparian habitats dominated by cottonwoods, oaks, sycamores, and walnuts.	–	SSC	–	–	May occur; potentially suitable foraging and roosting habitat; not observed during acoustical surveys.
Lasiurus cinereus **hoary bat**	**Occurs in open habitats or habitat mosaics with access to trees for cover and roosts in dense foliage of medium to large trees. Also uses trees in urban areas several miles away from undeveloped habitat.**	**–**	**SA**	**–**	**–**	**Observed foraging at the Dam (acoustical analysis results); not expected to roost at the Dam (tree roosting species); potentially suitable foraging and roosting habitat.**

TABLE 4-7
SPECIAL STATUS WILDLIFE SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Myotis thysanodes **fringed myotis**	**Occurs in a variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe, but mostly commonly in drier woodlands (i.e., oak, pinyon-juniper, and ponderosa pine). Forages in forest interior and along forest edges. Roosts in crevices in buildings, underground mines, rocks, cliff faces, bridges, decadent trees, and snags.**	**–**	**–**	**FSS**	**–**	**Observed foraging at the Dam (acoustical survey results); expected to roost in the Dam (crevices); potentially suitable foraging and roosting habitat.**
Eumops perotis californicus **western mastiff bat**	**Found in many open semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, palm oases, chaparral, desert scrub, and urban areas. Typically forages in open areas with high cliffs and roosts in small colonies in crevices on cliff faces.**	**–**	**SSC**	**–**	**–**	**Observed foraging at the Dam (acoustical survey results); limited potential to roost in the Dam (first observation recorded over an hour into the survey so bat likely traveled to the Dam from its roosting location); potentially suitable foraging and roosting habitat.**
Nyctinomops femorosaccus pocketed free-tailed bat	Occurs in areas with ponds or streams or in arid deserts that provide suitable foraging habitat. It primarily roosts in crevices in rugged cliffs, slopes, and tall rocky outcrops.	–	SSC	–	–	May occur; potentially suitable foraging and roosting habitat; not observed during acoustical surveys.
Nyctinomops macrotis big free-tailed bat	Feeds primarily on moths caught while flying over water sources in suitable habitat in the southwestern U.S. This species prefers rugged, rocky terrain and roosts in crevices in high cliffs or rocky outcrops.	–	SSC	–	–	May occur; potentially suitable foraging and roosting habitat; not observed during acoustical surveys.

TABLE 4-7
SPECIAL STATUS WILDLIFE SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Onychomys torridus ramona southern grasshopper mouse	Occurs in grassland and sparse scrub vegetation types and prefers sandy soils.	–	SSC	–	–	Limited potential to occur; potentially suitable habitat.
Perognathus longimembris brevinasus Los Angeles pocket mouse	Occurs in lower elevation grasslands and coastal sage scrub vegetation with open ground and fine sandy soils between 550 and 2,650 feet above msl.	–	SSC	–	–	May occur; potentially suitable habitat.

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; USFS: U.S. Forest Service; msl: mean sea level

Status Definitions

State (CDFW) Status
SSC Species of Special Concern
SC Candidate
FP California Fully Protected
WL Watch List
SA Special Animal

USFS Status
FSS Forest Service Sensitive Species

Species that were observed on site are shown in **boldface type.**

[a] Critical Habitat only applies to USFWS-listed species. As such, any species without a USFWS listing, will have a "–".

[b] All previous biological documentation for the study area including a Biological Technical Report, an Environmental Impact Report, and various focused survey reports were reviewed to compile this table (see Biological Technical Report for complete list of sources used). Results of previous surveys are only listed for species for which the respective report specifically mentioned that species. It should be noted that while the survey areas for previous surveys partially overlapped with the study area for this report, the boundaries varied from project to project. Repeated negative survey results contribute to increasing the strength of an absence finding.

Source: BonTerra Psomas 2014b (Appendix B).

Significant Ecological Areas

Significant Ecological Areas (SEAs) were established in 1980 by Los Angeles County based on a study completed in 1976 (England and Nelson 1976) to designate areas with sensitive environmental conditions and/or resources in order to preserve biological diversity. SEA boundaries are general in nature and broadly outline the biological resources of concern. The study area is not located in an SEA; however it is located approximately 1.8 miles from the Los Angeles County's San Gabriel Canyon SEA 62. This SEA is centered on the mouths of three major canyons—San Gabriel, Sawpit, and Santa Anita Canyon—which flow from the mountains and the interconnecting terrain in between. This area was designated because it contains the last remaining relatively well-developed lower montane riparian habitats in the eastern County.

Updates to Los Angeles County's SEAs have been drafted and are currently under review. The updated SEA boundaries include the Study Area within the San Gabriel Canyon SEA (LACDRP 2011). However, the new boundaries will not be effective until the SEA boundaries are finalized; until then, the existing SEA boundaries will be in effect.

Trees in Project Study Area

BonTerra Psomas Certified Arborists surveyed trees on August 28, 2014 and on September 2 and 15, 2014. All trees within the tree survey area boundaries that are subject to regulation by a City and/or County tree ordinance and/or the California Fish and Game Code were identified and mapped in the field. A total of 162 trees were documented that met this criteria. During the survey, each tree was tagged and the following data were collected: diameter at breast height (dbh), tree height, and canopy width, as well as qualitative ratings on aesthetics and overall health.

4.4.2 IMPACT ANALYSIS

Project Design Features

PDF BIO-1 A Biological Monitor will be on site during vegetation clearing in Project Work Areas (e.g., limits of disturbance). The Biological Monitor will confirm that the limits of Project Work Areas are clearly marked. The Biological Monitor shall provide environmental awareness training to the Contractor; the training will include a discussion of native habitat types, special status species that may occur in the Project Work Areas, direction for what to do if a special status species is observed, and an overview of applicable permit conditions. Prior to construction, the Biological Monitor will conduct a pre-clearing sweep of the Project Work Area and will flush or move wildlife outside the Project Work Area to the extent practicable.

Regulatory Requirements

None required.

Impact Discussion

For the purposes of all impact discussions below, all impacts are categorized as being either permanent or temporary. Permanent impact areas are defined as changes to or removal of an existing vegetation type or "other areas," including disturbed or developed (e.g., paved) that are permanent as a result of Project implementation. These impact areas are labeled with a red boundary on relevant graphics.

Temporary access/impact areas are defined as areas that may be subject to traversing vehicles or other mobile equipment, staging of equipment, stockpiles of soil, minor soil disturbance where there is no permanent alteration to the existing grade (e.g., no permanent holes, trenches, or berms), and no vegetation or tree removal. These impact areas are labeled with a yellow boundary on relevant graphics.

a) Would the project have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than Significant Impact with Mitigation. No federally or State Threatened or Endangered species are expected to occur in the Project area due to lack of suitable habitat or based on results of focused surveys. The Project Work Areas in relation to the underlying vegetation/other areas are mapped in Exhibits 4-3A through 4-3E, Project Work Areas. A State Candidate for listing, Townsend's big-eared bat, was observed foraging in the Dam Work Area but is not currently expected to roost in any Project Work Areas; this species is discussed further below under a discussion of impacts on bats.

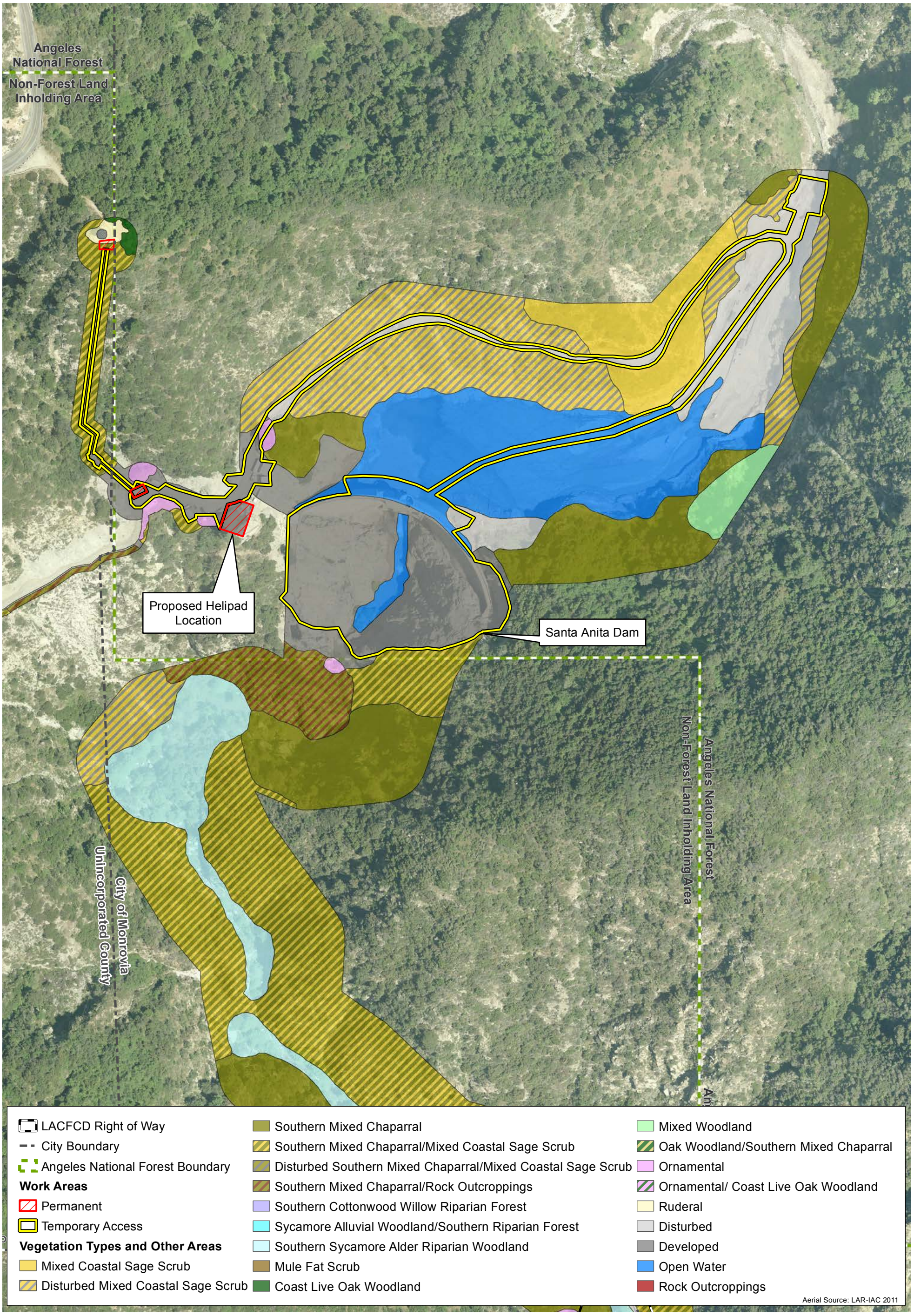
Two special status plant species were observed during the surveys: Engelmann oak and Coulter's matilija poppy. None of the Engelmann oaks or Coulter's matilija poppy are located in Project Work Areas; therefore, there would be no impact on these species. Although not anticipated, oak tree branches or oak tree roots may need to be trimmed or maintained during Project implementation. Damage to oak trees is potentially significant. Implementation of MM BIO-1, which requires that an arborist be consulted to obtain recommendations that would avoid adversely affecting the health and viability of the oak trees, would reduce this potential impact to less than significant.

To assess impacts on wildlife, the total impact on particular vegetation types that provide habitat for wildlife was analyzed. A summary of vegetation types is found in Table 4-8, Vegetation Types and Other Areas Within Project Work Areas (acres). These vegetation types are primarily native types, although some types have a mixture of native and non-native vegetation.

A turtle, not positively identified but consistent with a Pacific pond turtle (*Emys marmorata*), was observed in Santa Anita Reservoir during focused trapping surveys in 2011. Santa Anita Reservoir would be dewatered during work on the Dam, which would make this habitat unavailable to Pacific pond turtle during construction in the Dam Work Area. If the area upstream of the Headworks is ponded at the time of construction, this area would also be dewatered. Dewatering of the Reservoir and the pond upstream of the Headworks may affect this species and the impact would be considered potentially significant because this species meets the criteria to be considered under Section 15380 of the CEQA Guidelines.[8] Implementation of MM BIO-2, which requires pre-construction trapping and relocation of any Pacific pond turtles as authorized by the USFS and CDFW, would reduce this impact to a less than significant level.

Coast horned lizard (*Phrynosoma blainvillii*), coastal western whiptail (*Aspidoscelis tigris stejnegeri*), [San Bernardino] ringneck snake (*Diadophis punctatus modestus*), San Bernardino mountain kingsnake (*Lampropeltis zonata parvirubra*), northern three-lined boa [coastal rosy boa]

[8] Section 15380 of the CEQA Guidelines indicates that a lead agency can consider a non-listed species (e.g., CDFW Species of Special Concern) to be Endangered, Rare, or Threatened for the purposes of CEQA if the species can be shown to meet the criteria in the definition of Rare or Endangered. For the purposes of this discussion, the current scientific knowledge on the population size and distribution for each special status species was considered in determining if a non-listed species met the definitions for "Rare" and "Endangered" according to Section 15380 of the CEQA Guidelines.



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Project Work Areas – Biological Resources – Dam

Exhibit 4-3A

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

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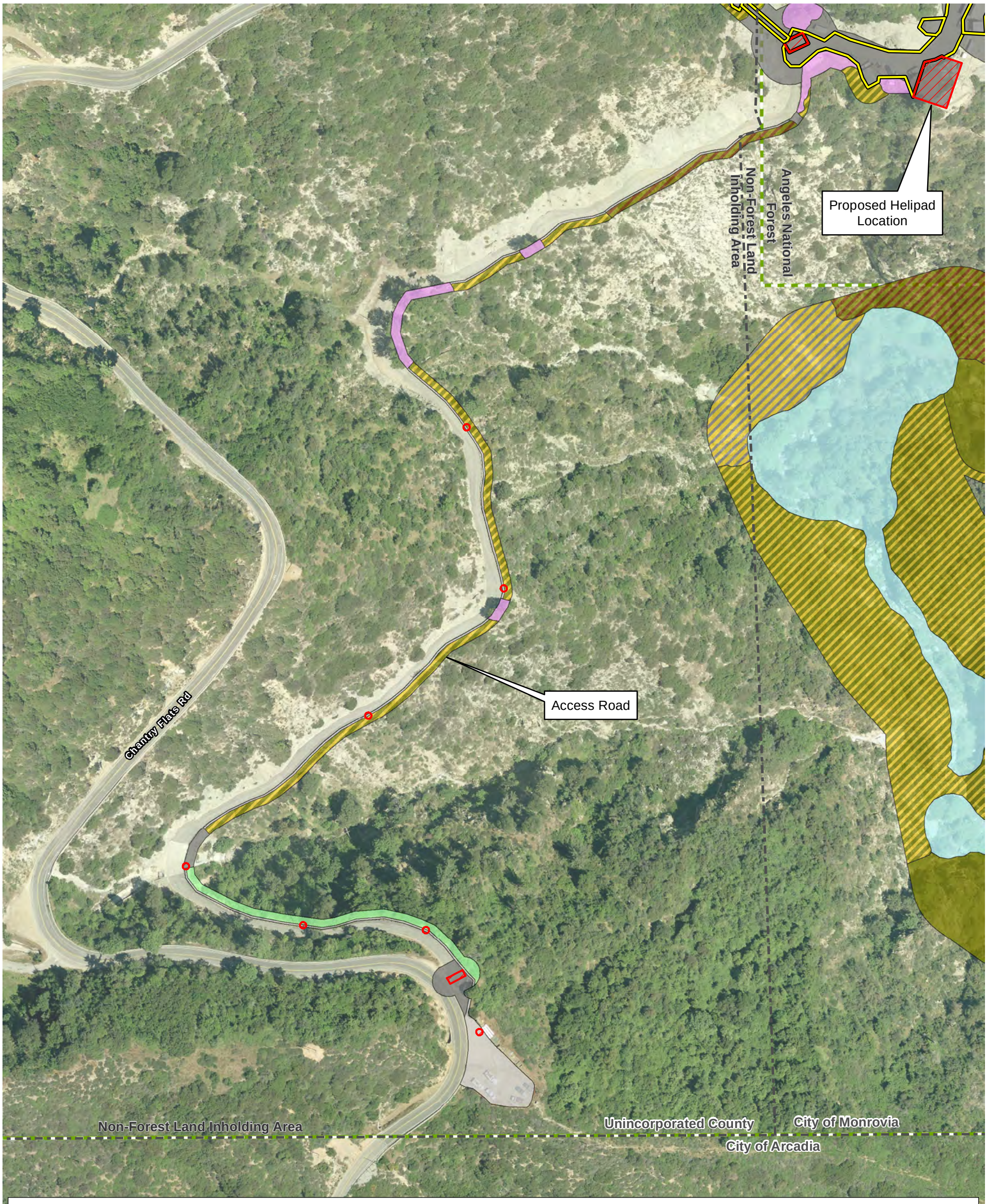

LACFCD Right of Way
City Boundary
Angeles National Forest Boundary
Work Areas
Permanent
Temporary Access
Vegetation Types and Other Areas
Mixed Coastal Sage Scrub
Disturbed Mixed Coastal Sage Scrub
Southern Mixed Chaparral
Southern Mixed Chaparral/Mixed Coastal Sage Scrub
Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub
Southern Mixed Chaparral/Rock Outcroppings
Southern Cottonwood Willow Riparian Forest
Sycamore Alluvial Woodland/Southern Riparian Forest
Southern Sycamore Alder Riparian Woodland
Mule Fat Scrub
Coast Live Oak Woodland
Mixed Woodland
Oak Woodland/Southern Mixed Chaparral
Ornamental
Ornamental/ Coast Live Oak Woodland
Ruderal
Disturbed
Developed
Open Water
Rock Outcroppings

Aerial Source: LAR-IAC 2011

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Project Work Areas – Biological Resources – Dam (Access Road)

Exhibit 4-3B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

150 75 0 150 Feet

BonTerra PSOMAS

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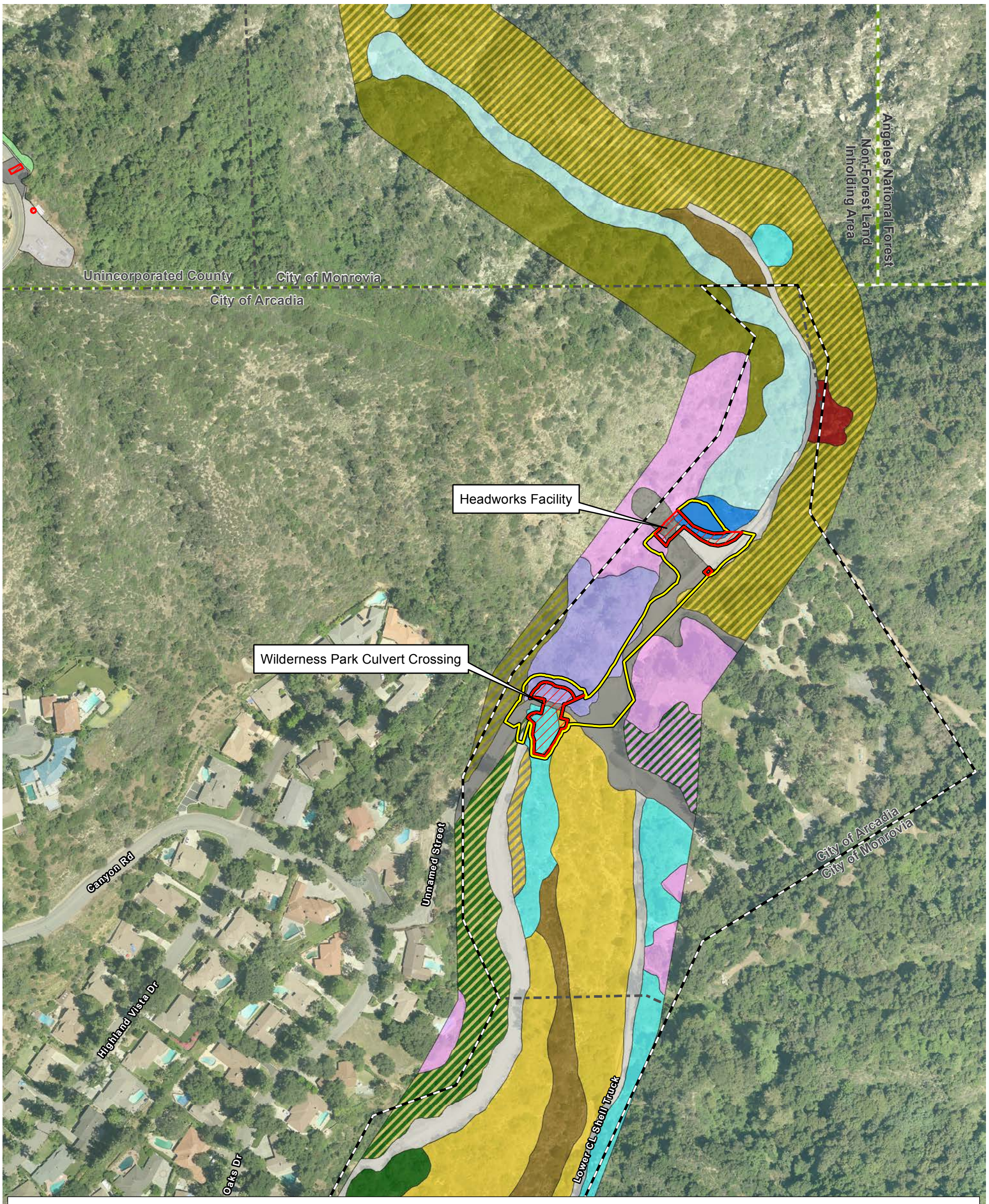

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Project Work Areas – Biological Resources – Headworks and Wilderness Park Culvert Crossing

Exhibit 4-3C

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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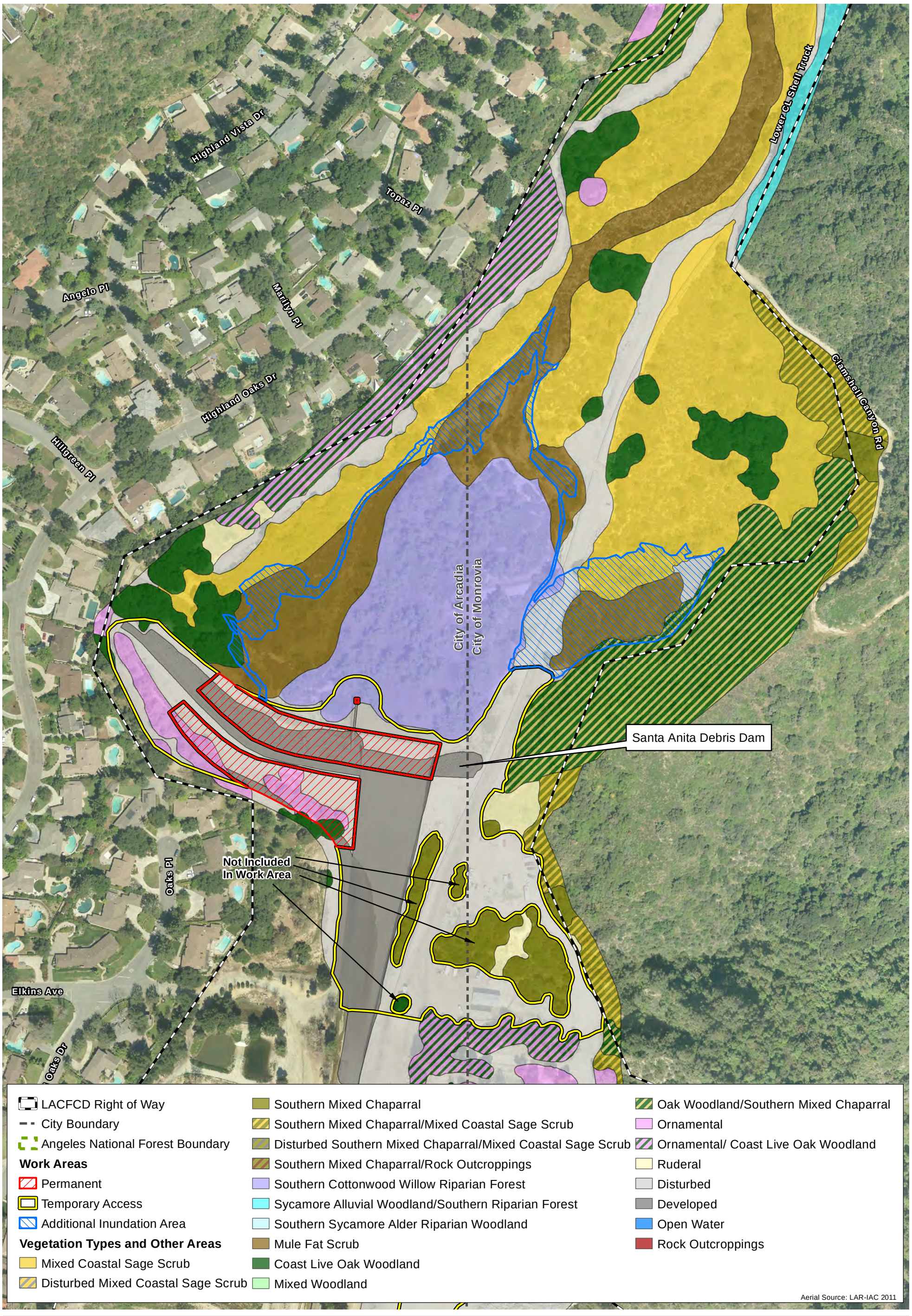

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Project Work Areas – Biological Resources – Debris Dam

Exhibit 4-3D

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

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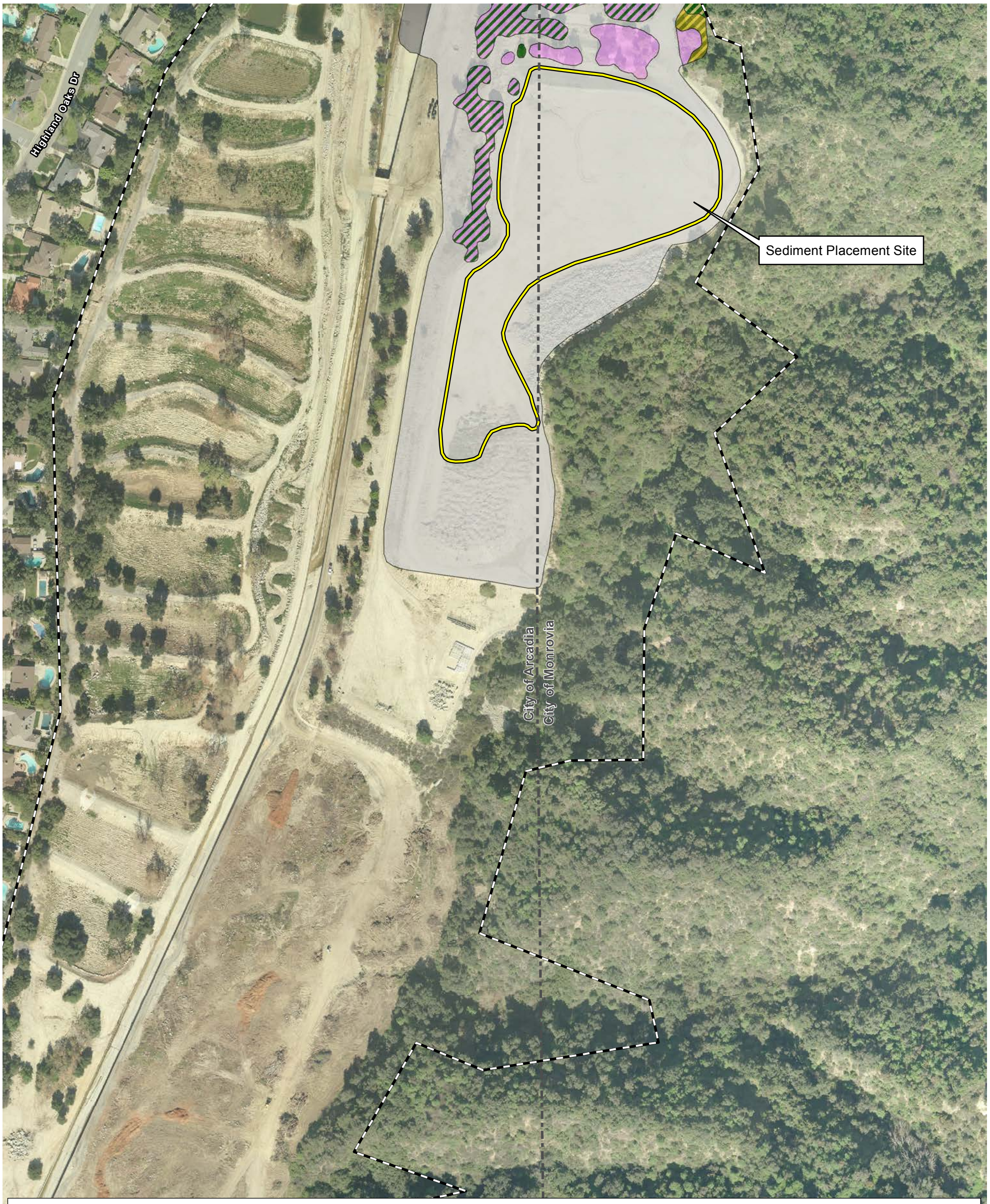

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Project Work Areas – Biological Resources – Debris Dam (Sediment Placement Site)

Exhibit 4-3E

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

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(*Lichanura orcutti* [*Charina trivirgata roseofusca*]), and coast patch-nosed snake have potential to occur or were observed in upland habitat types in the Project area. The two-striped garter snake was observed along Santa Anita Canyon during surveys. If during implementation of MM BIO-2, any two-striped garter snakes (or any other special status species) are observed, they will also be relocated to an appropriate site subject to the approval of USFS and CDFW.

The Project would result in the loss of approximately 0.80 acre of native habitat for these species (0.01 acre permanent and 0.12 acre for temporary access to the Dam; a permanent loss of 0.17 acre and a temporary loss of 0.23 acre for the Headworks and Wilderness Park Culvert Crossing; and a permanent loss of 0.04 acre and temporary loss of 0.23 acre for the Debris Dam). The minimal loss of native vegetation type (less than 0.01 percent of native vegetation types in the study area) would be considered less than significant in relation to the total amount of these vegetation types available in the study area and in the Project region (662,983 acres of open space in the Angeles National Forest). Therefore, the loss of habitat for these species would be considered less than significant. PDF BIO-1 requires biological monitoring during vegetation clearing; any individual wildlife observed by the Biological Monitor (e.g., lizards and snakes) would be relocated to outside the Project Work Areas.

Loggerhead shrike (*Lanius ludovicianus*) may occur in upland vegetation in the study area, and Southern California rufous-crowned sparrow was observed in upland vegetation in the study area. As shown in Table 4-8, Vegetation Types and Other Areas Within Project Work Areas (acres), and mapped on Exhibit 4-3, the Project Work Areas would include a total of approximately 0.19 acre of suitable habitat for these species (0.13 acre at the Dam and 0.06 acre at the Headworks facility). Due to the limited amount of habitat loss relative to the availability of habitat for these species in the Project area and region, impacts on loggerhead shrike and Southern California rufous-crowned sparrow would be considered adverse, but less than significant and no mitigation would be required. However, active nests of these species are protected by the Migratory Bird Treaty Act (MBTA) and the loss of an active nest would be considered a significant impact. Implementation of MM BIO-3, which requires pre-construction nesting bird surveys, would reduce this impact to a less than significant level.

Yellow warbler and yellow-breasted chat were observed in the study area. As shown in Table 4-8 and mapped on Exhibit 4-3, the Project Work Areas would include a total of 0.53 acre of suitable habitat for these species (0.33 acre at the Headworks, 0.20 acre at the Debris Dam) Due to the limited amount of habitat loss relative to the availability of habitat for these species in the Project area and region, impacts on yellow warbler and yellow-breasted chat would be considered adverse, but less than significant and no mitigation would be required. However, active nests of these species are protected by the MBTA and the loss of an active nest would be considered a significant impact. Implementation of MM BIO-3, which requires pre-construction nesting bird surveys, would reduce this impact to a less than significant level.

Cooper's hawk, white-tailed kite (*Elanus leucurus*), merlin (*Falco columbarius*), prairie falcon (*Falco mexicanus*), American peregrine falcon (*Falco peregrinus anatum*), long-eared owl (*Asio otus*), and black swift (*Cypseloides niger*) may forage over several habitats in the study area; Cooper's hawk was observed in the study area. Of these species, Cooper's hawk, white-tailed kite, and long-eared owl may nest in trees in the study area while prairie falcon and American peregrine falcon may nest on cliffs in the study area. As shown in Table 4-8 and mapped on Exhibit 4-3, the Project would result in the loss of a total of approximately 0.80 acre of native habitats and 11.41 acres of ornamental, ruderal, and disturbed areas of potential foraging habitat. The loss of foraging habitat for these species would contribute to the ongoing regional and local loss of foraging habitat. Although impacts on foraging habitat would be considered adverse, they would not be expected to appreciably affect the overall population of these species given the amount of suitable foraging habitat in the Project area and region. Therefore, impacts on foraging

habitat for these species would be considered adverse but less than significant and no mitigation would be required. However, the loss of any active raptor nest would be considered a potentially significant impact. Implementation of MM BIO-3, which requires pre-construction nesting bird surveys, would reduce this impact to a less than significant level.

Townsend's big-eared bat, hoary bat, fringed myotis, and western mastiff bat were observed in the Dam Work Area; pallid bat (*Antrozous pallidus*) was not positively identified but also may be present in the Dam Work Area based on a poor-quality call recorded during the survey. In addition, silver-haired bat (*Lasionycteris noctivagans*), western red bat (*Lasiurus blossevillii*), pocketed free-tailed bat (Nyctinomops femorosaccus), and big free-tailed bat (*Nyctinomops macrotis*) have potential to forage in the study area. Construction activities would only occur during daylight hours; therefore, foraging would continue to be available over the construction areas throughout the duration of construction. Many bat species prefer to forage over water. During construction of each facility, water would be routed around the construction area. Although each Project Work Area would be lower quality foraging habitat during construction, it is expected that water (i.e., preferred foraging habitat) would be available upstream and/or downstream of each Project Work Area during construction. This, combined with the large areas of open space surrounding the Project Work Areas would continue to provide suitable foraging habitat for bats throughout construction.

Additionally, following completion of each portion of the Project, open water would again be ponded within each facility. When natural rainfall allows, the modifications to the Debris Dam may increase the amount of open water ponded at the Debris Dam following completion of the project; a beneficial impact for foraging bats at the Debris Dam. Dewatering of the reservoir would also temporarily reduce the amount of flat water available for these bat species to drink during construction; however, drinking water would continue to be available upstream and downstream of each Project Work Area. Following completion of construction in each Project Work Area, the reservoir/ponded area would be allowed to refill and flat water would be available for bats to drink.

Townsend's big-eared bat typically roosts in caves and is therefore not expected to roost in the Dam or other structures. Additionally, no caves were observed immediately adjacent to Project Work Areas during the roosting bat survey and the acoustical surveys indicated that the Townsend's big-eared bat observed foraging at the Dam likely roosted some distance from the Project Work Area based on the timing of the first recorded call after dusk. Therefore, the Project is not expected to impact roosting Townsend's big-eared bat.

All of the other bat species listed above have potential to roost in or adjacent to Project Work Areas based on the presence of suitable habitat. Bats may roost in the rocky outcroppings along Santa Anita Canyon, in crevices of structures (e.g., Dam structure, gunite, Headworks facility building, Debris Dam outlet tower), or in large oak or sycamore trees in the study area (e.g., those at the Wilderness Park Culvert Crossing). Acoustical surveys are initiated before dusk and record sonar calls of bats as they emerge from their roosts; it is assumed that bats that are recorded within the first hour are roosting in or around the recording site while those that first appear over an hour into the recording are assumed to have traveled to the area to forage from a roost site out of the immediate area. Based on the acoustical recordings, fringed myotis and western mastiff bat have a low potential to roost in crevices and structures of the Dam Work Area because they were recorded over an hour into the survey. The hoary bat is not likely to roost in the Dam Work Area because it roosts in trees, although it may roost in other Project Work Areas. No special status bats were recorded at the Headworks or Debris Dam Work Areas during the acoustical surveys; however, suitable habitat is present and they may occur for roosting in the future.

As shown in Table 4-8 and mapped on Exhibit 4-3, the total combined loss of 0.57 acre of southern cottonwood willow riparian forest, sycamore alluvial woodland/southern riparian forest, and coast live oak woodland would remove potential roosting habitat for bat species that roost in trees (i.e., silver-haired bat, western red bat, and hoary bat); bat species that roost on cliffs and rocky outcroppings could be affected by repair of gunite adjacent to the Dam and/or construction on structures at the Dam and Headworks (i.e., pallid bat, Townsend's big-eared bat, fringed myotis, western mastiff bat, pocketed free-tailed bat, and big free-tailed bat). Impacts on bats roosting in trees and structures would be considered potentially significant because it could directly impact roosting individuals. Implementation of MM BIO-4, which requires pre-construction bat surveys, would reduce this impact to a less than significant level.

The loss of 0.57 acre of habitat for bats that roost in trees, and the temporary loss of crevices in the Dam or other structures where they could roost, would be considered adverse but less than significant because there are plenty of available trees and crevices in the Project vicinity that roosting bats could use as an alternative to roosting in Project Work Areas. Therefore, no mitigation would be required for the loss of roosts.

Southern grasshopper mouse (*Onychomys torridus ramona*) and Los Angeles pocket mouse (*Perognathus longimembris brevinasus*) may occur in sage scrub vegetation types in the study area. As shown in Table 4-8 and mapped on Exhibit 4-3, the Project would include a total of 0.03 acre of mixed sage scrub for construction of the Headworks facility and 0.13 acre of southern mixed chaparral/mixed coastal sage scrub for the Dam and 0.02 acre of southern mixed chaparral/mixed coastal sage scrub for the Headworks. Due to the limited amount of habitat loss relative to the availability of habitat for these species in the Project area and region, impacts on southern grasshopper mouse and Los Angeles pocket mouse would be considered adverse, but less than significant and no mitigation would be required.

TABLE 4-8
VEGETATION TYPES AND OTHER AREAS WITHIN PROJECT WORK AREAS (ACRES)

Vegetation Types and Other Areas	Existing Vegetation (Study Area)	Dam		Headworks and Wildness Park Culvert Crossing		Debris Dam			Total Permanent Structure	Total Temporary Access	Total Additional Inundation Area	Total Project Impacts
		Permanent (Structure)	Temporary (Construction Access)	Permanent (Headworks)	Temporary (Construction Access)	Permanent (Structure)	Temporary (Construction Access)	Additional Inundation Area				
Mixed Coastal Sage Scrub	14.09	0.00	0.00	0.01	0.02	0.00	0.00	0.58	**0.01**	**0.02**	**0.58**	**0.61**
Disturbed Mixed Coastal Sage Scrub	4.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Southern Mixed Chaparral	9.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Southern Mixed Chaparral/ Mixed Coastal Sage Scrub	12.72	0.01	0.12	0.00	0.02	0.00	0.00	0.00	**0.01**	**0.14**	**0.00**	**0.15**
Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub	0.50	0.00	0.00	0.00	0.01	0.00	0.00	0.00	**0.00**	**0.01**	**0.00**	**0.01**
Southern Mixed Chaparral/Rock Outcroppings	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Southern Cottonwood Willow Riparian Forest	6.36	0.00	0.00	0.06	0.14	0.00	0.20	0.08	**0.06**	**0.34**	**0.08**	**0.48**
Sycamore Alluvial Woodland/Southern Riparian Forest	1.80	0.00	0.00	0.10	0.03	0.00	0.00	0.00	**0.10**	**0.03**	**0.00**	**0.13**
Southern Sycamore Alder Riparian Woodland	3.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Mule Fat Scrub	5.99	0.00	0.00	0.00	0.00	0.00	0.00	1.78	**0.00**	**0.00**	**1.78**	**1.78**
Coast Live Oak Woodland	2.61	0.00	0.00	0.00	0.00	0.04	0.03	0.05	**0.04**	**0.03**	**0.05**	**0.12**
Mixed Woodland	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Oak Woodland/Southern Mixed Chaparral	6.03	0.00	0.00	0.00	0.01	0.00	0.00	0.12	**0.00**	**0.01**	**0.12**	**0.13**
Ornamental	3.86	0.00	0.02	0.01	0.03	0.31	0.38	0.00	**0.32**	**0.43**	**0.00**	**0.75**
Ornamental/ Coast Live Oak Woodland	3.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Ruderal	0.63	0.01	0.00	0.00	0.00	0.00	0.00	0.10	**0.01**	**0.00**	**0.00**	**0.01**
Disturbed	23.87	0.01	0.97	0.03	0.13	0.81	8.70	0.49	**0.85**	**9.80**	**0.49**	**11.14**
Developed	8.90	0.11	3.22	0.04	0.49	0.73	2.23	0.00	**0.88**	**5.94**	**0.00**	**6.82**
Open Water	4.99	0.00	0.76*	0.04*	0.09*	0.00	0.00	0.00	**0.04**	**0.85**	**0.00**	**0.89***
Rock Outcroppings	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Total Work Area Acreages	**115.50**	**0.14**	**5.09**	**0.29**	**0.97**	**1.89**	**11.54**	**3.10**	**2.32**	**17.60**	**3.10**	**23.02**

* Although shown on the graphic and in this table as an impact, the work area would be dewatered during construction but would be allowed to refill this area following construction; therefore, this impact is an artifact of mapping and is described as such in the text.

Source: BonTerra Psomas 2014b (Appendix B).

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

Less than Significant Impact with Mitigation. As shown in Table 4-8 and mapped on Exhibit 4-3, a total of 2.39 acres of riparian vegetation types would be impacted by all elements of the Project. The majority of this impact is located within the additional inundation area (1.86 acres comprised of 0.08 acre of southern cottonwood willow riparian forest and 1.78 acre of mule fat scrub) at the Debris Dam; this impact would not remove vegetation but may inundate the habitat in the event of a large storm. This vegetation type is located in the center of the inundation footprint and would be expected to be inundated the longest (i.e., a few weeks) during inundation events. However, riparian vegetation is adapted to periodic flooding and is expected to be able to withstand flooding events. Additionally, much of the riparian vegetation is within the basin and may be cleared periodically under existing permits for flood maintenance. In addition to the inundation area impacts, a total of 0.53 acre of southern cottonwood willow riparian forest and sycamore alluvial woodland/southern riparian forest is within the Project Work Areas. A total of 0.40 acre of southern cottonwood willow riparian forest would be disturbed: 0.20 acre for construction of the Wilderness Park Culvert Crossing (0.06 acre permanent structural, 0.14 acre temporary access); and 0.20 acre would be disturbed for temporary access in the Debris Dam Work Area. This disturbance area for the Debris Dam Work Area is associated with the reconstruction/replacement of the intake structure.

A total of 0.13 acre of sycamore alluvial woodland/southern riparian forest, including the removal of the sycamore trees located adjacent to the Wilderness Park Culvert Crossing, would be impacted in the Headworks Work Area (0.10 acre permanent structural, 0.03 acre temporary access). Southern cottonwood willow riparian forest and sycamore alluvial woodland/southern riparian woodland are special status vegetation types that are considered vulnerable by the State. These resources are also within the jurisdiction of the USACE, CDFW, and RWQCB. The loss of 0.53 acre (0.16 acre permanent structural, 0.37 acre temporary access) is considered significant. However, implementation of MM BIO-5, which requires permitting of jurisdictional resources through the applicable resource agencies, would reduce this impact to a less than significant level. Potential mitigation for the loss of the three sycamore trees located adjacent to the Wilderness Park Culvert Crossing may include transplanting the root ball(s) of the trees to a suitable riparian location, and/or utilize the woody debris from the trees to enhance habitat value at another nearby location, if determined to be feasible and if approved by the appropriate parties. At a minimum, MM AES-1 would require that new sycamore trees would be planted within a 100 foot radius of location of the original trees. This would comply with the CDFW Streambed Alteration Agreement (SAA) process, which may require a minimum of 1:1 replacement for impacted trees that are hydrologically connected to the Wash.

As shown in Table 4-8 and mapped on Exhibit 4-3, a total of 0.89 acre of open water would be within Project Work Areas. A total of 0.76 acre is within the Dam Work Area. It should be noted that the amount of open water varies substantially based on the rainfall of the year, the season (winter versus summer), and the amount of water being released from the Reservoir. It is anticipated that the Reservoir will be dewatered prior to start of construction activities, and as a result, the amount of open water impacted downstream of the Dam during construction would likely be substantially less than mapped for the Project in April 2012. Although 0.76 acre is shown in the Dam Work Area, this area would be expected to be dry during construction and would be allowed to refill with water following Project construction. A total of 0.04 acre of open water would be permanently impacted by construction of the new structures at the Headworks facility; a portion of this open water would be affected by the placement of riprap on the slope north of the structure. Additionally, 0.09 acre would be temporarily disturbed within the work area for the Headworks.

Open water would be dewatered from the Headworks Work Area during construction; open water would be allowed to refill (over the riprap) following Project construction. Though some of the areas would be affected by bank protection, open water would occur over the riprap/gunite and therefore, the impact is partially an artifact of mapping.

The Project would allow the Debris Dam to increase the inundation in the basin in order to capture water following rain events., Inundation behind the Debris Dam is reliant on releases from the Dam and the rainfall of the season, which will remain consistent with the conditions that currently exist in the basin and the time of year that the basin is inundated (winter/ early spring) would not substantially change. The Project would raise the Debris Dam height, thereby expanding the water retention capacity of the facility and would allow the inundation area to expand 3.10 acres beyond the existing basin.

Areas in the basin (currently within the existing inundation footprint) would be inundated more frequently and deeper than in the current condition. Additionally, the hillside slopes to the east of the basin and along the northern and western edges of the inundation area would experience an increased inundation area, as shown in Exhibit 4-3. The vegetation within the existing basin is dominated by willows, which have a high to very high tolerance to inundation when willows shoots (trunks, stems, leaves) are not fully submerged. As stated in Appendix B, Glentz et al (2006) found that willows can withstand a flooding duration for as much as 40 percent of the growing season (spring/summer); the study area receives most rainfall outside the growing season in the winter and early spring when willows are dormant (BonTerra Psomas 2014b). Therefore, the increased inundation capability of the Debris Dam is not expected to affect the riparian vegetation that currently exists in the basin.

Some areas adjacent to the existing basin would be newly inundated; however, these fringe areas would be inundated the least often and for the shortest duration (e.g., a few days). Although inundation would not directly remove vegetation from the study area, habitat within the inundation area would be unavailable to most wildlife when flooded. If inundation occurred during the breeding season, it could flood burrows and nests causing them to fail. However, it is anticipated that most inundation events would occur during the storm season (October 1 to April 15), which is outside the breeding season for most animals. Following each inundation event, the habitat would again be available for use with areas along the periphery becoming available most quickly. Although inundation effects would be considered adverse, they would affect a limited amount of habitat (3.10 acres) compared to the amount of habitat available in the study area and Project region. Therefore, inundation effects would be considered less than significant.

c) Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than Significant Impact with Mitigation. As shown in Table 4-9, Summary of Jurisdictional Resources in Project Work Areas, the Project would include a total of 3.392 acres of “Waters of the U.S.” under the jurisdiction of the USACE and the RWQCB, including 0.576 acre of open water and 2.816 acres of non-wetland Waters of the U.S. These areas are mapped on Exhibits 4-4A through 4-4E, Jurisdictional Impacts. The Project would include a total of 3.708 acres under the jurisdiction of the CDFW. Jurisdictional resources are protected by Sections 401 and 404 of the Clean Water Act (CWA) and by the *California Fish and Game Code* (Sections 1600 through 1616). Impacts on jurisdictional resources would be significant prior to mitigation and would require permitting with each of the resource agencies. Implementation of MM BIO-5, which requires permitting of jurisdictional resources through the applicable resource agencies and ensures that permanent impacts on jurisdictional resources are mitigated to obtain equivalent or

superior biological functions and values as those impacted by the Project. Implementation of MM BIO-5 would reduce this impact to a less than significant level. Through the permitting process, compensatory mitigation will be determined through negotiation with each resource agency.

TABLE 4-9
SUMMARY OF JURISDICTIONAL RESOURCES IN PROJECT WORK AREAS

Jurisdictional Resources	Existing (acres)	Dam		Headworks and Wildness Park Culvert Crossing		Debris Dam		Total Permanent Structure	Total Temporary Access	Total (acres)
		Permanent Structure (acres)	Temporary Access (acres)	Permanent Structure (acres)	Temporary Access (acres)	Permanent Structure (acres)	Temporary Access (acres)			
Total USACE Jurisdiction	19.421	0.000	0.958	0.100	0.113	0.324	1.897	**0.424**	**2.968**	**3.392**
Open Water	3.003	0.000	0.482	0.011	0.083	0.000	0.000	**0.011**	**0.565**	**0.576**
Other Non-wetland "Waters of the U.S."	16.418	0.000	0.476	0.089	0.030	0.324	1.897	**0.413**	**2.403**	**2.816**
Total RWQCB Jurisdiction	19.421	0.000	0.958	0.100	0.113	0.324	1.897	**0.424**	**3.533**	**3.392**
Total CDFW Jurisdiction	26.985	0.000	1.125	0.172	0.138	0.353	1.920	**0.525**	**3.183**	**3.708**

USACE: U.S. Army Corps of Engineers; RWQCB: Regional Water Quality Control Board; CDFW: California Department of Fish and Wildlife.

Source: BonTerra Psomas 2014b (Appendix B).

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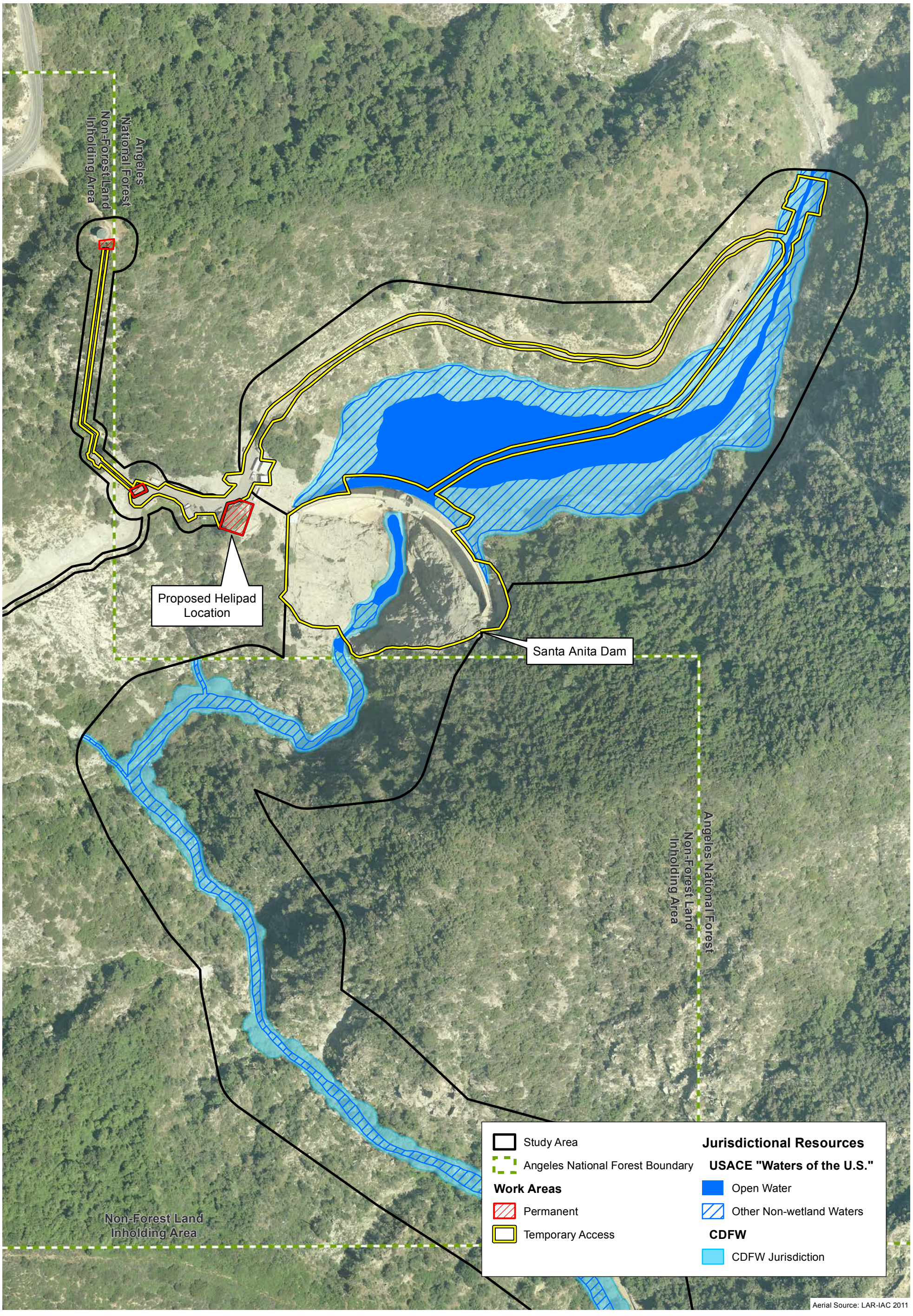

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Project Work Areas – Jurisdictional Resources – Dam

Exhibit 4-4A

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

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Project Work Areas – Jurisdictional Resources – Dam (Access Road)

Exhibit 4-4B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

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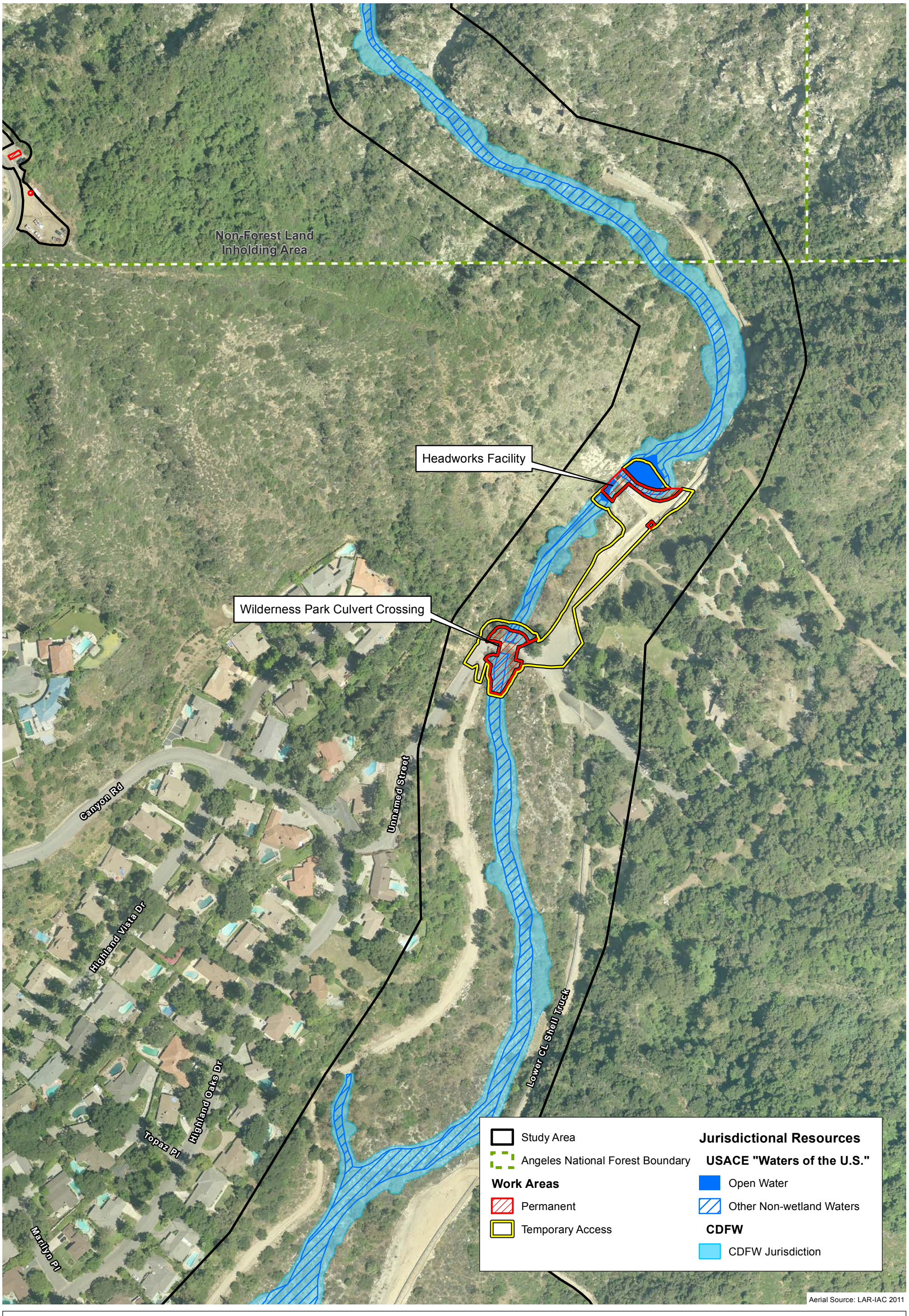

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Project Work Areas – Jurisdictional Resources – Headworks and Wilderness Park Culvert Crossing Exhibit 4-4C

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

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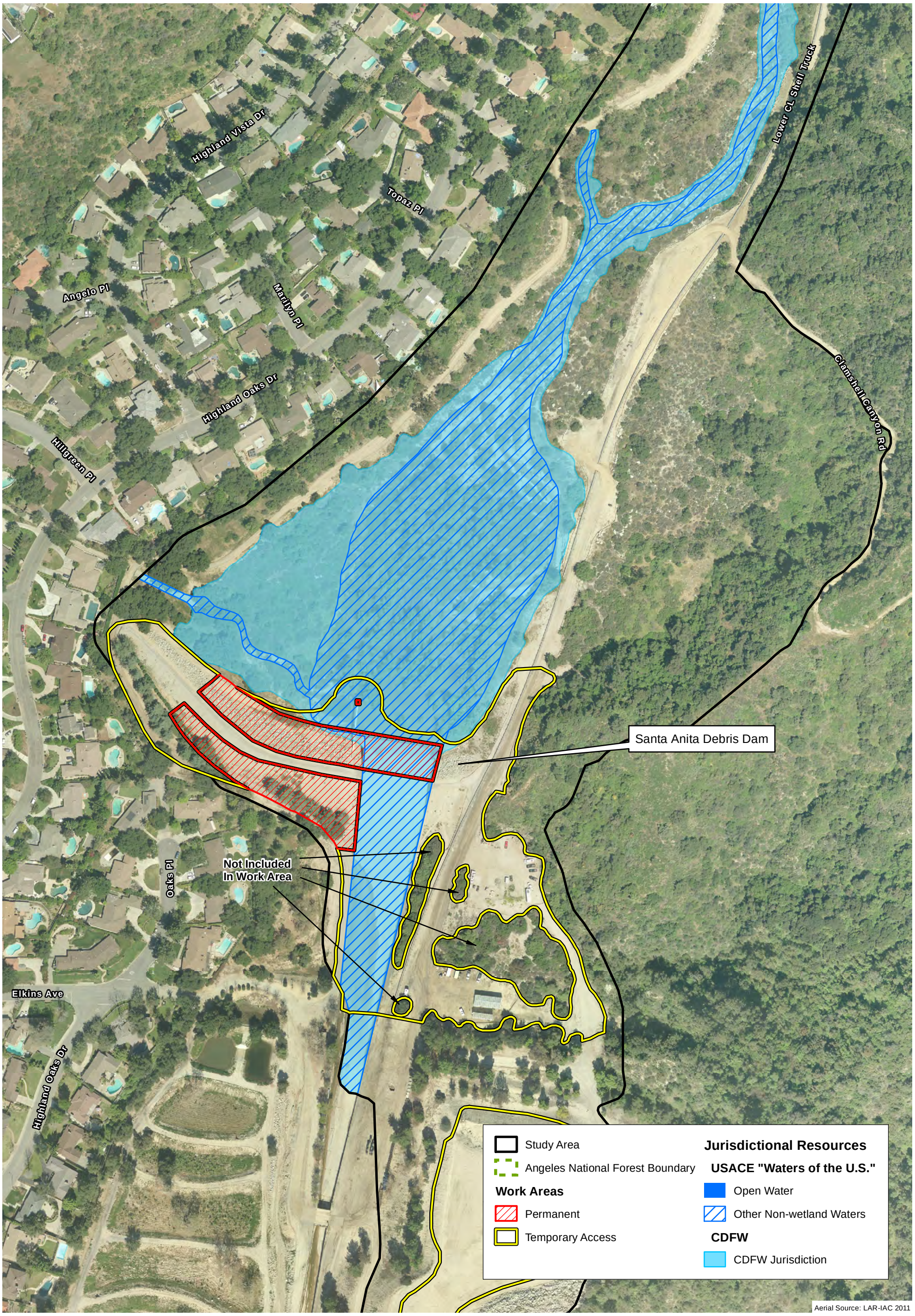

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Project Work Areas – Jurisdictional Resources – Debris Dam

Exhibit 4-4D

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

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Project Work Areas – Jurisdictional Resources – Debris Dam (Sediment Placement Site) Exhibit 4-4E

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

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

Less than Significant Impact. The Project Work Area currently consists of existing LACFCD flood-control facilities surrounded by open space. Construction at the Dam would be on the existing dam structure, adjacent developed areas, and adjacent gunite slopes; these changes are not expected to change wildlife movement patterns at the Dam.

Construction at the Headworks facility would replace an existing structure with a slightly larger structure and would modify the existing access road, reinforcing the slope with riprap; it would not reconfigure the road/facility substantially. Therefore, the Headworks facility would not be expected to change wildlife movement patterns at the Headworks facility. The Wilderness Park Culvert Crossing would replace the existing structure and culverts, resulting in a Culvert Crossing of the creek. Riprap would be placed along the bottom of the creek, both upstream and downstream of the Culvert Crossing structure. The Santa Anita Wash typically contains flowing water; therefore, the species moving through the culverts are expected to be small aquatic species (e.g., fish, and amphibians), which would continue to use the streambed beneath resulting from the proposed Wilderness Park Culvert Crossing. Medium- and large-sized mammals would be expected to continue to cross either over or under the Culvert Crossing/access road. Since the Project would not affect the number of visitors to the Wilderness Park or the currently low traffic volumes that cross the existing Culvert Crossing, no change to wildlife movement is expected at the Wilderness Park Culvert Crossing. If a temporary bypass crossing is constructed to allow passage to the Wilderness Park, would not be expected to disrupt wildlife movement; wildlife would be expected to be able to move through or around the structure during construction.

Project improvements at the Debris Dam would slightly expand the footprint of the existing Debris Dam structure to the east to accommodate the new spillway; however, the existing concrete spillway would be demolished and backfilled with dirt, creating a disturbed area that matches the rest of the area downstream of the existing Debris Dam. These modifications are not expected to change wildlife movement at the Debris Dam. The improvements at the Debris Dam would allow the basin to be inundated more frequently than it currently is inundated. With inundation of the Debris Dam basin, some terrestrial wildlife would have to circumnavigate the basin rather than crossing the basin bottom; this would not be substantively different than the existing conditions. Wildlife that fly or swim could continue to move freely in the basin even if it was inundated. While this effect would be adverse for some terrestrial wildlife, the basin edges would continue to be available for movement; thus, wildlife movement would not be substantially disrupted and less than significant impacts are anticipated.

Construction activities would create dust and noise within and adjacent to the work areas. During active construction, wildlife movement may be deterred by noise and human activity; however, most wildlife movement would occur at night while construction activities would occur during the day. In addition, construction activities would also be temporary in nature. Therefore, construction impacts on local wildlife movement would be considered adverse, but less than significant and no mitigation would be required.

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

Less than Significant Impact with Mitigation. The MBTA protects the nests of all native bird species, including common species such as mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), and house finch (*Carpodacus mexicanus*). Nesting birds and raptors have potential to occur in vegetation throughout the Project area. Sections 3503 and

3503.5 of the *California Fish and Game Code* protect nesting migratory birds and raptors. As described by MM BIO-3, vegetation removal should be planned for periods that are outside the breeding season if possible. If vegetation removal would occur during the breeding season, a pre-construction nesting bird/raptor survey would be required prior to clearing to ensure compliance with the MBTA.

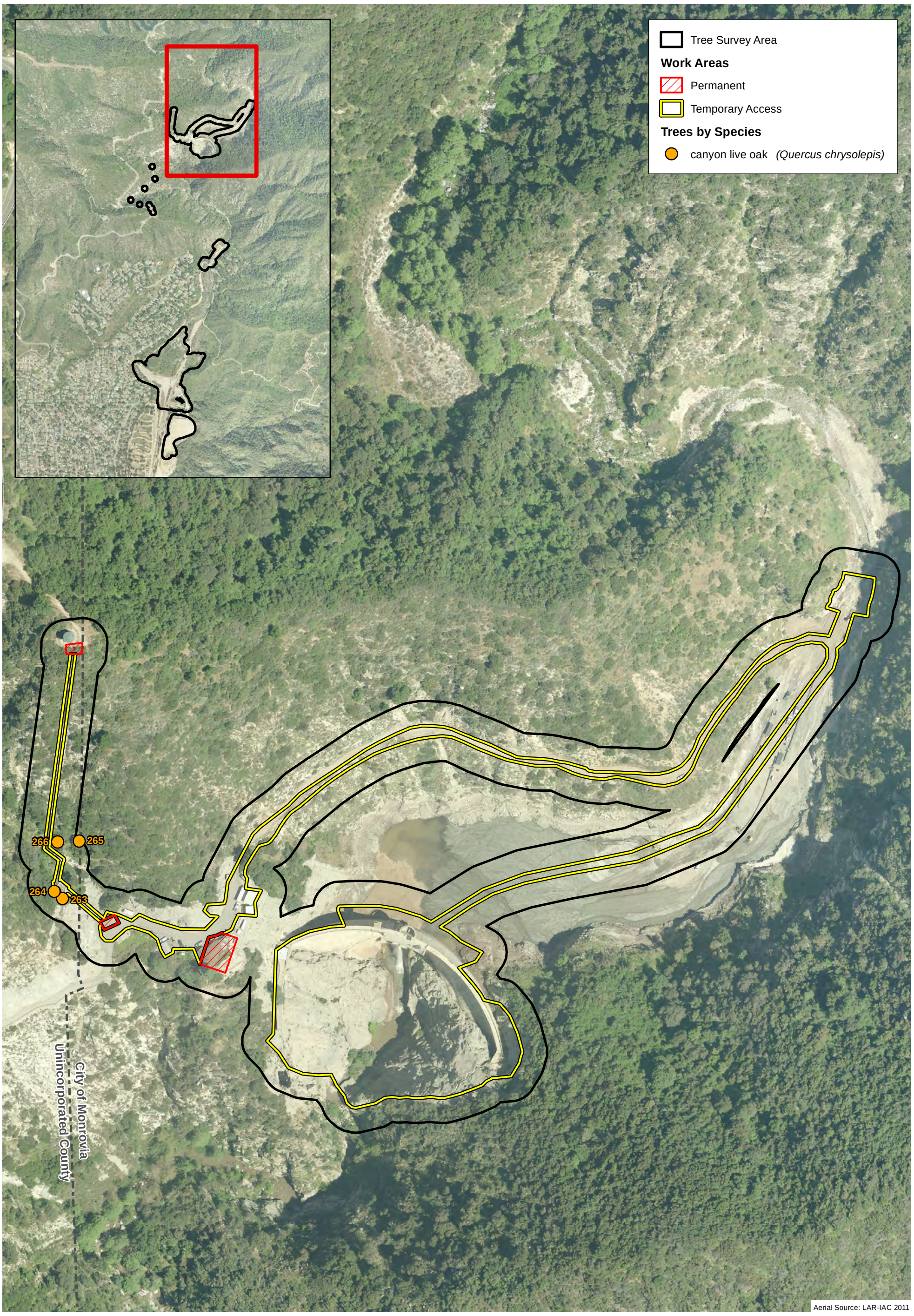
Exhibit 4-5A through 4-5E, Project Work Areas- Tree Locations, provides a graphical depiction of native trees located within 50 feet of the Project Work Areas. Of the 162 trees documented within the tree survey area, a total of four trees are located within Project Work Areas within the footprint for the Wilderness Park Culvert Crossing. These include three western sycamores (*Platanus racemosa*) (Tree Numbers 220-222) and one coast live oak (*Quercus agrifolia)* (Tree Number 219). All are located within CDFW jurisdiction and the oak tree is also located with the jurisdiction of the City of Arcadia.

Two sycamore trees (Tree Numbers 220 and 221) located downstream of the Culvert Crossing would be removed in order to construct the Project. One sycamore tree (Tree Number 222) is located at the edge of the permanent impact area and would likely not need to be removed; however, to provide for a conservative analysis, this tree is considered impacted. MM BIO-1, paragraph A, sets forth the mitigation requirements for these sycamore trees.

The oak tree (Tree Number 219) is also located at the edge of the permanent impact boundary; however, this tree would not need to be removed. Construction activities occurring directly adjacent to the oak tree, (and Tree Number 222 if it is able to be preserved), could harm the trees' root systems and may affect the health of the trees. Grading for the Culvert Crossing would remain outside of the edge of the oak tree's canopy wherever possible. MM BIO-1, paragraph B, sets forth requirements for protecting the oak tree, including fencing and monitoring by a Certified Arborist for any pruning, root cutting, and/or work within the canopy. Monitoring would occur for 6 months following construction and if its health declines two or more rating levels, than the tree must be mitigated for in coordination with CDFW and the City of Arcadia, requiring replacement at no less than a 1:1 ratio with a minimum replacement box size of 24 inches.

Oaks and other native trees are located near all of the Project Work Areas and could also be inadvertently affected by construction activities (e.g., stockpiling soil or other construction materials). MM BIO-1, paragraph C would be required to avoid construction impacts on native trees adjacent to Project Work Areas. Requirements include fencing placed at 1.5 times the dripline/root protection zone, labeling "tree protection areas" on construction plans, guidelines for stockpile materials and tree pruning, and coordination with certified arborists, as necessary.

At the Debris Dam, a total of 21 trees have been identified as being within the additional inundation footprint. This includes 10 coast live oak (Tree Numbers 126, 142–145, 147, 148, 150, 151, and 197), 1 Engelmann oak tree (Tree Number 149), 5 western sycamore trees (Tree Numbers 165, 177, 178, 181–184, 272) and two Goodding's black willow (Tree Number 179, 180). These trees are expected to be inundated infrequently and for short durations; therefore, no long-term impact is expected to the health of the trees. However, if natural rainfall events and/or management of the flood control facilities cause the trees to be inundated more frequently or for longer durations than can be accommodated by the trees, these trees could decline in health and may die over time. This impact would be considered potentially significant. Implementation of MM BIO-1, paragraph D, would be required ongoing annual monitoring, assessment of tree health, and a protocol for determining whether a decline in the tree's health would require mitigation for trees in the additional inundation area. With adherence to the requirements set forth in MM BIO-1, impacts to native trees would be less than significant.



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Project Work Areas – Tree Locations – Dam

Exhibit 4-5A

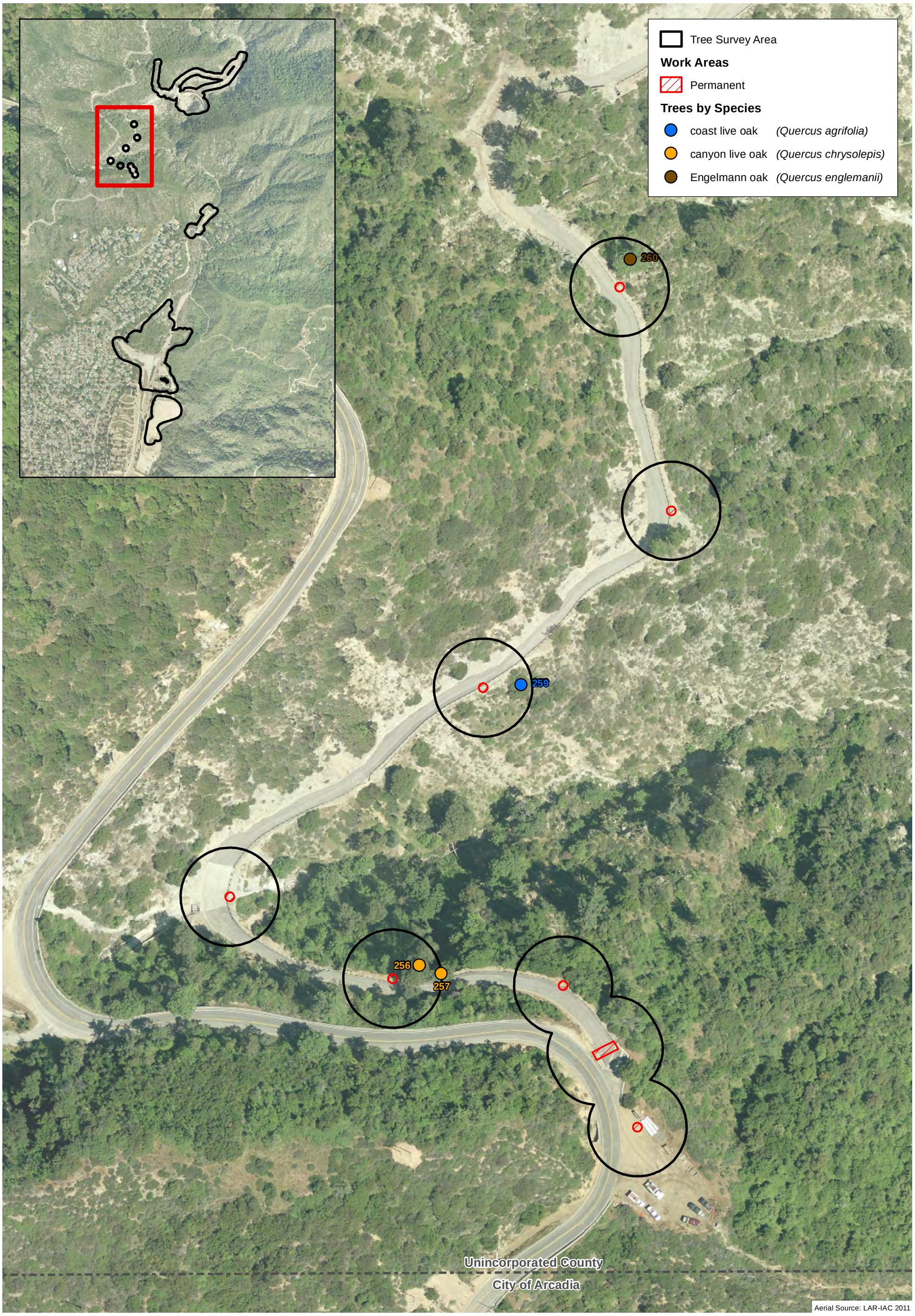
Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

180 90 0 180 Feet

BonTerra PSOMAS

(Rev: 9-30-2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\MND\ex4-5_impact_trees.pdf



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Project Work Areas – Tree Locations – Dam (Access Road)

Exhibit 4-5B

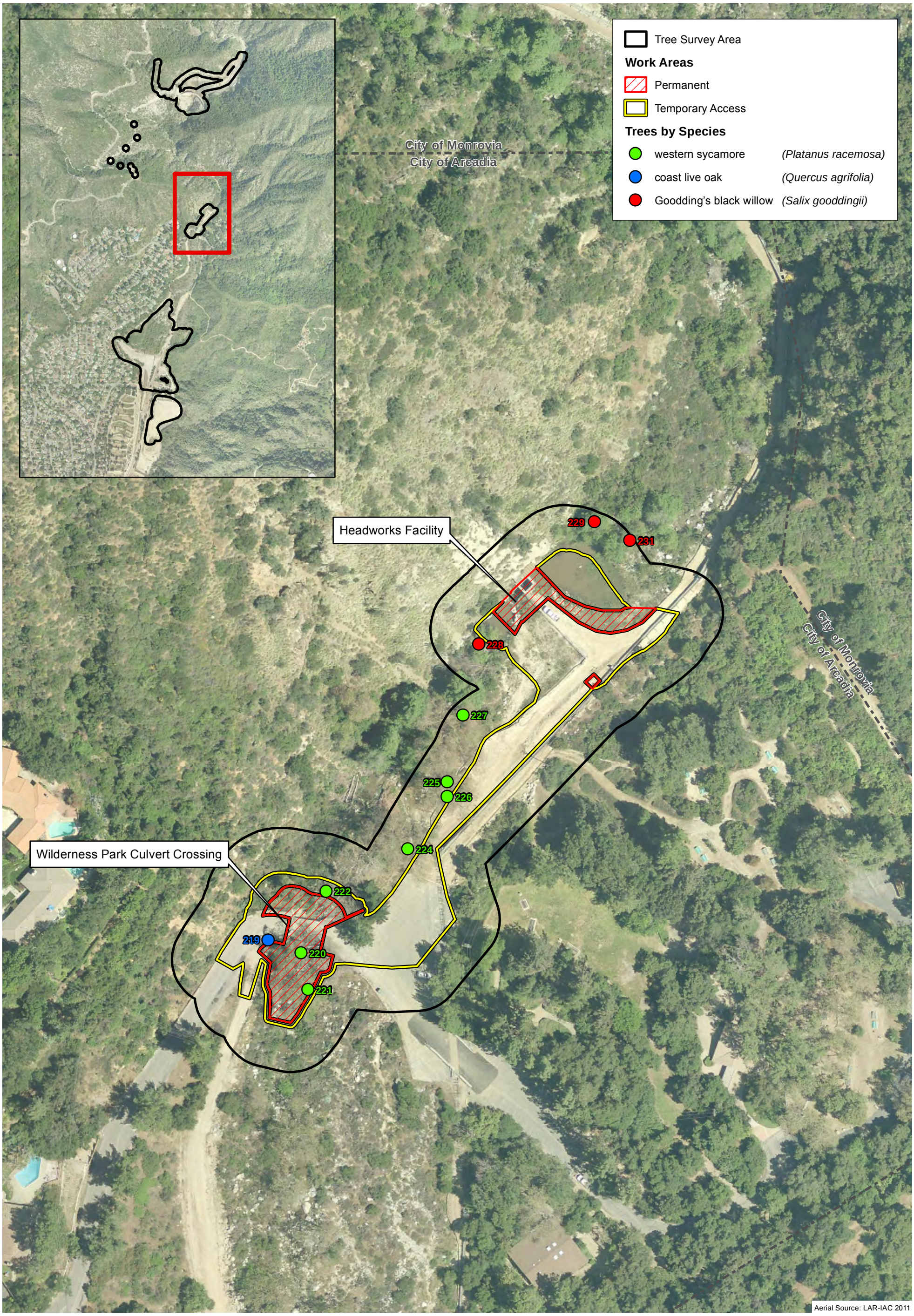
Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

(Rev: 9-30-2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\MND\ex4-5_impact_trees.pdf



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Project Work Areas – Tree Locations – Headworks and Wilderness Park Culvert Crossing

Exhibit 4-5C

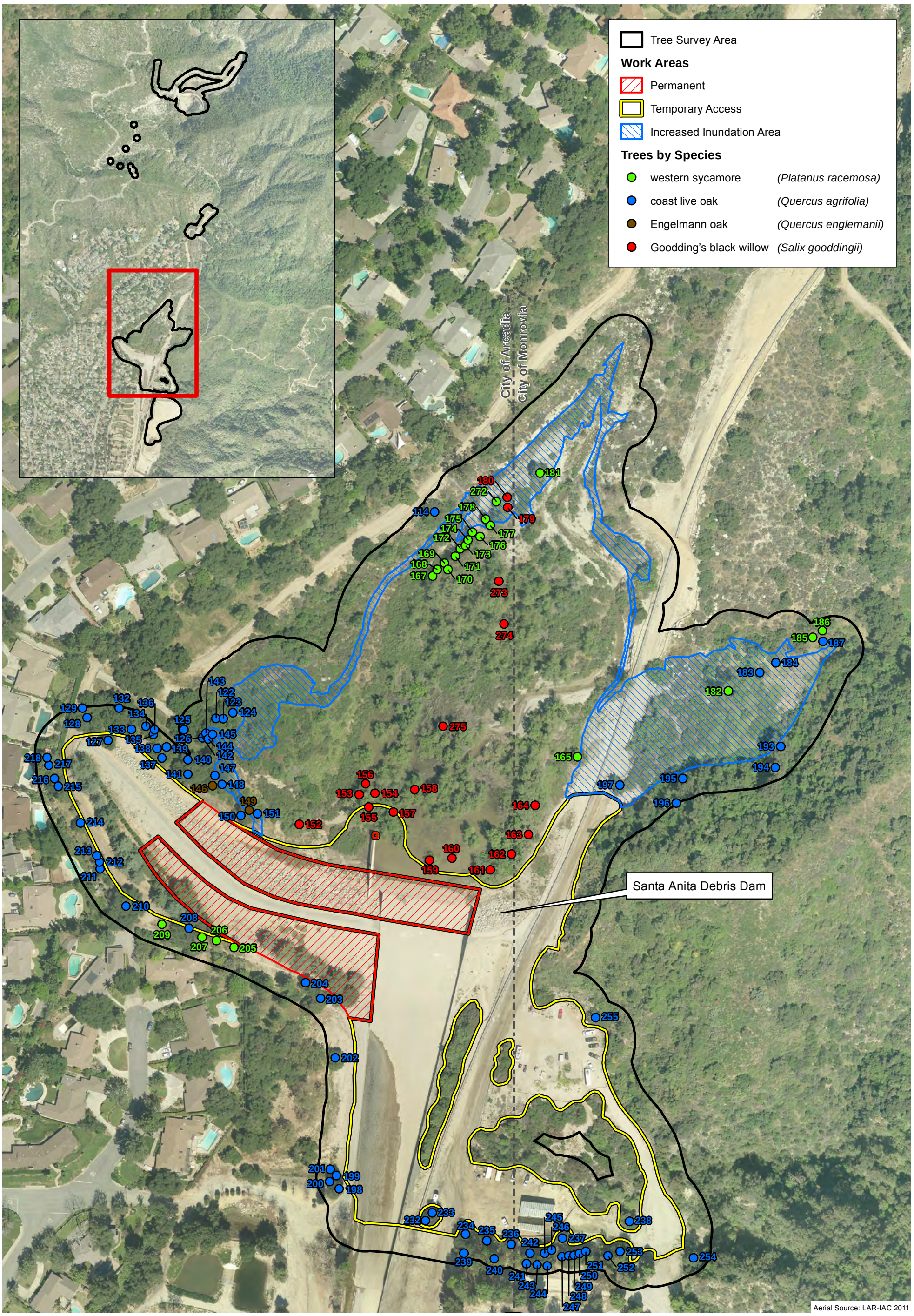
Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

(Rev: 9-30-2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\MND\ex4-5_impact_trees.pdf



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Project Work Areas – Tree Locations – Debris Dam

Exhibit 4-5D

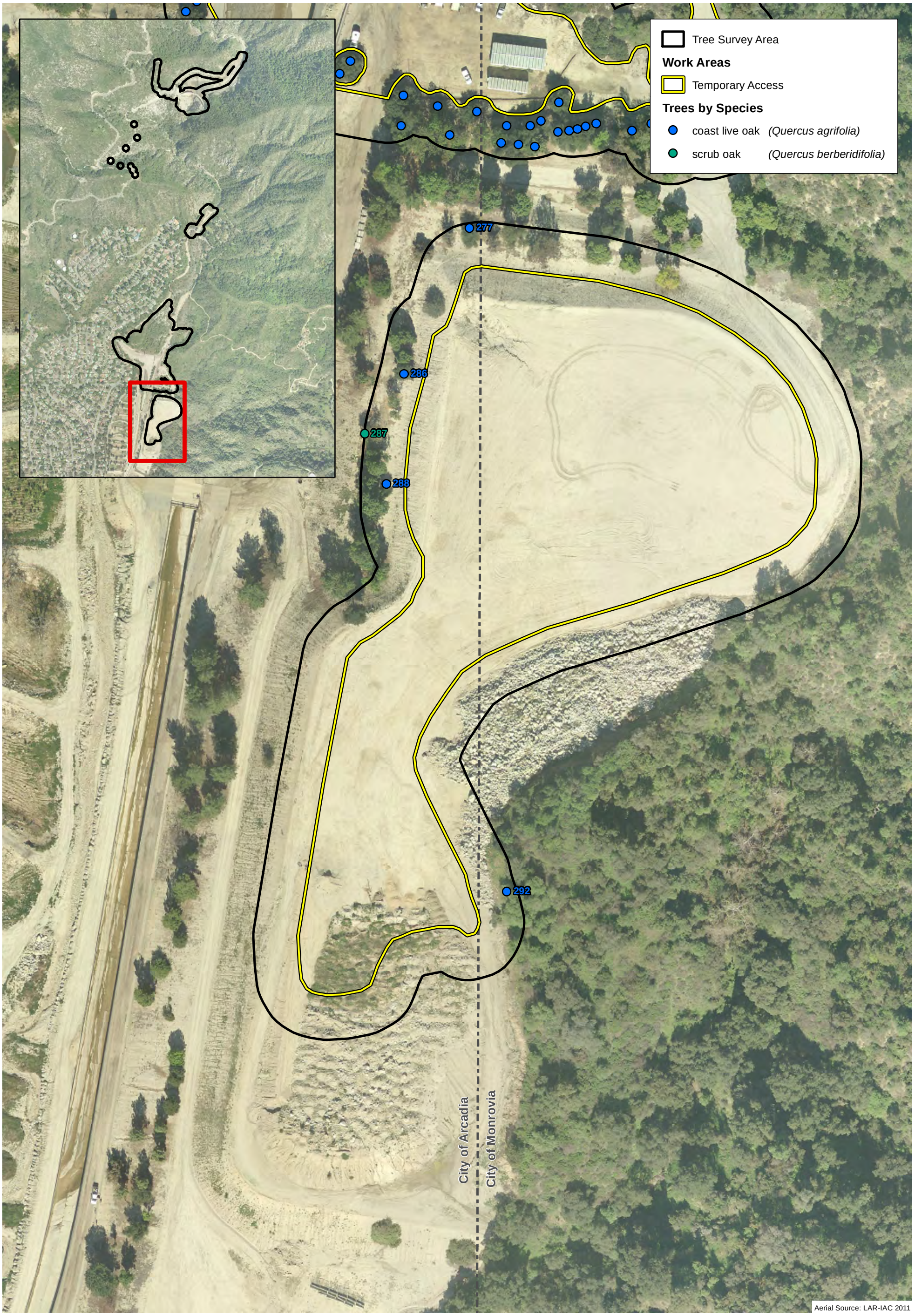
Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

160 80 0 160 Feet

BonTerra PSOMAS

(Rev: 9-30-2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\MND\ex4-5_impact_trees.pdf



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Project Work Areas – Tree Locations – Debris Dam (Sediment Placement Site)

Exhibit 4-5E

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

(Rev: 9-30-2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\MND\ex4-5_impact_trees.pdf

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. As previously stated, the Project area is not located within a Los Angeles County adopted SEA. Updates to LA County's SEAs have been drafted and are currently under review. The updated SEA boundaries include the study area within the San Gabriel Canyon SEA (LACDRP 2011). However, the new boundaries will not be effective until the SEA boundaries are finalized; until then, the existing SEA boundaries will be in effect. Therefore, the Project would not conflict with the County's adopted SEA program. The Project would not conflict with the provisions of an adopted Habitat Conservation Plan; Natural Community Conservation Plan; or other approved local, regional, or State habitat conservation plan.

4.4.3 MITIGATION MEASURES

MM BIO-1 **A.** Replacement shall occur for the western sycamores (Tree Numbers 220-222) that area removed by construction of the Wilderness Park Culvert Crossing. At a minimum, impacted sycamore trees at the Culvert Crossing shall be replaced at no less than a 1:1 ratio, and the minimum box size of replacement trees shall be 24 inches. The replacement trees shall be incorporated into the Riparian Habitat Mitigation and Monitoring Plan (HMMP), as set forth in MM BIO-5, or a separate Tree HMMP shall be prepared and shall contain the same required components.

B. The oak tree adjacent to the Wilderness Park Culvert Crossing (Tree Number 219) shall not be removed. This tree shall be protected as described in subsection "C" below. However, the protective fencing for this tree shall be placed at the edge of the canopy to allow for construction to occur immediately outside its canopy. When initial vegetation removal/ground disturbance is occurring within 1.5 times the dripline/root protection zone, the work shall be monitored by a Certified Arborist who shall oversee any removal/cutting of roots necessary and shall determine if trimming of the canopy is necessary to protect the health of the tree. The Certified Arborist shall monitor the health of this tree a minimum of once per month during construction of the Wilderness Park Culvert Crossing and once per month for a period of six-months following completion of construction. Photographs shall be taken monthly to compare the overall vigor of the tree over time. The tree shall be considered "impacted" if its health rating declines two or more rating levels as referenced in the Biological Technical Report (Appendix B, see Tree Survey Report). If this occurs, in coordination with CDFW and the City of Arcadia, the tree shall be mitigated at no less than a 1:1 ratio, and the minimum box size of replacement trees shall be 24 inches. If Tree Number 220 is also preserved, protection shall follow the same requirements that are specified herein for Tree Number 219.

C. To protect native trees adjacent to Project Work Areas, the following shall be implemented within each Project Work Area:

- Brightly-colored construction fencing shall be placed around all native trees to be preserved that are located within 50 feet of Project Work Areas. The fencing shall be placed at 1.5 times the dripline/root protection zone (defined as the outer canopy edge, at least 15 feet from the trunk). These areas shall be labeled as "Tree Protection Areas" and shall be regarded as Environmentally Sensitive Areas on construction plans. If an existing

access road is within the Tree Protection Area, the Tree Protection Area may be adjusted to allow for access along the existing roadway.

- Stockpiling of materials or vehicle operation shall be prohibited within the Tree Protection Areas. If a Tree Protection Area has been adjusted to allow for an existing access road, no stockpiles or materials shall be allowed within 1.5 times the dripline/root protection zone of the native tree.
- Limbs of native trees can be pruned if necessary to allow construction equipment access. Small branches (less than three inches diameter) can be trimmed without the supervision of a Certified Arborist if less than ten percent of the total canopy is removed. If larger branches need to be removed or if more than ten percent of the total canopy would be affected, these activities shall be supervised by a Certified Arborist.
- Changes to the grade or drainage patterns in the areas surrounding a Tree Protection Area shall be avoided so that excess water does not drain to native trees, unless otherwise approved by a Certified Arborist.
- Any activities (e.g., vehicle operation) occurring within a Tree Protection Area shall be coordinated with a Certified Arborist to ensure that activities would not affect the health of the tree(s). If construction would damage or remove any trees, the Certified Arborist shall contact the appropriate jurisdiction(s) to determine mitigation and permitting requirements before the tree is impacted.
- An on-site pre-construction field meeting shall be held to inform all construction personnel of tree restrictions prior the initiation of work.

D. A subset of 20 of the native trees located within the increased inundation area shall be monitored for health over the course of 5 years following completion of the Debris Dam construction. A Certified Arborist shall monitor these trees annually each spring following the rainy season for a period of 5 years for signs of any potential negative health effects from flooding (e.g., yellowing leaves, lack of new growth, trunk decay, etc.) using the same health rating scale described to evaluate baseline conditions. Monitoring will distinguish if any changes in health may be from other outside factors. Each monitoring event shall measure and track the dbh of the trees to determine growth patterns, and other trees outside of the future inundation areas shall also be measured to compare growth rates. Photographs shall be taken annually to compare the overall vigor of each tree's crown over time. Monitoring events shall assess whether a tree has been "affected" by determining if a tree's health rating declines two or more rating levels. Any affected trees shall be monitored for a two year period, which may be in addition to the original 5 year monitoring period, to determine if their health condition subsequently improves. If an affected tree shows improvement in the health rating during this two year period, it shall be considered a "recovered" tree and would not require mitigation. If an affected tree's health condition does not improve during this 2-year period, then the tree would be considered "impacted" and would require mitigation. If this occurs, in coordination with CDFW, the tree shall be mitigated at no less than a 1:1 ratio. The replacement trees shall be incorporated into the Riparian HMMP, as set forth in MM BIO-5, or a separate Tree HMMP shall be prepared and shall contain the same required components.

MM BIO-2 At least 7 days prior to the initiation of dewatering/construction at the Dam and Headworks (and Debris Dam if ponded water is present at the time of construction), a five-day/four-night pre-construction trapping for the Pacific pond turtle shall be conducted by a qualified Biologist. Concurrently with the trapping effort, the Biologist shall also visually search for and capture two-striped garter snakes and any other special status species in the Project Work Areas. If any Pacific pond turtles, two-striped garter snakes, or other special status species are captured, they shall be relocated to a suitable site along Santa Anita Wash outside of the construction area. Prior to relocating any of these species, the USFS and the CDFW shall approve the potential relocation site(s) and methods for transferring the turtles/snakes to the relocation sites. Any non-native animal species encountered during pre-construction surveys shall be permanently removed from the reservoir.

Additionally, a qualified Biologist shall be present during the latter stages of dewatering of the reservoir to ensure that no Pacific pond turtles, two-striped garter snakes, or other special status species are stranded. If any of these species are observed during monitoring, they shall be captured by a qualified Biologist (i.e., one with the necessary approvals to handle these species) and released at the approved relocation site. Any non-native animal species encountered during dewatering of the reservoir shall be permanently removed from the reservoir. A Letter Report shall be prepared to document the results of the pre-construction surveys and monitoring; the Report shall be provided to the USFS and the CDFW within 30 days of conclusion of the survey effort.

MM BIO-3 The Project shall be conducted in compliance with the conditions set forth in the Migratory Bird Treaty Act (MBTA) and *California Fish and Game Code* with methods approved by USFWS and CDFW to protect active bird/raptor nests. The nature of the Project requires that work would be initiated during the breeding season for nesting birds (March 15–September 15) and nesting raptors (February 1–June 30). The LACFCD, in consultation with a qualified Biologist, may employ bird exclusionary measures (e.g., mylar flagging) prior to the start of bird breeding season to minimize opportunities for birds to nest within established boundaries of the Project. In order to avoid direct impacts on active nests, a pre-construction survey shall be conducted by a qualified Biologist for nesting birds and/or raptors within
3 days prior to clearing of any vegetation or any work near existing structures (i.e., within 50 feet for nesting birds and within 500 feet for nesting raptors). If the Biologist does not find any active nests within or immediately adjacent to the impact area, the vegetation clearing/construction work shall be allowed to proceed.

If the Biologist finds an active nest within or immediately adjacent to the construction area and determines that the nest may be impacted or breeding activities substantially disrupted, the Biologist shall delineate an appropriate buffer zone around the nest depending on the sensitivity of the species and the nature of the construction activity. Any nest found during survey efforts shall be mapped on the construction plans. The active nest shall be protected until nesting activity has ended. To protect any nest site, the following restrictions to construction activities shall be required until nests are no longer active, as determined by a qualified Biologist: (1) clearing limits shall be established within a buffer around any occupied nest (the buffer shall be 25–100 feet for nesting birds and 300–500 feet for nesting raptors), unless otherwise determined by a qualified Biologist and (2) access and surveying shall be restricted within the buffer of any occupied nest,

unless otherwise determined by a qualified Biologist. Encroachment into the buffer area around a known nest shall only be allowed if the Biologist determines that the proposed activity would not disturb the nest occupants. Construction can proceed when the qualified Biologist has determined that fledglings have left the nest or the nest has failed.

MM BIO-4 Water shall be drained or re-routed around Project Work Areas at least one month prior to construction to deter bats from roosting in the vicinity of the Work Areas.

If exclusionary measures have not already been installed on all potential roost structures within the Project Work Area, a pre-construction follow-up roosting bat survey (including both day and evening efforts) shall be conducted by a qualified Biologist within two weeks prior to the initiation of construction to ensure that no active day-roosts would be impacted. The day survey will involve inspecting the structures for sign of bat roosting. The evening survey will involve monitoring each potential roost site for evening emergence, conducting exit counts, and acoustic monitoring (from a half an hour before sunset to at least one hour after sunset) near potential roosts. If active bat day-roosts occur within the Project Work Area, bat exclusion devices shall be installed under the supervision of a qualified biologist prior to the start of construction.

If active bat day-roosts occur within structures proposed for removal/repair (including gunite repair on hill slopes), then exclusionary measures, such as barriers with one-way doors or permanent exclusion (e.g., caulking or wire mesh), shall be installed under the supervision of a qualified Biologist.

If active bat day-roosts occur within trees proposed for removal, then either tree removal shall be conducted between September and November (to avoid the bat maternity and the bat hibernation season), or the tree removal will occur under the supervision of a qualified Biologist and will utilize phased tree trimming. If avoidance of bat hibernation and bat maternity season is not feasible, then exclusionary measures, such as netting or phased tree trimming, shall be implemented after the evening roost emergence under the supervision of a qualified Biologist. Once bats have been excluded from the trees to be removed, then tree removal can proceed.

MM BIO-5 Prior to initiation of Project activities, the Los Angeles County Flood Control District (LACFCD) shall obtain all necessary permits for impacts to U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CDFW jurisdictional areas. Mitigation for the loss of jurisdictional resources shall be negotiated with the resource agencies during the regulatory permitting process. Potential mitigation options shall include one or more of the following: (1) payment to a mitigation bank or regional riparian enhancement program (e.g., invasive plant or wildlife species removal) and/or (2) restoration of riparian habitat either on site or off site at a ratio of no less than 1:1, determined through consultation with the above-listed resource agencies. If in-lieu mitigation fees are required, prior to the initiation of any construction-related activities, the LACFCD shall pay the in-lieu mitigation fee to a mitigation bank/enhancement program for the in-kind (equivalent vegetation type and acreage) replacement of impacted jurisdictional resources. If a Restoration Program is required, prior to the initiation of any construction-related activities, the LACFCD shall prepare and submit a Riparian Habitat Mitigation and Monitoring Program (HMMP) for USACE and CDFW approval. If a Riparian HMMP is required, it shall contain the following items:

A. Responsibilities and qualifications of the personnel to implement and supervise the plan. The responsibilities of the Landowner, Specialists, and Maintenance Personnel that would supervise and implement the plan shall be specified.

B. Site selection. The mitigation site shall be determined in coordination with the USACE, CDFW, and RWQCB. The site shall either be located in a dedicated open space area on County land, USFS land, or off-site land shall be purchased.

C. Seed source. Seeds (or plantings) used shall be from local sources (within ten miles of the Project area) to ensure genetic integrity.

D. Site preparation and planting implementation. Site preparation shall include (1) protection of existing native species; (2) trash and weed removal; (3) native species salvage and reuse (i.e., duff); (4) soil treatments (i.e., imprinting, decompacting); (5) temporary irrigation installation; (6) erosion-control measures (i.e., rice or willow wattles); (7) seed mix application; and (8) container species planting.

E. Schedule. A schedule shall be developed which includes planting in late fall and early winter, between October 1 and January 30.

F. Maintenance Plan/Guidelines. The Maintenance Plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement planting.

G. Monitoring plan. The Monitoring Plan shall include (1) qualitative monitoring (i.e., photographs and general observations); (2) quantitative monitoring (i.e., randomly placed transects); (3) performance criteria, as approved by the above-listed resource agencies; (4) monthly reports for the first year and reports quarterly thereafter; and (5) annual reports for five years, which shall be submitted to the resource agencies on an annual basis. The site shall be monitored and maintained for five years to ensure successful establishment of riparian habitat within the restored and created areas.

H. Long-term preservation. Long-term preservation of the site shall also be outlined in the conceptual Mitigation Plan to ensure the mitigation site is not impacted by future development.

4.5 CULTURAL RESOURCES	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

Information in this section is derived from the *Phase I Cultural Resources Assessment for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California* dated October 2014 and prepared by BonTerra Psomas. This report is provided in its entirety in Appendix C. Information was also derived from the *Cultural Resources Assessment for the Proposed Santa Anita Riser Modification and Reservoir Sediment Removal Project, Los Angeles County*, dated November 2007and prepared by EDAW (EDAW 2007).

4.5.1 EXISTING CONDITIONS

Cultural Resources Records Search at the South Central Costal Information Center

A literature review of documents on file at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton was completed by Patrick Maxon of BonTerra Psomas on December 3, 2012. Twenty-two archaeological studies have been previously conducted within a one-mile radius of the Project site. Four of the studies included at least a portion of the Project site. Twelve previously recorded resources are located within one mile of the Area of Potential Effect (APE). One recorded resource is located within the Project site. Table 4-10, Cultural Resources Studies Within One Mile of the Project Site, identifies the previous cultural resources studies that include at least a portion of the Project site.

TABLE 4-10
CULTURAL RESOURCES STUDIES WITHIN ONE MILE OF THE PROJECT SITE

Report Number	Author(s) (Year)	Type of Study/Comments
LA3308	Bissell (1993)	Cultural Resources Reconnaissance of the Madison/Cloverleaf Specific Plan Area, Monrovia, Los Angeles County, California
LA3372	Triem (1993)	Historic Resources Evaluation and Management Plan, United State Forest Service, Angeles National Forest
LA6859	LSA Associates (1996)	Arcadia General Plan
LA10598	Strauss et al. (2007)	Cultural Resources Assessment for the Proposed Santa Anita Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, California
Source: BonTerra Psomas 2014d (Appendix C).		

Table 4-11 describes the known cultural resources within one mile of the Project site. One cultural resource noted in Table 4-11 is within the APE of the Project, P-19-188707 (Dam), and is detailed below.

TABLE 4-11
CULTURAL RESOURCES ON OR WITHIN
ONE MILE OF THE PROJECT SITE

Site Number	Recorder/(Year)	Comment	Resource Within APE
CA-LAN-1951H	McIntyre (1991)	Zion Trail	No
CA-LAN-2102H	Becker et al. (1993)	Lux Cabin	No
CA-LAN-2103H	Becker and Gregory (1993)	Two Chimneys	No
CA-LAN-2014H	Becker and Stevens (1993)	Survey Monument 2	No
CA-LAN-2106H	Bissell (1993)	Survey Monument 1	No
CA-LAN-2109H	Becker and Gregory (1993)	Concrete Channel	No
P-19-150017	Gregory (1993)	Shinoda Property – 610-620 Cloverleaf Dr	No
P-19-150018	Gregory (1993)	Quest's End – 1250 Cloverleaf Dr	No
P-19-150019	Gregory (1993)	Clover Crest, Lux Arboretum Annex	No
P-19-150025/26	Stone (1992)	Sierra Madre Ranger Station	No
P-19-187819	Huckabee(2006)	Chantry Road, 2N41	No
P-19-188707	**EDAW (2007)**	**Santa Anita Dam Complex**	**Yes**

APE: Area of Potential Effects

Bold entries indicate resources that are on the Project site.

Source: BonTerra Psomas 2014d (Appendix C).

Resources Within the Project Site

P-19-188707

This site is the Santa Anita Dam Complex. It consists of the Dam, shelter house, hoist house, relief quarters, storage shed, sluice gate control house, Dam Operator's house and garage, and paint shed. The Dam was completed in 1927 while the remaining resources were built after 1936. The complex was recorded by EDAW, Inc. (2007) as a part of the Santa Anita Sediment Removal and Riser Modification Project and was subsequently evaluated for significance by EDAW's Christy Dolan. It was determined to be not significant under any California Register of Historical Resources (CRHR) or National Register of Historic Places (NRHP) significance criteria (BonTerra Psomas 2014d).

U.S. Forest Service Cultural Resources Records Search

A second records search was undertaken at the USFS office in Arcadia. Mr. Maxon and Architectural Historian Pam Daly met Forest Service Archaeologist Darrell Vance at the USFS' Arcadia headquarters on January 9, 2013. Mr. Vance pointed out the location of reports and site records which BonTerra Psomas accessed independently. The reports and records documented work done outside of the Project's APE. No sites or studies are recorded within the APE. It was determined that the EDAW assessment completed for the Santa Anita Riser Modification Project and the accompanying site record for the Dam were missing from USFS archives. The 2007 EDAW report and site record was provided to Mr. Vance (BonTerra Psomas 2014d).

Native American Sacred Lands File Review

The Native American Heritage Commission's (NAHC) Search of the Sacred Lands File on December 21, 2012, did not identify the presence of Native American cultural resources on the Project site. The NAHC provided a list of Native American groups and individuals that might have knowledge of the religious and/or cultural significance of resources that may be in and near the Project site. Each of these groups and individuals were mailed an informational letter on January 2, 2013, describing the Project and requesting any information regarding resources that may exist on or near the Project site.

Table 4-12, Native America Consultation Summary, lists the results of consultation. To date, two responses have been received from the Native American groups and individuals contacted. All Native American correspondence can be viewed in Appendix C.

TABLE 4-12
NATIVE AMERICAN CONSULTATION SUMMARY

Date Sent	Native American Contact	Tribe/Affiliation	Comments
1/2/13	Ron Andrade	LA City/County Native American Indian Commission	No response was received.
1/2/13	Cindi Alvitre	Ti'At Society/Inter-Tribal Council of Pimu	No response was received.
1/2/13	John Tommy Rosas	Tongva Ancestral Territorial Tribal Nation	No response was received.
1/2/13	Anthony Morales	Gabrielino/Tongva San Gabriel Band of Mission Indians	Mr. Morales stated that the presence of water always increases the chances of presence of Native American cultural material and/or human remains and that all due diligence should be completed to determine the impacts of the Project on those resources.
1/2/13	Sam Dunlap	Gabrielino Tongva Nation	No response was received.
1/2/13	Robert Dorame	Gabrielino Tongva Indians of California Tribal Council	Mr. Dorame stated that this area was his family's territory and it is sensitive for the presence of archaeological resources. In the event of a discovery of resources during grading, Mr. Dorame would like to be informed.
1/2/13	Bernie Acuña	Gabrielino-Tongva Tribe	No response was received.
1/2/13	Linda Candelaria	Gabrielino-Tongva Tribe	No response was received.
1/2/13	Andrew Salas	Gabrielino Band of Mission Indians	No response was received.
1/2/13	Conrad Acuña	Gabrielino-Tongva Tribe	No response was received.
Source: BonTerra Psomas 2014d (Appendix C).			

Archaeological Field Survey

On January 9, 2013, BonTerra Psomas' Patrick Maxon and Pamela Daly conducted a pedestrian survey of the APE. Although there are additional built environment elements interspersed among these areas, for the purposes of archaeological resources, the survey area can be described as three distinct areas: the Dam; the Headworks and Wilderness Park Culvert Crossing; and the Debris Dam. Additionally, Mr. David Smith of BonTerra Psomas surveyed several Dam ancillary facilities in May 2014.

The Dam was not directly accessed, but a large part of it (mainly on the southwest side of the Dam) could be clearly seen from the access road just west of Project site. The Headworks area and Wilderness Park Culvert Crossing were examined for exposed archaeological resources and none were noted. The Debris Dam area was examined on foot and by car. The entire Debris Dam area has been greatly modified by modern human activity, yet much of the current surface within the Project area is undisturbed.

Historic Resources Survey

On January 9, 2013, Pamela Daly of Daly and Associates conducted a pedestrian survey of the Project area to identify and assess the significance of portions of the Santa Anita flood-control facilities. Ms. Daly identified and evaluated several historic resources on the site that are a part of the flood-control facilities. They include:

- **Dam and Sediment Transport Tunnel.** The complex includes the Dam; the Dam Operator's house and garage; a paint and explosives shed; a sluice gate control house; and a shelter house. The complex was previously evaluated and determined not eligible for listing on the CRHR or NRHP. The sediment transport tunnel was constructed to dispose of sediment that had accumulated in the Santa Anita Reservoir.
- **Headworks and Wilderness Park Culvert Crossing.** This structure intercepts the flow released from the Dam and redirects portions of it to the Spreading Grounds or allows it to continue to the Debris Dam. The channel crossing, which is located approximately 450 feet southwest of the Headworks and provides access to the Wilderness Park, consists of a concrete-slab road bed that is 29 feet wide and set on concrete walls. Four large steel culvert pipes have been set in concrete under the road bed to allow the flow of water and protect the Culvert Crossing.
- **Debris Dam and Spillway.** This area consists of an embankment constructed of compacted earth; an excavated area within the basin to catch debris; an outlet conduit to permit normal flow of water to pass through and drain the basin after a storm; and a concrete spillway to permit water to flow out of the basin when it is filled during a storm.

All the elements described above were evaluated for significance and all were determined not eligible for listing in the NRHP or CRHR (BonTerra Psomas 2014d). Refer to Daly (2013) in Appendix C.

4.5.2 IMPACT ANALYSIS

Regulatory Requirements

RR CUL-1 Should archaeological resources be found during ground-disturbing activities for the Project, an Archaeologist shall be hired to first determine whether it is a "unique archaeological resource" pursuant to Section 21083.2(g) of the *California Public Resources Code* (PRC) or a "historical resource" pursuant to Section 15064.5(a) of the State CEQA Guidelines. If the archaeological resource is determined to be a "unique archaeological resource" or a "historical resource", the Archaeologist shall formulate a mitigation plan in consultation with the LACFCD that satisfies the requirements of the above-referenced sections. If the Archaeologist determines that the archaeological resource is not a "unique archaeological resource" or "historical resource", s/he may record the site and submit the recordation form to the California Historic Resources Information System at the South Central Coastal Information Center at California State University, Fullerton.

RR CUL-2 If human remains are encountered during excavation activities, all work shall halt in the immediate vicinity of the discovery and the County Coroner shall be notified (*California Public Resources Code* §5097.98). The Coroner shall determine whether the remains are of forensic interest. If the Coroner, with the aid of the Archaeologist approved by the LACFCD, determines that the remains are prehistoric, s/he will contact the Native American Heritage Commission (NAHC). The NAHC shall be responsible for designating the most likely descendant (MLD), who will be responsible for the ultimate disposition of the remains, as required by Section 7050.5 of the *California Health and Safety Code.* The MLD shall make his/her recommendation within 48 hours of being granted access to the site. The MLD's recommendation shall be followed if feasible, and may include scientific removal and non-destructive analysis of the human remains and any items associated with Native American burials (*California Health and Safety Code* §7050.5). If the landowner rejects the MLD's recommendations, the landowner shall rebury the remains with appropriate dignity on the property in a location that will not be subject to further subsurface disturbance (*California Public Resources Code* §5097.98).

Impact Discussion

a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Less than Significant Impact. The Dam was constructed from 1924 to 1927 by the LACFCD. The Dam complex was previously evaluated in 2007 by EDAW as part of the EIR for the Sediment Removal Project and found not eligible for the NRHP. To be eligible for listing in the NRHP, a property must be at least 50 years of age and possess significance in American history and culture, architecture, or archaeology. A property of potential significance must meet one or more of four established criteria:

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

B. Associated with the lives of persons significant in our past; or

C. 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. Yield, or may be likely to yield, information important in prehistory or history.

The criteria for eligibility of listing in the CRHP are based upon NRHP criteria, but are identified as 1–4 instead of A–D. To be eligible for listing in the CRHP, a property must be at least 50 years of age and possess significance at the local, state, or national level, under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or

2. It is associated with the lives of persons important to local, California, or national history; or

3. It 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

4. It has yielded, or has the potential to yield, information important in the prehistory or history of the local area, California, or the nation.

From 1914 to the 1950s, the LACFCD built numerous dams and structures throughout Los Angeles County in an attempt to control destructive flooding. The Dam and associated buildings were part of that effort. Although the on-site structures were constructed during a substantial County-wide flood-control effort, they played a small role relative to the larger dams such as San Gabriel or Big Tujunga. Therefore, they are not considered eligible under Criteria A or 1 for their association with significant events. The Dam is associated with George Goethals, who oversaw the construction of the Panama Canal. Goethals oversaw all of the dams that were built under the same bond issue and he appears to have no special association with the Dam. Therefore, Criteria B and 2 do not apply. Neither the Dam nor its associated structures embody a distinctive type, period or method of construction. Nor do they represent the same style or period of construction, having been constructed in stages between 1927 and 1946. Therefore, they are not eligible under Criteria C or 3. Criteria D and 4 are usually reserved for archaeological sites. Since the Dam has been fully researched, there is no further information potential for the Santa Anita Dam. Therefore, the Dam complex is not considered eligible under Criterion D or 4 (EDAW 2007).

In the 1950s, the Headworks and Debris Dam were constructed to control and capture the flow of water from the Dam to protect life and property as populations rose. The Sediment Transport Tunnel was constructed only to provide access to the basin of the Dam reservoir so that accumulated silt could be removed and deposited elsewhere. Surveyors were able to use the most modern technology available in the form of laser beams to direct the mining operations associated with constructing a nine-foot-wide tunnel through the mountain (BonTerra Psomas 2014d).

Under NRHP and/or CRHR criterion relating to the association of the built-environment structures located within the APE with significant historical events that exemplify broad patterns of our history, the Project elements (i.e., the Dam and Sediment Transport Tunnel, the Headworks and Wilderness Park Culvert Crossing, and the Debris Dam and spillway) do not appear to qualify as significant historic resources individually or collectively. Throughout the world, debris basins and dams (masonry, earthen or timber) have been constructed by both private and public entities to control seasonal rainfall and to protect people and property. The structures located within the APE are just one of many flood-control systems that were constructed in the canyons of San Gabriel Mountain. There is no evidence that any of the structures in the APE are eligible for listing.

Under NRHP and/or CRHR criterion relating to the Project's association with persons of historic importance, the Project elements do not appear to qualify, individually or collectively, as significant resources. The design plans for the structures located in the Santa Anita Wash were prepared by LACFCD staff engineers or the USACE as part of their normal tasks and duties. There is no evidence that any of the structures in the APE are eligible for listing.

Under NRHP and/or CRHR criterion relating to the distinctive characteristics of a type, period, region, or method of construction, the built-environment structures located in the APE are not significant as they do not, individually or collectively, embody any innovative engineering design or method of construction, or high artistic design. The Headworks was designed using common technology to channel water from the Dam towards the Debris Dam or into the pipe leading to the Sierra Madre Spreading Grounds. The Debris Dam was constructed by excavating a water containment area in the Santa Anita Wash, and a spillway was erected to hold heavier debris

back during high rainfall events. The technology used to create the basin and associated spreading grounds were commonplace, as was the use of concrete to hold, channel, divert, and control the water as it came down from the foothills. The Project elements do not appear to present any technological achievement in the history of water systems locally, regionally or nationally, and are therefore not eligible for listing either individually or collectively.

Based upon a survey of the aboveground historic period resources in the APE, the facilities and structures that would be affected by Project implementation have not yielded, nor do they appear to have the potential to yield, information important to the history of the local area, California, or the nation pursuant to NRHP and/or the CRHR. Therefore, impacts to historic resources would be less than significant and no mitigation is required.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less than Significant Impact. The proposed improvements to the Dam facilities would be limited to existing engineered structures and gunite surfaces and are not expected to disturb any native sediments. However, construction activities at the Headworks and the Wilderness Park Culvert Crossing would require excavations within the native soils of the creekbed. Construction at the Debris Dam would require disturbance of accumulated sediment and possibly native soils within the water retention area to install the new/replacement intake tower and the Debris Dam embankment.

Given that the proposed construction activities have the potential to disturb native soils, it is possible that archaeological materials would be uncovered during construction activities at the Headworks/Wilderness Park Culvert Crossing and Debris Dam facilities. Although the likelihood of encountering archaeological resources in the APE is considered low, the *California Health and Safety Code* and the *California Public Resources Code* describes procedures for monitoring and protocols to be followed in the event that archaeological resources are discovered during construction activities, as described in RR CUL-1. Compliance with RR CUL-1 would ensure that impacts would be less than significant.

c) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less than Significant Impact. The proposed improvements to the Dam facilities would be limited to existing engineered structures and gunite surfaces and would not require deep excavations that may disturb underlying fossil remains. Construction activities at the Dam would have no impact on paleontological resources or unique geologic features. At the Headworks and the Wilderness Park Culvert Crossing, the proposed improvements would involve localized excavations, shallow grading, and fill materials to construct the new facilities, but would not excavate into paleontologically sensitive rock units. Because the Project would not excavate into paleontologically sensitive rock units, the Project would have a less than significant impact on paleontological resources and no mitigation is required.

d) Would the project disturb any human remains, including those interred outside of formal cemeteries?

Less than Significant Impact. There is no indication that human remains are present within the Project area. The records search and field survey indicates no evidence of human remains on or near the Dam, Headworks/Wilderness Park Culvert Crossing, or Debris Dam. Recently deposited sediment, debris, and vegetation that flowed with stormwaters into the Debris Dam are not expected to contain any human remains, including those interred outside formal cemeteries.

In the unlikely event of an unanticipated encounter with human remains in Project site, the *California Health and Safety Code* and the *California Public Resources Code* require that any activity in the area of a potential find be halted and the Los Angeles County Coroner be notified, as described in RR CUL-2. Compliance with RR CUL-2 would ensure that impacts would be less than significant.

4.5.3 MITIGATION MEASURES

There would be no significant impacts related to cultural resources; therefore, no mitigation measures are required.

4.6 GEOLOGY AND SOILS	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐
iv) Landslides?	☐	☒	☐	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

4.6.1 EXISTING CONDITIONS

The Project area is located in the southwestern section of San Gabriel Mountains, which occupy the central part of the Transverse Ranges (east-west orientation) at the northern margin of the Los Angeles Basin. According to the California Geological Survey's (CGS') 2010 Geologic Map of California, the Project site is underlain by Mesozoic-age plutonic rock[9] (CGS 2012a). This area, which is one of the most seismically active regions in California, is characterized by tectonic compression across east-west-trending reverse and strike-slip faults. This tectonic setting is believed to be caused by the bend in the San Andreas Fault Zone north of Los Angeles.

The CGS has published a Seismic Hazard Zone Map and associated Report for the Mt. Wilson 7.5-minute quadrangle, which includes the Project site. The site consists predominantly of Pleistocene and Holocene alluvial deposits composed primarily of sand, silt, and gravel. Elevations range up to 6,000 feet above msl in the San Gabriel Mountains in the northwest portion of the

[9] Plutonic rock is formed at considerable depth by crystallization of magma and/or by chemical alteration, and is characteristically medium- to coarse-grained and of granitoid texture (The American Geologic Institute 1984).

quadrangle (CGS 1998). The elevation within the immediate project area ranges from 1,318 feet above msl at Santa Anita Reservoir to 590 feet above msl at the existing sediment placement site.

As shown on Exhibit 4-6, Fault Map, the Sierra Madre Fault runs through the Project site, and the Raymond Fault is located two miles to the south. The Sierra Madre Fault is a reverse fault that is considered capable of producing an earthquake with a probable magnitude of 6.0 to 7.0 on the Richter Scale (SCEDC 2013). In addition, there are several regional faults that could produce significant ground shaking at the Project site, including the San Gabriel Fault and the San Andreas Fault. The site is not within an Alquist-Priolo Earthquake Fault Zone (CGS 2012c).

According to the Los Angeles County Seismic Safety Element, the Project site is located within an area identified by the California Division of Mines and Geology (CDMG) as having the potential for earthquake-induced landslides (County of Los Angeles 1980; CGS 1999). In addition, the Project site is identified as susceptible to liquefaction hazards, with the lands to the north and south of the site identified as susceptible to landslide hazards (CGS 1999). Exhibit 4-7, Landslide and Liquefaction Hazard Zones, shows the portions of the Project site that are located within a Seismic Hazard Zone, which are areas susceptible to liquefaction and landslides (CGS 1999).

4.6.2 IMPACT ANALYSIS

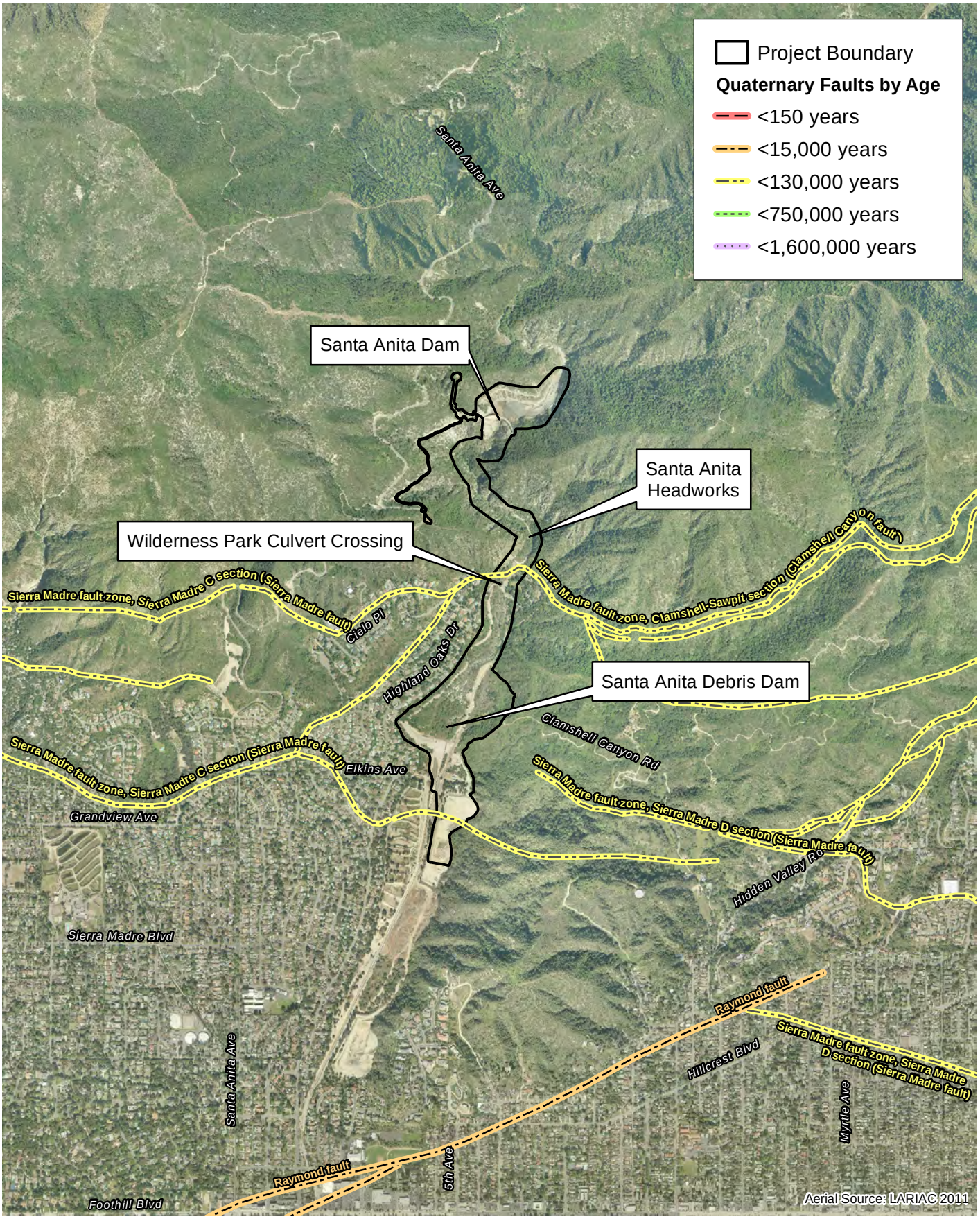
Project Design Features

PDF GEO-1 The Project shall be designed and constructed in compliance with the *Standard Specifications For Public Works Construction* (Greenbook), Construction Specifications Institute, and DSOD guidelines for seismic stability to ensure the structural integrity of proposed site improvements against seismic shaking. In case of conflict between two specifications, the stricter specification shall apply.

PDF GEO-2 A detailed geotechnical investigation shall be conducted to assess potential geotechnical issues at the Debris Dam. This investigation shall conform with all applicable County requirements and other pertinent criteria, including DSOD and Greenbook standards. Specific issues to be evaluated in the Project geotechnical investigation shall include seismic-related ground rupture, ground acceleration, and liquefaction, as well as expansive/corrosive soils; other types of soil/geologic instability (including subsidence, oversized materials and excavations); and any other issues deemed appropriate by the LACFCD and/or the Geotechnical Engineer. The geotechnical investigation shall be submitted to the LACFCD for review and approval prior to commencement of construction. All applicable requirements and recommendations identified in the approved geotechnical investigation shall be incorporated into the Project design and/or construction specifications as appropriate.

Regulatory Requirements

None required.



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Fault Map

Exhibit 4-6

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra PSOMAS

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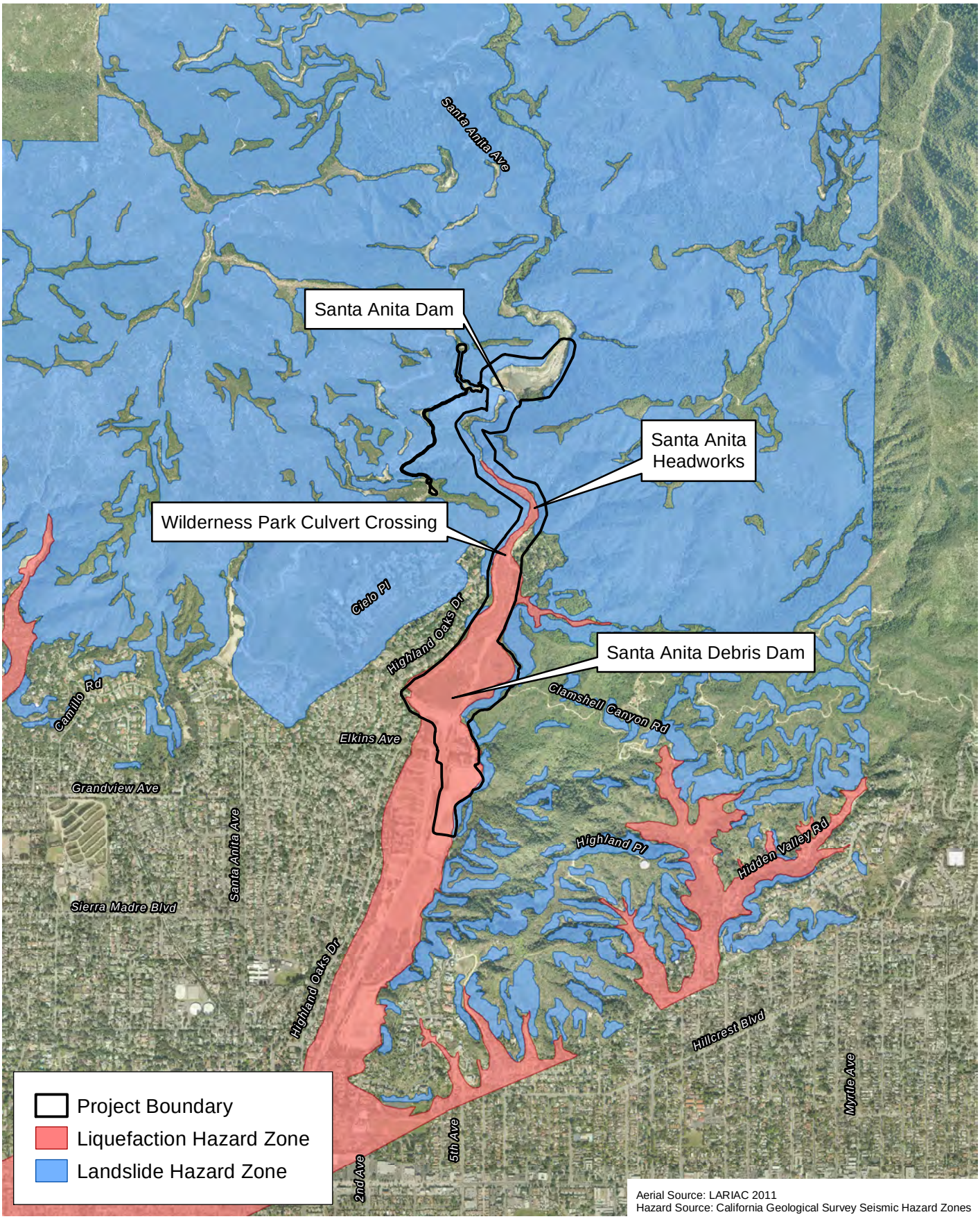

Aerial Source: LARIAC 2011
Hazard Source: California Geological Survey Seismic Hazard Zones

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Landslide and Liquefaction Hazard Zones

Exhibit 4-7

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra PSOMAS

(Rev: 9-30-2014 CJS) H:\PAS\Projects\CoLADPW\J166\Graphics\MND\Ex4-7_landslide_liquefaction.pdf

Impact Discussion

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

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

ii) Strong seismic ground shaking?

Less Than Significant Impact. As discussed above, the Sierra Madre Fault Zone runs through the Project site. Although the Project site is not located within an Alquist-Priolo Earthquake Fault Zone, the Raymond Fault is a designated Alquist-Priolo Earthquake Fault Zone that lies two miles to the south of the Project site. In addition, several potentially active fault zones are located in the Project vicinity, including the San Gabriel and San Andreas Fault Zones.

Segments of the Sierra Madre Fault have historically experienced surface rupture; the most recent was during the Holocene era. The interval between surface ruptures on this fault is expected to be several thousand years (SCEDC 2013). Additionally, the site could be subject to strong ground shaking in the event of an earthquake. As within most of Southern California, the Project area is within a seismically active region and there is the possibility of strong seismic ground shaking at the Project site. The CGS estimates the peak ground acceleration (PGA) having a 10 percent probability of being exceeded in 50 years at the Project site as approximately 0.74g, or 74 percent the force of gravity, based on the USGS' and CGS' Probabilistic Seismic Hazards Assessment (PSHA) Model (CGS 2012d, 1998). However, seismic ground shaking from major faults in the region is not anticipated to be greater than at any other sites in Southern California and is not considered to pose an unusual risk to the Project site.

The potential for surface rupture on the Sierra Madre Fault Zone, as well as the potential for strong ground shaking, are existing seismic hazards that affect the Project site; as such, Project implementation would not exacerbate these seismic hazards. The primary purpose of the Project is to improve public safety by addressing seismic safety and other structural issues at the Dam, Headworks/Wilderness Park Culvert Crossing, and Debris Dam. As stated in PDF GEO-1, the Project would be designed and constructed in compliance with Greenbook, Construction Specifications Institute, and DSOD standards and would incorporate the recommendations of the geotechnical investigation report as described in PDF GEO-2. The Project would not result in a significant adverse impact by exposing people or structures to major seismic hazards beyond what is considered normal for the Southern California region, and there are no significant impacts related to seismic ground shaking. However, PDFs GEO-1 and GEO-2 would ensure that the Project would be designed and constructed in accordance with the applicable standards.

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

iii) Seismic-related ground failure, including liquefaction?

iv) Landslides?

Less than Significant with Mitigation. According to the Los Angeles County Seismic Safety Element and as shown on Exhibit 4-7, the Project site is located within an area identified by the California Division of Mines and Geology (CDMG) as having the potential for earthquake-induced landslides (County of Los Angeles 1980; CGS 1999). In addition, the Project site is identified as

susceptible to liquefaction hazards, with the lands to the north and south of the site identified as susceptible to landslide hazards (CGS 1999).

The potential for liquefaction on the Sierra Madre Fault Zone, as well as the potential for landslides, are existing seismic hazards that affect the Project site; as such, implementation of the Project would not exacerbate these seismic hazards. The primary purpose of the Project is to improve public safety by addressing seismic safety and other structural issues at the Dam, Headworks/Wilderness Park Culvert Crossing, and Debris Dam and bring them in compliance with County and DSOD design requirements and seismic safety standards, as required by PDFs GEO-1 and GEO-2. For example, reinforcement of the Debris Dam would address liquefaction concerns with settlement/separation between the spillway and the embankment and would remove potential for failure caused by bending of the spillway walls.

However, the Project would result in temporary hazards for workers who will be on the site during construction. The greatest risk to the on-site crew would be the potential for landslides and falling debris, particularly in the Dam and Headworks areas, which are adjacent to steep canyon walls. MM HAZ-1 identifies the need for the contractor to prepare a Site-Specific Health and Safety Plan that includes a designated Site Health and Safety Officer; an Access and Evacuation Plan; and identification of site hazards. Therefore, through implementation of MM HAZ-1, there would be a less than significant risk to on-site crew related to potential exposure of people or structures to risks associated with landslides.

b) Would the project result in substantial soil erosion or the loss of topsoil?

Less than Significant Impact. While most of the proposed improvements would occur on existing facilities, construction of the Project would result in some ground surface disruption during excavation and grading activities that could create the potential for erosion to occur and result in the loss of topsoil. In particular, relocation of the spillway at the Debris Dam would involve the removal of a portion of the adjacent hillside. Additionally, excavation and grubbing activities within the creekbed could lead to sedimentation downstream.

Since the Project site is greater than one acre, the construction contractor would prepare and comply with a Stormwater Pollution Prevention Plan (SWPPP), which would include erosion-control measures. Compliance with RR HYD-1 regarding the implementation of non-stormwater management and materials pollution control Best Management Practices (BMPs), as outlined in the SWPPP for the Project, would reduce pollutants in the runoff. Compliance with the State Water Resources Control Board's (SWRCB's) Order No. 2003-0017-DWQ (RR HYD-2) regarding discharges from the Project would further reduce pollutants from being discharged into the downstream portion of the creekbed. Therefore, impacts related to potential soil erosion or loss of topsoil would be less than significant and no mitigation is required.

c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less than Significant Impact. As indicated in Threshold 4.6(a)(iii–iv) above and shown in Exhibit 4-7, the Project site and surrounding area are identified as unstable and susceptible to liquefaction and landslide hazards, respectively. However, the potential for landslides, liquefaction, and liquefaction-related lateral spreading are existing seismic hazards that affect the Project site; as such, implementation of the Project would not exacerbate these seismic hazards and impacts would be less than significant.

Land subsidence and collapse occur due to the loss of surface elevation due to the removal of subsurface support. These issues may be caused by activities that contribute to the loss of support materials within the underlying soils (e.g., agricultural practices or the overdraft of an aquifer). The Project would not include any construction activities that would remove subsurface support or draw down groundwater levels. Implementation of the Project would help improve the recharge of the local groundwater basin. As stated in PDF GEO-1, the Project would be designed and constructed in compliance with Greenbook, Construction Specifications Institute, and DSOD standards and would incorporate the recommendations of the geotechnical investigation report as described in PDF GEO-2. Therefore, impacts related to potential subsidence would be less than significant and no mitigation is required.

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

No Impact. Expansive soils are soils that swell when they absorb water and shrink as they dry. Pure clay soils and claystone are good examples of expansive soils. The hazard associated with expansive soils is that they can overstress and cause damage to the foundation of buildings set on top of them. Since the replacement structures are located within an area already developed and all applicable improvements would be required to comply with County and DSOD design requirements and seismic safety standards, as required by PDFs GEO-1 and GEO-2, there would be no impacts related to expansive soils.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. The Project does not include the construction of any septic systems. The construction crew would be served by portable toilets that would be brought to the site at the construction activities; regularly cleaned; and removed at the end of construction activities. Therefore, no impacts associated with use of a septic system or other alternative wastewater disposal systems would occur.

4.6.3 MITIGATION MEASURES

Incorporation of MM HAZ-1 would ensure that potential impacts due to geological hazards would be less than significant.

4.7 GREENHOUSE GAS EMISSIONS	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Information in this section is derived from the *Air Quality and Greenhouse Gas Emissions Impact Analysis for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California* dated June 2014 and prepared by BonTerra Psomas. This report is provided in its entirety in Appendix A.

4.7.1 EXISTING CONDITIONS

Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change may result from natural factors, natural processes, and human activities that change the composition of the atmosphere and alter the surface and features of the land. Significant changes in global climate patterns have recently been associated with global warming, which is an average increase in the temperature of the atmosphere near the Earth's surface; this is attributed to an accumulation of greenhouse gas (GHG) emissions in the atmosphere. GHGs trap heat in the atmosphere which, in turn, increases the Earth's surface temperature. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through fossil fuel combustion in conjunction with other human activities appears to be closely associated with global warming.

GHGs, as defined under California's Assembly Bill (AB) 32, include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). General discussions on climate change often include water vapor, ozone, and aerosols in the GHG category. Water vapor and atmospheric ozone are not gases that are formed directly in the construction or operation of development Projects, nor can they be controlled in these projects. Aerosols are not gases. While these elements have a role in climate change, they are not considered by either regulatory bodies (e.g., CARB) or climate change groups (e.g., the California Climate Action Registry [CCAR]) as gases to be reported or analyzed for control. Therefore, no further discussion of water vapor, ozone, or aerosols is provided.

GHGs vary widely in the power of their climatic effects; therefore, climate scientists have established a unit called global warming potential (GWP). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, since CH_4 and N_2O are approximately 25 and 298 times more powerful than CO_2, respectively, in their ability to trap heat in the atmosphere, they have GWPs of 25 and 298, respectively (CO_2 has a GWP of 1). Carbon dioxide equivalent (CO_2e) is a quantity that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 4-13, Global Warming Potentials and Atmospheric Lifetimes.

TABLE 4-13
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES

Greenhouse Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide (CO_2)	50.0–200.0	1
Methane (CH_4)	12.0	25
Nitrous Oxide (N_2O)	114.0	298
HFC-134a	14	1,430
PFC: Tetrafluoromethane (CF_4)	50,000.0	7,390
PFC: Hexafluoroethane (C_2F_6)	10,000.0	12,200
Sulfur Hexafluoride (SF_6)	3,200.0	22,800
HFC: hydrofluorocarbons; PFC: perfluorocarbons Source: BonTerra Psomas 2014a (Appendix A).		

Assembly Bill 32 – the California Global Warming Solutions Act of 2006

AB 32, the California Global Warming Solutions Act of 2006, recognizes that California is the source of substantial amounts of GHG emissions. The statute states that:

> Global warming poses a serious threat to the economic well being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

In order to avert these consequences, AB 32 establishes a State goal of reducing GHG emissions to 1990 levels by the year 2020, which is a reduction of approximately 16 percent from forecasted emission levels, with further reductions to follow (BonTerra Psomas 2014a).

County of Los Angeles General Plan

For the purposes of the Project, the County's existing General Plan is the applicable planning document, as the revised General Plan has not yet been approved. The existing General Plan was last updated in 1980. The Conservation and Open Space Element includes a section on air resources. GHGs are not addressed in the air resources section.

The County is in the process of updating the General Plan, and released their Revised Draft 2035 General Plan in October 2013. The Air Quality Element summarizes air quality issues and outlines the goals and policies in the General Plan that will improve air quality and reduce the GHG emissions. It states "The South Coast Air Basin, which includes the majority of Los Angeles County, continues to have among the worst air quality ratings in the country. Additionally, climate change, caused by an increase in greenhouse gas emissions, is one the most pressing environmental issues faced by all levels of government. Air pollution and climate change pose serious threats to the environment, economy, and public health" (BonTerra Psomas 2014a).

4.7.2 IMPACT ANALYSIS

Regulatory Requirements

None required.

Impact Discussion

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

Less than Significant Impact. Neither the County nor the LACFCD has adopted or established any quantitative GHG emissions significance criteria for GHG emissions. In April 2008, the SCAQMD convened a Greenhouse Gas Significance Threshold Working Group to provide guidance to local lead agencies on determining the significance for GHG emissions in their CEQA documents. The Working Group adopted a philosophy similar to recommendations made by other agencies in California to identify Significance Screening Levels, or thresholds, for GHG emissions. Projects with GHG emissions less than these levels or thresholds would be determined to have less than significant impacts. Projects with GHG emissions greater than the Significance Screening Level would be required to implement specific performance standards or purchase offsets to reduce their climate change impact to less than significant levels. Consequently, the County has determined, pursuant to the discretion afforded by Sections 15064.4(a) and 15064.4(b) of the State CEQA Guidelines, to quantify the GHG emissions from the Project based on the methodologies proposed by SCAQMD's GHG CEQA Significance Threshold Working Group.

On December 5, 2008, the SCAQMD Governing Board adopted an interim screening threshold for industrial projects where SCAQMD is the lead agency of 10,000 metric tons of carbon dioxide equivalent per year ($MTCO_2e$/year). In September 2010, the working group proposed to expand this 10,000 $MTCO_2e$/year threshold to other lead agency industrial projects. Although the SCAQMD Governing Board has yet to consider this proposal, because the Project is not a residential or commercial land use development project, the SCAQMD threshold for industrial projects is the most applicable to the project and is used in the analysis below. It is noted that the use of the SCAQMD's screening threshold is selected as a threshold for the Project because it is located in the South Coast Air Basin and these thresholds are based on the best available information and data at the time of preparation of this document. The development of CEQA project-level thresholds is an ongoing effort on State, regional, and County levels, and significance thresholds may differ for future projects based on further data and information that may be available at that time.

Construction

Construction GHG emissions are generated by vehicle engine exhaust from construction equipment, on-road hauling trucks, vendor trips, and worker commuting trips. The Project activities (e.g., demolition, grading, building) are identified by start date and duration, as described in Table 3-1. Each activity has associated off-road equipment (e.g., dozers, backhoes, cranes) and on-road vehicles (e.g., haul trucks, concrete trucks, worker commute vehicles), as described in Table 3-2. Construction GHG emissions were calculated by using CalEEMod as described in Section 4.3, Air Quality. The results are output in $MTCO_2e$ for each year of construction. The estimated construction GHG emissions for the Project are shown in Table 4-14.

GHG emissions generated from construction activities are finite and occur for a relatively short-term period of time. Unlike the numerous opportunities available to reduce a project's long-term GHG emissions through design features, operational restrictions, use of green-building materials, and other methods, GHG emissions-reduction measures for construction equipment are relatively limited. Therefore, SCAQMD staff recommended that construction emissions be amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies. As shown in Table 4-14, Estimated GHG Emissions From Construction, the 30-year amortized construction emissions would be 22 $MTCO_2e$/yr.

TABLE 4-14
ESTIMATED GHG EMISSIONS FROM CONSTRUCTION

Year	Emissions ($MTCO_2e$)
2015	43
2016	604
Total	**648**
Annual Emissions*	**22**

$MTCO_2e$: metric tons of carbon dioxide equivalent

Total does not add due to rounding.

* Combined total amortized over 30 years

Source: BonTerra Psomas 2014a (Appendix A).

Operations

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Dam, Headworks, or Debris Dam. Helipad operations would only result in one or two helicopter trips per year. Therefore, any Project-generated change in GHG emissions would be nominal.

As shown in Table 4-14, the estimated increase in annual GHG emissions, including amortized construction emissions, would be 22 $MTCO_2e$/yr. This value may be compared with and is less than the proposed SCAQMD screening threshold of 10,000 $MTCO_2e$/yr for industrial projects. It is accepted as very unlikely that any individual development project would have GHG emissions of a magnitude to directly impact global climate change; therefore, any impact would be considered on a cumulative basis (BonTerra Psomas 2014a). Because the proposed project's GHG emissions would be less than 10,000 $MTCO_2e$/yr, the emissions would not be cumulatively considerable. The impact would be less than significant; no mitigation is required.

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

Less Than Significant Impact. As discussed above, the principal State plan and policy adopted for the purpose of reducing GHG emissions is AB 32. The quantitative goal of AB 32 is to reduce GHG emissions to 1990 levels by 2020. Statewide plans and regulations, such as GHG emissions standards for vehicles and the Low Carbon Fuel Standard, are being implemented at the statewide level, and compliance at the specific plan or project level is not addressed. Therefore, the Project does not conflict with these plans and regulations.

The Project would contribute to regional efforts to reduce dependence on imported water supplies by providing increased opportunities to recharge stormflows emanating from the Santa Anita Canyon Watershed. As described in Section 1 of this IS/MND, the Project has been identified as a regional-level project that could help to increase recharge of the local groundwater basin and thereby increase local water supplies. Thus, the Project would reduce the GHG emissions associated with importing water from outside of the LACFCD.

As the Project does not conflict with State or County plans and regulations, it would result in a less than significant impact.

4.7.3 MITIGATION MEASURES

There would be no significant impacts related to GHG emissions; therefore, no mitigation measures are required.

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

4.8.1 EXISTING CONDITIONS

While no hazardous materials are present at the Headworks/Wilderness Park Culvert Crossing and Debris Dam, there are hazardous materials (e.g., propane, diesel gasoline, oils, paints) used for the operation and maintenance activities at the Dam.

The California Department of Toxic Substance Control (DTSC) maintains the EnviroStor Database, which compiles hazardous material sites and generators that have been identified for clean up or that are permitted to handle hazardous materials by various regulatory agencies. There are no hazardous material sites or generators at or near the Project site, as listed in the EnviroStor Database. The nearest hazardous materials site identified in the EnviroStor Database is a military ordnance facility located approximately 3.5 miles to the west in Pasadena (DTSC 2013a). The Project site is also not listed in the Hazardous Waste and Substances Sites (Cortese) List developed in compliance with Section 65962.5 of the *California Government Code* (DTSC 2013b).

The USEPA maintains the Envirofacts Database, which compiles lists of facilities subject to permitting for their potential environmental hazards to air, water, waste, land, toxics, radiation, regulatory compliance, and other hazards. There are no facilities that pose hazards related to hazardous materials use at or near the Project site, as listed in the Envirofacts Database. The nearest facility identified in the Envirofacts Database is a facility called "Sierra Madre Mad Scientist" in Sierra Madre, approximately 1.7 miles west of the Project site (USEPA 2013a).

The Project site is located within a Very High Fire Hazard Severity Zone (VHFHSZ) (CAL FIRE 2012). The potential for wildland fire is high due to the proximity of the open space and the Angeles National Forest, which includes chaparral, brush, and trees that could be highly flammable during fire season.

Several overhead power lines run through the Project site, supplying electricity to the various flood-control facilities. There are no gas transmission pipelines or hazardous liquid pipelines running near the Project site, as mapped by the National Pipeline Mapping System (PHMSA 2013).

4.8.2 IMPACT ANALYSIS

Regulatory Requirements

RR HAZ-1 Activities at the Project site shall comply with existing federal, State, and local regulations regarding hazardous material use, storage, disposal, and transport to prevent Project-related risks to public health and safety. All on-site generated waste that meets hazardous waste criteria shall be stored, manifested, transported, and disposed of in accordance with the *California Code of Regulations* (Title 22) and in a manner to the satisfaction of the local Certified Unified Program Agency (CUPA) and the U.S. Forest Service, as applicable.

Impact Discussion

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

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

Less than Significant Impact. The Project would primarily involve the use of common hazardous materials, including oil and grease, solvents, diesel fuel, and other chemicals in vehicles, trucks, and heavy equipment. Construction of the Project would not require extensive or on-going use of acutely hazardous materials or substances. Construction activities would be short-term and would be phased over the course of approximately a year and a half, and would involve the limited transport, storage, use, and/or disposal of common construction-related hazardous materials.

The use of hazardous materials at the Project site could pose risks to construction workers or lead to soil and water contamination, if not properly stored, used, or disposed. Due to the presence of water bodies, the potential for water contamination and the likelihood that accidentally contaminated soils would end in the water could create a public health and safety hazard.

To prevent environmental hazards, the handling of hazardous materials used in equipment would have to be conducted in accordance with existing regulations (RR HAZ-1). These regulations include the transport of hazardous materials; on-site storage and use of hazardous materials; and

procedures to implement in the event of a spill. In addition, under RR HYD-1, the Project would be implementing an SWPPP, as discussed in Section 4.9, Hydrology and Water Quality, which would include hazardous waste management BMPs and a sampling and analysis plan for the Contractor to report and mitigate for any hazardous material discharges that may contaminate waters. Compliance with RR HAZ-1 and RR HYD-1 would ensure that impacts related to hazards would be less than significant.

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

Less than Significant Impact. There are no schools within ¼ mile of Project site that could be affected by hazardous emissions or materials from the Project. The nearest school or day care facility is Highland Oaks Elementary School, located approximately 0.5 mile southwest of the Project site on Santa Anita Avenue and Virginia Road. However, it is anticipated that construction-related trucks would pass by the school, as it is located along the primary haul route. Compliance with RR HAZ-1 would ensure that the transport of hazardous materials would be conducted in accordance with existing regulations. Further, MM TRA-1 requires that heavy-duty diesel truck trips be scheduled to avoid peak drop-off and pick-up hours at the school. Therefore, impacts would be less than significant.

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

No Impact. As stated above, the Project site is not on a list of hazardous materials sites identified on the Cortese list or the Envirostor and Envirofacts Databases (DTSC 2013a, 2013b; USEPA 2012a, 2012b). The Project site is primarily open space and has not historically been used for industrial purposes. Therefore, implementation of the Project would have no impact associated with hazardous materials sites.

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

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Less than Significant Impact. There are no airports within two miles of the Project site. The closest airport to the Project site is the El Monte Airport, which is located approximately five miles south of the Project site. However, the Project would include construction of a helipad to provide aerial access to the Dam in the event of an emergency. It is anticipated that the helipad would only be used one or two times per year. In compliance with RR TRA-3, the helipad would require approval and permits from a number of agencies, including the Federal Aviation Administration (FAA), Caltrans, and Airport Land Use Commission. All helicopter operations would comply with the requirements of each of the regulatory agencies. The introduction of a helipad at this location would help improve emergency response to the Project site and surrounding area. Therefore, impacts related to air traffic hazards would be less than significant.

g) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less than Significant Impact. Construction activities would be staged on the Project site and would not interfere with any current emergency response plans or emergency evacuation plans for local, State, or federal agencies. The Project may temporarily impact adjacent roadways during construction, in particular the Wilderness Park Culvert Crossing, which would intermittently have no access or limited access for about six to eight weeks sometime between July 2015 and January 2016 when Culvert Crossing replacement is expected to occur. However, there are alternative roadways that could provide emergency access to the Project site, including Lower Clamshell Truck Trail through the City of Monrovia, which provides alternative access to the Wilderness Park and Debris Dam.

The Project would also include replacement of the Dam Operator's house with a helipad to provide aerial access to the Dam in the event of an emergency. It is anticipated that the helipad would only be used one or two times per year. The addition of a helipad would allow for improved emergency access to the Dam, as well as the other facilities downstream, especially if any of the access roads get obstructed. Although the Dam Operator would no longer reside at the Dam, he/she would still be on-site daily and available on-call after hours. The Project would include remote control capabilities that provide redundant control options from multiple off-site locations. The Dam also has a built-in safety mechanism to automatically pass water through the Dam once the reservoir surface reaches an elevation of 1,230 feet.

Although there are no significant impacts related to this issue, MM HAZ-1 identifies the need for the contractor to prepare a Site-Specific Health and Safety Plan that includes a designated Site Health and Safety Officer; an Access and Evacuation Plan; and identification of site hazards. Additionally, RR TRA-1 would ensure that construction traffic would be managed in compliance with Greenbook standards, as discussed in Section 4.16, Transportation. RR TRA-1 would ensure that roadways providing access to the Project site and the surrounding areas would not be impacted during Project construction in such a way that would physically impair or impede emergency response or evacuation. Therefore, implementation of MM HAZ-1 and RR TRA-1 would ensure that impacts related to emergency evacuation plans would remain less than significant.

h) Would the project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Less than Significant with Mitigation. The Project site is located within a VHFHSZ (CAL FIRE 2012). The potential for wildland fire is high due to the proximity of the open space and the Angeles National Forest, which includes chaparral, brush, and trees that could be highly flammable during fire season.

Project activities would not involve construction or operation of habitable structures in wildland areas or promote new development in wildland areas. However, Project activities have the potential to increase the risks associated with wildfires due to the presence of construction equipment due to leaks from heavy equipment; the use of flammable liquids; and presence of combustion engines, among others. In order to reduce wildfire risks and to protect workers during Project activities, MM HAZ-2 requires preparation of a Fire Protection Plan to include emergency reporting procedures; emergency notification, evacuation, and/or relocation of all persons on site; procedures for "hot work" operations; management of hazardous materials and removal of combustible debris; maintenance of emergency access roads; identification of exit routes and assembly areas; and identification of fire apparatus. The Fire Protection Plan would be prepared

and distributed to involved parties prior to commencement of any construction activities. Additionally, the Project includes construction of a helipad to provide aerial access to the Dam in the event of an emergency, including wildfires. The introduction of a helipad at this location would help improve emergency response to the Project site and surrounding area. Implementation of MM HAZ-2 would ensure that short-term wildfire hazards associated with Project activities would be less than significant. Impacts related to wildland fires would be less than significant after mitigation.

4.8.3 MITIGATION MEASURES

MM HAZ-1 Prior to commencement of any construction activities, the LACFCD shall require that the Contractor prepare a Site-Specific Health and Safety Plan for review and approval. The Plan shall be implemented throughout the construction activities. The Site-Specific health and safety plan shall be prepared in accordance with the Occupational Safety and Health Administration's (OSHA's) Safety and Health Regulations for Construction (29 *Code of Federal Regulations* 1926) and shall include, a Site Health and Safety Officer; an Access and Evacuation Plan; identification of site hazards; and response protocols in the event of an earthquake or landslide.

MM HAZ-2 Prior to commencement of any construction activities, a Fire Protection Plan shall be prepared that includes emergency reporting procedures; emergency notification, evacuation, and/or relocation of all persons on site; procedures for "hot work" operations; management of hazardous materials and removal of combustible debris; maintenance of emergency access roads; identification of exit routes and assembly areas; and identification of fire apparatus. The Fire Protection Plan shall be distributed to involved parties at least two weeks prior to commencement of any construction activities.

4.9 HYDROLOGY AND WATER QUALITY	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation onsite or offsite?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

4.9.1 EXISTING CONDITIONS

The Project site is located within the 834-square-mile Los Angeles River Watershed. The Watershed is highly modified, with an upper 360-square-mile portion covered by forest or open space, and the remaining 474 square miles developed with highly urbanized land uses. The Watershed encompasses and is shaped by the path of the Los Angeles River.

Surface Drainage

As previously discussed, surface runoff from the Santa Anita Canyon Watershed drains along natural courses towards the Santa Anita Wash, which runs north-south beginning at Dam. The purpose of the Dam is to decrease peak flood flow by retaining stormwater and discharging it at

controlled release rates. The released flows continue downstream to the Headworks facility, which intercepts the flows from the Dam and either allow the flows to continue downstream or be diverted to the spreading grounds. Flows that continue downstream enter the Debris Dam, where debris carried by floodwaters is trapped and thereafter flows can be diverted to the Santa Anita Spreading Grounds, where the water is then recharged into the Raymond Basin. Water that is not diverted to the Santa Anita Spreading Grounds or overtops the Debris Dam spillway during storm events is conveyed downstream in a concrete-lined channel that is a tributary of the Rio Hondo, which hydraulically connects the Los Angeles and San Gabriel River Watersheds through the Whittier Narrows Reservoir. Water in the Rio Hondo eventually flows to the Los Angeles River near the City of Downey.

Flooding

Historically, stormwater flows from the San Gabriel Mountains were unpredictable and often led to damaging floods. Continued urbanization within the watershed has increased the amount of impermeable surface, resulting in an increase in surface flows and flooding. Ultimately, the LACFCD was created and flood-control measures (e.g., dams, debris basins, and river channels) were implemented to address the increased flows. Dams and detention basins, such as the Dam and Debris Basin, are designed to decrease peak flood flow and to discharge detained stormwater at controlled release rates. Debris basins retain debris carried by floodwaters and also allow for infiltration of stormwater into the groundwater basin.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map indicates that the Project site is located in Flood Zone D, which means there are possible but undetermined flood hazards. The majority of the Project area is located within the inundation hazard area of the Dam (Arcadia 2010b).

Groundwater

As previously discussed, the Project area is situated within the Los Angeles-San Gabriel Hydrologic Unit, which covers most areas of Los Angeles County. Within this hydrologic unit, the Project site overlies the Raymond Groundwater Basin, a 41-square-mile groundwater basin located in the northwest part of the San Gabriel Valley. The basin extends from La Cañada Flintridge and the San Rafael Hills on the west to Santa Anita Canyon on the east and is bound on the north by contact with consolidated basement rocks of the San Gabriel Mountains and on the south by the Raymond Fault.

The main water-bearing materials of the Raymond Basin are unconsolidated Quaternary alluvial sediments deposited by streams originating in the San Gabriel Mountains. Recharge to the Raymond Basin mainly occurs from direct percolation of precipitation and percolation of ephemeral stream flow from the San Gabriel Mountains, as well as the Sierra Madre and Santa Anita Spreading Grounds. Additional water enters the basin as underflow through fractures systems in the San Gabriel Mountains. Precipitation averages in the basin range from about 19 inches in the valley, to 25 inches in upland areas, with the average precipitation over the basin approximating 21 inches annually (DWR 2004).

Historic high groundwater levels in the project area range from less than 40 feet below ground surface in the lower portion of the project area to greater than 100 feet below ground surface in the upper portion of the project area (CGS 1998).

4.9.2 IMPACT ANALYSIS

Regulatory Requirements

RR HYD-1 Prior to the start of construction activities, the LACFCD shall file a Permit Registration Document (PRD) with the State Water Resources Control Board (SWRCB) in order to obtain coverage under that National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with the Construction and Land Disturbance Activities (Order No 2009-009-DWQ, NPDES No. CAS000002) or the latest approved general permit. This permit is required for construction activities (including demolition, clearing, grading, and excavation) and other land disturbance activities that result in the disturbance of one acre or more of total land area. The PRD consists of a Notice of Intent (NOI); Risk Assessment; Site Map; Storm Water Pollution Prevention Program (SWPPP); annual fee; and a signed certification statement. Pursuant to permit requirements, the Contractor shall develop and incorporate Best Management Practices (BMPs) for reducing or eliminating construction-related pollutants in site runoff.

In addition, during construction, the LACFCD shall comply with the appropriate requirements listed in the adopted Municipal Separate Storm Sewer System (MS4) Permit (Order No. R4-2012-0175, NPDES No. CAS004001), which regulates municipal discharges of stormwater and non-stormwater.

RR HYD-2 Discharges during construction are regulated under SWRCB Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification", which requires compliance with all conditions of the Water Quality Certification issued by the Regional Water Quality Control Board (RWQCB). Compliance with the Water Quality Certification issued by the RWQCB would ensure that any discharge from the Project does not conflict with the applicable provisions of Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, or any other applicable requirements of State law.

Impact Discussion

a) Would the project violate any water quality standards or waste discharge requirements?

f) Would the project otherwise substantially degrade water quality?

Less than Significant Impact. The Project site is within the jurisdiction of the Los Angeles (Region 4) Regional Water Quality Control Board (RWQCB). The RWQCB has developed a Water Quality Control Plan entitled *Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura County* (Basin Plan) to protect the water quality of surface and ground waters of the region (RWQCB 1995). The Basin Plan designates beneficial uses; sets narrative and numerical objectives to protect beneficial uses of water resources; and describes implementation programs. Beneficial uses are processes, habitats, organisms, or features that require water and are considered worthy of protection.

Beneficial uses listed in the Basin Plan for the Santa Anita Wash include the following:

- MUN (Municipal and domestic supply)
- GWR (Groundwater recharge)
- REC-1 (Water contact recreation)
- REC-2 (Non-contact water recreation)
- WARM (Warm freshwater habitat)
- WILD (Wildlife habitat)
- RARE (Rare, Threatened, or Endangered Species)

The Project could result in short-term construction impacts to surface water quality from grading and other construction-related activities (e.g., erosion, spills, and leaks from construction equipment). Compliance with RR HYD-1 regarding the implementation of non-stormwater management and pollution-control BMPs, as outlined in the SWPPP for the Project, would reduce pollutants in the runoff. Compliance with the State Water Resources Control Board's (SWRCB's) Order No. 2003-0017-DWQ (RR HYD-2) regarding discharges from the Project would further reduce pollutants from being discharged into the downstream portion of the creek. Impacts on water quality would be less than significant with compliance with RR HYD-1 and RR HYD-2.

Operation of the Project would not violate any water quality standards or waste discharge requirements, as it would not generate any new land use or introduce any new sources of wastewater discharge or effluent that could adversely impact wastewater. The Project would not generate wastewater that would require conveyance or treatment in on-site septic systems or at wastewater plants in the region. Portable toilets would be provided for employees at the construction areas, and these portable toilets would be regularly cleaned and their contents disposed of offsite by an outside company. Wastewater from these portable toilets would not exceed the treatment requirements of the RWQCB, and the Project would not need new or expanded treatment facilities. Therefore, impacts associated with wastewater discharge requirements would be less than significant and no mitigation is required.

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

Less than Significant Impact. The Project site is underlain by the East Raymond Groundwater Basin, which is a subarea of the overall Raymond Basin. There are currently two domestic water purveyors that overlay this area with extraction facilities (wells): the City of Arcadia and the City of Sierra Madre. Both water purveyors are experiencing decreased water levels and water quality concerns in some wells. The City of Sierra Madre relies solely on the Raymond Basin for its water supply, since it does not have any alternative water delivery infrastructure in place to meet its needs.

The Project activities would require the use of municipal water supplies during construction activities; however, the amount of water to be used for dust control would be limited. Implementation of the Project would help improve recharge of the local groundwater basin. Remediating the seismic deficiencies at the Debris Dam would result in DSOD removing the operational restrictions on the facility, thus restoring 119 acre-feet of water conservation capacity.

The Debris Dam would also be enlarged by raising the existing spillway by 4 feet, which would create 40 acre-feet of additional storage for a total of 159 acre-feet. As captured stormwater is released to the spreading grounds for groundwater recharge, the Debris Dam could then capture more runoff from upstream flows, thereby using the capacity multiple times depending on the frequency, duration, and intensity of storm events. The resulting additional water conservation is needed to recharge the Raymond Basin. Therefore, the Project would have negligible demands for groundwater supplies as a result of Project implementation, and impacts would be less than significant.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?

d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?

Less than Significant Impact. Stormwater runoff from the Project site currently drains to the existing flood-control facilities in the Santa Anita Wash. Implementation of the Project would not result in the redirection of flows or alteration of drainage patterns when compared to the existing condition. Waters released from the Dam would continue to travel through Santa Anita Wash, through the improved Headworks and into the Debris Dam. During construction, the Dam, Headworks, and Debris Dam would be dewatered and flows would be temporarily diverted via small cofferdams and plastic bypass pipelines (sized to accommodate a certain flow dependent on the time of year), which would carry water around the work so that it can proceed downstream.

With regard to erosion or siltation, the long-term operation of the Project would not result in exposed soils that could be eroded or generate additional siltation within the watershed. As discussed under Thresholds 4.9(a) and 4.9(f), construction activities would be subject to compliance with RR HYD-1 and RR HYD-2 to minimize sediment releases into downstream areas. With regard to an increased rate or amount of surface runoff that could result in flooding, the Project would not develop any new impervious surfaces that could alter the amount of on-site stormwater infiltration. Additionally, the Project would improve the system's overall ability to capture sediment-laden stormwater runoff and stormwater flows, thereby resulting in a beneficial impact. Impacts would be less than significant and no mitigation is required.

e) Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff?

No Impact. Implementation of the Project would increase opportunities to capture and infiltrate storm flows emanating from the Santa Anita Canyon Watershed into the groundwater basin. Remediating the seismic deficiencies at the Debris Dam would result in the DSOD removing the operational restrictions on the facility, thereby restoring 119 acre-feet of water conservation capacity. The Debris Dam would also be enlarged by raising the existing spillway by 4 feet, which would create 40 acre-feet of additional storage for a total of 159 acre-feet. When captured stormwater is released to the spreading grounds for groundwater recharge, the Debris Dam can then capture more runoff, which would allow for water storage capacity multiple times depending on the frequency, duration, and intensity of storm events. In doing so, less water would need to be sent to the downstream stormwater drainage infrastructure. Therefore, the Project would have no impact on the capacity of the existing downstream stormwater drainage system.

g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h) Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

No Impact. The Project would not involve the construction of any housing or other temporary or permanent habitable structures. The Project would not create new impervious surfaces that could increase the rate or amount of stormwater runoff. The Project involves the reconstruction of existing flood-control facilities that are located within the Wash; however, these structures would not alter the current drainage patterns or impede/redirect flows when compared to the existing condition. The Project would reduce flood hazards to persons and structures downstream of the Dam by reclaiming the original capacity of the Debris Basin and bringing the Debris Dam up to current seismic standards. The flood-control facilities would be fully functional during the rainy season and there would be no hazards associated with the Dam's, Headworks', or Debris Dam's ability to retain storm flows.

i) Would the project expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

No Impact. The Project would reclaim the original capacity of the Debris Dam to accommodate future inflows and to reduce the potential for exposure of downstream populations to risks from flooding due to reduced holding capacity and water overtopping the Dam. The Dam inundation area encompasses most of the City of Arcadia to the south. While the Dam has not been subject to failure in the past, the proposed spillway improvements, in conjunction with the Santa Anita Dam Riser Modification and Sediment Removal project (which was recently completed in 2012), would bring these facilities up to current DSOD and County design standards at the existing restricted elevation. Therefore, no impacts related to Dam failure would occur.

j) Would the project cause inundation by seiche, tsunami, or mudflow?

No Impact. Due to the distance of the Project site to the Pacific Ocean (approximately 30 miles west of the Project site) and the numerous structures between the Project site and the ocean, there is virtually no risk of on-site hazard due to tsunamis (seismically induced waves).

The Santa Anita Reservoir has the potential to experience a seiche (sloshing of a closed body of water from earthquake shaking); however, implementation of the Project would not change or eliminate the existing seiche hazard or compromise the Dam's or the Debris Dam's ability to hold water as designed. During the construction period, which would occur during the dry season, any water would be drawn down from the Reservoir and from the Debris Dam basin, eliminating the potential for seiche during construction. Mudflows could occur during construction of the Project due to the topography the surrounding the Project site. However, the Project would reduce the risk of seiche and mudflows to persons and structures downstream of the Dam by reclaiming the original capacity of the Debris Basin and bringing the Debris Dam up to current seismic standards. Therefore, no adverse impacts related to tsunami, seiche, or mudflow would occur.

4.9.3 MITIGATION MEASURES

There would be no significant impacts related to hydrology or water quality; therefore, no mitigation measures are required.

4.10 LAND USE AND PLANNING	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

4.10.1 EXISTING CONDITIONS

The flood-control facilities in Santa Anita Canyon are existing public facilities operated and maintained by the LACFCD. The Dam is located within the Angeles National Forest and is zoned as “Back Country Motorized Use Restricted” by the USFS Land Management Plan (USFS 2005b). As shown in Exhibit 2-2, the actual Dam and the facilities immediately adjacent to the Dam (including the existing Dam Operator’s house and storage shed) are on land owned by the USFS, whereas the area immediately to the west (including most of the access road, upper and lower water tanks) are located in an inholding area. The Forest Plan for the Angeles National Forest includes the vision, strategy, and design criteria for USFS’ management activities and practices to ensure the protection of forest resources. The portions of the Project located within the City of Arcadia, including the Headworks and the Debris Dam, are designated by the *Arcadia General Plan* as Public Facilities and Grounds (P) (Arcadia 2010b). Current zoning for the site is Residential Mountainous (R-M), as defined by the City of Arcadia Zoning Code (Arcadia 2010a).

The eastern edge of the Debris Dam that is located in the City of Monrovia is designated Hillside Wilderness Area in the General Plan and zoned as Hillside Wilderness Preserve (Monrovia 2012a). No construction activities would occur within the City of Monrovia. However, temporary access/impact areas would be located within the City of Monrovia, including areas that may be subject to traversing vehicles or other mobile equipment, staging of equipment, placing stockpiles of soil, and excavating soil from the adjacent Sediment Placement Site for use in the buttressing backfill for the Debris Dam. No vegetation or tree removal would occur within the City of Monrovia. All of these activities would be limited to the LACFCD fee-owned right-of-way.

4.10.2 IMPACT ANALYSIS

Regulatory Requirements

RR USE-1 Prior to commencement of any construction activities at the Dam, the LACFCD must obtain approval from the U.S. Forest Service (USFS) in accordance with Provision 3 of the existing Special Use Permit (SUP) for additional construction at the Dam, which is subject to review in compliance with the National Environmental Policy Act (NEPA).

Impact Discussion

a) Would the project physically divide an established community?

No Impact. The Project does not involve the displacement of existing land uses or the construction of barriers across the Project area. Project construction activities would occur within portions of the Angeles National Forest and the City of Arcadia. There are no residential uses or established communities on the Project site. There would be no impact related to dividing an established community.

b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less than Significant Impact. The Project would not change existing land uses at the Project site. The proposed improvements to the existing flood-control facilities in the Santa Anita Wash do not conflict with the land use and zoning designations in the City of Arcadia (Public Facilities and Grounds) General Plan and Zoning Code. The proposed improvements at Dam also would not conflict with the "Back Country, Motorized" zone of the USFS Land Management Plan.

In the USFS Forest Plan, "Back Country, Motorized" zones include areas that are generally undeveloped with few roads. These have remote recreational and administrative facilities. This zone is managed for motorized public access on designated roads and trails, with some roads closed to public access. Back Country roads provide access to scattered recreational opportunities in remote areas, such as camping and access to trailhead facilities for hiking or biking. The purpose of the Back Country Zone is to retain the natural character of the Angeles National Forest by limiting the level and type of development in these areas. The Project activities would occur on existing developed facilities and would not affect recreational areas, roads, or the natural character in areas designated as "Back Country, Motorized".

The Project activities would also not conflict with the strategic goals in the Forest Plan, as they relate to community protection, forest health, invasive species, outdoor recreation, energy resources, watershed conditions, and the mission of the U.S. Department of Agriculture. The Project would support the watershed functions of the Angeles National Forest, which is a beneficial impact. Therefore, the Project would not conflict with applicable land use plans, policies, or regulations.

An SUP was issued for the Dam in 1955, which remains active today. Provision 3 in the SUP indicates that written approval is required for additional construction (USFS 1955). RR USE-1 requires that prior to commencement of any construction activities at the Dam, the LACFCD shall obtain approval from the USFS in accordance with Provision 3 of the existing SUP for additional construction at the Dam. With compliance with RR USE-1, the components of the Project under USFS jurisdiction would comply with applicable USFS land use plans, policies, or regulations and impacts would be less than significant.

c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. There is no habitat conservation plan or natural community conservation plan for the Project area. Also, the Project site is not located within a designated Significant Ecological Area (SEA) under the County's SEA program. Updates to LA County's SEAs have been drafted and are currently under review. The updated SEA boundaries include the study area within the San

Gabriel Canyon SEA (LACDRP 2011). However, the new boundaries will not be effective until the SEA boundaries are finalized; until then, the existing SEA boundaries will be in effect. Impacts on biological resources are discussed in Section 4.4 above. Therefore, no impacts related to habitat conservation plans or natural community conservation plans would occur.

4.10.3 MITIGATION MEASURES

There would be no significant impacts related to land use and planning; therefore, no mitigation measures are required.

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

4.11.1 EXISTING CONDITIONS

Mineral resources are naturally occurring chemicals, elements, or compounds formed by inorganic processes or organic substances. These resources include bituminous rock, gold, sand, gravel, clay, crushed stone, limestone, diatomite, salt, borate, potash, geothermal, petroleum, and natural gas resources. Construction aggregate refers to sand and gravel (natural aggregates) and crushed stone (rock) that are used as Portland-cement-concrete aggregate, asphaltic-concrete aggregate, road base, railroad ballast, riprap, fill, and the production of other construction materials.

The CGS has identified deposits of regionally significant aggregate resources in the State. These clusters or belts of mineral deposits are designated as Mineral Resources Zone 2 (MRZ-2), which are areas that require special management due to the presence of mineral resources important to the State (DOC 1987). The Project site is located within a MRZ-2 zone; however, there are no active mining activities. The only area in the City available for mining activity is the Livingston-Graham sand and gravel extraction site, which is located approximately 4.5 miles south of the Project site (Arcadia 2010b).

Review of maps prepared by the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources shows that there are no gas, geothermal fields, or active wells in or near the Project site (DOGGR 2010). Additionally, there are no ongoing mining or extraction activities at or near Santa Anita Canyon.

4.11.2 IMPACT ANALYSIS

Regulatory Requirements

None required.

Impact Discussion

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

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

No Impact. As previously stated, the Project site is located within an MRZ-2 Mineral Resources Zone. The CGS, under the Department of Conservation, has designated the Project site as an area containing significant mineral resources. However, as stated in the *Arcadia General Plan,* the various facilities managed by the LACFCD are required for flood-control purposes and are not available for mineral extraction (Arcadia 2010b).

The presence and ongoing operation of the Dam since 1927 precludes the use of the area for commercial aggregate resource production. The Project would not require mineral resources, nor would it change the availability of resources on or near the Project site. However, the presence of the LACFCD's flood-control facilities do not necessarily preclude future mining activity, if desired by the LACFCD and USFS. Additionally, no new structures or facilities would be constructed that could restrict future mineral resource recovery activities. Thus, impacts to mineral resources would not occur.

4.11.3 MITIGATION MEASURES

There would be no significant impacts related to mineral resources; therefore, no mitigation measures are required.

4.12 NOISE	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Information in this section is derived from the *Noise Impact Analysis for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California* dated October 2014 and prepared by BonTerra Psomas. This report is provided in its entirety in Appendix D and includes discussions of noise and vibration basic concepts and terminology.

4.12.1 EXISTING CONDITIONS

Sensitive Receptors

There are no residential or other noise-sensitive or vibration-sensitive land uses in the vicinity of Dam, with the exception of the residence of the Dam Operator, located west of the Dam. This residence would be removed by implementation of the Project; therefore, there would be no sensitive receptors in the vicinity of the Dam that could be impacted by construction noise.

There are no residential receptors in the vicinity of the Headworks. The nearest residences are approximately 550 feet southwest of the Headworks at the north end of Highland Vista Drive. There is no line of sight from the Headworks to these residences because of steep cliffs adjacent to the west and southwest side of the Headworks. There is also substantial vegetative growth that would attenuate noise between the Headworks and these homes.

The residences at the north end of Highland Vista Drive are approximately 250 feet west of the Wilderness Park Culvert Crossing. The elevation of the homes is approximately 150 feet above the Culvert Crossing. The Wilderness Park is located east of the Wilderness Park Culvert

Crossing and parking lot; the closest open space use area is approximately 150 feet east of the east end of the Culvert Crossing.

There are single-family residences in the City of Arcadia adjacent to the west and south of the Debris Dam. The homes south of the Debris Dam are on Oaks Place. The homes west and northwest of the Debris Dam face Highland Oaks Drive. The residential structures closest to the Debris Dam are approximately 40 to 200 feet from the base (toe) of the downstream embankment. The homes near the Debris Dam are shown in Exhibit 4-8, Noise Monitoring Locations. The nearest sensitive receptors to the Debris Dam in the City of Monrovia are approximately ½ mile east of the Debris Dam.

Existing Noise Levels

The Project vicinity is a relatively quiet, suburban area. Existing noise sources include vehicles coming to and from the local residences and Arcadia Wilderness Park; maintenance and inspection activities at the Project facilities; and typical residential neighborhood sounds such as landscape maintenance machinery, barking dogs, and trash collection.

Ambient noise level measurements were taken on December 20, 2012, using a Larson Davis Laboratories Model 831 integrating sound level meter (LD 831). The LD 831 sound level meter and microphone was mounted on a tripod four to five feet above the ground and equipped with a windscreen during all measurements. The LD 831 was calibrated before and after use. Two short-term noise level measurements were collected at the Debris Dam. Monitoring was conducted at the Debris Dam because this work site has the closest sensitive receptors and therefore would provide the most conservative noise impact analysis.

The monitoring locations were approximately 55 to 70 feet from the closest residences. Each short-term measurement was taken for a period of approximately 20 minutes to provide representative average daytime noise levels. These ambient noise measurement locations are shown in Exhibit 4-8, Noise Monitoring Locations, and the average, maximum, and minimum (L_{eq}, L_{max}, and L_{min}) values taken at each short-term ambient noise measurement location are summarized in Table 4-15, Summary of Short-Term Ambient Noise Level Measurements. The complete noise monitoring results are included in Appendix D.

TABLE 4-15
SUMMARY OF SHORT-TERM AMBIENT NOISE LEVEL MEASUREMENTS

Location No.	Location	Start Time, Duration	Noise Levels (dBA)			Primary Noise Source	Notes
			L_{eq}	L_{max}	L_{min}		
1	Debris Dam, south of the Dam's east end, on Lower Clam Shell Truck Rd.	12:57 PM 20 min	48	61	40	Vehicles on service road, residences.	Construction nearby but not close; barking dog.
2	Debris Dam, south of the Dam's west end, on Lower Clam Shell Truck Rd.	1:24 PM, 20 min	44	59	34	Vehicles on service road, residences.	Construction nearby but not close.

dBA: A-weighted decibel; L_{eq}: average noise level over a period of minutes or hours expressed as the equivalent noise level for that time period; L_{max} and L_{min}: the highest and lowest (respectively) A-weighted sound level that occurs during that noise event; min: minutes.

Source: BonTerra Psomas 2014c (Appendix D).

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Noise Monitoring Locations

Exhibit 4-8

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

(Rev: 9-30-2014 JAZ) H:\PAS\Projects\CoLADPW\J166\Graphics\MND\ex4-8_DebrisBasinNoise.pdf

As shown in Table 4-15, the average daytime noise levels in the Project area when there is no construction work at the Debris Dam ranged from an average noise level (L_{eq}) between 44 and 48 A-weighted decibels (dBA). The existing background noise environment (i.e., ambient noise) in the Project area is primarily influenced by occasional vehicle traffic on the roads adjacent to the Project site.

Regulatory Setting

Public agencies have established noise guidelines and standards to protect citizens from potential hearing damage and other various adverse physiological and social effects associated with noise. The Dam is located within the jurisdiction of the U.S. Forest Service in the Angeles National Forest. The Headworks, the Wilderness Park Culvert Crossing, the Arcadia Wilderness Park, and the Debris Dam are located in the City of Arcadia. The noise- and vibration-sensitive receptors in the vicinity of the Wilderness Park and the Debris Dam are located in the City of Arcadia. The City of Arcadia has not adopted quantitative noise standards for construction activity. Therefore, in order to quantitatively assess construction noise impacts, the County of Los Angeles noise standards have voluntarily been used in this analysis even though such activities are exempted from the ordinance. Since there are no sensitive receptors in the City of Monrovia adjacent to the Project site (only open space), the analysis using the County's noise standards would be appropriate.

County Noise and Vibration Standards

Section 12.08 of the County of Los Angeles Code (County Code) contains the County Noise Ordinance. The County Noise Ordinance prohibits unnecessary, excessive, and annoying sounds from sources on private properties by setting limits that cannot be exceeded at adjacent properties. Section 12.08.440 of the County Code prohibits construction noise between the hours of 7:00 PM and 7:00 AM on weekdays (including Saturday), and at any time on Sunday or a federal holiday if it creates a disturbance across a residential or commercial real-property line. The County also sets maximum construction noise levels "at residential structures". As shown in Table 4-16 below, the daytime noise level limit at single-family residences for mobile construction equipment is 75 dBA.

TABLE 4-16
COUNTY OF LOS ANGELES CONSTRUCTION EQUIPMENT NOISE LIMITS

Time Interval	Single-Family Residential (dBA)	Multi-Family Residential (dBA)	Semi-Residential or Commercial (dBA)
Mobile Equipment			
Daily, except Sundays and legal holidays, 7:00 AM to 8:00 PM	75	80	85
Daily, 8:00 PM to 7:00 AM, and all day Sunday and legal holidays	60	64	70
Stationary Equipment			
Daily, except Sundays and legal holidays, 7:00 AM to 8:00 PM	60	65	70
Daily, 8:00 PM to 7:00 AM, and all day Sunday and legal holidays	50	55	60

dBA: A-weighted decibels

Source: BonTerra Psomas 2014c (Appendix D).

The County's Noise Ordinance requirements are not applicable to mobile noise sources such as automobiles or heavy trucks when traveling in a legal manner on public roadways or on private property. Mobile noise source control is preempted by federal and State laws.

Section 12.08.560 of the County Code states, "Operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of-way is prohibited. The perception threshold shall be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hertz."

City of Arcadia Noise and Vibration Standards

Construction noise is addressed in the Arcadia Municipal Code, Article IV, Chapter 2, Part 6, Nighttime Construction, Sections 4261 and 4262:

> 4261. PROHIBITED HOURS DEFINED.
>
> The term "prohibited hours" as used in this Part shall mean any time after the hour of 7:00 p.m. of any day; any time before the hour of 7:00 a.m. of any day; any time on any Sunday; and any time on any of the following holidays: January 1 (New Year's Day); May 30 (Memorial Day); July 4; Labor Day; November 11 (Veteran's Day); Thanksgiving Day; and December 25 (Christmas Day); provided that if in any calendar year any such holiday falls on a Sunday, the following Monday shall constitute the holiday.
>
> 4262. CONSTRUCTION LIMITED.
>
> Unless a permit so to do shall first have been obtained as provided in Section 4263, no person shall during prohibited hours engage in any earth excavation, land fill or earth moving operation or in the construction of any portion of a building or structure, nor shall any person during prohibited hours use or operate any truck, tractor, crane, rig or any mechanical equipment of any kind in connection with, in the performance of or in furtherance of any of the foregoing.

There are no City of Arcadia vibration standards applicable to the Project.

Structural Vibration Damage

There are no applicable County or City standards for structural damage from vibration. However, the California Department of Transportation (Caltrans) vibration damage thresholds are shown in Table 4-17, Guidelines Vibration Damage Potential Threshold Criteria.

TABLE 4-17
GUIDELINE VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

Structure and Condition	Maximum ppv (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

ppv: peak particle velocity; in/sec: inch(es) per second

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: BonTerra Psomas 2014c (Appendix D).

4.12.2 IMPACT ANALYSIS

Regulatory Requirements

RR NOI-1 In compliance with the County Code and consistent with the City of Arcadia Municipal Code, Project construction activities at the Dam, Headworks, Wilderness Park Culvert Crossing, and Debris Dam that generate substantial noise, such as the operation of construction equipment and mechanical equipment, shall be limited to the hours of 7:00 AM to 7:00 PM Monday through Saturday.

Impact Discussion

a) Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less than Significant Impact with Mitigation. Temporary noise impacts associated with the Project would be limited to the construction phases. Typically, the primary noise sources during construction of a project are generated by the diesel engines of construction equipment and the impact noise from operations such as pile driving, blasting, and jackhammering. No pile driving or blasting activities are anticipated for the Project; jackhammering may be used for some demolition work.

Construction noise is related primarily to the use of heavy equipment. Construction equipment can be considered to operate in two modes: stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed-power operation (such as pumps, generators and compressors) or a variable noise operation (such as rock drills and pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion, such as bulldozers, graders, and loaders. Noise impacts from stationary equipment are assessed from the location of the specific equipment, while noise impacts from mobile construction equipment are assessed from the center of the equipment activity or construction site. The noise level at a receptor is dependent on the distance from the source to the receptor and the intervening topography and ground cover.

Variation in power is also a factor in characterizing the noise source levels from construction equipment. Power variation is accounted for by describing the noise at a reference distance from equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation.[10] Typical duty cycles and noise levels generated by representative pieces of equipment are listed in Table 4-18, Typical Maximum Construction Equipment Noise Levels.

TABLE 4-18
TYPICAL MAXIMUM CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level (dBA) at 50 ft	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 KVA or less)	70	50%
Generator (more than 25 KVA)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
In situ Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%

[10] The duty cycle is the percentage of time that the equipment is typically at full power.

TABLE 4-18
TYPICAL MAXIMUM CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level (dBA) at 50 ft	Typical Duty Cycle
Pile Driver, Impact (diesel or pneumatic)	95	20%
Pile Driver, Vibratory	101	20%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%
dBA: A-weighted decibels; ft: feet; KVA: kilovolt amps Source: BonTerra Psomas 2014c (Appendix D).		

Construction Phasing

Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some would have higher continuous noise levels than others, and some have high-impact noise levels. The L_{eq} of each phase is determined by combining the L_{eq} contributions from each piece of equipment used in that phase. As shown in Table 3-1, construction of the Project at the Dam is anticipated to commence in December of 2015.

Temporary Construction Noise

Typical heavy construction equipment would include bulldozers, excavators, dump trucks, front-end loaders, graders, and industrial/concrete saws. Construction of the Project would include demolition, which may result in impact noise. As previously mentioned, construction activities associated with the Project would not include blasting or pile driving.

Because of the effects of noise attenuation, the distance from the noise source to a receptor is a primary consideration in determining the noise level experienced at the receptor. The distances and locations of potential sensitive receptors near the Project site were discussed above and sensitive receptors near the Debris Dam are shown in Exhibit 4-8. Because different construction stages involve different pieces of equipment and may involve only localized portions of a site, each construction stage can result in different noise levels being generated depending on the distance to sensitive receptors. As described in RR NOI-1, all construction activity must be limited to the hours of 7:00 AM to 7:00 PM Monday through Saturday. However, in order to reduce construction-related impacts to nearby residences, the Project would only be under construction during the weekdays (Monday through Friday) and work would not occur on Saturdays.

<u>Dam</u>

Construction at the Dam would occur for approximately 10 months (starting in December 2015). There are no noise-sensitive receptors near the Dam or near the slope improvement area north of the Dam. Although construction activity would result in substantial temporary noise increases in the area near the Dam, there would be no impacts because there are no nearby sensitive receptors.

Headworks

Construction at the Headworks would occur for approximately one month (starting in March 2016). Construction noise would result in substantial temporary noise increases in the area around the Headworks. Although the nearest homes are more than 500 feet from the Headworks and there are topographic and vegetation barriers that would attenuate noise between the Headworks and the homes, some construction noise would be audible. Neither the magnitude nor the duration of the construction noise would be substantial and the impact would be less than significant.

Wilderness Park Culvert Crossing

Construction at the Wilderness Park Culvert Crossing would occur for approximately 4.5 months (starting in April 2016) after construction at the Headworks. Construction noise would result in substantial temporary noise increases in the area immediately adjacent to the Wilderness Park Culvert Crossing. The noisiest piece of equipment used at this site would be a concrete saw, which would be used intermittently in the demolition of the existing concrete slab and Culvert Crossing. As shown in Table 4-18, the maximum noise level for a concrete saw is 90 dBA at a distance of 50 feet. Another noise source would be the diesel engines of a bulldozer, excavator, truck, or backhoe. Two of the noisiest pieces of diesel engine driven equipment each generates noise levels of 85 dBA L_{max}. If operated at full power simultaneously, the combined maximum noise level would be 88 dBA at 50 feet. A concrete saw and a diesel engine at maximum noise levels together would be 91 dBA at 50 feet.

The nearest homes are approximately 250 feet from the Wilderness Park Culvert Crossing. At a distance of 250 feet and without absorbent vegetation or barriers blocking the line of sight, a noise level of 91 dBA at 50 feet would be reduced to 77 dBA. The topography between the homes and the Culvert Crossing (i.e., the bluff edges) would act as a barrier, blocking the line of sight; the topography would, therefore, act as a barrier along the noise transmission path between most or all of the construction activities and the homes, reducing noise by 3 to 5 dBA. Maximum noise levels, assuming they occur intermittently at the homes, are estimated at 72 to 74 dBA, and may be substantially less depending on the noise attenuation provided by the intervening topography. However, some construction noise would be audible and may occasionally be disturbing to persons in the backyards of the homes. The maximum noise levels would be less than the County Noise Ordinance 75 dBA limit for construction noise from mobile equipment to single-family residential land uses. Therefore, the impact would be less than significant and no mitigation is required.

However, in order to minimize noise impacts to residences in the vicinity of the Wilderness Park Culvert Crossing, MM NOI-1 would be implemented, which specifies construction practices to minimize noise effects upon sensitive receptors. The Project would also implement MM NOI-2, which would provide a process for identifying and correcting excessive construction noise levels. Neither MM NOI-1 nor MM NOI-2 is required to ensure that impacts at the Wilderness Park Culvert Crossing would be less than significant.

The County Noise Ordinance construction equipment noise limits are not applicable to the Wilderness Park because it is neither a residential nor commercial land use. However, it is noted that short-term construction noise levels at the Culvert Crossing may be annoying for some visitors. Construction noise is generally understood to be a temporary inconvenience, especially for people that are not obligated to stay near the noise source and can freely move to a quieter location. Therefore, there would be no impacts to park users from construction noise associated with the Culvert Crossing.

Debris Dam

Construction at the Debris Dam would occur for approximately six months (starting April of 2016). Construction noise would result in substantial temporary noise increases in the residential area immediately adjacent to the Debris Dam. The homes west and south of the Debris Basin are approximately 40 to 200 feet from the base of the downstream Debris Dam embankment, relatively close to the proposed structural buttressing that would occur at the toe of the downstream embankment. Excavation for the structural buttress at the toe of the Debris Dam would occur at distances 25 to 50 feet from the closest residences. When construction work would occur on the upstream side of the embankment, the embankment would act as a noise barrier to the residences on the downstream side, reducing the noise level at those receptors. Similarly, the Debris Dam would be a barrier between upstream receptors and noise generated on the downstream side. As previously discussed, there are no sensitive noise receptors near the Project site in the City of Monrovia. Thus, the focus of the noise analysis at the Debris Dam is potential impacts to receptors near the downstream embankment.

As previously discussed in Section 4.3, Air Quality, construction activities at the Debris Dam are expected to include one excavator, one dozer, one backhoe, one loader, as well as on-road trucks. As shown in Table 4-18, some of this equipment has a maximum noise level of 85 dBA at 50 feet. Two of the noisiest pieces of equipment, if at full power simultaneously, would have a maximum noise level of 88 dBA at 50 feet. If large diesel engine powered construction equipment would operate on or below the downstream embankment, the resulting noise level of 88 dBA at 50 feet would exceed the County Noise Ordinance 75 dBA limit at residences closer than 225 feet, and mitigation is required.

MM NOI-3 would be implemented, which requires (1) the installation of a temporary 16-foot-high noise barrier between the Debris Dam and the residences closest to the downstream side of the Debris Dam to ensure a minimum noise transmission loss of 22 dBA and (2) that only 1 piece of equipment be operated at full power at any time for work that is done on the downstream side of the Debris Dam within 50 feet of residences. For example, when a loader is at full power loading a truck, the truck should be shut down or on low idle; when the truck powers up to move, the loader should be shut down or a low idle. As previously noted, work on the structural buttress may occur as close as 25 feet from a residence. At that distance and without a noise barrier, the noise level from a piece of construction equipment that generates 85 dBA at 50 feet would be 91 dBA. With those parameters, the noise barrier would provide a minimum of 18 dBA noise reduction, reducing the maximum noise level to 73 dBA or less.

The effectiveness of a noise barrier, called insertion loss, varies with the locations of the noise source and receptor relative to the barrier. Table 4-19, Noise Levels with Noise Barrier, shows noise levels without and with a 16-foot-high noise wall with various locations of the noise source.

TABLE 4-19
NOISE LEVELS WITH NOISE BARRIER

Source Noise Level at 50 ft (dBA)	Source to Receptor Distance (ft)	Receptor Noise Level w/o Wall (dBA)	Wall Height (ft)	Insertion Loss (dBA)	Receptor Noise Level with Wall (dBA)
85	25	91	16	18	73
85	50	85	16	16	69
85	75	81.5	16	16	65.5

dBA: A-weighted decibels; ft: feet

Note: Data for source and receptor at the same elevation. The source (construction equipment) may be at a higher elevation when working on the downstream side of the Debris Dam. In this case the effective wall height and insertion loss would be reduced, but noise levels at the receptor would not exceed 75 dBA.

Source: BonTerra Psomas 2014c (Appendix D).

As shown in Table 4-19, with 1 piece of equipment with a noise level of 85 dBA at 50 feet distance from residences, the receptor noise level would be 73 dBA at a 25-foot distance between the source and receptor. A second piece of equipment with the same noise level would increase the receptor noise by 3 dBA, which would exceed the 75 dBA threshold. Therefore, MM NOI-3 limits the number of equipment at full power within 50 feet of residences. The proposed location of the noise barrier is shown on Exhibit 4-8. With implementation of MM NOI-3, construction equipment noise levels would not exceed 75 dBA at the adjacent residences and impacts would be reduced to levels less than significant.

In order to further minimize noise impacts to residences in the vicinity of the Debris Dam, MM NOI-1 would be implemented, which specifies construction practices to minimize noise effects upon sensitive receptors. The Project would also implement MM NOI-2, which would provide a process for identifying and correcting excessive construction noise levels. Neither MM NOI-1 nor MM NOI-2 is required to ensure that impacts at the Debris Dam would be less than significant.

<u>On-Road Construction Traffic</u>

The Project would generate traffic on N. Santa Anita Avenue, Highland Oaks Drive, and Elkins Avenue. During the approximate 10-month construction period, the traffic noise impacts would be related to movement of construction equipment, trucks, and construction worker trips. Once construction equipment is transported to the various flood-control facilities, it is anticipated that the equipment would remain on site until the end of each phase and all Project-related traffic noise would be related to workers entering and leaving the Project site during the workdays. The anticipated number of worker trips are detailed in Table 3-2. Individual truck passbys would be heard at residences adjacent to the roads used; the noise would be similar to the occasional noise of waste collection trucks, which would be approximately 73 to 77 dBA at a distance of 50 feet from the centerline of the road, depending on the speed of the truck.

Peak trucking periods, including concrete trucks and dump trucks for hauling fill material, would occur at two distinct construction phases: (1) a two-week period in December 2015, when construction at the Dam (reinforcement of the armoring on the downstream canyon wall and construction of the helipad) would occur; concrete pours and other material deliveries would require approximately 50 daily round trips (e.g. equates to approximately 6.3 round trips per hour per workday-assuming 8 hours of activity per day); and (2) over approximately 5 weeks starting in August 2016, when construction of the Debris Dam buttresses would require approximately

74 round trips for soil import per day (e.g. equates to approximately 9.2 round trips per hour per workday-assuming 8 hours of activity per day).[11] The anticipated schedule for construction activities are shown in Table 3-1 and the anticipated number of truck/worker trips during each period are shown in Table 3-2.

With the exception of noise generated during the two construction activities described above, the hourly average noise increase due to construction traffic would be less than 3 dBA. Because there is relatively little existing traffic noise on Highland Oaks Drive and Elkins Avenue, the hourly average noise level could increase up to 8 dBA during trucking to the Dam and Wilderness Park Culvert Crossing, and up to 12 dBA during trucking to the Debris Dam. During these periods of concrete truck activity, there would be a clearly audible increase in periodic noise events (i.e. the noise increase associated with each truck pass); however, these two periods of increased traffic noise would be short-term and would occur over a period of approximately 7 weeks. It is also noted that the community noise equivalent level (CNEL) would not exceed 60 dBA during these two peak traffic noise periods, which is the City's "Normally Acceptable" noise compatibility guideline for development in a low density residential area. This guideline is not applicable to the Project because traffic noise is short-term due to construction activities, whereas the guideline refers to long-term operational noise sources. However, it is mentioned to provide context and illustrate that even short-term construction activities would be within the City's "Normally Acceptable" noise compatibility guideline. The impact would be less than significant.

b) Would the project result in exposure of persons to or generate excessive groundborne vibration or groundborne noise levels?

Less than Significant with Mitigation. The Project has the potential to generate vibration at the nearest homes, located adjacent to the west and south of the Debris Dam.

Construction

Groundborne vibration generated by construction activities is usually highest during pile driving, blasting, soil compacting, jack-hammering, and demolition-related activities. No blasting or pile driving would be required; however, the Project would require demolition activities that may require jackhammers. Next to demolition, grading activity has the greatest potential for vibration impacts as the largest and heaviest equipment would be used during this stage.

Vibration levels are usually expressed as single-number measurements of vibration magnitude (in terms of velocity or acceleration), which describes the severity of the vibration. The peak particle velocity (ppv) is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in inches per second (in/sec).

Table 4-20, Vibration Levels During Construction, summarizes typical vibration levels measured during construction activities for various vibration-inducing pieces of equipment at a distance of 25 feet and the calculation of these levels at a distance of 50 feet. Excavation for the structural buttress at the toe of the Debris Dam would occur at distances 25 to 50 feet from the closest residences.

[11] Estimated soil import requirements of 65,000 cubic yards, delivered in 16 cubic yard trucks, would result in 4,063 truck trips over the course of 2.5 months, as shown in Tables 3.1-2 and 3.2-2. Because approximately half of the import fill material would be obtained from the adjacent SPS, the first 5 weeks of soil import would not require the dump trucks to travel through the adjacent neighborhoods. Once the full amount of soil is obtained from the SPS, import will be required for the remaining 32,500 cubic yards, which would occur over the remaining 5 week period.

TABLE 4-20
VIBRATION LEVELS DURING CONSTRUCTION

Equipment		PPV at 25 ft (in/sec)	PPV at 50 ft (in/sec)
Pile driver - impact	Upper range	1.518	0.617
	Typical	0.644	0.262
Large bulldozer		0.089	0.036
Caisson drilling		0.089	0.036
Loaded trucks		0.076	0.031
Jackhammer		0.035	0.014
Small bulldozer		0.003	0.001

ft: feet; in/sec: inches per second.

Source: BonTerra Psomas 2014c (Appendix D).

Although it is possible for vibration from construction projects to cause building damage, vibration from construction activities are almost never of sufficient amplitude to cause more than minor cosmetic damage to buildings. There are no off-site structures near the Dam or the Headworks. The closest residential structures to the Wilderness Park Culvert Crossing are 250 feet away. The closest residential structures to the Debris Dam work area are 25 feet away. The highest potential vibration level at a distance of 25 feet shown in Table 4-20 above (i.e., a large bulldozer at 0.089 ppv in/sec) would be substantially less than the 0.3 ppv in/sec structural damage guideline for older residential structures. Therefore, there would be no potential for structural damage to existing structures near the Project site.

Section 12.08.560 of the Los Angeles County Code considers the vibration perception threshold is a motion velocity of 0.01 in/sec. As shown in Table 4-20, if large equipment were to operate frequently within 25 feet of an occupied residence, vibration level would be approximately 0.09 in/sec and would be distinctly perceptible. At a distance of 140 feet, the vibration level from the largest equipment shown in Table 4-20, a heavy bulldozer, would not exceed 0.01 in/sec. In order to limit vibration at the residences to less than 0.01 in/sec, MM NOI-4 would be implemented. MM NOI-4 would prohibit the use of large bulldozers and large loaded trucks on the Project site within 140 feet of an occupied residential structure. Jackhammer vibration would not exceed 0.01 in/sec at distances greater than 60 feet. While jackhammers may be used for some demolition activities at the Debris Dam, no demolition is planned within 60 feet of an occupied residence. With the implementation of MM NOI-4, the impact would be less than significant.

c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

No Impact. When Project construction is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Dam, Headworks, or Debris Dam, nor would there be any associated noise generation. Noise impacts associated with the Project would be solely related to construction activities with the following exception. Helicopter flights to and from the new helipad at the Dam would occur only in emergencies and would not be anticipated to occur more than once or twice per year. These occasional noise events would not permanently affect the ambient noise levels. Therefore, there would be no Project-generated change in long-term ambient noise levels in the Project vicinity.

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

No Impact. The Project would not develop land uses that would locate persons in an area subject to noise from public airports, nor would the Project generate aircraft noise. There is no public airport within two miles of the site. The closest airport to the Project site is the El Monte Airport, approximately five miles to south. There would be no impact.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Less that Significant Impact. The Project would not develop land uses that would locate persons in an area subject to noise from private airports or airstrips. Noise generated by emergency helicopter flights is not anticipated to occur more than once or twice per year and would not be excessive. The impact would be less than significant.

4.12.3 MITIGATION MEASURES

MM NOI-1 Even though measures set forth in this mitigation are not required to reduce noise to less than significant levels at either the Culvert Crossing or the Debris Dam, these measures will be implemented at these construction sites to further reduce noise impacts.

- The construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.
- The construction contractors shall place all stationary construction equipment so that the equipment is as far as feasible from the noise-sensitive receptors and so that emitted noise is directed away from the noise-sensitive receptors.
- The construction contractors shall locate equipment staging in areas that will create the greatest distance between staging area noise sources and noise-sensitive receptors during all Project construction.
- The construction contractors shall limit haul truck deliveries to the same hours specified for operation of construction equipment.

MM NOI-2 Even though measures set forth in this mitigation are not required to reduce noise to less than significant levels at either the Culvert Crossing or the Debris Dam, these measures will be implemented at these construction sites to further reduce noise impacts.

At least two weeks before, but not more than one month prior to the start of noise-generating construction activities, notification shall be mailed to owners and occupants of all developed land uses within 300 feet of the Culvert Crossing and Debris Dam providing a schedule for major construction activities that will occur through the duration of the construction period. The notification shall include the identification and contact number for a designated construction manager that would be available on site to monitor construction activities. Contact information

for the Construction Manager shall also be located at the Arcadia City Hall and the Arcadia Police Department.

Complaints may be made during construction hours and a response shall be made within one work day. The Construction Manager shall document all complaints and resolutions and shall provide copies to the LACFCD within three working days of the complaint.

The Construction Manager, upon observation of excessive noise occurring near adjacent homes or upon receipt of a complaint about excessive noise shall do the following:

- Ensure that construction equipment is properly muffled according to industry standards, and
- Modify operations to reduce the number of pieces of equipment operating near noise sensitive receptors or operating concurrently, unless the modification would prevent completion of the task, or
- Implement corrective or additional noise-attenuation measures considered appropriate to address the complaint, which may include, but are not limited to, noise barriers or noise blankets.

MM NOI-3 Prior to the start of grading or similar heavy equipment operation on the downstream side of the Debris Dam, the County shall erect a temporary noise barrier between the structural buttressing work area and the residences to the southwest. The barrier shall be located along the southwest edge of the site access road, but the horizontal location may be adjusted as necessitated by geographical or topographical constraints or to avoid trees. The barrier shall be 16 feet high and solid from the ground to the top. The barrier shall be plywood of at least 0.75-inch thickness or other material with a noise transmission loss of 22 dBA or more.

When equipment is working on the downstream site of the Debris Dam within 50 feet of residences, only one piece of equipment shall be at full power at any time; other equipment shall be shut down or at low idle.

MM NOI-4 Large bulldozers and large loaded trucks shall not be operated on the Project site within 140 feet of an occupied residence. Consistent with the County Code, this restriction does not apply to trucks on a public right-of-way.

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

4.13.1 EXISTING CONDITIONS

The Project site does not include residential homes or land uses, with the exception of the Dam Operator who is a LACFCD employee who resides on site. All other staff travel to the various flood-control facilities to perform maintenance activities and leave when the work is completed. The Debris Dam is located immediately adjacent to a residential neighborhood in the City of Arcadia.

4.13.2 IMPACT ANALYSIS

Regulatory Requirements

None required.

Impact Discussion

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

No Impact. The Project would not include the construction of any habitable structures or any new land uses that could induce population growth. The Project does not involve the extension of new infrastructure that could serve future populations. The Project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, including the Santa Anita Dam, the Santa Anita Headworks, the Wilderness Park Culvert Crossing, and the Santa Anita Debris Dam. The LACFCD facility improvements would: (1) reduce flood risk to downstream communities; (2) enhance sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre-feet per year; (3) improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing. Obtaining these goals would have no direct or indirect impact on population growth.

The Project would bring in LACFCD staff, contractors, and other authorized personnel to the various flood-control facilities for the duration of the Project construction period (i.e., during the daytime hours between approximately April 2015 and October 2016, except for Sundays and holidays). However, these workers are not expected to generate a demand for housing, goods or services, nor would they change land uses in the area. The local population (i.e., in Los Angeles County) could provide adequate skilled workers to satisfy the construction-related positions, and

there would be no need to relocate workers from other areas. The national recession has negatively affected employment for construction workers throughout Southern California, and the unemployment rate in Los Angeles County during March 2013 was 9.9 percent (USBLS 2013). Although there are signs that the economy is recovering, there is no shortage of local labor to satisfy the worker demands of the Project. Thus, no indirect change in the population and housing of the County or in the immediately surrounding area is expected with the presence of construction crews on site.

b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

c) Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Less than Significant Impact. Project implementation would result in demolition of the existing Dam Operator's house, which would be replaced with a helipad to provide aerial access to the Dam in the event of emergencies. The loss of the house would result in displacement of the Dam Operator's household. However, replacement housing would be provided by the LACFCD in existing off-site housing; no new housing would be constructed. Therefore, impacts related to population and housing would be less than significant.

4.13.3 MITIGATION MEASURES

There would be no significant impacts related to population and housing; therefore, no mitigation measures are necessary.

4.14 PUBLIC SERVICES	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

4.14.1 EXISTING CONDITIONS

Fire protection for the Project area is currently provided by the City of Arcadia Fire Department and the U.S. Forest Service (USFS). The USFS provides law enforcement of federal laws (within the Angeles National Forest). The Arcadia Fire Station that would respond to calls in the area of the Project site is Station 107, which is located at 79 West Orange Grove Avenue. Police protection for the Project site is currently provided by the Arcadia Police Department, which is located at 250 West Huntington Drive. The LACFCD's flood-control facilities do not generate a demand for schools, parks, or libraries.

4.14.2 IMPACT ANALYSIS

Regulatory Requirements

None required.

Impact Discussion

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

- **Fire protection?**
- **Police protection?**
- **Schools?**
- **Parks?**
- **Other public facilities?**

Fire Protection

Less than Significant Impact. The Project would not involve the construction of any new land uses, structures, or other improvement or operational activities that could increase demands for long-term fire protection services, nor would the Project indirectly affect population growth. The proposed improvements would not require the long-term use of flammable, combustible, or explosive materials. The Project includes construction of a helipad to provide aerial access to the Dam in the event of an emergency, including wildfires. The introduction of a helipad at this location would help improve emergency response to the Project site and surrounding area. Therefore, the Project would not generate increased demand for fire protection services, directly or indirectly, such that new or physically altered fire protection facilities would be required.

Although there are no significant impacts related to this issue, it is noted that the Project is located in a VHFHSZ-designated area. As discussed in Section 4.8 Hazards and Hazardous Materials, implementation of MM HAZ-2 would ensure reduction of wildfire risks and protect workers during Project construction activities. MM HAZ-2 requires that the LACFCD prepare a Fire Protection Plan that includes emergency reporting procedures; emergency notification, evacuation, and/or relocation of all persons on site; procedures for “hot work” operations; management of hazardous materials and removal of combustible debris; maintenance of emergency access roads; identification of exit routes and assembly areas; and identification of fire apparatus. Therefore impacts related to demand for fire protection services would be less than significant.

Sheriff Protection

Less than Significant Impact. As discussed above, the Project would not involve the construction or operation of structures or infrastructure improvements that could increase demands for long-term sheriff protection (i.e., law enforcement) services, including USFS services. Temporary Project-related activities, such as the presence of construction equipment on the Project site, may provide increased opportunities for theft. The construction areas would be fenced and the LACFCD’s Contractor would be required to secure building materials and construction equipment to prevent theft and vandalism from occurring at the Project site during construction. Additionally, there would be no unusually valuable or out of the ordinary equipment or materials associated with Project implementation that would generate an unusual attraction for theft. Any increase in demand for sheriff protection services due to the Project would be less than significant, and there would be no new demands for sheriff protection services that could result in new or physically altered sheriff facilities.

Schools, Parks, and Other Public Facilities

No Impact. The Project would generate no demand for schools, parks, or other public facilities because the Project does not involve the development of new or expanded land uses or infrastructure improvements and would not generate any population growth. No impact on schools, parks, or other public facilities would occur.

4.14.3 MITIGATION MEASURES

There would be no significant adverse impacts related to public services; therefore no mitigation measures are required.

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

4.15.1 EXISTING CONDITIONS

The Dam does not provide any recreational facilities, although the surrounding area within the Angeles National Forest offers opportunities for various recreational activities. While the Dam and Reservoir are located within the Angeles National Forest, public access within these areas is prohibited. The access road to the Dam is gated to prevent trespassing and for public safety. Also, the steep slopes surrounding the reservoir and downstream canyon prevent easy access to the Dam and Reservoir.

The USFS Chantry Flats Recreation Area is located approximately one mile north of the Dam and is accessed via Santa Anita Canyon Road (which turns into Chantry Flats Road). This recreation area contains a large picnic area and trailheads for many popular hiking trails. The gate at Santa Anita Canyon Road, which leads to Chantry Flats Recreation Area, is open from 6:00 AM to 10:00 PM and U.S. Forest Adventure Pass is required for parking and day use in this area.

The majority of the Project site is located in the City of Arcadia. The Project includes replacement of the Culvert Crossing that provides sole public access to the Arcadia Wilderness Park and associated parking lot. Amenities at the Wilderness Park include a Nature Center, picnic areas, a multi-purpose field, nature trails, a barbeque, a fire circle, and restrooms. The Wilderness Park is open from 8:30 AM to 4:30 PM Monday through Friday from October through April and from 8:30 AM to 7:00 PM Monday through Friday from May through September. The Wilderness Park is used for various programs and classes throughout the year, including overnight Boy Scout campouts every Friday and Saturday and youth day camps every weekday between mid-June to late-August.

A Los Angeles County Trail, County Trail #7 – Santa Anita Wash Trail Extension, is located on the Project site (LACDPR 2001). This trail connects to County Trail #6 – Santa Anita Wash Trail, and provides access to the Angeles National Forest.

4.15.2 IMPACT ANALYSIS

Regulatory Requirements

None required.

Impact Discussion

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

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

Less than Significant Impact. As discussed above in Section 4.13, Population and Housing, Project activities would not induce population growth directly or indirectly that could generate a need for or increase use of neighborhood and regional parks, including nearby recreational trails. The Project consists of improvements to existing stormwater flood-control facilities and would not increase the use of existing park or recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. The roads and trails of the Angeles National Forest would remain operational during construction activities and after the Project is complete.

As previously discussed, it is anticipated that adequate vehicular and pedestrian access could be provided to the Arcadia Wilderness Park throughout the majority of the construction period for the Culver Crossing, with only occasional closures required for periods of about a week or less at any given time during construction. Notification of any temporary closures would be posted at the entrance to the Wilderness Park. Those brief closures would avoid important events at the Wilderness Park, such as the overnight Boy Scout campouts every Friday and Saturday and youth day camps every weekday between mid-June to late-August. However, in order to provide a conservative analysis for impacts to Biological Resources (see Section 4.4 of this MND), the assembly of a temporary bypass crossing located north of the existing Culvert Crossing, which could require removal of a sycamore tree, has been assumed and assessed to account for the event that the temporary bypass crossing is used.

As such, construction activities would have a less than significant impact on access to this recreational amenity. If Wilderness Park users are bothered by construction noise near the parking areas associated with the Culvert Crossing replacement, or are inconvenienced by temporary access closures, there are existing recreational facilities with similar amenities located within an approximate five-mile radius that could be used by patrons of the Wilderness Park. Monrovia Canyon Park in the City of Monrovia is located approximately 2.0 miles to east of the Wilderness Park and has a Nature Center, picnic areas, and nature trails; the U.S. Forest Service Chantry Flat Recreation Area is located approximately 1.8 miles to the north and has a Ranger Station, Adams' Pack Station and General Store, picnic areas, restrooms, camping, and trailheads for hiking trails within the National Forest; and there are 4 additional parks in the City of Arcadia within approximately 1.0 mile of the Project site—Highland Oaks, Eisenhower Memorial, Newcastle, and Forest Avenue Parks—which provide both active and passive recreational facilities.

Once construction of the replacement Culvert Crossing is complete, the temporary crossing would be dismantled (if it was constructed) and access to the Wilderness Park would be reinstated over the new Culvert Crossing. There would be less than significant impacts related to park access and recreational facilities and no mitigation is required.

4.15.3 MITIGATION MEASURES

There would be no significant impacts related to recreation; therefore, no mitigation measures are required.

4.16 TRANSPORTATION/TRAFFIC	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system. Including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or change in location that results in substantial safety risks?	☐	☐	☒	☐
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

4.16.1 EXISTING CONDITIONS

Santa Anita Avenue is a north-south oriented two-lane divided local roadway in the Project vicinity. Santa Anita Avenue is designated an arterial roadway south of Foothill Boulevard and provides an interchange with Interstate (I) 210. The roadway has a landscaped median and the northbound leg of the roadway is generally 28 feet in width and the southbound leg is generally 24 feet in width. As it travels north towards the Angeles National Forest, it becomes Chantry Flats Road (Forest Route 2N40), providing access to the Dam and other recreational opportunities in the forest. It does not connect to any other thoroughfares that traverse the forest. Elkins Avenue is a two-lane residential roadway that connects the Project site east of Highland Oaks Drive with Santa Anita Avenue to the west. The curb-to-curb width of the roadway is 36 feet. Single-family homes are located along this roadway and on-street parking is provided. The speed limit is 25 miles per hour (mph). The Elkins Avenue intersection at Highland Oaks Drive is controlled by a stop sign on Highland Oaks Drive. Highland Oaks Drive is a two-lane residential roadway that connects northeastern residential areas to Elkins Avenue. The speed limit is 25 mph, and on-street parking is permitted. The roadway also provides direct access to the entrance/exit driveway of the Arcadia Wilderness Park.

According to the Arcadia General Plan EIR, traffic counts in 2010 show approximately 365–557 vehicles during the peak hour passed on Santa Anita Avenue in the Project area, which is Level of Service (LOS) of A or B in both the AM and PM Peak Hours (Arcadia 2010c). Far fewer vehicles are expected on Chantry Flats Road during peak hours as it enters the Angeles National Forest. Existing vehicle trips to the Dam are minimal and include an average of a couple of trips per day for maintenance-related activities.

I-210 is generally an east-west freeway located approximately 1.6 miles to the south of the Project site. The freeway functions as the primary linkage between many suburban cities and communities that surround Los Angeles to the north and east. In the project vicinity, I-210 has four general purpose traffic lanes and one high-occupancy vehicle (HOV) lane in each direction. On- and off-ramps are provided at Santa Anita Avenue. Average daily volumes at the segment crossing the Santa Anita Avenue exit were estimated at approximately 17,500 to 17,700 vehicles per peak hour in 2010 (Caltrans 2011).

The 2010 Congestion Management Program for Los Angeles County identifies the segment of I-210 between the I-605 and the community of Sunland is operating at an LOS D or better in both the AM and the PM Peak Hours (Metro 2010). Additionally, Caltrans does not identify this segment of I-210 as being a “Congested Urban Area” (Caltrans 2010).

4.16.2 IMPACT ANALYSIS

Project Design Feature

PDF TRA-1 Heavy-duty diesel truck vehicle (with a Gross Vehicle Weight Rating of 10,000 lbs. or heavier) trips shall be scheduled to avoid school crosswalks at Highland Oaks Elementary School during peak drop-off hours between 8:00 AM to 9:00 AM and pick-up hours between 2:00 PM to 3:00 PM. As required by State Commercial Vehicle Idling Regulations, trucks shall be prohibited from idling for more than 5 minutes if queuing within 100 feet from any residential area.

Regulatory Requirements

RR TRA-1 The movement of large equipment on public roadways shall be made in compliance with the Los Angeles County Code (Title 16, Highway), which requires a moving permit and which includes provisions regarding the size of vehicles/equipment; night moves; moving in inclement weather; parking on streets; travel outside peak hours and holidays; over-length, over-height, and over-width requirements; lighting; signs; and restricted routes. Oversized transport vehicles on State highways, if required, would need to obtain a transportation permit from the California Department of Transportation (Caltrans). Oversized transport vehicles on local roadways, if required, would need to obtain a transportation permit from the Cities of Arcadia and Sierra Madre.

RR TRA-2 The County’s general construction requirements require the implementation of temporary traffic control in accordance with the *Standard Specifications for Public Works Construction* (Greenbook), which contains standards for traffic and access (i.e., maintenance of access, traffic control, and notification of emergency personnel). The Contractor shall provide temporary traffic control in accordance with the Greenbook during construction activities.

RR TRA-3 Design, construction, and operation of the helipad at the Santa Anita Dam shall comply with the requirements of all regulatory and oversight agencies including, but not limited to, the FAA, Caltrans, and Los Angeles County Department of Regional Planning Airport Land Use Commission.

Impact Discussion

a) Would the project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less than Significant Impact. The Project would generate traffic from the I-210 to N. Santa Anita Avenue, where trucks/workers going to the Dam would continue up Chantry Flats Road. Trucks/workers going to the Headworks and Culvert Crossing would continue from N. Santa Anita Avenue to Elkins Avenue, to Highland Oaks Drive and into the Arcadia Wilderness Park. Trucks/workers going to the Debris Dam would continue from N. Santa Anita Avenue to Elkins Avenue, where the trucks would enter a gated driveway just north of the spreading basins.

During the approximate 10-month construction period, the traffic impacts that would occur within public streets are related to movement of construction equipment and construction worker trips. Once construction equipment is transported to the various flood-control facilities, it is anticipated that the equipment would remain on site until the end of each phase and all Project-related traffic impacts would be related to workers entering and leaving the Project site during the workdays. There would also be trips associated with vendors delivering construction materials, haul trucks removing export materials to disposal sites, and trucks importing concrete and fill materials. In order to minimize the export of waste, is anticipated that most of the excavated material and demolished concrete would be reused/recycled on site as backfill at the Debris Dam.

Peak trucking periods, including concrete trucks and dump trucks for hauling fill material, would occur at two distinct construction phases: (1) a two-week period in December 2015, when construction at the Dam (reinforcement of the armoring on the downstream canyon wall and construction of the helipad) would occur; concrete pours and other material deliveries would require approximately 50 daily round trips (e.g. equates to approximately 6.3 round trips per hour per workday-assuming 8 hours of activity per day); and (2) over approximately 5 weeks starting in August 2016, when construction of the Debris Dam buttresses would require approximately 74 round trips for soil import per day (e.g. equates to approximately 9.2 round trips per hour per workday-assuming 8 hours of activity per day). The anticipated schedule for construction activities are shown in Table 3-1 and the anticipated number of truck/worker trips during each period are shown in Table 3-2.

These construction-related trips would add to traffic volumes on the local roadway system. As stated above, the LOS on Santa Anita Avenue, which would be the primary thoroughfare for construction related traffic, is at LOS B or better during Peak Hours. The only traffic that could affect peak hour traffic would be up to 25 worker trips to and from the Project site, although many of these trips would occur early in the morning prior to the peak traffic hours. All truck trips, including the approximately 74 daily round-trip truck trips for soil import, would be required to avoid morning and evening peak hours, per RR TRA-1 requiring compliance with the Los Angeles County Code (Title 16, Highway). RR TRA-1 requires scheduling travel outside peak hours and holidays. Due to minimal impacts to peak hour traffic, the current minimal traffic along the trucking route, and the temporary nature of the construction activities, Project implementation would not

have a measurable impact on traffic on N. Santa Anita Avenue or the other local streets, including Elkins Avenue and Highland Oaks Drive.

RR TRA-2 ensures that construction traffic would be managed in compliance with Greenbook standards and applicable requirements to limit roadway obstruction and the need for temporary detours. PDF TRA-1 would ensure that truck trips would be scheduled to avoid school drop-off and pick-up times, thereby minimizing roadway hazards, congestion, and queuing on local roads. Compliance with RRs TRA-1 and TRA-2 and incorporation of PDF TRA-1 would ensure that Project-related traffic impacts remain less than significant.

There would be no impact to the use of mass transit systems, non-motorized travel, or pedestrian and bicycle paths with Project implementation because the Project site is not near any alternative transportation systems and is likely too far to allow for bicycle or pedestrian access to the site by Project workers. The nearest bus stop is located at Santa Anita Avenue and Sierra Madre Boulevard, located approximately 1.2 miles south of the Debris Dam.

b) Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand established by the county congestion management agency for designated roads or highways?

Less than Significant Impact. The Los Angeles County Congestion Management Program (CMP) calls for monitoring of the highway and roadway system in the County and a multi-modal system performance analysis. The program also promotes alternative modes of transportation; requires monitoring of land use and roadway performance by individual jurisdictions; and provides guidelines for conducting a Traffic Impact Analysis (TIA). The CMP TIA guidelines require analysis of freeway segments, ramps, and intersections if a proposed project would add 150 or more trips (in either direction) during either the AM or PM weekday peak periods at any CMP location.

There are no CMP intersections north of the I-210 Foothill Freeway in the western San Gabriel Valley. Therefore, none of the intersections that could be affected by Project-related traffic are part of the 164 CMP arterial monitoring locations or freeway system according to CMP guidelines and threshold of significance (Metro 2010). Implementation of the Project would generate additional vehicle trips from short-term demolition and construction activities; however, it would not generate any long-term increases in traffic that would conflict with the County's CMP. The Project would not add more than 50 trips at any CMP arterial monitoring station during the AM or PM peak hour, nor would it add 150 or more trips to the freeway system. Therefore, impacts would be less than significant.

c) Would the project result in a change in air traffic patterns, including either an increase in traffic levels or change in location that results in substantial safety risks?

Less than Significant Impact. The Project would include construction of a new helipad to provide aerial access to the Dam in the event of an emergency. It is anticipated that the helipad would only be used one or two times per year. In compliance with RR TRA-3, the helipad would require approval and permits from a number of agencies, including the FAA, Caltrans, and Airport Land Use Commission. All helicopter operations would comply with the requirements of each of the regulatory agencies. Therefore, impacts on air traffic patterns would be less than significant.

d) Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

e) Would the project result in inadequate emergency access?

Less than Significant Impact*.* Construction activities related to the Project would not require changes to any road configurations that could create sharp curves or dangerous intersections. Construction activities would largely be staged on the Project site and would not obstruct emergency access. The Project may temporarily impact local roadways during construction. Although there are no significant impacts related to this issue, compliance with RR TRA-1 ensures that construction traffic would be managed in compliance with Greenbook standards. In addition, RR TRA-2 would require that the movement of large equipment on public roadways be made in compliance with Title 16 of the Los Angeles County Code, and PDF TRA-1 would ensure that truck trips would be scheduled to avoid school drop-off and pick-up times, thereby minimizing congestion and queuing on local roads. Therefore, impacts related to emergency access would be less than significant.

f) Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

No Impact. Implementation of the Project would not create a demand for alternative transportation systems and would not affect public transit services. No demand for public transit, bicycle, or pedestrian facilities would be created by the Project since there would be no change to land uses in the Project area. The increase in truck traffic on Santa Anita Avenue would have no impact on alternative transportation systems.

4.16.3 MITIGATION MEASURES

There would be no significant impacts related to transportation/traffic; therefore, no mitigation measures are required.

4.17 UTILITIES AND SERVICE SYSTEMS	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less than Significant Impact**	**No Impact**
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has inadequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

4.17.1 EXISTING CONDITIONS

There are power lines in the Project area that provide electricity to the various flood-control facilities. Stormwater on the Project site drains directly into Santa Anita Wash and is managed through the Project-related facilities under the jurisdiction of the LACFCD. Wastewater and solid waste generation at the Project site is confined to the Dam Operator's residence, as well as at the Arcadia Wilderness Park restroom facilities, which are connected to the City's main sewer system via a connector line that runs along the side of the Wilderness Park Culvert Crossing, as shown in Exhibit 3-5, Culvert Crossing Plan.

4.17.2 IMPACT ANALYSIS

Regulatory Requirements

RR UTL-1 Construction activities on the Project site shall be conducted in compliance with Chapter 20.87 (Construction and Demolition Debris Recycling and Reuse) of the Los Angeles County Code, which requires at least 50 percent of all Collection and Demolition (C&D) debris, soil, rock, and gravel removed from the Project site to be recycled or reused unless a lower percentage is approved by the Los Angeles County Director of Public Works. A Recycling and Reuse Plan (RRP) must be submitted by the Contractor to the Los Angeles County Department of Public Works, Environmental Programs Division. The RRP must contain a Project description and the estimated total weight of the project C&D debris, with separate

estimates for (1) soil, rock, and gravel; (2) other inert materials; and (3) all other project C&D debris. The ordinance also requires that annual progress reports be submitted to the LACFCD for review.

Impact Discussion

a) Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

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

Less than Significant Impact. The Project only involves short-term construction related to the improvement of the LACFCD flood-control facilities. The Project would not generate wastewater that would require conveyance or treatment in on-site septic systems or at wastewater plants in the region. Portable toilets would be provided for employees at the construction areas, and these portable toilets would be regularly cleaned and their contents disposed of offsite by an outside company. Wastewater from these portable toilets would not exceed the treatment requirements of the RWQCB, and the Project would not need new or expanded treatment facilities. Capacity at existing wastewater treatment plants would not be exceeded. Impacts related to wastewater facilities would be less than significant.

b) Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

d) Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Less than Significant Impact. The Project would require water for the control of fugitive dust on access roads and at the construction sites, which would be provided by a water truck on an as-needed basis. Water for dust control would be sourced from municipal water supplies and trucked to the Project site; however, the amount of water is expected to be limited. Construction-related water needs at the Dam site could be supplemented through the existing on-site water supply and no additional sources would be required.

While the Project would include improvements to the potable water distribution system at the Dam, there would be no substantive change in long-term water demand at the Dam. It is likely that water demand would decrease due to the elimination of the Dam Operator House. No other Project components have long-term potable water demands. Therefore, the Project would not need new water supplies, tanks, pumps, or other water system facilities and there would be a less than significant impact.

c) Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. Implementation of the Project would increase opportunities to capture and infiltrate storm flows emanating from the Santa Anita Canyon Watershed into the groundwater basin. Remediating the seismic deficiencies at the Debris Dam would result in the DSOD removing the operational restrictions on the facility, thereby restoring 119 acre-feet of water conservation capacity. The Debris Dam would also be enlarged by raising the existing spillway by 4 feet, which

would create 40 acre-feet of additional storage for a total of 159 acre-feet. When captured stormwater is released to the spreading grounds for groundwater recharge, the Debris Dam can then capture more runoff, which would allow for water storage capacity multiple times depending on the frequency, duration, and intensity of storm events. In doing so, less water would need to be sent to the downstream stormwater drainage infrastructure. Therefore, the Project would have no impact on the capacity of the existing downstream stormwater drainage system and no mitigation is required.

f) Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

g) Would the project comply with federal, state, and local statutes and regulations related to solid waste?

Less than Significant Impact. Construction of the Project would generate solid waste, including approximately 1,187 cubic yards (cy) of concrete, metal, and excavated soil during construction of the Dam, Headworks, and Debris Dam improvements. The nearest landfill that could accept solid waste from the Project site is the Puente Hills Landfill, located at 13130 Crossroads Parkway South in the City of Industry; however this landfill was closed on October 31, 2013. The second nearest landfill is the Savage Canyon Landfill, located at 13919 East Penn Street in Whittier. According to the *County of Los Angeles Countywide Integrated Waste Management Plan 2011 Annual Report* published in August 2012 by the LACDPW, the Savage Canyon Landfill has a maximum permitted daily capacity of 350 tons per day (584 cy) and an anticipated closure date of 2061 (LACDPW 2012). As previously noted, the majority of soil import/export required for Project construction would be reused or balanced on site. The remaining approximately 1,187 cy of inert construction waste (e.g., concrete, metal, packaging waste) would be disposed of at a municipal solid waste facility. This volume of debris represents approximately 203 percent of the Savage Canyon Landfill's daily capacity. However, the debris would be exported from the site over several months (rather than in a single day). Therefore, both these landfills have available capacity to accommodate the Project construction waste stream.

Additionally, all waste generated during construction of the Project would be handled and disposed of in compliance with all applicable federal, State, and local statutes and regulations related to solid waste, including RR UTL-1, which requires at least 50 percent of all C&D debris to be recycled or reused, and RR HAZ-1 (from Section 4.9, Hazards and Hazardous Materials), which requires that hazardous materials encountered on site be handled and disposed of in accordance with applicable laws. With implementation of RR UTL-1, there would be approximately 593 cy of inert construction waste requiring landfill disposal. Therefore, with implementation of RRs UTL-1 and HAZ-1, there would be less than significant impacts related to landfill capacity and solid waste regulations.

Solid wastes generated by employees and other on-site activities during long-term Project operation (i.e., maintenance visits and repair) would be similar to the existing condition and would be minimal. The long-term solid waste stream would not be large enough to require any measurable landfill capacity.

As such, neither construction nor operation of the Project would directly or cumulatively exceed capacity of the likely landfills serving the Project site. The Project would comply with RR UTL-1 and all applicable federal, State, and local statutes and regulations related to solid waste. Impacts related to landfill capacity and solid waste regulations would be less than significant and no mitigation is required.

4.17.3 MITIGATION MEASURES

There would be no significant impacts related to utilities and service systems; therefore, no mitigation measures are required.

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

4.18.1 MANDATORY FINDINGS OF SIGNIFICANCE ANALYSIS

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

Less than Significant Impact. As discussed above in Section 4.4, Biological Resources, although there are no Rare or Endangered plant or animal species found on the Project site, Project implementation would lead to the disturbance of existing plant, aquatic, and/or animal habitats on and near the Project site. Mitigation measures MMs BIO-1 through BIO-5 have been developed to reduce potential environmental impacts on biological resources to less than significant levels. Implementation of the mitigation measures would ensure that the Project does not degrade the quality of the environment; substantially reduce the habitat of fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or reduce the number or restrict the range of a Rare or Endangered plant or animal.

As discussed in Section 4.5, Cultural Resources, there would be less than significant impacts to known historic, archaeological, and/or paleontological resources. Potential impacts to unknown archaeological resources and potential impacts to human remains from implementation of the Project would comply with RRs CUL-1 and CUL-2. Therefore, the Project does not have the potential to eliminate important examples of the major periods of California history or prehistory.

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

Less than Significant Impact. As shown in the analysis in Sections 4.1 through 4.17 above, all construction-related impacts—identified for aesthetics, biological resources, geology and soils, hazards, and noise—would be mitigated to a less than significant level. As demonstrated by the analysis in this IS/MND, there would be no long-term operational impacts because the Project consists of improvements to existing flood-control facilities, which would continue operating in a similar manner to existing conditions. The long-term operation of the helipad would result in a new facility in the Project study area; however, there would be no long-term environmental impacts requiring mitigation.

The area surrounding the Project site is primarily comprised of open space wilderness areas to the north and east, and single-family neighborhoods to the west and south. Single-family residential areas are largely built-out; therefore, potential future projects in the area would be limited to in-fill residential-scale improvements, which would not be considered cumulatively considerable. The only known non-residential projects that would occur near the Project site include the LACFCD's improvements to the spreading basins downstream of the Project site, and the LACFCD's Oak Woodland Habitat Revegetation/Mitigation Program (OWHMP) at the Lower Sediment Placement Site (SPS), located approximately 0.8 mile south of the Debris Dam. All spreading basin improvements are anticipated to be completed in 2015 prior to the rainy season and would therefore not overlap with the Project's construction activities, which would commence in December 2015 at the Dam, and in April 2016 at the Debris Dam.

The OWHMP includes the creation of 5.5 acres of oak woodland habitat and 2.5 acres of sage scrub habitat as compensation for impacts associated with the Santa Anita Dam Riser Modification and Sediment Removal Project. The primary goal of the on-site mitigation program is to create a developing, diverse, self-sustaining oak woodland and associated scrub that will result in habitats of similar quality and ecological function to the habitat areas impacted by the Sediment Removal Project.

The Lower SPS is accessed via the same entrance (Elkins Avenue gate) and on-site maintenance roads as the Debris Dam, and would therefore share the same local access roadways as the Project. Activities requiring the use of construction equipment at the Lower SPS have already been completed, including bulk grading, precise grading (and relocation of 1,100 yards of soil to the Middle SPS), and surface soil decompaction on the plateau. Installation of mitigation (irrigation system, container plant, and seed mix installation) will be completed in two phases. The first phase occurred from January to March 2014, while the second phase is anticipated to occur from November to December 2014. Upon the completion of mitigation installation tasks, maintenance and monitoring activities would occur for the following seven to ten years, as required by the natural resource agencies. Maintenance tasks will primarily include weed removal and the operation and maintenance of the irrigation system. These tasks will be performed on an approximate biweekly basis for at least the first two years of the maintenance period, with an expected reduction in maintenance frequency in the later years of the program.

Because the Project would result in only construction-period impacts, a cumulatively considerable impact could only occur if construction of a development project in the Project vicinity was constructed at the same time as the Project, which would be implemented in phases over an approximately 10-month period. As construction for the improvements at the Debris Dam are not expected to start until April 2016, there is no expected overlap of construction with the earthwork

activities associated with the OWHMP. While the Project would coincide with ongoing maintenance and monitoring activities for the OWHMP, based on the relatively minor number of trips required (typically one or two flatbed trucks and/or large utility vehicles with as many as 10 to 12 workers), combined with the lack of significant and unavoidable impacts associated with the Project after mitigation, the potential for cumulatively considerable impacts due to the Project is remote. However, the following discusses the potential for cumulative impacts for each of the topics addressed in this IS/MND.

As discussed in Section 4.1, Aesthetics, potential visual impacts due to removal of trees adjacent to the Culvert Crossing would be mitigated with implementation of MM AES-1. As discussed, the Project involves improvements to existing stormwater flood-control facilities, and therefore views into the Project site from public vantage points would not substantively change because the improvements would occur on existing facilities. The new helipad, three-bay garage, water pipelines, and power poles would not be visible from public vantage points, and operation of the helipad would be very infrequent. Views of construction activity at the Dam, Headworks, Wilderness Park Culvert Crossing, and Debris Dam would be fleeting or partial views by motorists or hikers, and would be temporary and similar to other construction sites and not typically considered adverse. The Project would not result in cumulatively considerable aesthetic impacts.

As discussed in Section 4.2, Agriculture and Forestry Resources, no mitigation is required for either short-term or long-term impacts due to Project implementation. Implementation of the Project would not have a cumulatively considerable effect on the conversion of agricultural land to non-agricultural uses because (1) there are no active agricultural activities on the Project site; (2) the site does not contain FMMP-designated Farmland; and (3) is not under a Williamson Act contract. Conversion of Other Land or Grazing Land to non-agricultural uses is not considered a significant impact under CEQA.

As discussed in Section 4.3, Air Quality, no mitigation is required for either short-term or long-term impacts due to Project implementation. The SCAQMD's approach for assessing cumulative impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the Federal and State Clean Air Acts. As discussed in Threshold 4.3(a), the Project would be consistent with the AQMP, which is intended to bring the SoCAB into attainment for all criteria pollutants.[12] In addition, the mass regional emissions calculated for the Project (Table 4-5) would be lower than the applicable SCAQMD daily significance thresholds that are designed to assist the region in attaining the applicable State and national ambient air quality standards. With regard to cumulative local impacts due to concurrent construction activities of related projects, there are no projects currently active or proposed within the local vicinity, as described above. The Project would not result in cumulatively considerable air quality impacts.

As discussed in Section 4.4, Biological Resources, potential impacts related to Englemann oak trees; Pacific pond turtle; active bird and raptor nests protected under the MBTA; roosting bats; southern cottonwood willow riparian forest and sycamore alluvial woodland/southern riparian woodland vegetation types; and jurisdictional resources would be mitigated through implementation of MMs BIO-1 through BIO-5, respectively. Cumulative impacts on Biological Resources include changes in plant and animal habitats in the Project vicinity due to increasing

[12] Section 15064(h)(3) of the State CEQA Guidelines states "A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program which provides specific requirements that will avoid or substantially lessen the cumulative problem (e.g. water quality control plan, air quality plan, integrated waste management plan) within the geographic area in which the project is located. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency".

urbanization and population growth in the region. New developments would also need to conduct biological surveys and provide the required on-site preservation or off-site mitigation in coordination with the CDFW, the USFWS, the USACE, and the RWQCB. However, the Project would result in only construction-period impacts, and would not result in substantial degradation of biological resources with implementation of mitigation, as discussed under Threshold 4.18(a) above. Therefore, the Project would not result in cumulatively considerable biological resource impacts.

As discussed in Section 4.5, Cultural Resources, potential impacts related to unknown archaeological resources, paleontological resources, and human remains would be addressed through compliance with RRs CUL-1 and CUL-2. Due to the site-specific nature of cultural resources, it is difficult to determine if significant cumulative impacts to cultural resources would occur on individual development sites, if present. Since cultural resources are site-specific, no cumulative significant adverse impacts are expected from future developments with implementation of site-level surveys and mitigation outlined as part of cultural resource studies for individual development projects. Therefore, the Project would not result in cumulatively considerable cultural resource impacts.

As discussed in Section 4.6, Geology and Soils, potential impacts related to seismic-related hazards, such as liquefaction and landslides, would be mitigated with implementation of MM HAZ-1, which requires a Site Health and Safety Officer, an Access and Evacuation Plan, identification of site hazards, and response protocols in the event of an earthquake or landslide. Geology and soils impacts are generally site specific and there is typically little, if any, cumulative relationship between the development of a Project and development within a larger cumulative area. For example, development at the Project site would not alter geologic events or soil features/characteristics (such as ground shaking, seismic intensity, or soil expansion) at other locations; therefore, the Project would not result in cumulatively considerable geology and soils impacts.

As discussed in Section 4.7, Greenhouse Gas Emissions, no mitigation is required for either short-term or long-term impacts due to Project implementation. Construction-related emissions would be negligible (23 $MTCO_2e$/yr) and there would be no Project-generated change in GHG emissions compared with the existing conditions. The operations of the helipad, which are anticipated to occur one to two times per year, would have negligible air quality impacts. Therefore, the Project would not result in cumulatively considerable GHG emissions impacts.

As discussed in Section 4.8, Hazards and Hazardous Materials, potential impacts related to hazardous material spills during construction would be less than significant. Potential impacts related to increased site hazards risks and wildfire risk would be mitigated through implementation of MMs HAZ-1 and HAZ-2. Any project is required to address issues related to hazards and hazardous materials or wastes, and federal, State, and local regulations require measures to protect against site contamination by hazardous materials as well as wildfire risks. Therefore, the Project would not result in cumulatively considerable hazards and hazardous materials impacts.

As discussed in Section 4.9, Hydrology and Water Quality, no mitigation is required for either short-term or long-term impacts due to Project implementation. With incorporation of appropriate BMPs during construction, the Project's surface runoff water quality would comply with adopted regulatory requirements (RRs HYD-1 and HYD-2) that are designed by the RWQCB to ensure that construction activity does not adversely affect water quality and hydromodification in receiving streams. Operation of the Project would not violate any water quality standards or waste discharge requirements. Therefore, the Project's incremental contribution to cumulative surface water quality impacts is not significant. Regarding groundwater and storm drainage, implementation of the Project would increase opportunities to capture and infiltrate storm flows

emanating from the Santa Anita Canyon Watershed into the Raymond Basin. Implementation of the Project would not result in the redirection of flows or alteration of drainage patterns when compared to the existing condition. Also, the Project would improve the system's overall ability to capture sediment-laden stormwater runoff and stormwater flows, thereby resulting in a beneficial impact related to drainage and flooding. Therefore, the Project would not result in cumulatively considerable hydrology and water quality impacts.

As discussed in Section 4.10, Land Use and Planning, no mitigation is required for either short-term or long-term impacts due to Project implementation. The Project would not change existing land uses at the Project site. The proposed improvements to the existing flood-control facilities in the Santa Anita Wash do not conflict with the land use and zoning designations in the City of Arcadia General Plan and Zoning Code. RR USE-1 required the submittal of plans to the USFS for construction of the Dam in accordance with the USFS Special Use Permit (SUP). The proposed improvements at Dam also would not conflict with the "Back Country, Motorized" zone of the USFS Land Management Plan. Implementation of the Project would not divide an established community; and there is no habitat conservation plan or natural community conservation plan for the Project area, nor is the Project located within the County's SEA program. Therefore, the Project would not result in cumulatively considerable land use and planning impacts.

As discussed in Section 4.11, Mineral Resources, no mitigation is required for either short-term or long-term impacts due to Project implementation. While the CGS has designated the Project site as an area containing significant mineral resources, the presence and ongoing operation of the Dam since 1927 precludes the use of the area for commercial aggregate resource production. The Project would not require mineral resources, nor would it change the availability of resources on or near the Project site. However, the presence of the LACFCD's flood-control facilities do not necessarily preclude future mining activity, if desired by the LACFCD and USFS. Additionally, no new structures or facilities would be constructed that could restrict future mineral resource recovery activities. Therefore, the Project would not result in cumulatively considerable mineral resource impacts.

As discussed in Section 4.12, Noise, potential impacts related to construction noise and vibration would be mitigated with implementation of MMs NOI-1 through NOI-4. Overlapping construction activities can increase noise in a Project vicinity but, as discussed above, due to the surrounding land use types combined with the effects of noise attenuation and the remote likelihood of construction activity occurring in the immediately vicinity of Project construction activity at the same time, construction noise and vibration levels, which are less than significant with mitigation, would not be cumulatively considerable. Operational noise associated with the Project is negligible and would not be cumulatively considerable.

As discussed in Section 4.13, Population and Housing, no mitigation is required for either short-term or long-term impacts due to Project implementation. The Project would have no residential uses and would not directly or indirectly affect local or regional population projections. Therefore, the Project would not result in cumulatively considerable population or housing impacts.

As discussed in Section 4.14, Public Services, no mitigation is required for either short-term or long-term impacts due to Project implementation. In general, cumulative impacts on public services occur with increasing demands for services from a Project and from related projects in the respective service areas of affected services. The Project would not involve the construction of any new land uses, structures, or other improvement or operational activities that could increase demands for long-term fire protection, sheriff protection, schools, parks or other public

services, nor would the Project indirectly affect population growth. Therefore, the Project would not result in cumulatively considerable public services impacts.

As discussed in Section 4.15, Recreation, no mitigation is required for either short-term or long-term impacts due to Project implementation. The Project would not generate a need for or increase the use of neighborhood and regional parks, including nearby recreational trails, or affect access to the Wilderness Park during construction activities.

As discussed in Section 4.16, Transportation and Traffic, no mitigation is required for either short-term or long-term impacts due to Project implementation. The LOS on Santa Anita Avenue, which would be the primary thoroughfare for construction related traffic, is at LOS B or better during peak hours. During construction activities, the addition of up to 25 worker trips in the morning and evening and 75 daily truck round trips during off-peak hours (as required by RR TRA-1) would not have a measurable impact on traffic on Santa Anita Avenue or the other local streets that would be used, including Elkins Avenue and Highland Oaks Drive. There would be remaining capacity for other temporary construction traffic in the unlikely event a related project's construction overlaps with the Project and the same roadway(s) are used. The Project would not result in any long-term changes in traffic and would not cumulatively considerable transportation and traffic impacts.

As discussed in Section 4.17, Utilities and Service Systems, no mitigation is required for either short-term or long-term impacts due to Project implementation. The Project would not generate wastewater, and would increase groundwater recharge and therefore have no impact on the downstream stormwater drainage system capacity. The Project would require water for the control of fugitive dust on access roads and at the construction sites, which would be provided by a water truck on an as-needed basis. There is ample capacity available in local landfills that could serve the Project to dispose of the approximately 1,187 cy of inert construction waste anticipated with Project implementation. The Project would not result in new households or habitable structures that could generate long-term demands for utilities. Therefore, the Project's negligible demand for utilities and service systems during construction would not result in cumulatively considerable impacts.

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

Less than Significant with Mitigation. The Project would have environmental effects that could cause substantial adverse effects on human beings, either directly or indirectly, as they relate to Geology and Soils (landslide hazards during construction), Hazards and Hazardous Materials (emergency response and wildfire risk), and Noise as previously discussed within the text under these environmental issues. Mitigation measures have been provided to reduce these impacts to less than significant levels, including MMs HAZ-1, HAZ-2, and NOI-1 through NOI-4. Thus, the potentially significant adverse effects on human beings would be less than significant after mitigation. Implementation of the Project would also have beneficial impacts by addressing seismic safety and other structural issues, and preventing flood damage to downstream communities.

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SECTION 6.0 REFERENCES

American Geological Institute, The. (Bates, R.L. and J. Jackson, Eds.). 1984. *Dictionary of* Geological Terms (3rd Edition). New York, NY: Doubleday.

Arcadia, City of. 2010a (December). *Arcadia Zoning Code Amendments and Zoning Map.* Arcadia, CA: Arcadia.

———. 2010b (November). *Arcadia General Plan.* Arcadia, CA: Arcadia.

———. 2010c (July). Draft Program Environmental Impact Report for the City of Arcadia 2010 General Plan Update. Arcadia, CA: Arcadia.

BonTerra Psomas. 2014a (October). *Air Quality and Greenhouse Gas Emissions Impact Analysis, Santa Anita Stormwater Flood Management and Seismic Strengthening Project, Los Angeles County, California.* Pasadena, CA: BonTerra Psomas (Appendix A).

———. 2014b (October). *Biological Technical Report, Santa Anita Stormwater Flood Control and Seismic Strengthening Project, Los Angeles County, California.* Pasadena, CA: BonTerra Psomas (Appendix B).

———. 2014c (October). *Noise Report for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California.* Pasadena, CA: BonTerra Psomas (Appendix D).

———. 2014d (October). *Phase I Cultural Resources Assessment, Santa Anita Stormwater Flood Management and Seismic Strengthening Project.* Pasadena, CA: BonTerra Psomas (Appendix C).

California Air Resources Board (CARB). 2013 (February 15, last reviewed). Board Meetings. Sacramento, CA: CARB. http://www.arb.ca.gov/board/meetings.htm#future.

California Department of Conservation (DOC). 1987. Mineral Land Classification of the Greater Los Angeles Area. *Special Report 143.* Sacramento, CA: DOC.

California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR). 2010. DOGGR Online Mapping System. Sacramento, CA: DOGGR. http://maps.conservation.ca.gov/doms/doms-app.html.

California Department of Conservation, Farmland Mapping and Monitoring Program (FMMP). 2011 (September). Los Angeles County Important Farmland 2010. Sacramento, CA: FMMP.

California Department of Forestry and Fire Protection (CAL FIRE). 2012 (May). Draft Fire hazards Severity Zones in LRA. Sacramento, CA: CALFIRE. http://frap.cdf.ca.gov/ webdata/maps/los_angeles/LosAngelesCounty.pdf

———. 2007 (November 7). *Los Angeles County – Fire Hazard Severity Zones in SRA*. Sacramento, CA: CAL FIRE. http://frap.cdf.ca.gov/webdata/maps/los_angeles/ fhszs_map.19.pdf.

California Department of Toxic Substances Control (DTSC). 2013a. (May 14, access date). DTSC's EnviroStor Database. http://www.envirostor.dtsc.ca.gov/public/

———. 2013b. (May 14, access date). DTSC's Hazardous Waste and Substances Site List – Site Cleanup (Cortese List). http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm.

California Department of Transportation (Caltrans). 2012. California Scenic Highway Mapping System – Los Angeles County. Sacramento, CA: Caltrans. http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm.

———. 2011. Traffic and Vehicle Data Systems Unit – 2010 All Traffic Volumes on CSHS. Sacramento, CA: Caltrans. http://traffic-counts.dot.ca.gov/2010all/Route198-220.html

———. 2010 (September). *Corridor System Management Plan (CSMP); Los Angeles I-210 Corridor; Final Report.* Sacramento, CA: Caltrans. http://www.dot.ca.gov/hq/tpp/corridor-mobility/CSMPs/d7_CSMPs/I-210/D07_I-210_CSMP_101101_Final_Report.pdf.

California, Department of Water Resources (DWR). 2004 (February 27). Raymond Groundwater Basin. *California's Groundwater Bulletin 118.* Sacramento, CA: DWR. http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/4-23.pdf

California Geological Survey (CGS). 2012a. 2010 Geologic Map of California. Sacramento, CA: CGS. http://www.quake.ca.gov/gmaps/GMC/stategeologicmap.html

———. 2012b. 2010 Fault Activity Map of California. Sacramento, CA: CGS. http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html

———. 2012c. Alquist-Priolo Earthquake Fault Zone Maps. Sacramento, CA: CGS. http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

———. 2012d (Last edited April 12). Interactive Probabilistic Seismic Hazards Map. Sacramento, CA: CGS. http://redirect.conservation.ca.gov/cgs/rghm/pshamap/ pshamain.html.

———. 1999 (March 25). *Seismic Hazards Mapping Program, Mt Wilson Quadrangle*. Sacramento, CA: CGS. http://gmw.consrv.ca.gov/shmp/download/ pdf/ozn_mtwil.pdf.

———.1998. *Seismic Hazard Evaluation of the Mt. Wilson 7.5 Quadrangle*. Sacramento, CA: CGS.

EDAW. 2007 (November). *Cultural Resources Assessment for the Proposed Santa Anita Riser Modification and Reservoir Sediment Removal Project, Los Angeles County.* Los Angeles, CA: EDAW.

England and Nelson Environmental Consultants. 1976. *Los Angeles County Significant Ecological Area Study*. (Prepared for the Los Angeles County Department of Regional Planning and Environmental Systems Research Institute). Riverside, CA: England and Nelson Environmental Consultants.

Leadership Committee of Greater Los Angeles County Integrated Regional Water Management Plan (IWRMP). 2006 (December 13). *The Greater Los Angeles County Integrated Regional Water Management Plan.* Los Angeles, CA: IWRMP.

Los Angeles, County of. 2012 (June 12, current through). *Los Angeles, California County Code*. Tallahassee, FL: Municipal Code Corporation for the County.

Los Angeles, County of, Department of Parks and Recreation (LACDPR). 2001. Riding and Hiking Trails Map. Los Angeles, CA: LACDPR.

———. 2011 (October). County of Los Angeles General Plan Significant Ecological Areas and Coastal Resource Areas (Figure 6.2). Los Angeles, CA: LACDRP. http://planning.lacounty.gov/assets/upl/project/gp_2035_FIG_6-2_significant_ecological_areas.pdf

———. 1980 (as amended). *County of Los Angeles General Plan*. Los Angeles, CA: County of Los Angeles.

Los Angeles, County of Department of Public Works (LACDPW). 2013. Los Angeles River Watershed. Los Angeles, CA: LACDPW. http://www.ladpw.org/wmd/watershed/la/

———. 2012 (August). *County of Los Angeles Countywide Integrated Waste Management Plan 2011 Annual Report.* Los Angeles, CA: LACDPW. http://dpw.lacounty.gov/epd/swims/ShowDoc. aspx?id=391&hp=yes&type=PDF.

———. 2009 (May). *Final EIR for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal*. Los Angeles, CA: LACDPW.

Los Angeles County Flood Control District (LACFCD). 2011 (April 14). *Application for grant funding pursuant to The Disaster Preparedness and Flood Prevention Bond Act 2006 (Proposition 1E) for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project.* Los Angeles, CA: LACFCD.

Los Angeles County Metropolitan Transportation Authority (Metro). 2010. *2010 Congestion Management Program for Los Angeles County.* Los Angeles, CA: Metro. http://www.metro.net/projects_studies/cmp/images/CMP_Final_2010.pdf.

Los Angeles Regional Water Quality Control Board (RWQCB). 1995 (February 23). *Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.* Los Angeles, CA: LARWQCB.

Monrovia, City of. 2012a (July). *Comprehensive Zoning Law of the City of Monrovia and Official Zoning Map.* Monrovia, CA: Monrovia.

———. 2012b (November, current through). *Monrovia, California Code of Ordinances.* Cincinnati, OH: American Legal Publishing Corporation for the City.

———. 2011 (August). *Oak Tree Preservation Ordinance, Department of Community Development.* Monrovia, CA: the City. http://cityofmonrovia.ws/images/content/city_government/departments/community_development/divisions/Planning/Oak_trees/oak%20tree%20regulations.pdf.

Pipeline and Hazardous Material Safety Administration (PHMSA). 2013 (last accessed on May 14). National Pipeline Mapping System. Alexandria, VA: PHMSA. https://www.npms.phmsa.dot.gov/PublicViewer/

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation (Second Edition)*. Sacramento, CA: CNPS.

South Coast Air Quality Management LACFCD (SCAQMD). 2013a (updated April 17). 2012 Air Quality Management Plan. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/aqmp/2012aqmp/index.htm.

South Coast Air Quality Management District. 2013b. California Emission Estimator Model (CalEEMod)™ Version 2013.2.2 Developed by Environ International Corporation in Collaboration with SCAQMD and other California Air Districts. Diamond Bar, CA: SCAQMD.

———. 1993. *CEQA Air Quality Handbook*. Diamond Bar, CA: SCAQMD.

———. 1976a (May 7, adopted). Rule 402: Nuisance. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/rules/reg/reg04/r402.pdf.

———. 1976b (May, as amended through 2005). Rule 403: Fugitive Dust. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/rules/reg/reg04_tofc .html.

Southern California Earthquake Data Center (SCEDC). 2013 (January 31, last update). Significant Earthquakes and Faults: San Andreas Fault Zone. Pasadena, CA: California Institute of Technology. http://www.data.scec.org/significant/sanandreas.html.

U.S. Army Corps of Engineers (USACE). 2008. *Public Notice, Application for Permit SPL-2008-00370-VEN, Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project*. Los Angeles, CA: USACE.

United State Bureau of Labor Statistics (USBLS). 2013 (March). Local Area Unemployment Statistics. Washington, D.C.: USBLS. http://www.bls.gov/lau/#cntyaa

United States Department of Agriculture Forest Service (USFS). 2005a (September). Angeles National Forest, Planning: Suitable Land Use Zones. Arcadia, CA: USFS. http://www.fs.usda.gov/detailfull/angeles/landmanagement/planning/?cid=stelprdb5329851&width=full.

———. 2005b (September). *USDA Land Management Plan: Part 2 Angeles National Forest Strategy.* Arcadia, CA: USFS. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5166877.pdf.

———. 1955 (September 22). Special Use Permit Issued to the Los Angeles County Flood Control District for constructing, reconstructing, and/or maintaining facilities for continuous operation of the Santa Anita Dam and Reservoir. Los Angeles, CA: USFS.

United States Environmental Protection Agency (USEPA). 2013a (last accessed on May 14). Envirofacts Database. Washington, D.C.: USEPA. http://www.epa.gov/enviro/.

———.2013b (Accessed February 7). National Ambient Air Quality Standards, Washington DC: USEPA. http://www.epa.gov/air/criteria.html.

———. 2012a (December 12, access date). CERCLIS Hazardous Waste Sites. Washington, D.C.: USEPA. http://www.epa.gov/superfund/sites/cursites/index.htm.

———. 2012b (December 12, access date). National Priorities List. Washington DC: USEPA. http://www.epa.gov/superfund/sites/npl/index.htm.

APPENDIX A

AIR QUALITY AND GREENHOUSE GAS IMPACT ANALYSIS

Air Quality and Greenhouse Gas Emissions Impact Analysis

Santa Anita Stormwater Management and Seismic Strengthening Project, Los Angeles County, California

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October 2014

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A Air Quality and Greenhouse Gas Emissions Calculations

1.0 INTRODUCTION

This Air Quality Emissions Impact Analysis has been prepared to analyze the potential regional and localized air quality impacts associated with the Santa Anita Stormwater Management and Seismic Strengthening Project (hereinafter referred to as "the Project"), in accordance with the requirements of the California Environmental Quality Act (CEQA). This information has been reported in accordance with accepted technical standards consistent with the requirements of the South Coast Air Quality Management District (SCAQMD). This study evaluates air quality and greenhouse gas (GHG) emissions impacts related to implementation of the Project.

2.0 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The Project study area is located within the jurisdictions of the City of Arcadia, City of Monrovia, and a County-owned inholding within the U.S. Forest Service (USFS) boundary, and property within the USFS Angeles National Forest. The Project site is located in the foothills of the San Gabriel Mountains, in the western San Gabriel Valley in Los Angeles County, approximately 15 miles northeast of downtown Los Angeles, as depicted in Exhibit 1, Regional Location and Local Vicinity Map. Land uses adjacent to the Project area include the natural open space and mountains within the Angeles National Forest (i.e., San Gabriel Mountains) to the north, the recreational and open space uses associated with the City of Arcadia Wilderness Park and City of Monrovia to the east, and City of Arcadia single-family residential uses to the south and west.

Exhibit 1 shows the existing locations of the various Project components. The Project is located in Santa Anita Canyon at the southern margin of the San Gabriel Mountains. Santa Anita Dam is at the north end of the Project site, located in the Angeles National Forest and accessed via a private road off Chantry Flats Road, approximately 2.5 miles north of the City of Arcadia. The Headworks structure is located approximately 0.5 mile downstream of the Dam on the border of the Angeles National Forest and the City of Arcadia and accessed off Highland Oaks Drive. The Debris Dam is located approximately 0.5 mile downstream of the Headworks in the City of Arcadia; a portion of the Debris Dam's eastern slope is located in the City of Monrovia and can be accessed via a maintenance road that runs along the channel.

For air quality considerations, the Project site is located within the South Coast Air Basin (SoCAB), so named because its geographical formation is that of a basin with the surrounding mountains trapping the air and its pollutants in the valleys and basins. The SoCAB includes Orange County in its entirety and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties.

2.2 PROPOSED PROJECT

The Los Angeles County Flood Control District's (LACFCD) Project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, including the Santa Anita Dam, Santa Anita Headworks, Wilderness Park Culvert Crossing, and the Santa Anita Debris Dam. The Project benefits and the contributing LACFCD facility improvements are as follows:

- Reduce flood risk to downstream communities by:

Regional Location

Exhibit 1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

10 5 0 10 Miles

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  - Modifying the Santa Anita Dam spillway to safely pass the Probable Maximum Flood
  - Remediating seismic safety issues at the Santa Anita Dam and Debris Dam
- Enhance sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre-feet per year by:
  - Restoring storage capacity at Santa Anita Debris Dam
  - Rehabilitating the Santa Anita Headworks for more reliable diversion of stormwater runoff to the spreading grounds
  - Modernizing facilities and implementing new monitoring and control systems
- Improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing

2.2.1 Dam

The Dam would be structurally altered to accommodate a new spillway with sufficient capacity to pass the probable maximum flood (PMF) of 26,100 cubic feet per second (cfs) in order to reduce the risk of Dam failure from uncontrolled overtopping during major storm events. The proposed improvements to the Dam would not result in changes to the existing maximum water surface elevation restrictions; therefore, the reservoir's capacity to retain water would not be altered by Project implementation.

The spillway modification would consist of cutting a "notch" in the Dam crest to allow the PMF to overtop in a controlled manner. The proposed notch would be centered on the crest of the Dam, similar to the existing emergency crest spillway, and would require concrete removal from the Dam. An existing spillway on the far western edge of the Dam would remain and be unaltered by the Project; however, the existing auxiliary orifice spillway beneath the proposed new spillway would be removed. A new pedestrian bridge would be constructed over the notch and the existing hoist system would be upgraded to have a higher load capacity and re-aligned to accommodate the new spillway. The upgrade work includes the relocation of the lower hoist tower along the Dam crest (and potentially cantilevered of the back side, if necessary). The proposed improvements would not change the height of the Dam; the crest of the Dam would remain at an elevation of 1,325 feet above mean sea level (msl) and the parapet wall would remain at an elevation of 1,328 feet above msl.

To better manage stormwater runoff and to ensure reliability and efficiency of operations, six of the existing valves would be replaced (three control valves and three backup valves), along with new electrical and control systems. The Dam's structural concrete would be repaired to ensure that it meets acceptable standards consistent with the required seismic performance of the Dam.

The downstream canyon walls and the toe of the Dam would be re-armored with additional reinforced gunite or equivalent concrete erosion protection to dissipate the energy from the potential overtopping water as the flow cascades through the spillway notch and the orifice spillway or sluiceway. The flow would be directed onto the downstream armoring before flowing into the channel downstream of the Dam. The new re-armoring would reinforce the existing armoring that extends approximately 100 feet downstream from the toe of the Dam. The re-armoring would be held in position with tie-back anchors to be drilled and grouted into the bedrock. The tie-ins for the re-armoring may include superficial rock excavation, grading, and subsurface

pressure grouting. The color of the material used for re-armoring would be the same as the existing concrete.

The Project would also include improvements to ancillary facilities of the Dam. The existing garage/storage shed would be demolished and replaced with a new three-bay garage (the third bay would house a new back-up generator). The existing Dam Operator's house would be removed and replaced with a helipad to provide aerial access to the Dam in the event of an emergency. It is anticipated that the helipad would only be used 1 or 2 times per year. The existing relief quarters and control house would remain to serve as an office. Although the Dam Operator would no longer reside at the Dam, he/she would still be on-site daily and available on-call after hours. The Project would include remote control capabilities that provide redundant control options from multiple off-site locations. The Dam also has a built-in safety mechanism to automatically pass water through the Dam once the reservoir surface level reaches the California Department of Water Resources, Division of Safety of Dams (DSOD) restriction.

The existing potable water system that serves the Dam site would be replaced. The water system currently consists of a 60,000-gallon upper tank located off Chantry Flats Road that connects to two 5,000-gallon lower tanks located near the Dam access road via a pipeline that runs down the mountainside. The slope adjacent to the upper tank has erosion damage and would be repaired as part of the Project. To repair the slope, an approximate 216-square-foot eroded gully located near the tank's foundation would be grubbed and stabilized with engineered fill and geotextile fabric or with support piles. The exposed portions of the existing water pipeline would be removed while any underground portions would be capped and abandoned in place. The replacement pipeline would run along the same general alignment as the existing pipeline. The two lower tanks would be removed and would not require replacement.

The existing manual swing gate at Chantry Flats Road that provides secured entry to the Dam access road would be replaced with a new electric slide gate. In order to provide electricity to the gate and new lighting/intercom systems, a power line would be strung on up to 7 new power poles to be installed along the outer edge of the Dam's access road, or where possible, in conduit along the inner slope of the access road.

2.2.2 Headworks and Wilderness Park Culvert Crossing

Headworks

The Headworks structure would be replaced and the associated earthen levee would be partially reconstructed to better manage the diversion of flows to the downstream spreading grounds and the downstream Debris Dam. A rehabilitation of the Headworks is needed to protect facilities from stormwater damage and to direct stormwater runoff to the spreading grounds for groundwater recharge. Redevelopment of the Headworks would include reconstruction of the levee to ensure it can withstand flows produced by a 25-year storm event and replacement of the existing tainter gate (used to divert flows) with a new rubber diversion structure. The new rubber diversion structure would be a pneumatically operated, bottom hinged, spillway gate system.

The majority of the existing Headworks structure would be demolished and removed, including the tainter gate, supporting walls, catwalk, and keys. The new facility would increase the width of the structure by approximately 20 feet in order to house the 34-foot rubber diversion structure. Operation of the rubber diversion structure would result in the retention of waters behind the levee to allow for the diversion of flows through the intake gates and into the existing 30-inch RCP leading to the Santa Anita Spreading Grounds and/or Sierra Madre Spreading Grounds. The pool created by the new rubber diversion structure would remain the same as under existing conditions. Construction of the new diversion structure would require work in the creekbed

extending approximately 25 feet downstream of the Headworks, including the placement of new riprap on the downstream side.

The rehabilitation of the Headworks would also include a new control system, including remote operation capabilities, to increase efficiency of water conservation operations. Currently, the response time required for County personnel to drive to the Headworks and manually operate the tainter gate, along with the limited flow rates that can be bypassed, results in the loss of a water conservation opportunity. A new control system integrated with the control system of the other Project components would optimize water conservation. A control house for the rubber diversion structure would be constructed on the other side of the channel next to the access road.

The earthen levee would be reinforced and raised approximately five feet higher to match the height of the Headworks structure by removing and under-excavating the existing levee and rebuilding the new levee using a combination of imported fill and suitable material from the existing levee. It would then be recompacted to the proposed height. The access road leading to the facility would be modified to match the height of the reinforced earthen levee. The existing riprap on the upstream side of the levee would be reinforced. A subsurface conduit would be installed along the length of the levee to connect the rubber diversion structure to the control house on the other side.

Wilderness Park Culvert Crossing

In addition to the improvements at the Headworks, armoring of the roadway and construction of a replacement culvert crossing to the Wilderness Park is needed to ensure that the structure can withstand flows produced by a larger storm event. The existing Culvert Crossing located approximately 450 feet downstream of the Headworks, including the concrete slab and corrugated metal culverts, would be removed and replaced with a new crossing structure.

The Culvert Crossing would be approximately 30 feet wide on the deck plate, allowing for two-way traffic. The new Culvert Crossing would be built on top of a new abutment and would be designed with a permanent guard rail and flexible pavement driving surface adequate for emergency vehicles. The new roadway elevation of the Culvert Crossing would be raised above the existing roadway elevation by approximately 4.5 feet to accommodate higher flows. Approximately 1,800 square feet of the roadways leading to and from the Culvert Crossing would be repaved and sloped to join the existing grade.

Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing would be grubbed and graded to accommodate the new Culvert Crossing. It is anticipated that adequate vehicular and pedestrian access could be provided to the Arcadia Wilderness Park for the majority of the construction period for the Culvert Crossing, with only occasional closures required for periods of about a week or less at any given time during construction. Notification of any temporary closures would be posted at the entrance to the Wilderness Park. Those brief closures would avoid important events at the Wilderness Park, such as the overnight Boy Scout campouts every Friday and Saturday and youth day camps every weekday between mid-June to late-August. However, in order to provide a conservative analysis, the assembly of a temporary bypass crossing located north of the existing Culvert Crossing, which could require removal of a sycamore tree, has been assumed and assessed, to account for the event that the temporary crossing is used.

Therefore, access to the Wilderness Park would be maintained throughout construction with minimal interruptions to access. Two existing sycamore trees located adjacent to the crossing on the eastern shore of the Wash, south of the Culvert Crossing, would need to be removed. One sycamore located on the eastern shore of the Wash, north of the Culvert Crossing, may need to

be removed, depending on whether or not the temporary bypass crossing is installed. In order to provide a conservative analysis, this IS/MND assumes that all three upstream and downstream sycamore trees would be removed.

The LACFCD may transplant the root ball(s) of the sycamores to a suitable riparian location, and/or utilize the woody debris from the sycamore to enhance habitat value at another nearby location, if determined to be feasible and if approved by the County and other appropriate parties. In addition, new sycamore trees would be planted within a 100-foot radius of the original location of any removed existing trees.

New riprap would be installed upstream and downstream of the Culvert Crossing. The roadways leading to and from the Culvert Crossing would be armored, 36 feet on the upstream side and 84 feet on the downstream side, to withstand flows and sloped to join the existing grade. The existing water and sewer lines that run through the current Culvert Crossing would need to be relocated to the new height and alignment of the structure. The sewer force main is on the downstream surface of the Culvert Crossing and the water line is on the upstream surface of the Culvert Crossing. Additionally, the fire hydrant, vault, water valve and standpipe would be demolished and relocated approximately 15 feet to the north in the case that the temporary bypass crossing is utilized. All utility trenching and relocations would remain within the area anticipated for impacts by the Culvert Crossing construction activities, and there would be no changes in water/sewer quantities or demands as a result of the Project.

2.2.3 Debris Dam

Remediation of the seismic deficiencies at the Debris Dam would involve improvements to the existing structures, including the intake tower and embankment. As a result of the loss of water conservation capacity from the DSOD restrictions on the Dam, there is an increased need to capture as much stormwater runoff as possible in facilities below the Dam. As a result, the Debris Dam would also be enlarged by raising the existing spillway by four feet. Remediating the seismic deficiencies at the Debris Dam would result in the DSOD removing the operational restrictions on the facility, thereby restoring 119 acre-feet of water conservation capacity. Enlarging the Debris Dam would create an additional 40 acre-feet of additional storage capacity, for a total of 159 acre-feet. When captured stormwater is released from the Dam to the spreading grounds for groundwater recharge, the Debris Dam can then capture more runoff, which would allow for water storage capacity multiple times in a single season depending on the frequency, duration, and intensity of storm events.

The intake tower located in the Debris Dam is unable to resist seismic loading and would be strengthened or replaced. The improved intake tower would be connected to the existing 48-inch outlet pipe (being lined as part of this Project). The outlet pipe has an existing junction box, which is used to deliver water either into the spillway channel or into the spreading grounds. The upstream and downstream portions of the Debris Dam embankment and alluvial foundation material that are subject to potential liquefaction would be reinforced with structural buttressing. Currently, a cross-section of the Debris Dam resembles a triangle (e.g., sloped sides on the upstream and downstream sides of the dam) with a flat top (e.g., flattened to accommodate vehicular access). The top of the embankment ranges from an elevation of 796 feet above msl at its center to an elevation of 811 feet above msl at the western edge. The construction activities would involve the removal of the existing riprap exterior surface on portions of both the upstream (approximately 0.69 acre) and downstream (approximately 0.89 acre) slopes. Engineered fill materials beneath the riprap would be excavated and removed, and an engineered buttress would be constructed. Upon completion of construction activities, the sloped upstream and downstream surfaces of the Debris Dam would be reconfigured into a single stair-stepped terrace. The surface of the Debris Dam would be completed with a riprap similar to the existing condition.

As part of the improvements, six non-native deodar cedar trees located at the downstream toe of the embankment would be removed as mandated by the DSOD to ensure the structural integrity of the Debris Dam.

A new automated outlet gate and control system would be constructed to modernize operations and to ensure compatibility with other Project components. Upon completion of these improvements, the DSOD would issue a new certificate for the facility and remove the current operating restriction on the Debris Dam, which would increase the Debris Dam's available and allowable water conservation storage capacity from 0 acre-feet to 159 acre-feet.

3.0 AIR POLLUTANTS

3.1 CRITERIA POLLUTANTS

Air quality regulations were first promulgated with the Federal Clean Air Act (CAA) of 1970. Air quality is defined by ambient air concentrations of seven "criteria air pollutants", which are a group of common air pollutants identified by the U.S. Environmental Protection Agency (USEPA) to be of concern with respect to the health and welfare of the general public. Federal and State governments regulate criteria air pollutants by using ambient standards based on criteria regarding the health and/or environmental effects of each pollutant. The criteria pollutants are defined as follows: nitrogen dioxide (NO_2), ozone (O_3), particulate matter (including both respirable particulate matter with a diameter of 10 microns or less [PM10] and fine particulate matter with a diameter of 2.5 microns or less [PM2.5]), carbon monoxide (CO), sulfur dioxide (SO_2), and lead. A description of each criteria air pollutant, including source types and health effects, is provided below.

3.1.1 Nitrogen Dioxide

Nitrogen gas, normally relatively inert (nonreactive), comprises about 80 percent of the air. At high temperatures (e.g., in a combustion process) and under certain other conditions, nitrogen can combine with oxygen to form several different gaseous compounds collectively called nitrogen oxides (NOx). Nitric oxide (NO), NO_2, and nitrous oxide (N_2O) are important constituents of NOx. NO is converted to NO_2 in the atmosphere. Motor vehicle emissions are the main source of NOx in urban areas.

NO_2 is a red-brown pungent gas and is toxic to various animals and to humans because of its ability to form nitric acid with water in the eyes, lungs, mucus membranes, and skin. In animals, long-term exposure to NOx increases susceptibility to respiratory infections, lowering resistance to such diseases as pneumonia and influenza. Laboratory studies show that susceptible humans, such as asthmatics, who are exposed to high concentrations of NO_2 can suffer lung irritation and potentially lung damage. Epidemiological studies have also shown associations between NO_2 concentrations and (1) daily mortality from respiratory and cardiovascular causes and (2) hospital admissions for respiratory conditions.

Although the National Ambient Air Quality Standards (NAAQS) only address NO_2, NO and NO_2 are both O_3 and PM2.5 precursor emissions, as discussed below. Because of this and the fact that NO emissions largely convert to NO_2, NOx emissions are typically examined when assessing potential air quality impacts.

3.1.2 Ozone

Ozone is a secondary pollutant, meaning that it is not directly emitted. It is a gas that is formed when volatile organic compounds (VOCs) (also referred to as reactive organic gases or "ROGs") and NOx undergo photochemical reactions that occur only in the presence of sunlight. The primary source of VOC emissions is unburned hydrocarbons in motor vehicle and other internal combustion engine exhaust. NOx forms as a result of the combustion process, most notably due to the operation of motor vehicles. Sunlight and hot weather cause ground-level O_3 to form;[1] as a result, ozone is known as a summertime air pollutant. Ground-level O_3 is the primary constituent of smog. Because O_3 formation occurs over extended periods of time, both O_3 and its precursors are transported by wind, and high O_3 concentrations can occur in areas well away from sources of its constituent pollutants.

People with lung disease, children, older adults, and people who are active can be affected when O_3 levels exceed ambient air quality standards. Numerous scientific studies have linked ground-level O_3 exposure to a variety of problems, including:

- lung irritation that can cause inflammation much like a sunburn;
- wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities;
- permanent lung damage to those with repeated exposure to O_3 pollution; and
- aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

3.1.3 Particulate Matter

Particulate matter includes both aerosols and solid particles with a wide range of size and composition. Of particular concern are those particles smaller than 10 microns in diameter (PM10) and smaller than or equal to 2.5 microns in diameter (PM2.5). Particulate matter size refers to the aerodynamic diameter of the particle. Smaller particles are of greater concern because they can penetrate deeper into the lungs than large particles.

Particulate matter tends to occur primarily in the form of fugitive dust. Fugitive dust is generated by both local and regional sources, the latter during moderate to high wind episodes. The principal sources of dust in urban areas are from grading, construction, disturbed areas of soil, and dust entrained by vehicles on roadways.

PM10 is generally emitted directly as a result of mechanical processes that crush or grind larger particles or from the re-suspension of dusts, most typically through construction activities and vehicular entrainment. PM10 generally settles out of the atmosphere rapidly and is not readily transported over large distances.

PM2.5 is directly emitted in combustion exhaust and formed in atmospheric reactions between various gaseous pollutants including NOx, sulfur oxides (SOx), and VOCs. PM2.5 can remain suspended in the atmosphere for days and/or weeks and can be transported long distances.

[1] Ground-level O_3 is not to be confused with atmospheric O_3 or the "ozone layer", which occurs very high in the atmosphere and shields the planet from some ultraviolet rays.

The principal health effects of airborne particulate matter are on the respiratory system. Short-term exposures to high PM2.5 and PM10 levels are associated with premature mortality and increased hospital admissions and emergency room visits; increased respiratory symptoms are also associated with short-term exposures to high PM10 levels. Long-term exposures to high PM2.5 levels are associated with premature mortality and development of chronic respiratory disease. According to the USEPA, some people are much more sensitive than others to breathing PM10 and PM2.5. People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worse illnesses; people with bronchitis can expect aggravated symptoms; and children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered sensitive include smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive because many breathe through their mouths (USEPA 2013c)

3.1.4 Carbon Monoxide

Carbon monoxide (CO) is a colorless and odorless gas which, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can cause headaches; aggravate cardiovascular disease; and impair central nervous system functions. CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near congested intersections; along heavily used roadways carrying slow-moving traffic; and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (i.e., up to 600 feet or 185 meters) of heavily traveled roadways. Overall, CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973. CO levels in the SoCAB are in compliance with State and federal one-hour and eight-hour standards (CARB 2012b).

3.1.5 Sulfur Dioxide

Sulfur oxides (SOx) constitute a class of compounds of which sulfur dioxide (SO_2) and sulfur trioxide (SO_3) are of greatest importance. Ninety-five percent of pollution-related SOx emissions are in the form of SO_2. SOx emissions are typically examined when assessing potential air quality impacts of SO_2. The primary contributor of SOx emissions is fossil fuel combustion for generating electric power. Industrial processes, such as nonferrous metal smelting, also contribute to SOx emissions. SOx is also formed during combustion of motor fuels; however, most of the sulfur has been removed from fuels, greatly reducing SOx emissions from vehicles.

SO_2 combines easily with water vapor, forming aerosols of sulfurous acid (H_2SO_3), a colorless, mildly corrosive liquid. This liquid may then combine with oxygen in the air, forming the even more irritating and corrosive sulfuric acid (H_2SO_4). Peak levels of SO_2 in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO_2 gas and particles cause respiratory illness and aggravate existing heart disease. SO_2 reacts with other chemicals in the air to form tiny sulfate particles, which are measured as PM2.5.

3.1.6 Lead

Lead is a stable compound that persists and accumulates both in the environment and in animals. In humans, it affects the body's blood-forming (or hematopoletic), nervous, and renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological and gastrointestinal systems, although there is significant

individual variability in response to lead exposure. Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles and the use of unleaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e., lead smelters and battery manufacturers) and are not applied to residential or commercial development, or infrastructure projects.

3.2 TOXIC AIR CONTAMINANTS

Toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or in serious illness or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. TACs are different than the “criteria” pollutants previously discussed because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects, and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., of long duration) and acute (i.e., severe but of short duration) adverse effects on human health.

Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The solid emissions in diesel exhaust are known as diesel particulate matter (diesel PM). In 1998, California identified diesel PM as a TAC based on its potential to cause cancer, premature death, and other health problems (e.g., asthma attacks and other respiratory symptoms). Those most vulnerable are children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California’s known cancer risk from outdoor air pollutants. Diesel engines also contribute to California’s PM2.5 air quality problems. In addition, diesel soot causes visibility reduction (CARB 2010a).

Carcinogenic risks (i.e., cancer risks) are estimated as the incremental probability that an individual will develop cancer over his/her lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a probability (e.g., 10 in 1 million). A risk level of 1 in 1 million implies a likelihood that up to 1 person out of 1 million equally exposed people would contract cancer if exposed continuously (24 hours per day) to the specific concentration over 70 years (an assumed lifetime). This would be in addition to those cancer cases that would normally occur in an unexposed population of 1 million people (USEPA 2011a). The Hazard Index (HI) expresses the potential for chemicals to result in non-cancer-related health impacts. HIs are expressed using decimal notation (e.g., 0.001). A calculated HI exposure of less than 1.0 will likely not result in adverse non-cancer-related health effects over a lifetime of exposure. Conversely, an HI greater than 1.0 does not necessarily mean that adverse effects will occur (USEPA 2011a).

3.3 GLOBAL CLIMATE CHANGE AND GREENHOUSE GASES

3.3.1 Description of Global Climate Change

Global climate change is an important environmental, economic, and political issue. It is noted that some persons reject or doubt the conclusions of the Intergovernmental Panel on Climate Change describing the effects of greenhouse gas (GHG) emissions and climate change. However, scientific research indicates very high confidence (i.e., at least 90 percent) that the rate and magnitude of current global temperature changes are anthropogenic[2] and that global warming will lead to adverse climate change effects around the globe (IPCC 2007). GHG emissions are primarily associated with (1) the burning of fossil fuels during motorized transport, electricity generation, natural gas consumption, industrial activity, manufacturing, and other activities; (2) deforestation; (3) agricultural activity; and (4) solid waste decomposition. This increasing temperature phenomenon is known as “global warming”, and the climatic effect is known as “climate change” or “global climate change”.

Climate change is a recorded change in the Earth’s average weather measured by variables such as wind patterns, storms, precipitation, and temperature. Historical records show that global temperature changes have occurred naturally in the past, such as during previous ice ages. Eleven of the 12 years from 1995 to 2006 rank among the warmest years in the instrumental record of global surface temperature (since 1850). An increase in global surface temperature of 0.74 degree Celsius (°C) (1.33 degrees Fahrenheit [°F]) occurred during the 100-year period from 1906 to 2005. Current data from the National Aeronautics and Space Administration (NASA) indicates that 2010 tied 2005 as the warmest on record, being approximately 1.13°F warmer than the average global surface temperature from 1951 to 1980. Even for a near record-breaking year like 2010, the broader context is more important than a single year. To measure climate change, scientists look at long-term trends. The temperature trend, including data from 2010, shows the climate has warmed by approximately 0.36°F per decade since the late 1970s (NASA 2011).

3.3.2 Greenhouse Gases

GHGs are comprised of atmospheric gases and clouds within the atmosphere that influence the Earth’s temperature by absorbing most of the infrared radiation that rises from the sun-warmed surface and that would otherwise escape into space. This process is commonly known as the “Greenhouse Effect”. GHGs are emitted by natural processes and human activities. The Earth’s surface temperature averages about 58°F because of the Greenhouse Effect. Without it, the Earth’s average surface temperature would be somewhere around an uninhabitable 0°F. The resulting balance between incoming solar radiation and outgoing radiation from both the Earth’s surface and the atmosphere maintains the planet’s habitability.

GHGs, as defined under California’s Assembly Bill (AB) 32, include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). General discussions on climate change often include water vapor, atmospheric O_3, and aerosols in the GHG category. Water vapor and atmospheric O_3 are not formed directly in the construction or operation of development projects, nor can they be controlled in these projects. Aerosols are not gases. While these elements have a role in climate change, they are not considered by either regulatory bodies (e.g., CARB) or climate change groups (e.g., the California Climate Action Registry [CCAR]) as gases to be reported or analyzed for control. Therefore, no further discussion of water vapor, O_3, or aerosols is provided.

[2] Anthropogenic effects, processes, objects, or materials are those that are derived from human activities, as opposed to those occurring in natural environments without human influence.

Anthropogenic emissions of GHGs into the atmosphere enhance the Greenhouse Effect by absorbing radiation from other atmospheric GHGs that would otherwise escape into space, thereby trapping more radiation in the atmosphere and causing temperatures to increase. CO_2 is the most important and common anthropogenic GHG. The global atmospheric concentration of CO_2 has increased from a pre-industrial (roughly 1750) value of about 280 parts per million (ppm) to 387 ppm in 2009, primarily due to fossil fuel use, with land use change providing a significant but smaller contribution (USEPA 2011b). As of July 2014, the CO_2 concentration exceeded 396 ppm (ESRL 2014). The annual growth rate in CO_2 concentrations continues to increase, with a larger annual CO_2 concentration growth rate average during the ten-year period between 1995 and 2005 than since the beginning of continuous direct measurements in 1960.

CO_2 constitutes approximately 84 percent of all GHG emissions in California (CEC 2006). Worldwide, California ranks as about the 12th largest emitter of CO_2 and is responsible for approximately 2 percent of the world's CO_2 emissions (CEC 2007, 2006). However, throughout the United States, California is the fourth lowest in CO_2 emissions per capita (CEC 2006).

GHGs are global pollutants and are unlike air pollutants such as O_3, particulate matter and TACs, which are pollutants of regional and local concern. While air pollutants with localized air quality effects have relatively short atmospheric lifetimes (generally a few days), GHGs have long atmospheric lifetimes that range from one year to several thousand years. Long atmospheric lifetimes allow for GHGs to disperse around the globe.

Since GHGs vary widely in the power of their climatic effects, climate scientists have established a unit called global warming potential (GWP). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, since CH_4 and N_2O are approximately 25 and 298 times more powerful than CO_2, respectively, in their ability to trap heat in the atmosphere; they have GWPs of 25 and 298, respectively (CO_2 has a GWP of 1). Carbon dioxide equivalent (CO_2e) is a quantity that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 1.

TABLE 1
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES

Greenhouse Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide (CO_2)	50–200	1
Methane (CH_4)	12	25
Nitrous Oxide (N_2O)	114	298
HFC-134a	14	1,430
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800
HFC: hydrofluorocarbon; PFC: perfluorocarbon Source: IPCC 2007.		

3.3.3 Global, National, State, and Regional Contributions to Greenhouse Gas Emissions

Table 2 shows the magnitude of GHG emissions on the global, national, State, and regional scale.

TABLE 2
COMPARISON OF WORLDWIDE GHG EMISSIONS

Area and Data Year	Annual GHG Emissions ($MMTCO_2e$)
World (2011)	29,986
United States (2012)	6,501
California (2012)	459
Los Angeles County (2008)	93
$MMTCO_2e$: million metric tons of CO_2e; GHG: greenhouse gas(es) Source: WRI 2012; USEPA 2014; CARB 2013c; SCAG 2011.	

3.3.4 Federal Recognition of Greenhouse Gas as an Air Pollutant

On April 2, 2007, in *Massachusetts v. EPA* (549 U.S. 497 [2007]), the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the Administrator of the USEPA must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On April 17, 2009, the Administrator of the USEPA signed a proposal with two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act (USEPA 2010b):

- The Administrator is proposing to find that the current and projected concentrations of the mix of six key greenhouse gases—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the endangerment finding.
- The Administrator is further proposing to find that the combined emissions of CO_2, CH_4, N_2O, and HFCs from new motor vehicles and motor vehicle engines contribute to the atmospheric concentrations of these key greenhouse gases and hence to the threat of climate change. This is referred to as the cause or contribute finding.

The findings do not include any proposed regulations.

4.0 REGULATORY SETTING AND AIR QUALITY STANDARDS

Federal and State ambient air quality standards have been set to protect the most sensitive persons from illness or discomfort. Residential areas, schools, playgrounds, child care centers, athletic facilities, hospitals, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes are especially likely to include persons sensitive to air pollutants.

4.1 FEDERAL

4.1.1 Criteria Pollutants

The USEPA is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The standards are shown in Table 3, which also includes California standards. The USEPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The USEPA's air quality mandates are drawn primarily from the Clean Air Act (CAA), which was

enacted in 1970. The most recent major amendments made by Congress were in 1990. As part of its enforcement responsibilities, the USEPA requires each State with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain and maintain the federal standards. The SIP must integrate federal, State, and local plan components and regulations to identify specific measures to reduce pollution by using a combination of performance standards and market-based programs within the SIP-identified timeframe.

TABLE 3
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary[a]	Secondary[b]
O_3	1 Hour	0.09 ppm (180 µg/m^3)	–	–
	8 Hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as Primary
PM10	24 Hour	50 µg/m^3	150 µg/m^3	Same as Primary
	AAM	20 µg/m^3	–	Same as Primary
PM2.5	24 Hour	–	35 µg/m^3	Same as Primary
	AAM	12 µg/m^3	12.0 µg/m^3	Same as Primary
CO	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
NO_2	AAM	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
	1 Hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	–
SO_2	24 Hour	0.04 ppm (105 µg/m^3)	–	–
	3 Hour	–	–	0.5 ppm (1,300 µg/m^3)
	1 Hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	–
Lead	30-day Avg.	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3	Same as Primary
	Rolling 3-month Avg.	–	0.15 µg/m^3	
Visibility Reducing Particles	8 hour	Extinction coefficient of 0.23 per km – visibility ≥ 10 miles (0.07 per km – ≥30 miles for Lake Tahoe)	**No Federal Standards**	
Sulfates	24 Hour	25 µg/m^3		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)		

O_3: ozone; ppm: parts per million; µg/m^3: micrograms per cubic meter; PM10: large particulate matter; AAM: Annual Arithmetic Mean; PM2.5: fine particulate matter; CO: carbon monoxide; mg/m^3: milligrams per cubic meter; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; km: kilometer; –: No Standard.

[a] National Primary Standards: The levels of air quality necessary, within an adequate margin of safety, to protect the public health.

[b] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

TABLE 3
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary[a]	Secondary[b]

Note: More detailed information in the data presented in this table can be found at the CARB website (www.arb.ca.gov).

Source: CARB 2013c.

Based on monitored air pollutant concentrations, the USEPA designates an area's status in attaining the NAAQS. Table 4 summarizes the attainment status in the SoCAB for the criteria pollutants. Table 4 also includes State attainment designations. When an area has been reclassified from a nonattainment to an attainment area for a federal standard, the status is identified as "maintenance", and there must be a plan and measures that will keep the region in attainment for the following ten years.

TABLE 4
ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN THE SOUTH COAST AIR BASIN

Pollutant	State	Federal
O_3 (1 hour)	Nonattainment	No standard
O_3 (8 hour)		Extreme Nonattainment
PM10	Nonattainment	Attainment/Maintenance[a]
PM2.5	Nonattainment	Nonattainment
CO	Attainment	Attainment/Maintenance
NO_2	Attainment[b]	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead*	Attainment[b]	Attainment[c]
All others	Attainment/Unclassified	No standards

O_3: ozone; PM10: particulate matter 10 microns or less in diameter; PM2.5: particulate matter 2.5 microns or less in diameter; CO: carbon monoxide; NO_2: nitrogen dioxide; SO_2: sulfur dioxide.

[a] Federal standard: The SoCAB was redesignated for PM10 from nonattainment to attainment-maintenance effective July 26, 2013.
[b] State standard: CARB Executive Order R-14-001 of February 25, 2014 reclassified the SoCAB to Attainment for NO_2 and Los Angeles County to Attainment for Lead effective July 1, 2014.
[c] Federal standard: Los Angeles County is classified nonattainment for lead; the remainder of the SoCAB is in attainment of the State and federal standards.

Source: CARB 2012b; USEPA 2012; USEPA 2013d.

The SoCAB is a federal nonattainment area for O_3 and PM2.5, as shown in Table 4. Therefore, the state of California is required to prepare and update SIPs for these pollutants. The SIPs are comprised of individual plans prepared by the agencies responsible for air quality management in each nonattainment area. In the SoCAB, the SCAQMD is the responsible agency and the plans to attain or maintain federal air quality standards are called Air Quality Management Plans (AQMPs).

4.1.2 Greenhouse Gases

There are no federal regulations for GHG emissions that are applicable to the Project.

4.2 STATE OF CALIFORNIA

CARB, a part of the State of California Environmental Protection Agency, is responsible for the coordination and administration of both federal and State air pollution control programs in California. In this capacity, CARB conducts research; sets the California Ambient Air Quality Standards (CAAQS); compiles emission inventories; develops suggested control measures; and oversees local programs, including those relevant to climate change and global warming. The CAAQS are included in Table 3.

4.2.1 Criteria Pollutants

For regions that do not attain the CAAQS (Table 3), CARB requires the applicable air district (SCAQMD) to prepare plans for attaining the standards. These plans are then integrated into the State SIP. Table 4 also includes State attainment designations; the SoCAB is a State nonattainment area for O_3, PM10, and PM2.5. Therefore, the SCAQMD AQMPs must also address the attainment and maintenance of the CAAQS. CARB establishes emissions standards for motor vehicles sold in California; consumer products (e.g., hair spray, aerosol paints, and barbecue lighter fluid); and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

4.2.2 Greenhouse Gases

There are numerous State plans, policies, regulations, and laws related to GHGs and global climate change. Following is a discussion of some of these plans, policies, and regulations that (1) establish overall State policies and GHG reduction targets; (2) require State or local actions that result in direct or indirect GHG emission reductions for the Project; and (3) require CEQA analysis of GHG emissions.

Assembly Bill 1493 – Clean Car Standards

Assembly Bill (AB) 1493 (Pavley) required CARB to develop and adopt, by January 1, 2005, regulations that achieve “the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state”. Implementation of AB 1493 was delayed until 2009 by prolonged litigation and USEPA actions. On September 24, 2009, CARB adopted amendments to the AB 1493 regulations that reduce GHG emissions in new passenger vehicles from 2009 through 2016. The amendments bind California’s enforcement of AB 1493 (starting in 2009) while providing vehicle manufacturers with new compliance flexibility. The amendments also prepare California to merge its rules with the federal Corporate Average Fuel Economy (CAFE) rules for passenger vehicles (CARB 2010c).

Executive Order S-3-05

On June 1, 2005, former Governor Arnold Schwarzenegger signed Executive Order S-3-05, which proclaims that California is vulnerable to climate change impacts. It declares that increased temperatures could reduce snowpack in the Sierra Nevadas; further exacerbate California’s air quality problems; and potentially cause a rise in sea levels. In an effort to avoid or reduce climate change impacts, Executive Order S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

The California Legislature adopted the public policy position that global warming is "a serious threat to the economic well-being, public health, natural resources, and the environment of California" (*California Health and Safety Code* §38501). Furthermore, the State Legislature has determined that:

> the potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra Nevada snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious disease, asthma, and other human health-related problems.

These public policy statements became law with the enactment of AB 32, the California Global Warming Solutions Act of 2006, signed by former Governor Arnold Schwarzenegger in September 2006. AB 32 is now codified as Sections 38500–38599 of the *California Health and Safety Code.* AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020.

Senate Bill 97 and Amendments to the State CEQA Guidelines

SB 97 directed the California Natural Resources Agency (CNRA) to adopt amendments to the CEQA Guidelines that require evaluation of GHG emissions or the effects of GHG emissions by January 1, 2010. The CNRA has done so, and the amendments to the State CEQA Guidelines, in a new Section 15064.4, entitled Determining the Significance of Impacts from Greenhouse Gas Emissions, provide that (CNRA 2009):

(a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project.

(b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

    (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

    (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;

    (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions.

The amendments also add a new Section 15126.4(c), Mitigation Measures Related to Greenhouse Gas Emissions.

CARB GHG Emissions Data and Scoping Plan

In December 2007, CARB published California's GHG inventory, which compiled statewide anthropogenic GHG emissions and sinks for 1990 through 2004. The estimated statewide GHG 1990 emissions level, and therefore the 2020 emissions target, is 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$).[3]

AB 32 requires CARB to develop a Scoping Plan to lower the State's GHG emissions to meet the 2020 limit. The Scoping Plan was approved at the December 2008 CARB meeting, and the measures in the Scoping Plan have been developed. Statewide measures addressing vehicle emissions, energy efficiency, vehicle fuel, and power generation are planned to achieve the greater amounts of emissions reductions. However, reductions at all levels will be needed to reach the 2020 targets.

Key elements of the Scoping Plan include (1) expanding and strengthening existing energy efficiency programs and building and appliance standards; (2) achieving a statewide renewable energy mix of 33 percent; (3) developing a California cap and trade program linked with other similar programs; (4) establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets; (5) implementing existing laws and standards such as California's clean car standards (identified in the Scoping Plan as Light Duty Vehicle GHG Standards and described above under the discussion of AB 1493), goods movement measures, and the Low Carbon Fuel Standard (LCFS); and (6) issuing targeted fees to fund the State's long-term commitment to AB 32 administration (CARB 2008).

The estimated 2020 GHG emissions reductions for measures described in the 2008 Scoping Plan were based on the best available information as of December 2008. CARB staff has since revised the expected 2020 emission reductions in consideration of the economic recession and the availability of updated information from development of measure-specific regulations. In addition, CARB moved the Light Duty Vehicle and renewable portfolio standards into the baseline calculation. Based on these revisions, the AB 32 2020 baseline is now forecasted to be 507 $MMTCO_2e$. Reductions of an estimated 80 $MMTCO_2e$ are necessary to reduce statewide emissions to the AB 32 Target of 427 $MMTCO_2e$ by 2020. The forecasted reductions for the individual scoping plan measures have been or are being reevaluated. For example, the estimated reductions from energy efficiency and conservation have been revised from 19.5 to 11.9 $MMTCO_2e$, and reductions from regional, transportation-related GHG targets have been revised from 5.0 to 3.0 $MMTCO_2e$ (CARB 2011).

4.3 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The project is located in Los Angeles County. Air quality in the non-desert portion of Los Angeles County, which includes Arcadia, is regulated by the SCAQMD. As a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), County transportation commissions, and local governments and cooperates actively with all federal and State government agencies. The SCAQMD develops rules and regulations;

[3] CO_2e emissions are commonly expressed in metric tons of carbon dioxide equivalent ($MTCO_2e$). Larger quantities of emissions, such as on the State or world scale, are expressed in million metric tons (or "tonnes") of carbon dioxide equivalent ($MMTCO_2e$). The CO_2e for a gas is derived by multiplying the tons of the gas by the associated GWP such that $MMTCO_2e$ = (million metric tons of a GHG) x (GWP of the GHG). For example, the GWP for CH_4 is 21. This means that emissions of 1 million metric tons of CH_4 are equivalent to the emissions of 21 million metric tons of CO_2.

establishes permitting requirements for stationary sources; inspects emissions sources; and enforces such measures through educational programs or fines, when necessary.

4.3.1 Criteria Pollutants

The SCAQMD is directly responsible for reducing emissions from stationary (area and point), mobile, and indirect sources. It has responded to this requirement by preparing a sequence of Air Quality Management Plans (AQMPs). An AQMP establishes a program of rules and regulations directed at attaining the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The regional plan applicable to the Project is the SCAQMD's AQMP.

On December 7, 2012, the SCAQMD adopted the 2012 AQMP, which is a regional and multi-agency effort (SCAQMD, CARB, SCAG, and USEPA). The 2012 AQMP incorporates the latest scientific and technical information and planning assumptions, including SCAG's 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS); updated emission inventory methodologies for various source categories; and SCAG's latest growth forecasts (SCAQMD 2013a). On December 20, 2012, the 2012 AQMP was submitted to CARB and the USEPA for concurrent review and approval for inclusion in the SIP (SCAQMD 2013a). The 2012 AQMP was approved by the CARB on January 25, 2013 (CARB 2013a).

4.3.2 Greenhouse Gases

Beginning in April 2008, the SCAQMD convened a Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. The Working Group is scheduled to meet once per month. On December 5, 2008, the SCAQMD Governing Board adopted its staff proposal for an interim CEQA GHG significance threshold of 10,000 metric tons of CO_2 equivalent per year (MTCO2e /yr) for projects where the SCAQMD is the lead agency. The policy objective for establishing this significance threshold and the recommended screening thresholds, below, is to capture projects that represent approximately 90 percent of GHG emissions from new sources (SCAQMD 2008a). These projects would be subject to further analysis and the incorporation of measures to reduce GHG emissions.

In September 2010, the Working Group presented a revised tiered approach to determining GHG significance for residential and commercial projects (SCAQMD 2010). These proposals have not yet been considered by the SCAQMD Board.

At Tier 1, GHG emissions impacts would be less than significant if the project qualifies under a categorical or statutory CEQA exemption. At Tier 2, for projects that do not meet the Tier 1 criteria, the GHG emissions impact would be less than significant if the project is consistent with a previously adopted GHG reduction plan that meets specific requirements. At Tier 3, the Working Group proposes extending the 10,000 metric tons of carbon dioxide equivalent per year ($MTCO_2e$/yr) screening threshold currently applicable to industrial projects where the SCAQMD is the lead agency, described above, to other lead agency industrial projects. For residential and commercial projects, the Working Group proposes the following Tier 3 screening values: either (1) a single 3,000 $MTCO_2e$/yr threshold for all land use types or (2) separate thresholds of 3,500 $MTCO_2e$/yr for residential projects, 1,400 $MTCO_2e$/yr for commercial projects, and 3,000 $MTCO_2e$/yr for mixed-use projects. A project with emissions less than the applicable screening value would be considered to have less than significant GHG emissions.

4.4 CLIMATE AND METEOROLOGY

The Project site is located in the SoCAB, which is arid with little rainfall and abundant sunshine during the summer months. It has light winds and poor vertical mixing compared to the other large urban areas in the United States. The combination of poor dispersion and abundant sunshine provides conditions especially favorable to the formation of photochemical smog. The SoCAB is bound to the north and east by mountains with elevations exceeding 10,000 feet above msl. The unfavorable combination of meteorology, topography, and emissions from the nation's second largest urban area (i.e., Los Angeles metropolitan area) results in the SoCAB having the worst air quality in the U.S. (SCAQMD 2007).

The annual average maximum temperature as measured at the Sierra Madre Henszey climatic station is 75.3°F. The highest monthly average maximum temperature (88.5°F) occurs in August, and the lowest monthly average minimum temperature (45.1°F) occurs in January. The average annual precipitation is 24.01 inches (WRCC 2013).

4.5 EXISTING AIR QUALITY

4.5.1 Criteria Pollutants

Attainment Designations

Attainment designations are discussed in Sections 4.1.1 and 4.2.1 and Table 4. The SoCAB is a federal and State nonattainment area for O_3 and PM2.5. The SoCAB is also a State nonattainment area for PM10.

Monitored Air Quality

Criteria air pollutant concentrations are measured at several monitoring stations in Los Angeles County. The closest station to the Project site is identified as the Azusa Monitoring Station, located at 803 North Loren Avenue approximately 7 miles southeast of the Project site. Equipment at the station measures O_3, PM10, PM2.5, CO, and NO_2 levels. Table 5 summarizes the air quality data from this station for the most recent three-year period (2011–2013).

The data show violations of the federal and State 8-hour O_3 standards and the 1-hour O_3 State standard in each year. The levels of CO and NO_2 did not exceed State or federal standards in the last three years. PM10 levels exceeded the State 24 hour and annual standards in each of the three years. PM2.5 levels exceeded the federal 24 hour standard in 2011 and 2012.

TABLE 5
AMBIENT AIR QUALITY AT AZUSA MONITORING STATION

Pollutant	Averaging Time	Federal Primary Standards	California Standards	Maximum Concentrations[a]			Number of Days Exceeding Federal Standard[b]			Number of Days Exceeding State Standard[b]		
				2011	2012	2013	2011	2012	2013	2011	2012	2013
O_3 [c]	1 hour	none	0.09 ppm	0.111	0.134	0.115	-	-	-	13	18	7
	8 hour	0.075 ppm	0.07 ppm	0.092	0.095	0.085	12	10	6	19	20	15
PM2.5	24 hours	35 µg/m^3	none	94.6	39.6	29.6	2	1	0	-	-	-
	Annual	15 µg/m^3	12 µg/m^3	12.1	11.0	11.5	0	0	0	0	0	0
PM10	24 hours	150 µg/m^3	50 µg/m^3	65.0	78.0	76	0	0	0	8	6	6
	Annual	none	20 µg/m^3	31.9	29.6	32.3	0	0	0	1	1	1
CO	8 hour	9 ppm	9.0 ppm	1.36	1.13	*	0	0	*	0	0	*
NO_2	1 hour	0.100 ppm	0.18 ppm	0.080	0.072	0.077	0	0	0	0	0	0
	Annual	0.053 ppm	0.030 ppm	*	0.019	0.017	0	0	0	0	0	0

O_3: ozone; ppm: parts per million; *****: there was insufficient data to determine the value; –: data not available or applicable; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; µg/m^3: micrograms per cubic meter; PM10: respirable particulate matter with a diameter of 10 microns or less; CO: carbon monoxide; NO_2: nitrogen dioxide.

[a] Concentration units for O_3, CO, and NO_2 are in ppm. Concentration units for PM2.5 are in µg/m^3.
[b] For annual standards, a value of 1 indicates that the standard has been exceeded.
[c] O_3 data are recorded separately for federal and State purposes because USEPA and California methods are slightly different. Federal values are shown.

Source: CARB 2014b.

4.5.2 Toxic Air Contaminants

The Multiple Air Toxics Exposure Study III (MATES III) is a monitoring and evaluation study conducted in the SoCAB and is part of the SCAQMD Governing Board's 2003–2004 Environmental Justice Workplan. The study focuses on the carcinogenic risk from exposure to air toxics. It does not estimate mortality or other adverse health effects from particulate exposures.

The MATES III Study consists of several elements, including a monitoring program; an updated emissions inventory of toxic air contaminants; and a modeling effort to characterize risk across the SoCAB. The MATES III study estimates that the average carcinogenic risk from air toxics in the SoCAB is about 1,200 per 1 million. This risk refers to the expected number of additional cancers in a population of 1 million individuals that are exposed over a 70-year lifetime. Using the MATES III methodology, about 94 percent of the risk is attributed to emissions associated with mobile sources, and about 6 percent of the risk is attributed to toxics emitted from stationary sources, which include industries and businesses such as dry cleaners and chrome plating operations. The results indicate that diesel exhaust is the major contributor to air toxics risk and accounts on average for about 84 percent of the total (SCAQMD 2008b).

The MATES III study used monitored data to model risk throughout the SoCAB. The modeled carcinogenic risk for the area, including the project site is 174 per 1 million, which is substantially less than the SoCAB average of about 1,200 per 1 million (SCAQMD 2008c).

5.0 REGULATORY REQUIREMENTS

RR AQ-1 All construction activities shall be conducted in compliance with South Coast Air Quality Management District Rule 403, Fugitive Dust, for controlling fugitive dust and avoiding nuisance. Compliance with this rule will reduce short-term particulate pollutant emissions. Contractor compliance with Rule 403 requirements shall be mandated in the contractor's specifications.

RR AQ-2 All construction activities shall be conducted in compliance with South Coast Air Quality Management District Rule 402, Nuisance, which states that a Project shall not "discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property".

6.0 AIR QUALITY IMPACTS

6.1 THRESHOLDS OF SIGNIFICANCE

6.1.1 Criteria and Toxic Air Pollutants

The following significance criteria are included in Appendix G of the State CEQA Guidelines. The project may result in a significant impact related to air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Appendix G of the State CEQA Guidelines states that the significance criteria established by the applicable air quality management or air pollution control LACFCD may be relied upon to make the above determinations. The SCAQMD has established significance thresholds to assess the regional and localized impacts of project-related air pollutant emissions. The significance thresholds are updated, as needed, to appropriately represent the most current technical information and attainment status in the SoCAB. Table 6 presents the most current significance thresholds, including regional daily thresholds for short-term construction and long-term operational emissions; maximum incremental cancer risk and hazard indices for TACs; and maximum ambient concentrations for exposure of sensitive receptors to localized pollutants. A project with daily emission rates, risk values, or concentrations below these thresholds is generally considered to have a less than significant effect on air quality.

TABLE 6
SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds (lbs/day)		
Pollutant	**Construction**	**Operation**
VOC	75	55
NOx	100	55
CO	550	550
PM10	150	150
PM2.5	55	55
SOx	150	150
Lead	3	3
Toxic Air Contaminants		
TACs[a]	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to Rule 402	
GHG	10,000 MT/yr CO_2e for industrial facilities	
Ambient Air Quality For Criteria Pollutants[b]		
NO_2	1-hour average ≥ 0.18 ppm Annual average ≥ 0.03 ppm	
CO	1-hour average ≥ 20.0 ppm (State) 8-hour average ≥ 9.0 ppm (State/federal)	
PM10	24-hour average ≥ 10.4 µg/m^3 (construction) 24-hour average ≥ 2.5 µg/m^3 (operation) Annual average ≥ 1.0 µg/m^3	
PM2.5	24-hour average ≥ 10.4 µg/m^3 (construction) 24-hour average ≥ 2.5 µg/m^3 (operation)	
Sulfate	24-hour average ≥ 1.0 µg/m^3	

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SOx: sulfur oxides; TACs: toxic air contaminants; GHG: greenhouse gas emissions; MT/yr: metric tons per year; CO_2e: carbon dioxide equivalent; NO_2: nitrogen dioxide; ppm: parts per million; µg/m^3: micrograms per cubic meter.

[a] TACs (carcinogenic and noncarcinogenic)
[b] Ambient air quality threshold based on SCAQMD Rule 403.

Source: SCAQMD 2011a.

6.2 METHODOLOGY

6.2.1 Construction Mass Emissions

Construction emissions were calculated by using California Emissions Estimator Model (CalEEMod) version 2013.2.2 (SCAQMD 2013b). CalEEMod is a computer program accepted by the SCAQMD that can be used to estimate anticipated emissions associated with land development projects in California. CalEEMod has separate databases for specific counties and air districts. The Los Angeles County database was used for the Project. The model calculates emissions of CO, PM10, and PM2.5 and the O_3 precursors VOC and NOx.[4] The results are expressed in pounds per day (lbs/day) and are compared with the SCAQMD mass daily thresholds to determine impact significance.

[4] CalEEMod also calculates emissions of lead, SO_2, CO_2, and other pollutants. Lead and SO_2 emissions data are not used for the Project because emissions of these pollutants would be negligible.

Specific inputs to CalEEMod include land uses and building areas. Construction input data include but are not limited to (1) the anticipated start and finish dates of each project construction activity (e.g., demolition, grading, building, and paving); (2) inventories of construction equipment to be used during each activity; (3) areas to be excavated and graded for development; (4) volumes of materials to be exported from and imported to the project area; and (5) areas to be paved. The input data and assumptions are discussed in Section 6.3.1 below and in Appendix A. The CalEEMod model has the capability to calculate reductions in construction emissions from the effects of dust control, diesel-engine classifications, and other selected emissions reduction measures. CalEEMod was developed using EMFAC 2011 and OFFROAD 2011 for calculating emissions from on-road vehicles and off-road construction equipment, respectively.

6.2.2 Local Concentrations of Criteria Pollutants From On-Site Emissions

As part of the SCAQMD's environmental justice program, more attention has been focused on localized air quality effects. In addition to existing CEQA significance thresholds for mass daily emissions and regional conditions, the SCAQMD has established thresholds for ambient air quality (Table 4) to address localized impacts. Also, while regional impact analysis is based on attaining or maintaining regional emissions standards, localized impact analysis compares the concentration of a pollutant at a receptor site to a health-based standard.

SCAQMD staff then developed localized significance threshold (LST) methodology and mass rate look-up tables by source receptor area (SRA) that can be used by public agencies to determine whether a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standard; they are developed based on the ambient concentrations of that pollutant for each SRA (SCAQMD 2008d). The LST methodology translates the concentration standards into emissions thresholds that are a function of project site area, source to receptor distance, and the location within the SoCAB. The LST methodology is recommended to be limited to projects of five acres or less and to avoid the need for complex dispersion modeling. The method was used for the project because construction near any individual receptor would occur in an area of less than five acres.

The local concentration analysis is performed for project construction activities. The analysis is not performed for operations because there would be no substantial on-site long-term sources of pollutants.

6.3 AIR QUALITY IMPACT ANALYSIS

6.3.1 Conformance to Federal and State Ambient Air Quality Standards

Construction Emissions

Table 7, Project Construction Schedule, shows the projected construction start dates and duration for the various Project components. As shown in Table 7, construction of the Project is anticipated to commence in the winter of 2015 and end in the fall of 2016. Certain elements of each Project component would likely not be performed during the wet season (October to April) in order to ensure flood control and water conservation efforts can proceed satisfactorily. While the schedule may be modified due to the date of Project approval and receipt of required permits, this table illustrates the approximate duration of major Project activities. As shown, it is anticipated that work would proceed at multiple facilities at one time.

It is possible that the Debris Dam construction would require longer than the 6-month time period shown in Table 7. If the construction period of the Debris Dam were to be extended, this would spread out the construction activities over a longer period of time, resulting in less "intensity" of impacts. All Project-related impacts would be less than significant (some requiring mitigation), and extending the duration of construction activities at the Debris Dam would not increase the level of significance. Decreasing the intensity and spreading out construction activities would generally reduce impacts. Therefore, in order to provide a more conservative impact analysis, the more condensed construction period for the Debris Dam, as shown in Table 7, has been assumed throughout this analysis.

TABLE 7
PROJECT CONSTRUCTION SCHEDULE

Construction Phase	Estimated Construction Start	Anticipated Duration
Dam	**December 2015**	10 months
Armor Canyon/Dam	December 2015	2 weeks
Garage, Helipad, Water System	December 2015	6 weeks
Remove/Replace Jib Crane	February 2016	2 weeks
Repair Concrete	February 2016	2 weeks
Hoist	March 2016	4 weeks
Construct New Spillway	April 2016	6 months
Install Valves	April 2016	2 weeks
Electrical	April 2016	4 weeks
Headworks and Wilderness Park Culvert Crossing	**March 2016**	**6 months**
Headworks Demolition	March 2016	1 week
Rubber Dam	March 2016	1 week
Construct Levee	March 2016	2 weeks
Culvert Crossing Demolition	April 2016	2 weeks
Site Clear/Grub	April 2016	4 weeks
Grading/Implement Temporary Access	May 2016	2 weeks
Abutments and Wing Walls	June 2016	4 weeks
Construct Culvert Crossing Deck	July 2016	6 weeks
Paving Culvert Crossing	August 2016	2 weeks
Debris Dam	**April 2016**	**6 months**
Modify Spillway	April 2016	2 months
Construct Buttresses	June 2016	2.5 months
Construct New Subdrain	August 2016	1 month
Remove/Construct Outlet Tower(s)	September 2016	2 weeks

Trip generation for employees and delivery trucks would vary depending on the phase of construction. During the peak of construction, a typical day would include the transportation of workers; movement of heavy equipment; and transportation of materials. Detailed construction equipment and trip generation are shown in Table 8.

TABLE 8
ESTIMATED PROJECT CONSTRUCTION EQUIPMENT AND TRIP GENERATION

Construction Phase	Offroad Equipment	Worker Trips[a]	Truck Trips[a]
Dam			
Armor Canyon/Dam	1 Concrete Pump	3	500
Garage, Helipad, Water System	1 Concrete Pump, 1 Loader/Backhoe	5	10
Remove/Replace Jib Crane	1 Crane	3	5
Repair Concrete	1 Concrete Pump	3	5
Hoist	1 Crane	3	10
Construct New Spillway	1 Backhoe, 1 Concrete Pump, 1, Crane, 1 Loader, 1 Concrete Saw	8	56
Install Valves	1 Crane	3	5
Electrical	1 Crane	3	10
Headworks and Wilderness Park Culvert Crossing			
Headworks Demolition	1 Concrete Saw, 1 Excavator, 1 Backhoe	5	10
Rubber Dam	2 Backhoes	3	3
Construct Levee	1 Backhoe, 1 Concrete Pump	3	19
Culvert Crossing Demolition	1 Concrete Saw, 1 Excavator, 1 Backhoe	5	14
Site Clear/Grub	1 Backhoe	3	210
Grading/ Implement Temporary Access	2 Backhoes	5	--
Abutments and Wing Walls	2 Concrete Pumps	4	46
Construct Culvert Crossing Deck	1 Concrete Pump	3	18
Paving Culvert Crossing	1 Roller	3	15
Debris Dam			
Modify Spillway	1 Concrete Pump, 1 Concrete Saw, 1 Drilling Rig	4	63
Dam			
Construct Buttresses[b]	1 Excavator, 1 Dozer, 1 Backhoe, 1 Loader, 1 Water Truck	5	4,063
Construct New Subdrain	2 Loaders	3	157
Remove Outlet Tower	2 Backhoes, 1 Water Truck	3	5

[a] All trips are round trips.

[b] The 4,063 number of trips was estimated based on 65,000 cubic yards of material required for the buttressing, assuming use of 16 cubic yard trucks occurring over 55 workdays (i.e. 2.5 months). Approximately half of this material (32,500 cubic yards) is estimated to be harvested from the adjacent Sediment Placement Site (SPS); therefore, the first 27 workdays (i.e. 5 weeks) of the sediment/fill truck trips would occur on-site between the SPS and the Debris Dam, and would not affect local residential roadways. Once fill from the SPS is exhausted, the remaining fill amount would be imported to the Debris Dam site, requiring off-site trucking for approximately 5 weeks.

Emissions were calculated using the CalEEMod emissions inventory model (SCAQMD 2013b). Dust control by watering was assumed, consistent with the requirements of SCAQMD Rule 403 (RR AQ-1). The quantity, duration, and the intensity of construction activity have an effect on the

amount of construction emissions and their related pollutant concentrations that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of (1) a more modern and cleaner-burning construction equipment fleet mix, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval).

Mass Emissions Thresholds

The results of the criteria pollutant calculations for project construction are shown in Table 9. The data are presented as the maximum anticipated daily emissions for comparison with the SCAQMD mass daily thresholds.

TABLE 9
ESTIMATED MAXIMUM DAILY CONSTRUCTION EMISSIONS (LBS/DAY)

Year	VOC	NOx	CO	PM10	PM2.5
Maximum daily emissions in 2015	4	46	35	3	2
Maximum daily emissions in 2016	8	92	73	9	5
SCAQMD Thresholds (Table 4)	*75*	*100*	*550*	*150*	*55*
Exceed Threshold?	***No***	***No***	***No***	***No***	***No***
VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management LACFCD.					

Based on the anticipated Project phasing and equipment, the estimated peak day (worst case) emissions of all pollutants—VOC, NOx, CO, PM10, and PM2.5—would occur during the approximate one month period in 2016 when construction of the Dam spillway is assumed to be concurrent with construction of the Debris Dam buttresses and the construction of the Culvert Crossing abutments and wing walls. This scenario, which represents the overlap of activities that would result in the reasonably worst case for NOx emissions, is detailed below:

Dam Spillway

- *Off-road equipment:* 1, backhoe, 1 concrete pump, 1 crane, 1 loader, 1 concrete saw
- *On-road equipment:* 56 concrete/material truck round trips over a 6-month period
- *Worker trips:* 8 daily round trips

Culvert Crossing Abutments and Wing Walls

- *Off-road equipment:* 2 concrete pumps
- *On-road equipment:* 46 material truck round trips in a one month period
- *Worker trips:* 4 daily round trips

Debris Dam Buttresses

- *Off-road equipment:* 1 excavator, 1 dozer, 1 backhoe, 1 loader, 1 water truck
- *On-road equipment:* 4,063 material truck round trips over a 2 ½ month period
- *Worker trips:* 5 daily round trips

As shown in Table 9, all criteria pollutant emissions would be less than their respective SCAQMD thresholds. . Emissions from proposed construction would not violate any air quality standard or substantially contribute to an existing or projected air quality violation. Impacts would be less than significant and no mitigation is required.

Ambient Air Quality – Local Significance Thresholds

The localized effects from the on-site portion of daily emissions were evaluated at sensitive receptor locations potentially impacted by the Project according to the SCAQMD's localized significance threshold (LST) methodology, which utilizes on-site mass emissions rate look up tables and Project-specific modeling, where appropriate. LSTs are applicable to the following criteria pollutants: NO_2, CO, PM10, and PM2.5. LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor. For PM10 and PM2.5, LSTs were derived based on requirements in SCAQMD Rule 403, Fugitive Dust. The mass rate look-up tables were developed for each source receptor area and can be used to determine whether or not a project may generate significant adverse localized air quality impacts. SCAQMD provides LST mass rate look-up tables for projects that are less than or equal to five acres.

When quantifying mass emissions for localized analysis, only emissions that occur on-site are considered. Consistent with the SCAQMD Localized Significance Threshold (LST) methodology guidelines, emissions related to off-site delivery/haul truck activity and employee trips are not considered in the evaluation of localized impacts. The LSTs for a 1-acre site with receptors at a distance of 25 meters were used; these are the most conservative thresholds. As shown in Table 10, localized emissions for all criteria pollutants would remain below their respective SCAQMD LSTs for all pollutants. Thus, impacts would be less than significant and no mitigation is required.

TABLE 10
LOCAL SIGNIFICANCE THRESHOLD EMISSIONS

	NOx	**CO**	**PM10**	**PM2.5**
	Emissions (lbs/day)			
Dam	20	13	1	1
Wilderness Park Culvert Crossing	11	8	1	1
Debris Dam	19	14	3	2
Headworks	11	8	1	1
LST Thresholds	*89*	*623*	*5*	*3*
Exceed Threshold?	***No***	***No***	***No***	***No***

lbs/day: pounds per day; NOx: nitrogen oxides; CO: carbon monoxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; LST: Local Significance Threshold.

Source: SCAQMD 2009.

Operational Emissions

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Dam, Headworks, or Debris Dam. The helipad at the Dam would be used only in the event of an emergency. It is expected that helipad operations would only result in one or two helicopter trips per year. Therefore, any Project-generated change in pollutant emissions would be nominal. Impacts would be less than significant.

Summary

Construction mass emissions of criteria pollutants would be less than the SCAQMD CEQA significance thresholds. On-site construction emissions would not exceed SCAQMD emissions thresholds related to local concentration limits. Operational emissions would be less than the SCAQMD CEQA significance thresholds. Construction and operational emissions would be less than significant.

6.3.2 Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

Carbon Monoxide Hotspots

A CO hotspot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. If a project increases average delay at signalized intersections operating at level of service (LOS) E or F or causes an intersection that would operate at LOS D or better without the project to operate at LOS E or F with the project, a quantitative screening is required.

As discussed previously, the project would not generate new traffic. Therefore, the project is not anticipated to increase congestion at major signalized intersections in the area. There would be no impact and no exposure of sensitive receptors to project-generated local CO emissions. Mitigation is not required.

Criteria Pollutants From On-Site Construction

As described in the Ambient Air Quality – Local Significance Thresholds discussion in Section 6.3.1, project construction would not expose sensitive receptors to emissions that would exceed the applicable 1-hour and 24-hour ambient air quality standards.

Toxic Air Contaminants

Pollutants Generated On Site

The greatest potential for TAC emissions during construction would be related to diesel particulate emissions associated with heavy equipment operations during earth-moving activities. The SCAQMD does not consider diesel-related cancer risks from construction equipment to be an issue due to the short-term nature of construction activities, by definition. Construction activities associated with the Project would be sporadic, transitory, and short term in nature (no more than two years). The assessment of cancer risk is typically based on a 70-year exposure period. Because exposure to diesel exhaust would be well below the 70-year exposure period, construction of the Project is not anticipated to result in an elevated cancer risk to exposed persons due to the short-term nature of construction. As such, Project-related toxic emission impacts during construction would not be significant and no mitigation is required.

6.3.3 Cumulatively Considerable Net Increase of Nonattainment Criteria Pollutants

The region is a federal and/or State nonattainment area for PM10, PM2.5, and O_3. The project would contribute particulates and the O_3 precursors VOC and NOx to the area during short-term project construction. As described in Section 6.3.1, regional emissions during construction would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Construction emissions would be less than the SCAQMD CEQA significance thresholds (Table 9). Therefore, regional construction emissions would not be cumulatively considerable, and the impact would be less than significant.

With respect to local impacts, cumulative construction particulate impacts are considered when projects may be within a few hundred yards of each other. No projects have been identified in the vicinity of the project site that would be under construction concurrently with the Project. Further, as shown in Table 10, local emissions from the Project would be less than half of the screening thresholds. Therefore, local construction emissions would not be cumulatively considerable, and the impact would be less than significant.

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Santa Anita Dam, Headworks, or Debris Dam. Therefore, there would be no Project-generated change in pollutant emissions. The long-term cumulative impact would be less than significant.

6.3.4 Air Quality Management Plan Conformance

The main purpose of an AQMP is to bring an area into compliance with the requirements of federal and State air quality standards. For a project to be consistent with the AQMP, the pollutants emitted from the project should not exceed the SCAQMD CEQA air quality significance thresholds or cause a significant impact on air quality. As shown above, pollutant emissions from the Project would be less than the SCAQMD thresholds and would not result in a significant impact. Further, the Project, being structural improvements to existing facilities without changes in operations, would not result in development that may not have been anticipated in the AQMP. No conflict with the 2012 AQMP would occur with the Project.

6.3.5 Odors

Project construction equipment and activities would generate odors. Potential construction odors include diesel exhaust emissions and paving operations. There may be situations where construction activity odors will be noticeable by persons working at or visiting nearby facilities, but these odors would not be unfamiliar or necessarily objectionable. The odors would be temporary and would dissipate rapidly from the source with an increase in distance. Therefore, the impacts would be short-term; would not be objectionable to a substantial number of people; and would be less than significant. Long-term odors would be the same as for the existing conditions. There would be no impact.

7.0 GREENHOUSE GAS EMISSIONS IMPACTS

7.1 THRESHOLDS OF SIGNIFICANCE

7.1.1 Greenhouse Gas Emissions

Because the magnitude of global GHG emissions is extremely large when compared with the emissions of typical local infrastructure projects, it is accepted as very unlikely that any individual project would have GHG emissions of a magnitude to directly impact global climate change. CAPCOA's *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act* states, "GHG impacts are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective" (CAPCOA 2008). As noted in the CNRA's *Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97,* "Due to the global nature of GHG emissions and their potential effects, GHG emissions will typically be addressed in a cumulative impacts analysis" (CNRA 2009). Therefore, the GHG impact analysis represents the cumulative impact analysis for the project related to GHG emissions.

The following significance criteria are from Appendix G of the State CEQA Guidelines. These significance criteria are used as the thresholds of significance to determine whether project impacts would be significant and unavoidable or less than significant. The project would result in a significant impact related to GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

There are no established federal, State, or local quantitative thresholds applicable to the project to determine the quantity of GHG emissions that may have a significant effect on the environment. CARB, the SCAQMD, and various cities and agencies have proposed, or adopted on an interim basis, thresholds of significance or threshold levels that require the implementation of GHG emission reduction measures. Because the Project is not a residential or commercial land use development project, the SCAQMD adopted interim threshold of 10,000 $MTCO_2e$ for industrial projects is considered (SCAQMD 2008a).

7.2 METHODOLOGY

7.2.1 Amortization of Construction GHG Emissions

Because GHG emission reduction measures for construction equipment are relatively limited, SCAQMD, in its *Draft Guidance Document – Interim CEQA GHG Significance Thresholds,* recommends that construction emissions be amortized over a 30-year project lifetime and considered to be an element of operational emissions (SCAQMD 2008a).

7.3 GREENHOUSE GAS IMPACT ANALYSIS

7.3.1 Calculated Greenhouse Gas Emissions

Construction Emissions

GHGs would be emitted by off-road and on-road construction equipment and worker vehicles. Construction emissions were calculated using CalEEMod, as described in the Methodology section (Section 6.2). The details of phasing, selection of construction equipment, and other input parameters are included in Section 6.3.1 and Appendix A of this report. GHGs for each phase of construction are shown in Table 11. The 30-year amortized GHGs from project construction are estimated at 23 $MTCO_2e$.

TABLE 11
ESTIMATED GHG EMISSIONS FROM PROJECT CONSTRUCTION

Phase and Year	Emissions ($MTCO_2e$)
2015	43
2016	604
Total	**648**
Annual Emissions*	**22**

$MTCO_2e$: metric tons of carbon dioxide equivalent

Total does not add due to rounding.

* Combined total amortized over 30 years

Operational Emissions

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Santa Anita Dam, Headworks, or Debris Dam. Helipad operations would only result in one or two helicopter trips per year. Therefore, any Project-generated change in GHG emissions would be nominal.

As described in Section 6.2.3 (Methodology), the impact of construction emissions is considered by amortizing the emissions over an assumed 30-year project lifetime. Therefore, the increase in long-term GHG emissions would be approximately 22 $MTCO_2e$ per year. This value is substantially less than the threshold of 10,000 $MTCO_2e$ per year that has been proposed by SCAQMD. The project GHG emissions would not be cumulatively considerable, and the impact would be less than significant. No mitigation measures would be required.

7.3.2 Conformance with Applicable Plans, Policies, and Regulations

As discussed above, the principal State plan and policy adopted for the purpose of reducing GHG emissions is AB 32. The quantitative goal of AB 32 is to reduce GHG emissions to 1990 levels by 2020. Statewide plans and regulations, such as GHG emissions standards for vehicles and the Low Carbon Fuel Standard, are being implemented at the statewide level, and compliance at the specific plan or project level is not addressed. Therefore, the Project does not conflict with these plans and regulations.

The Project would contribute to regional efforts to reduce dependence on imported water supplies by providing increased opportunities to recharge storm flows emanating from the Santa Anita Canyon Watershed. The Project has been identified as a regional-level project that could help to

increase recharge of the local groundwater basin and thereby increase local water supplies. Thus, the Project would reduce the GHG emissions associated with importing water from outside of the LACFCD.

As the Project does not conflict with State or County plans and regulations, it would result in a less than significant impact.

8.0 REFERENCES

California Air Pollution Control Officers Association (CAPCOA). 2008 (January). *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.* Sacramento, CA: CAPCOA. http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-White-Paper.pdf.

California Air Resources Board (CARB). 2014 (March 24, last updated). California Greenhouse Gas Inventory for 2000–2012 — by Category, as Defined in the 2008 Scoping Plan. Sacramento, CA: CARB. http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-12_2014-03-24.pdf.

———. 2013a (January 29, last reviewed). Board Meetings. Sacramento, CA: CARB. http://www.arb.ca.gov/board/meetings.htm#future

———. 2014b (September 26, access date). Air Quality Data Statistics. Sacramento, CA: CARB. http://www.arb.ca.gov/adam/topfour/topfour1.php.

———. 2013c (June 7). Ambient Air Quality Standards. Sacramento, CA: CARB. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

———. 2012b (May 21, last reviewed) Standards and Area Designations. Sacramento, CA: CARB. http://www.arb.ca.gov/desig/ 2012statedesig.htm.

———. 2011. Status of Scoping Plan Recommended Measures. Sacramento, CA: CARB. http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf.

———. 2010a (April 19, last reviewed). Health Effects of Diesel Exhaust. Sacramento, CA: CARB. http://www.arb.ca.gov/research/diesel/diesel-health.htm.

———. 2010b (May 12, last updated). California Greenhouse Gas Inventory for 2000-2008 – by Category as Defined in the Scoping Plan. Sacramento, CA: CARB. http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-08_2010-05-12.pdf.

———. 2010c (October 4, last reviewed). Clean Car Standards – Pavley, Assembly Bill 1493. Sacramento, CA: CARB. http://www.arb.ca.gov/cc/ccms/ ccms.htm.

———. 2008 (December). *Climate Change Scoping Plan, a Framework for Change*. Sacramento, CA: CARB.

———. 2007 (November 28). Letter to Mr. Wayne Nastri, USEPA, submitting revisions to the California State Implementation Plan, including revisions identified as the 2007 South Coast SIP. Sacramento, CA: CARB. http://www.arb.ca.gov/planning/sip/ 2007sip/southcoast/scsipsubltr.pdf.

California Climate Action Registry (CCAR). 2009 (January). *California Climate Action Registry General Reporting Protocol* (Version 3.1). Los Angeles, CA: CCAR.

California Energy Commission (CEC). 2007. *2007 Integrated Energy Policy Report* (CEC-100-2007-008-CMF). Sacramento, CA: CEC.

———. 2006 (December). *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004* (Staff Final Report, Publication CEC-600-2006-013-SF). Sacramento, CA: CEC. http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF.

California Natural Resources Agency (CNRA). 2009 (December). *Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97.* Sacramento CA: CNRA. http://ceres.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf.

Intergovernmental Panel on Climate Change (IPCC). 2007 (February). *Climate Change 2007: The Physical Science Basis. Summary for Policymakers* (Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change). Boulder, CO: IPCC, Working Group I.

National Aeronautics and Space Administration, Goddard Institute for Space Studies (NASA). 2011 (January 12). *NASA Research Finds 2010 Tied for Warmest Year on Record.* http://www.giss.nasa.gov/research/news/20110112/.

South Coast Air Quality Management District (SCAQMD). 2013a (updated April 17). 2012 Air Quality Management Plan. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/aqmp/2012aqmp/index.htm.

———. 2013b. California Emission Estimator Model (CalEEMod)™ Version 2013.2.2 Developed by Environ International Corporation in Collaboration with SCAQMD and other California Air LACFCDs. Diamond Bar, CA: SCAQMD.

———. 2011a (March). *SCAQMD Air Quality Significance Thresholds*. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/ceqa/ handbook/signthres.pdf.

———. 2010 (September 28). Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group Meeting #15 (slide presentation). Diamond Bar, CA. SCAQMD. http://www.aqmd.gov/ceqa/handbook/GHG/ 2010/sept28mtg/ghgmtg15-web.pdf.

———. 2009 (October 21). Appendix C to *Final Localized Significance Threshold Methodology*. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/ceqa/handbook/LST/appC.pdf.

———. 2008a (October). *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Thresholds*. Diamond Bar, CA: SCAQMD.

———. 2008b (September). *Final Report, Multiple Air Toxics Exposure Study in the South Coast Air Basin, MATES III September 2008*, Executive Summary. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/prdas/matesIII/ Final/Document/ab-MATESIIIExecutive Summary-Final92008.pdf.

———. 2008c. Multiple Air Toxics Exposure Study III Model Estimated Carcinogenic Risk. Diamond Bar, CA: SCAQMD. http://www2.aqmd.gov/webappl/matesiii/.

———. 2008d (July, as revised). *Final Localized Significance Threshold Methodology*. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/ceqa/handbook/ LST/Method_final.pdf.

———. 2007 (June 1, adopted). *Final 2007 Air Quality Management Plan*. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/aqmp/07aqmp/aqmp/Complete_Document.pdf.

———. 1993 (as amended). *CEQA Air Quality Handbook*. Diamond Bar, CA: SCAQMD.

———. 1976a (May 7, adopted). Rule 402: Nuisance. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/rules/reg/reg04/r402.pdf. (SCAQMD 1976)

———. 1976b (May, as amended through 2005). Rule 403: Fugitive Dust. Diamond Bar, CA: SCAQMD. http://www.aqmd.gov/rules/reg/reg04/r403.pdf.

Southern California Association of Governments (SCAG). 2011 (December). Draft Program Environmental Impact Report [for the] 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (Section 3.6, Greenhouse Gas Emissions). Los Angeles, CA: SCAG. http://rtpscs.scag.ca.gov/Pages/Draft-2012-PEIR.aspx.

———. 2008 (January). *Draft 2008 Regional Transportation Plan Program Environmental Report* (Chapter 3.2 Air Quality). Los Angeles, CA: SCAG. http://www.scag.ca.gov/RTPpeir2008/draft/index.htm.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Earth System Research Laboratory, Global Monitoring Division (ESRL) 2014 (Accessed September 24). Trends in Atmospheric Carbon Dioxide. Boulder, CO: ESRL. http://www.esrl.noaa.gov/gmd/ccgg/trends/.

U.S. Environmental Protection Agency (USEPA). 2014 (February). Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2012. Washington, D.C.: USEPA. http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html.

———. 2013a (Accessed February 7). National Ambient Air Quality Standards. Washington, D.C.: USEPA. http://www.epa.gov/air/ criteria.html

———. 2013b (last updated February 4). Status of Nonattainment Area and Ozone Transport Region SIP Requirements. Washington, D.C.: USEPA. http://www.epa.gov/air/urbanair/ sipstatus/nonattainment.html.

———. 2013c (Accessed March 11). What Are the Six Common Air Pollutants? Washington, D.C.: USEPA. http://www.epa.gov/airquality/urbanair/.

———. 2013d (June 26). Approval and Promulgation of Implementation Plans; Designation of Areas for Air Quality Planning Purposes; California; South Coast Air Basin; Approval of PM_{10} Maintenance Plan and Redesignation to Attainment for the PM_{10} Standard. *Federal Register* 78(123): 38223–38226). Washington, D.C.: USEPA.

———. 2012 (July). The Green Book Nonattainment Areas for Criteria Pollutants. Washington, D.C.: USEPA. http://www.epa.gov/oar/oaqps/greenbk/index.html.

———. 2011a (January 12). USEPA Technology Transfer Network National Air Toxics 2005 National-Scale Air Toxics Assessment Glossary of Key Terms. Washington, D.C.: USEPA. http://www.epa.gov/ttn/atw/ natamain/gloss1.html.

———. 2011b. *Climate Change Indicators in the United States*. Washington, D.C.: USEPA. http://www.epa.gov/climatechange/indicators.html.

———. 2010a (April). Inventory of US Greenhouse Gas Emissions and Sinks 1990–2008. Washington, D.C.: USEPA. http://www.epa.gov/climatechange/emissions/usinventoryreport.html.

———. 2010b (April 24, last update). Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. Washington, D.C.: USEPA. http://epa.gov/climatechange/endangerment.html.

———. 1980 (February). AP 42, Fifth Edition – Compilation of Air Pollutant Emission Factors (Section 13.3, Explosives Detonation). Washington, D.C.: USEPA. http://www.epa.gov/ttn/chief/ap42/ch13/index.html.

Western Regional Air Partnership (WRAP). 2006. Fugitive Dust Handbook. Washington, D.C.: WRAP. http://www.wrapair.org/forums/dejf/fdh/index.html.

World Resources Institute (WRI). 2012. Climate Analysis Indicators Tool (CAIT) version 7.0. Washington, D.C.: WRI. http://cait.wri.org/

Western Regional Climate Center (WRCC). 2013. Period of Record Monthly Climate Summary, Sierra Madre Henszey, California (048210). Reno, NV: WRCC. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca8210.

APPENDIX A

AIR QUALITY AND GREENHOUSE GAS EMISSIONS CALCULATIONS

Santa Anita Dam

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2016
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction only, no operational

Land Use -

Construction Phase - Construction Schedule based on LACDPW FCD email 092314

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

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Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Trips and VMT - Assumptions based on "Revised Santa Anita data needs 082014.xls" and CalEEMod Appx A

Demolition - Assumptions based on "Revised Santa Anita data needs 032014.xlsx"

Grading - Assumptions based on "Revised Santa Anita data needs 082014.xlsx"

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	23.00
tblConstructionPhase	NumDays	0.00	30.00
tblConstructionPhase	NumDays	0.00	30.00
tblConstructionPhase	NumDays	0.00	5.00

tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	131.00
tblConstructionPhase	NumDays	0.00	42.00
tblConstructionPhase	NumDays	0.00	54.00
tblConstructionPhase	NumDays	0.00	23.00
tblConstructionPhase	NumDays	0.00	11.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	PhaseEndDate	2/8/2016	12/28/2015
tblConstructionPhase	PhaseEndDate	1/11/2016	2/12/2016
tblConstructionPhase	PhaseEndDate	3/25/2016	3/28/2016
tblConstructionPhase	PhaseEndDate	4/29/2016	4/15/2016
tblConstructionPhase	PhaseEndDate	5/13/2016	4/29/2016
tblConstructionPhase	PhaseEndDate	9/26/2016	8/10/2016
tblConstructionPhase	PhaseEndDate	4/4/2016	3/11/2016
tblConstructionPhase	PhaseEndDate	6/13/2016	4/15/2016
tblConstructionPhase	PhaseEndDate	10/3/2016	9/30/2016
tblConstructionPhase	PhaseEndDate	11/29/2016	5/30/2016
tblConstructionPhase	PhaseEndDate	9/13/2016	8/15/2016
tblConstructionPhase	PhaseEndDate	9/28/2016	9/15/2016
tblConstructionPhase	PhaseEndDate	5/27/2016	5/28/2016
tblConstructionPhase	PhaseEndDate	8/24/2016	8/26/2016
tblConstructionPhase	PhaseEndDate	5/27/2016	5/14/2016
tblConstructionPhase	PhaseStartDate	1/26/2016	12/15/2015
tblConstructionPhase	PhaseStartDate	12/29/2015	2/1/2016
tblConstructionPhase	PhaseStartDate	2/27/2016	3/1/2016
tblConstructionPhase	PhaseStartDate	4/16/2016	4/2/2016
tblConstructionPhase	PhaseStartDate	4/16/2016	4/2/2016
tblConstructionPhase	PhaseStartDate	8/16/2016	6/30/2016

tblConstructionPhase	PhaseStartDate	3/29/2016	3/7/2016
tblConstructionPhase	PhaseStartDate	5/31/2016	4/2/2016
tblConstructionPhase	PhaseStartDate	4/2/2016	4/1/2016
tblConstructionPhase	PhaseStartDate	10/1/2016	4/1/2016
tblConstructionPhase	PhaseStartDate	6/30/2016	6/1/2016
tblConstructionPhase	PhaseStartDate	8/27/2016	8/16/2016
tblConstructionPhase	PhaseStartDate	8/11/2016	8/15/2016
tblConstructionPhase	PhaseStartDate	4/30/2016	4/16/2016
tblGrading	MaterialImported	0.00	65,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblTripsAndVMT	HaulingTripNumber	4.00	20.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,000.00
tblTripsAndVMT	HaulingTripNumber	0.00	112.00
tblTripsAndVMT	HaulingTripNumber	0.00	126.00
tblTripsAndVMT	HaulingTripNumber	0.00	313.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	HaulingTripNumber	0.00	38.00
tblTripsAndVMT	HaulingTripNumber	11.00	28.00
tblTripsAndVMT	HaulingTripNumber	0.00	420.00
tblTripsAndVMT	HaulingTripNumber	0.00	92.00
tblTripsAndVMT	HaulingTripNumber	0.00	36.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00

tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	13.00	16.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	5.00	6.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	3.8830	45.7798	35.3221	0.0917	1.9262	1.4954	3.4215	0.5259	1.4315	1.9574	0.0000	9,224.9947	9,224.9947	0.2892	0.0000	9,231.0682
2016	8.3089	92.3880	72.5535	0.1692	7.7375	3.6590	11.3965	3.3446	3.4795	6.8241	0.0000	16,888.4349	16,888.4349	1.1285	0.0000	16,912.1328
Total	**12.1919**	**138.1679**	**107.8757**	**0.2609**	**9.6636**	**5.1543**	**14.8180**	**3.8705**	**4.9109**	**8.7815**	**0.0000**	**26,113.4296**	**26,113.4296**	**1.4177**	**0.0000**	**26,143.2010**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	3.8830	45.7798	35.3221	0.0917	1.9262	1.4954	3.4215	0.5259	1.4315	1.9574	0.0000	9,224.9947	9,224.9947	0.2892	0.0000	9,231.0682
2016	8.3089	92.3880	72.5535	0.1692	4.8993	3.6590	8.5583	1.8176	3.4795	5.2971	0.0000	16,888.4349	16,888.4349	1.1285	0.0000	16,912.1328
Total	**12.1919**	**138.1679**	**107.8757**	**0.2609**	**6.8255**	**5.1543**	**11.9798**	**2.3435**	**4.9109**	**7.2545**	**0.0000**	**26,113.4296**	**26,113.4296**	**1.4177**	**0.0000**	**26,143.2010**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**29.37**	**0.00**	**19.15**	**39.45**	**0.00**	**17.39**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	SAD Helipad and Water System	Building Construction	12/15/2015	1/25/2016	5	30	
2	SAD Armor Canyon/Dam	Building Construction	12/15/2015	12/28/2015	5	10	
3	SAD Repair Leaks	Building Construction	2/1/2016	2/12/2016	5	10	
4	SAD Remove/Replace Jib Crane	Building Construction	2/13/2016	2/26/2016	5	10	
5	SAD Hoist	Building Construction	3/1/2016	3/28/2016	5	20	
6	SAHW Demo	Demolition	3/7/2016	3/11/2016	5	5	
7	SAHW Rubber Dam	Building Construction	3/12/2016	3/18/2016	5	5	
8	SAHW Construct Levee	Building Construction	3/19/2016	4/1/2016	5	10	
9	SAD Construct New Spillway	Grading	4/1/2016	9/30/2016	5	131	
10	SADD Construct New Spillway	Grading	4/1/2016	5/30/2016	5	42	
11	WPB Demo	Demolition	4/2/2016	4/15/2016	5	10	
12	SAD Install Valves	Building Construction	4/2/2016	4/15/2016	5	10	
13	SAD Electrical	Building Construction	4/2/2016	4/29/2016	5	20	
14	WPB Clear/Grub	Site Preparation	4/16/2016	5/14/2016	5	20	
15	WPB Grading	Grading	5/15/2016	5/28/2016	5	10	
16	WPB Abutments and Wing Walls	Building Construction	5/29/2016	6/29/2016	5	23	
17	SADD Construct Downstream Buttress	Grading	6/1/2016	8/15/2016	5	54	
18	WPB Construct Deck	Building Construction	6/30/2016	8/10/2016	5	30	
19	WPB Pave Bridge	Paving	8/15/2016	8/26/2016	5	10	
20	SADD Construct New Subdrain	Grading	8/16/2016	9/15/2016	5	23	
21	SADD Remove Outlet Tower	Grading	9/16/2016	9/30/2016	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
SAHW Demo	Concrete/Industrial Saws	1	8.00	81	0.73
SAHW Demo	Excavators	1	6.00	162	0.38
SAHW Demo	Tractors/Loaders/Backhoes	1	6.00	97	0.37
SAHW Rubber Dam	Tractors/Loaders/Backhoes	2	8.00	97	0.37
SAHW Construct Levee	Pumps	1	8.00	84	0.74
SAHW Construct Levee	Tractors/Loaders/Backhoes	1	8.00	97	0.37
WPB Demo	Concrete/Industrial Saws	1	8.00	81	0.73
WPB Demo	Excavators	1	6.00	162	0.38
WPB Demo	Tractors/Loaders/Backhoes	1	6.00	97	0.37
WPB Clear/Grub	Tractors/Loaders/Backhoes	1	8.00	97	0.37
WPB Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
WPB Abutments and Wing Walls	Pumps	2	8.00	84	0.74
WPB Construct Deck	Pumps	1	8.00	84	0.74
SAD Helipad and Water System	Pumps	1	6.00	84	0.74
SAD Helipad and Water System	Tractors/Loaders/Backhoes	1	8.00	97	0.37
SAD Armor Canyon/Dam	Pumps	1	8.00	84	0.74
WPB Pave Bridge	Rollers	1	7.00	80	0.38
SAD Repair Leaks	Pumps	1	8.00	84	0.74
SAD Remove/Replace Jib Crane	Cranes	1	4.00	226	0.29
SAD Hoist	Cranes	1	4.00	226	0.29
SAD Construct New Spillway	Concrete/Industrial Saws	1	8.00	81	0.73
SAD Construct New Spillway	Cranes	1	4.00	226	0.29
SAD Construct New Spillway	Pumps	1	8.00	84	0.74
SAD Construct New Spillway	Tractors/Loaders/Backhoes	2	6.00	97	0.37
SADD Construct New Spillway	Bore/Drill Rigs	1	6.00	205	0.50
SADD Construct New Spillway	Concrete/Industrial Saws	1	8.00	81	0.73
SADD Construct New Spillway	Pumps	1	6.00	84	0.74
SAD Install Valves	Cranes	1	4.00	226	0.29

SAD Electrical	Cranes	1	4.00	226	0.29
SADD Construct Downstream Buttress	Excavators	1	6.00	162	0.38
SADD Construct Downstream Buttress	Rubber Tired Dozers	1	6.00	255	0.40
SADD Construct Downstream Buttress	Tractors/Loaders/Backhoes	2	6.00	97	0.37
SADD Construct New Subdrain	Tractors/Loaders/Backhoes	2	8.00	97	0.37
SADD Remove Outlet Tower	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
SAHW Demo	3	10.00	0.00	20.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAHW Rubber Dam	2	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAHW Construct Levee	2	6.00	0.00	38.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Demo	3	10.00	0.00	28.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Clear/Grub	1	6.00	0.00	420.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Grading	2	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Abutments and Wing Walls	2	8.00	0.00	92.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Construct Deck	1	6.00	0.00	36.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Helipad and Water System	2	10.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Armor Canyon/Dam	1	6.00	0.00	1,000.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Pave Bridge	1	6.00	3.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Repair Leaks	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Remove/Replace Jib Crane	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Hoist	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Construct New Spillway	5	16.00	0.00	112.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SADD Construct New Spillway	3	10.00	0.00	126.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Install Valves	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Electrical	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SADD Construct Downstream Buttress	4	10.00	0.00	8,125.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SADD Construct New Subdrain	2	6.00	0.00	313.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

SADD Remove Outlet Tower	2	10.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 SAD Helipad and Water System - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9187	7.4134	5.3478	8.0500e-003		0.5679	0.5679		0.5464	0.5464		794.7644	794.7644	0.1479		797.8708
Total	**0.9187**	**7.4134**	**5.3478**	**8.0500e-003**		**0.5679**	**0.5679**		**0.5464**	**0.5464**		**794.7644**	**794.7644**	**0.1479**		**797.8708**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0106	0.1014	0.1334	2.2000e-004	6.2300e-003	1.6800e-003	7.9100e-003	1.7700e-003	1.5400e-003	3.3200e-003		22.0778	22.0778	1.8000e-004		22.0817
Worker	0.0514	0.0688	0.7205	1.3700e-003	0.1118	1.1200e-003	0.1129	0.0296	1.0200e-003	0.0307		120.0108	120.0108	7.2600e-003		120.1631
Total	**0.0620**	**0.1702**	**0.8539**	**1.5900e-003**	**0.1180**	**2.8000e-003**	**0.1208**	**0.0314**	**2.5600e-003**	**0.0340**		**142.0886**	**142.0886**	**7.4400e-003**		**142.2448**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9187	7.4134	5.3478	8.0500e-003		0.5679	0.5679		0.5464	0.5464	0.0000	794.7644	794.7644	0.1479		797.8708
Total	**0.9187**	**7.4134**	**5.3478**	**8.0500e-003**		**0.5679**	**0.5679**		**0.5464**	**0.5464**	**0.0000**	**794.7644**	**794.7644**	**0.1479**		**797.8708**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0106	0.1014	0.1334	2.2000e-004	6.2300e-003	1.6800e-003	7.9100e-003	1.7700e-003	1.5400e-003	3.3200e-003		22.0778	22.0778	1.8000e-004		22.0817
Worker	0.0514	0.0688	0.7205	1.3700e-003	0.1118	1.1200e-003	0.1129	0.0296	1.0200e-003	0.0307		120.0108	120.0108	7.2600e-003		120.1631
Total	**0.0620**	**0.1702**	**0.8539**	**1.5900e-003**	**0.1180**	**2.8000e-003**	**0.1208**	**0.0314**	**2.5600e-003**	**0.0340**		**142.0886**	**142.0886**	**7.4400e-003**		**142.2448**

3.2 SAD Helipad and Water System - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Off-Road	0.8421	6.9370	5.3094	8.0500e-003		0.5179	0.5179		0.4978	0.4978		790.9532	790.9532	0.1429		793.9532
Total	**0.8421**	**6.9370**	**5.3094**	**8.0500e-003**		**0.5179**	**0.5179**		**0.4978**	**0.4978**		**790.9532**	**790.9532**	**0.1429**		**793.9532**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.0556**	**0.1519**	**0.7752**	**1.5900e-003**	**0.1180**	**2.4400e-003**	**0.1205**	**0.0314**	**2.2400e-003**	**0.0337**		**137.8423**	**137.8423**	**6.8600e-003**		**137.9863**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8421	6.9370	5.3094	8.0500e-003		0.5179	0.5179		0.4978	0.4978	0.0000	790.9532	790.9532	0.1429		793.9532
Total	**0.8421**	**6.9370**	**5.3094**	**8.0500e-003**		**0.5179**	**0.5179**		**0.4978**	**0.4978**	**0.0000**	**790.9532**	**790.9532**	**0.1429**		**793.9532**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.0556**	**0.1519**	**0.7752**	**1.5900e-003**	**0.1180**	**2.4400e-003**	**0.1205**	**0.0314**	**2.2400e-003**	**0.0337**		**137.8423**	**137.8423**	**6.8600e-003**		**137.9863**

3.3 SAD Armor Canyon/Dam - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7444	5.3084	3.8963	6.5800e-003		0.3991	0.3991		0.3991	0.3991		623.0357	623.0357	0.0669		624.4400
Total	**0.7444**	**5.3084**	**3.8963**	**6.5800e-003**		**0.3991**	**0.3991**		**0.3991**	**0.3991**		**623.0357**	**623.0357**	**0.0669**		**624.4400**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1270	32.8466	24.7919	0.0746	1.7411	0.5249	2.2660	0.4767	0.4828	0.9595		7,593.0996	7,593.0996	0.0626		7,594.4146
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0308	0.0413	0.4323	8.2000e-004	0.0671	6.7000e-004	0.0677	0.0178	6.1000e-004	0.0184		72.0065	72.0065	4.3500e-003		72.0979
Total	**2.1579**	**32.8879**	**25.2241**	**0.0755**	**1.8082**	**0.5256**	**2.3337**	**0.4945**	**0.4834**	**0.9779**		**7,665.1060**	**7,665.1060**	**0.0670**		**7,666.5125**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7444	5.3084	3.8963	6.5800e-003		0.3991	0.3991		0.3991	0.3991	0.0000	623.0357	623.0357	0.0669		624.4400
Total	**0.7444**	**5.3084**	**3.8963**	**6.5800e-003**		**0.3991**	**0.3991**		**0.3991**	**0.3991**	**0.0000**	**623.0357**	**623.0357**	**0.0669**		**624.4400**

Mitigated Construction Off-Site

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

Hauling	2.1270	32.8466	24.7919	0.0746	1.7411	0.5249	2.2660	0.4767	0.4828	0.9595		7,593.0996	7,593.0996	0.0626		7,594.4146
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0308	0.0413	0.4323	8.2000e-004	0.0671	6.7000e-004	0.0677	0.0178	6.1000e-004	0.0184		72.0065	72.0065	4.3500e-003		72.0979
Total	**2.1579**	**32.8879**	**25.2241**	**0.0755**	**1.8082**	**0.5256**	**2.3337**	**0.4945**	**0.4834**	**0.9779**		**7,665.1060**	**7,665.1060**	**0.0670**		**7,666.5125**

3.4 SAD Repair Leaks - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6688	4.9093	3.8623	6.5800e-003		0.3563	0.3563		0.3563	0.3563		623.0346	623.0346	0.0603		624.3008
Total	**0.6688**	**4.9093**	**3.8623**	**6.5800e-003**		**0.3563**	**0.3563**		**0.3563**	**0.3563**		**623.0346**	**623.0346**	**0.0603**		**624.3008**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6688	4.9093	3.8623	6.5800e-003		0.3563	0.3563		0.3563	0.3563	0.0000	623.0346	623.0346	0.0603		624.3008
Total	**0.6688**	**4.9093**	**3.8623**	**6.5800e-003**		**0.3563**	**0.3563**		**0.3563**	**0.3563**	**0.0000**	**623.0346**	**623.0346**	**0.0603**		**624.3008**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

3.5 SAD Remove/Replace Jib Crane - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3600	4.2658	1.4924	2.8200e-003		0.1936	0.1936		0.1781	0.1781		293.1174	293.1174	0.0884		294.9741
Total	**0.3600**	**4.2658**	**1.4924**	**2.8200e-003**		**0.1936**	**0.1936**		**0.1781**	**0.1781**		**293.1174**	**293.1174**	**0.0884**		**294.9741**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3600	4.2658	1.4924	2.8200e-003		0.1936	0.1936		0.1781	0.1781	0.0000	293.1174	293.1174	0.0884		294.9741

Total	**0.3600**	**4.2658**	**1.4924**	**2.8200e-003**		**0.1936**	**0.1936**		**0.1781**	**0.1781**	**0.0000**	**293.1174**	**293.1174**	**0.0884**		**294.9741**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

3.6 SAD Hoist - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3600	4.2658	1.4924	2.8200e-003		0.1936	0.1936		0.1781	0.1781		293.1174	293.1174	0.0884		294.9741
Total	**0.3600**	**4.2658**	**1.4924**	**2.8200e-003**		**0.1936**	**0.1936**		**0.1781**	**0.1781**		**293.1174**	**293.1174**	**0.0884**		**294.9741**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3600	4.2658	1.4924	2.8200e-003		0.1936	0.1936		0.1781	0.1781	0.0000	293.1174	293.1174	0.0884		294.9741
Total	**0.3600**	**4.2658**	**1.4924**	**2.8200e-003**		**0.1936**	**0.1936**		**0.1781**	**0.1781**	**0.0000**	**293.1174**	**293.1174**	**0.0884**		**294.9741**

Mitigated Construction Off-Site

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

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

3.7 SAHW Demo - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1669	0.0000	0.1669	0.0253	0.0000	0.0253			0.0000			0.0000
Off-Road	1.1932	10.3864	8.1560	0.0126		0.6988	0.6988		0.6706	0.6706		1,247.8622	1,247.8622	0.2550		1,253.2170
Total	**1.1932**	**10.3864**	**8.1560**	**0.0126**	**0.1669**	**0.6988**	**0.8657**	**0.0253**	**0.6706**	**0.6959**		**1,247.8622**	**1,247.8622**	**0.2550**		**1,253.2170**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0746	1.1607	0.9223	2.9800e-003	0.0697	0.0166	0.0863	0.0191	0.0153	0.0344		300.3670	300.3670	2.2500e-003		300.4143
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.1209**	**1.2229**	**1.5736**	**4.3500e-003**	**0.1814**	**0.0177**	**0.1991**	**0.0487**	**0.0163**	**0.0650**		**416.3701**	**416.3701**	**8.9400e-003**		**416.5579**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0651	0.0000	0.0651	9.8600e-003	0.0000	9.8600e-003			0.0000			0.0000
Off-Road	1.1932	10.3864	8.1560	0.0126		0.6988	0.6988		0.6706	0.6706	0.0000	1,247.8622	1,247.8622	0.2550		1,253.2170
Total	**1.1932**	**10.3864**	**8.1560**	**0.0126**	**0.0651**	**0.6988**	**0.7639**	**9.8600e-003**	**0.6706**	**0.6805**	**0.0000**	**1,247.8622**	**1,247.8622**	**0.2550**		**1,253.2170**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0746	1.1607	0.9223	2.9800e-003	0.0697	0.0166	0.0863	0.0191	0.0153	0.0344		300.3670	300.3670	2.2500e-003		300.4143
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.1209**	**1.2229**	**1.5736**	**4.3500e-003**	**0.1814**	**0.0177**	**0.1991**	**0.0487**	**0.0163**	**0.0650**		**416.3701**	**416.3701**	**8.9400e-003**		**416.5579**

3.8 SAHW Rubber Dam - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6812	6.5101	4.8252	6.2300e-003		0.5012	0.5012		0.4611	0.4611		647.3546	647.3546	0.1953		651.4551
Total	**0.6812**	**6.5101**	**4.8252**	**6.2300e-003**		**0.5012**	**0.5012**		**0.4611**	**0.4611**		**647.3546**	**647.3546**	**0.1953**		**651.4551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6812	6.5101	4.8252	6.2300e-003		0.5012	0.5012		0.4611	0.4611	0.0000	647.3546	647.3546	0.1953		651.4551

Total	**0.6812**	**6.5101**	**4.8252**	**6.2300e-003**		**0.5012**	**0.5012**		**0.4611**	**0.4611**	**0.0000**	**647.3546**	**647.3546**	**0.1953**		**651.4551**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

3.9 SAHW Construct Levee - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0093	8.1644	6.2749	9.6900e-003		0.6069	0.6069		0.5869	0.5869		946.7119	946.7119	0.1579		950.0284
Total	**1.0093**	**8.1644**	**6.2749**	**9.6900e-003**		**0.6069**	**0.6069**		**0.5869**	**0.5869**		**946.7119**	**946.7119**	**0.1579**		**950.0284**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0709	1.1027	0.8762	2.8300e-003	0.0662	0.0158	0.0820	0.0181	0.0145	0.0327		285.3486	285.3486	2.1400e-003		285.3936
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0987**	**1.1400**	**1.2670**	**3.6500e-003**	**0.1332**	**0.0164**	**0.1497**	**0.0359**	**0.0151**	**0.0510**		**354.9505**	**354.9505**	**6.1500e-003**		**355.0798**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0093	8.1644	6.2749	9.6900e-003		0.6069	0.6069		0.5869	0.5869	0.0000	946.7119	946.7119	0.1579		950.0284
Total	**1.0093**	**8.1644**	**6.2749**	**9.6900e-003**		**0.6069**	**0.6069**		**0.5869**	**0.5869**	**0.0000**	**946.7119**	**946.7119**	**0.1579**		**950.0284**

Mitigated Construction Off-Site

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

Hauling	0.0709	1.1027	0.8762	2.8300e-003	0.0662	0.0158	0.0820	0.0181	0.0145	0.0327		285.3486	285.3486	2.1400e-003		285.3936
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0987**	**1.1400**	**1.2670**	**3.6500e-003**	**0.1332**	**0.0164**	**0.1497**	**0.0359**	**0.0151**	**0.0510**		**354.9505**	**354.9505**	**6.1500e-003**		**355.0798**

3.10 SAD Construct New Spillway - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.1862	18.6797	12.7489	0.0203		1.2731	1.2731		1.2275	1.2275		1,994.3335	1,994.3335	0.3525		2,001.7364
Total	**2.1862**	**18.6797**	**12.7489**	**0.0203**	**0.0000**	**1.2731**	**1.2731**	**0.0000**	**1.2275**	**1.2275**		**1,994.3335**	**1,994.3335**	**0.3525**		**2,001.7364**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0160	0.2481	0.1971	6.4000e-004	0.0149	3.5600e-003	0.0185	4.0800e-003	3.2700e-003	7.3500e-003		64.2006	64.2006	4.8000e-004		64.2107
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0741	0.0995	1.0422	2.1900e-003	0.1788	1.6900e-003	0.1805	0.0474	1.5500e-003	0.0490		185.6050	185.6050	0.0107		185.8298
Total	**0.0901**	**0.3475**	**1.2393**	**2.8300e-003**	**0.1937**	**5.2500e-003**	**0.1990**	**0.0515**	**4.8200e-003**	**0.0563**		**249.8056**	**249.8056**	**0.0112**		**250.0405**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.1862	18.6797	12.7489	0.0203		1.2731	1.2731		1.2275	1.2275	0.0000	1,994.3335	1,994.3335	0.3525		2,001.7364
Total	**2.1862**	**18.6797**	**12.7489**	**0.0203**	**0.0000**	**1.2731**	**1.2731**	**0.0000**	**1.2275**	**1.2275**	**0.0000**	**1,994.3335**	**1,994.3335**	**0.3525**		**2,001.7364**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0160	0.2481	0.1971	6.4000e-004	0.0149	3.5600e-003	0.0185	4.0800e-003	3.2700e-003	7.3500e-003		64.2006	64.2006	4.8000e-004		64.2107
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0741	0.0995	1.0422	2.1900e-003	0.1788	1.6900e-003	0.1805	0.0474	1.5500e-003	0.0490		185.6050	185.6050	0.0107		185.8298
Total	**0.0901**	**0.3475**	**1.2393**	**2.8300e-003**	**0.1937**	**5.2500e-003**	**0.1990**	**0.0515**	**4.8200e-003**	**0.0563**		**249.8056**	**249.8056**	**0.0112**		**250.0405**

3.11 SADD Construct New Spillway - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4092	12.2388	8.2081	0.0178		0.7300	0.7300		0.7208	0.7208		1,740.7482	1,740.7482	0.3079		1,747.2149
Total	**1.4092**	**12.2388**	**8.2081**	**0.0178**	**0.0000**	**0.7300**	**0.7300**	**0.0000**	**0.7208**	**0.7208**		**1,740.7482**	**1,740.7482**	**0.3079**		**1,747.2149**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0560	0.8705	0.6917	2.2400e-003	0.0522	0.0125	0.0647	0.0143	0.0115	0.0258		225.2752	225.2752	1.6900e-003		225.3107
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.1023**	**0.9327**	**1.3431**	**3.6100e-003**	**0.1640**	**0.0135**	**0.1776**	**0.0439**	**0.0125**	**0.0564**		**341.2783**	**341.2783**	**8.3800e-003**		**341.4543**

Mitigated Construction On-Site

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

Off-Road	1.4092	12.2388	8.2081	0.0178		0.7300	0.7300		0.7208	0.7208	0.0000	1,740.7482	1,740.7482	0.3079		1,747.2149
Total	**1.4092**	**12.2388**	**8.2081**	**0.0178**	**0.0000**	**0.7300**	**0.7300**	**0.0000**	**0.7208**	**0.7208**	**0.0000**	**1,740.7482**	**1,740.7482**	**0.3079**		**1,747.2149**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0560	0.8705	0.6917	2.2400e-003	0.0522	0.0125	0.0647	0.0143	0.0115	0.0258		225.2752	225.2752	1.6900e-003		225.3107
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.1023**	**0.9327**	**1.3431**	**3.6100e-003**	**0.1640**	**0.0135**	**0.1776**	**0.0439**	**0.0125**	**0.0564**		**341.2783**	**341.2783**	**8.3800e-003**		**341.4543**

3.12 WPB Demo - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2300	0.0000	0.2300	0.0348	0.0000	0.0348			0.0000			0.0000
Off-Road	1.1932	10.3864	8.1560	0.0126		0.6988	0.6988		0.6706	0.6706		1,247.8622	1,247.8622	0.2550		1,253.2170
Total	**1.1932**	**10.3864**	**8.1560**	**0.0126**	**0.2300**	**0.6988**	**0.9288**	**0.0348**	**0.6706**	**0.7055**		**1,247.8622**	**1,247.8622**	**0.2550**		**1,253.2170**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0522	0.8125	0.6456	2.0900e-003	0.0488	0.0117	0.0604	0.0134	0.0107	0.0241		210.2569	210.2569	1.5800e-003		210.2900
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.0986**	**0.8747**	**1.2970**	**3.4600e-003**	**0.1605**	**0.0127**	**0.1732**	**0.0430**	**0.0117**	**0.0547**		**326.2600**	**326.2600**	**8.2700e-003**		**326.4336**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0897	0.0000	0.0897	0.0136	0.0000	0.0136			0.0000			0.0000
Off-Road	1.1932	10.3864	8.1560	0.0126		0.6988	0.6988		0.6706	0.6706	0.0000	1,247.8622	1,247.8622	0.2550		1,253.2170
Total	**1.1932**	**10.3864**	**8.1560**	**0.0126**	**0.0897**	**0.6988**	**0.7885**	**0.0136**	**0.6706**	**0.6842**	**0.0000**	**1,247.8622**	**1,247.8622**	**0.2550**		**1,253.2170**

Mitigated Construction Off-Site

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

Hauling	0.0522	0.8125	0.6456	2.0900e-003	0.0488	0.0117	0.0604	0.0134	0.0107	0.0241		210.2569	210.2569	1.5800e-003		210.2900
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.0986**	**0.8747**	**1.2970**	**3.4600e-003**	**0.1605**	**0.0127**	**0.1732**	**0.0430**	**0.0117**	**0.0547**		**326.2600**	**326.2600**	**8.2700e-003**		**326.4336**

3.13 SAD Install Valves - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3600	4.2658	1.4924	2.8200e-003		0.1936	0.1936		0.1781	0.1781		293.1174	293.1174	0.0884		294.9741
Total	**0.3600**	**4.2658**	**1.4924**	**2.8200e-003**		**0.1936**	**0.1936**		**0.1781**	**0.1781**		**293.1174**	**293.1174**	**0.0884**		**294.9741**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3600	4.2658	1.4924	2.8200e-003		0.1936	0.1936		0.1781	0.1781	0.0000	293.1174	293.1174	0.0884		294.9741
Total	**0.3600**	**4.2658**	**1.4924**	**2.8200e-003**		**0.1936**	**0.1936**		**0.1781**	**0.1781**	**0.0000**	**293.1174**	**293.1174**	**0.0884**		**294.9741**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

3.14 SAD Electrical - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3600	4.2658	1.4924	2.8200e-003		0.1936	0.1936		0.1781	0.1781		293.1174	293.1174	0.0884		294.9741
Total	**0.3600**	**4.2658**	**1.4924**	**2.8200e-003**		**0.1936**	**0.1936**		**0.1781**	**0.1781**		**293.1174**	**293.1174**	**0.0884**		**294.9741**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3600	4.2658	1.4924	2.8200e-003		0.1936	0.1936		0.1781	0.1781	0.0000	293.1174	293.1174	0.0884		294.9741

Total	**0.3600**	**4.2658**	**1.4924**	**2.8200e-003**		**0.1936**	**0.1936**		**0.1781**	**0.1781**	**0.0000**	**293.1174**	**293.1174**	**0.0884**		**294.9741**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2900e-003	0.0897	0.1238	2.2000e-004	6.2400e-003	1.3800e-003	7.6200e-003	1.7700e-003	1.2700e-003	3.0500e-003		21.8392	21.8392	1.7000e-004		21.8427
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0371**	**0.1270**	**0.5146**	**1.0400e-003**	**0.0733**	**2.0100e-003**	**0.0753**	**0.0196**	**1.8500e-003**	**0.0214**		**91.4411**	**91.4411**	**4.1800e-003**		**91.5289**

3.15 WPB Clear/Grub - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3406	3.2551	2.4126	3.1100e-003		0.2506	0.2506		0.2306	0.2306		323.6773	323.6773	0.0976		325.7276
Total	**0.3406**	**3.2551**	**2.4126**	**3.1100e-003**	**0.0000**	**0.2506**	**0.2506**	**0.0000**	**0.2306**	**0.2306**		**323.6773**	**323.6773**	**0.0976**		**325.7276**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3917	6.0937	4.8419	0.0157	0.3657	0.0874	0.4531	0.1001	0.0804	0.1805		1,576.9265	1,576.9265	0.0118		1,577.1751
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.4195**	**6.1310**	**5.2328**	**0.0165**	**0.4328**	**0.0880**	**0.5208**	**0.1179**	**0.0810**	**0.1989**		**1,646.5284**	**1,646.5284**	**0.0159**		**1,646.8613**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3406	3.2551	2.4126	3.1100e-003		0.2506	0.2506		0.2306	0.2306	0.0000	323.6773	323.6773	0.0976		325.7276
Total	**0.3406**	**3.2551**	**2.4126**	**3.1100e-003**	**0.0000**	**0.2506**	**0.2506**	**0.0000**	**0.2306**	**0.2306**	**0.0000**	**323.6773**	**323.6773**	**0.0976**		**325.7276**

Mitigated Construction Off-Site

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

Hauling	0.3917	6.0937	4.8419	0.0157	0.3657	0.0874	0.4531	0.1001	0.0804	0.1805		1,576.9265	1,576.9265	0.0118		1,577.1751
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.4195**	**6.1310**	**5.2328**	**0.0165**	**0.4328**	**0.0880**	**0.5208**	**0.1179**	**0.0810**	**0.1989**		**1,646.5284**	**1,646.5284**	**0.0159**		**1,646.8613**

3.16 WPB Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5109	4.8826	3.6189	4.6700e-003		0.3759	0.3759		0.3459	0.3459		485.5159	485.5159	0.1465		488.5913
Total	**0.5109**	**4.8826**	**3.6189**	**4.6700e-003**	**0.0000**	**0.3759**	**0.3759**	**0.0000**	**0.3459**	**0.3459**		**485.5159**	**485.5159**	**0.1465**		**488.5913**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.0463**	**0.0622**	**0.6514**	**1.3700e-003**	**0.1118**	**1.0600e-003**	**0.1128**	**0.0296**	**9.7000e-004**	**0.0306**		**116.0031**	**116.0031**	**6.6900e-003**		**116.1436**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5109	4.8826	3.6189	4.6700e-003		0.3759	0.3759		0.3459	0.3459	0.0000	485.5159	485.5159	0.1465		488.5913
Total	**0.5109**	**4.8826**	**3.6189**	**4.6700e-003**	**0.0000**	**0.3759**	**0.3759**	**0.0000**	**0.3459**	**0.3459**	**0.0000**	**485.5159**	**485.5159**	**0.1465**		**488.5913**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.0463**	**0.0622**	**0.6514**	**1.3700e-003**	**0.1118**	**1.0600e-003**	**0.1128**	**0.0296**	**9.7000e-004**	**0.0306**		**116.0031**	**116.0031**	**6.6900e-003**		**116.1436**

3.17 WPB Abutments and Wing Walls - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3375	9.8186	7.7246	0.0132		0.7126	0.7126		0.7126	0.7126		1,246.0691	1,246.0691	0.1206		1,248.6016
Total	**1.3375**	**9.8186**	**7.7246**	**0.0132**		**0.7126**	**0.7126**		**0.7126**	**0.7126**		**1,246.0691**	**1,246.0691**	**0.1206**		**1,248.6016**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0746	1.1607	0.9223	2.9800e-003	0.0697	0.0166	0.0863	0.0191	0.0153	0.0344		300.3670	300.3670	2.2500e-003		300.4143
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0371	0.0497	0.5211	1.1000e-003	0.0894	8.5000e-004	0.0903	0.0237	7.8000e-004	0.0245		92.8025	92.8025	5.3500e-003		92.9149
Total	**0.1117**	**1.2104**	**1.4434**	**4.0800e-003**	**0.1591**	**0.0175**	**0.1766**	**0.0428**	**0.0161**	**0.0589**		**393.1695**	**393.1695**	**7.6000e-003**		**393.3292**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3375	9.8186	7.7246	0.0132		0.7126	0.7126		0.7126	0.7126	0.0000	1,246.0691	1,246.0691	0.1206		1,248.6016

Total	**1.3375**	**9.8186**	**7.7246**	**0.0132**		**0.7126**	**0.7126**		**0.7126**	**0.7126**	**0.0000**	**1,246.0691**	**1,246.0691**	**0.1206**		**1,248.6016**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0746	1.1607	0.9223	2.9800e-003	0.0697	0.0166	0.0863	0.0191	0.0153	0.0344		300.3670	300.3670	2.2500e-003		300.4143
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0371	0.0497	0.5211	1.1000e-003	0.0894	8.5000e-004	0.0903	0.0237	7.8000e-004	0.0245		92.8025	92.8025	5.3500e-003		92.9149
Total	**0.1117**	**1.2104**	**1.4434**	**4.0800e-003**	**0.1591**	**0.0175**	**0.1766**	**0.0428**	**0.0161**	**0.0589**		**393.1695**	**393.1695**	**7.6000e-003**		**393.3292**

3.18 SADD Construct Downstream Buttress - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.6527	0.0000	4.6527	2.5033	0.0000	2.5033			0.0000			0.0000
Off-Road	1.7307	18.6087	14.0540	0.0153		1.0235	1.0235		0.9416	0.9416		1,590.5285	1,590.5285	0.4798		1,600.6035
Total	**1.7307**	**18.6087**	**14.0540**	**0.0153**	**4.6527**	**1.0235**	**5.6762**	**2.5033**	**0.9416**	**3.4449**		**1,590.5285**	**1,590.5285**	**0.4798**		**1,600.6035**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.8064	43.6609	34.6920	0.1122	2.6202	0.6260	3.2462	0.7174	0.5759	1.2933		11,298.5256	11,298.5256	0.0848		11,300.3065
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**2.8527**	**43.7230**	**35.3434**	**0.1136**	**2.7320**	**0.6271**	**3.3590**	**0.7471**	**0.5768**	**1.3239**		**11,414.5287**	**11,414.5287**	**0.0915**		**11,416.4501**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.8146	0.0000	1.8146	0.9763	0.0000	0.9763			0.0000			0.0000
Off-Road	1.7307	18.6087	14.0540	0.0153		1.0235	1.0235		0.9416	0.9416	0.0000	1,590.5285	1,590.5285	0.4798		1,600.6035
Total	**1.7307**	**18.6087**	**14.0540**	**0.0153**	**1.8146**	**1.0235**	**2.8380**	**0.9763**	**0.9416**	**1.9179**	**0.0000**	**1,590.5285**	**1,590.5285**	**0.4798**		**1,600.6035**

Mitigated Construction Off-Site

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

Hauling	2.8064	43.6609	34.6920	0.1122	2.6202	0.6260	3.2462	0.7174	0.5759	1.2933		11,298.5256	11,298.5256	0.0848		11,300.3065
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**2.8527**	**43.7230**	**35.3434**	**0.1136**	**2.7320**	**0.6271**	**3.3590**	**0.7471**	**0.5768**	**1.3239**		**11,414.5287**	**11,414.5287**	**0.0915**		**11,416.4501**

3.19 WPB Construct Deck - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6688	4.9093	3.8623	6.5800e-003		0.3563	0.3563		0.3563	0.3563		623.0346	623.0346	0.0603		624.3008
Total	**0.6688**	**4.9093**	**3.8623**	**6.5800e-003**		**0.3563**	**0.3563**		**0.3563**	**0.3563**		**623.0346**	**623.0346**	**0.0603**		**624.3008**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0224	0.3482	0.2767	8.9000e-004	0.0209	4.9900e-003	0.0259	5.7200e-003	4.5900e-003	0.0103		90.1101	90.1101	6.8000e-004		90.1243
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0502**	**0.3855**	**0.6675**	**1.7100e-003**	**0.0880**	**5.6200e-003**	**0.0936**	**0.0235**	**5.1700e-003**	**0.0287**		**159.7120**	**159.7120**	**4.6900e-003**		**159.8105**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6688	4.9093	3.8623	6.5800e-003		0.3563	0.3563		0.3563	0.3563	0.0000	623.0346	623.0346	0.0603		624.3008
Total	**0.6688**	**4.9093**	**3.8623**	**6.5800e-003**		**0.3563**	**0.3563**		**0.3563**	**0.3563**	**0.0000**	**623.0346**	**623.0346**	**0.0603**		**624.3008**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0224	0.3482	0.2767	8.9000e-004	0.0209	4.9900e-003	0.0259	5.7200e-003	4.5900e-003	0.0103		90.1101	90.1101	6.8000e-004		90.1243
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0502**	**0.3855**	**0.6675**	**1.7100e-003**	**0.0880**	**5.6200e-003**	**0.0936**	**0.0235**	**5.1700e-003**	**0.0287**		**159.7120**	**159.7120**	**4.6900e-003**		**159.8105**

3.20 WPB Pave Bridge - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2947	2.7237	1.7618	2.2900e-003		0.2006	0.2006		0.1845	0.1845		238.4182	238.4182	0.0719		239.9284
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2947**	**2.7237**	**1.7618**	**2.2900e-003**		**0.2006**	**0.2006**		**0.1845**	**0.1845**		**238.4182**	**238.4182**	**0.0719**		**239.9284**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0279	0.2691	0.3714	6.5000e-004	0.0187	4.1500e-003	0.0229	5.3200e-003	3.8100e-003	9.1400e-003		65.5176	65.5176	5.0000e-004		65.5281
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0557**	**0.3064**	**0.7622**	**1.4700e-003**	**0.0858**	**4.7800e-003**	**0.0906**	**0.0231**	**4.3900e-003**	**0.0275**		**135.1195**	**135.1195**	**4.5100e-003**		**135.2143**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2947	2.7237	1.7618	2.2900e-003		0.2006	0.2006		0.1845	0.1845	0.0000	238.4182	238.4182	0.0719		239.9284

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2947**	**2.7237**	**1.7618**	**2.2900e-003**		**0.2006**	**0.2006**		**0.1845**	**0.1845**	**0.0000**	**238.4182**	**238.4182**	**0.0719**		**239.9284**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0279	0.2691	0.3714	6.5000e-004	0.0187	4.1500e-003	0.0229	5.3200e-003	3.8100e-003	9.1400e-003		65.5176	65.5176	5.0000e-004		65.5281
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.0557**	**0.3064**	**0.7622**	**1.4700e-003**	**0.0858**	**4.7800e-003**	**0.0906**	**0.0231**	**4.3900e-003**	**0.0275**		**135.1195**	**135.1195**	**4.5100e-003**		**135.2143**

3.21 SADD Construct New Subdrain - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6812	6.5101	4.8252	6.2300e-003		0.5012	0.5012		0.4611	0.4611		647.3546	647.3546	0.1953		651.4551
Total	**0.6812**	**6.5101**	**4.8252**	**6.2300e-003**	**0.0000**	**0.5012**	**0.5012**	**0.0000**	**0.4611**	**0.4611**		**647.3546**	**647.3546**	**0.1953**		**651.4551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2538	3.9489	3.1377	0.0102	0.2370	0.0566	0.2936	0.0649	0.0521	0.1170		1,021.9006	1,021.9006	7.6700e-003		1,022.0617
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.2816**	**3.9862**	**3.5286**	**0.0110**	**0.3041**	**0.0573**	**0.3613**	**0.0827**	**0.0527**	**0.1353**		**1,091.5025**	**1,091.5025**	**0.0117**		**1,091.7479**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6812	6.5101	4.8252	6.2300e-003		0.5012	0.5012		0.4611	0.4611	0.0000	647.3546	647.3546	0.1953		651.4551
Total	**0.6812**	**6.5101**	**4.8252**	**6.2300e-003**	**0.0000**	**0.5012**	**0.5012**	**0.0000**	**0.4611**	**0.4611**	**0.0000**	**647.3546**	**647.3546**	**0.1953**		**651.4551**

Mitigated Construction Off-Site

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

Hauling	0.2538	3.9489	3.1377	0.0102	0.2370	0.0566	0.2936	0.0649	0.0521	0.1170		1,021.9006	1,021.9006	7.6700e-003		1,022.0617
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0373	0.3908	8.2000e-004	0.0671	6.3000e-004	0.0677	0.0178	5.8000e-004	0.0184		69.6019	69.6019	4.0100e-003		69.6862
Total	**0.2816**	**3.9862**	**3.5286**	**0.0110**	**0.3041**	**0.0573**	**0.3613**	**0.0827**	**0.0527**	**0.1353**		**1,091.5025**	**1,091.5025**	**0.0117**		**1,091.7479**

3.22 SADD Remove Outlet Tower - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5109	4.8826	3.6189	4.6700e-003		0.3759	0.3759		0.3459	0.3459		485.5159	485.5159	0.1465		488.5913
Total	**0.5109**	**4.8826**	**3.6189**	**4.6700e-003**	**0.0000**	**0.3759**	**0.3759**	**0.0000**	**0.3459**	**0.3459**		**485.5159**	**485.5159**	**0.1465**		**488.5913**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0170	0.2638	0.2096	6.8000e-004	0.0158	3.7800e-003	0.0196	4.3300e-003	3.4800e-003	7.8100e-003		68.2652	68.2652	5.1000e-004		68.2760
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.0633**	**0.3260**	**0.8610**	**2.0500e-003**	**0.1276**	**4.8400e-003**	**0.1324**	**0.0340**	**4.4500e-003**	**0.0384**		**184.2683**	**184.2683**	**7.2000e-003**		**184.4196**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5109	4.8826	3.6189	4.6700e-003		0.3759	0.3759		0.3459	0.3459	0.0000	485.5159	485.5159	0.1465		488.5913
Total	**0.5109**	**4.8826**	**3.6189**	**4.6700e-003**	**0.0000**	**0.3759**	**0.3759**	**0.0000**	**0.3459**	**0.3459**	**0.0000**	**485.5159**	**485.5159**	**0.1465**		**488.5913**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0170	0.2638	0.2096	6.8000e-004	0.0158	3.7800e-003	0.0196	4.3300e-003	3.4800e-003	7.8100e-003		68.2652	68.2652	5.1000e-004		68.2760
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0622	0.6514	1.3700e-003	0.1118	1.0600e-003	0.1128	0.0296	9.7000e-004	0.0306		116.0031	116.0031	6.6900e-003		116.1436
Total	**0.0633**	**0.3260**	**0.8610**	**2.0500e-003**	**0.1276**	**4.8400e-003**	**0.1324**	**0.0340**	**4.4500e-003**	**0.0384**		**184.2683**	**184.2683**	**7.2000e-003**		**184.4196**

Santa Anita Dam

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2016
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction only, no operational

Land Use -

Construction Phase - Construction Schedule based on LACDPW FCD email 092314

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

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Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Off-road Equipment - Equipment based on "Revised Santa Anita data needs 082014.xls"

Trips and VMT - Assumptions based on "Revised Santa Anita data needs 082014.xls" and CalEEMod Appx A

Demolition - Assumptions based on "Revised Santa Anita data needs 032014.xlsx"

Grading - Assumptions based on "Revised Santa Anita data needs 082014.xlsx"

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	23.00
tblConstructionPhase	NumDays	0.00	30.00
tblConstructionPhase	NumDays	0.00	30.00
tblConstructionPhase	NumDays	0.00	5.00

tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	131.00
tblConstructionPhase	NumDays	0.00	42.00
tblConstructionPhase	NumDays	0.00	54.00
tblConstructionPhase	NumDays	0.00	23.00
tblConstructionPhase	NumDays	0.00	11.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	PhaseEndDate	2/8/2016	12/28/2015
tblConstructionPhase	PhaseEndDate	1/11/2016	2/12/2016
tblConstructionPhase	PhaseEndDate	3/25/2016	3/28/2016
tblConstructionPhase	PhaseEndDate	4/29/2016	4/15/2016
tblConstructionPhase	PhaseEndDate	5/13/2016	4/29/2016
tblConstructionPhase	PhaseEndDate	9/26/2016	8/10/2016
tblConstructionPhase	PhaseEndDate	4/4/2016	3/11/2016
tblConstructionPhase	PhaseEndDate	6/13/2016	4/15/2016
tblConstructionPhase	PhaseEndDate	10/3/2016	9/30/2016
tblConstructionPhase	PhaseEndDate	11/29/2016	5/30/2016
tblConstructionPhase	PhaseEndDate	9/13/2016	8/15/2016
tblConstructionPhase	PhaseEndDate	9/28/2016	9/15/2016
tblConstructionPhase	PhaseEndDate	5/27/2016	5/28/2016
tblConstructionPhase	PhaseEndDate	8/24/2016	8/26/2016
tblConstructionPhase	PhaseEndDate	5/27/2016	5/14/2016
tblConstructionPhase	PhaseStartDate	1/26/2016	12/15/2015
tblConstructionPhase	PhaseStartDate	12/29/2015	2/1/2016
tblConstructionPhase	PhaseStartDate	2/27/2016	3/1/2016
tblConstructionPhase	PhaseStartDate	4/16/2016	4/2/2016
tblConstructionPhase	PhaseStartDate	4/16/2016	4/2/2016
tblConstructionPhase	PhaseStartDate	8/16/2016	6/30/2016

tblConstructionPhase	PhaseStartDate	3/29/2016	3/7/2016
tblConstructionPhase	PhaseStartDate	5/31/2016	4/2/2016
tblConstructionPhase	PhaseStartDate	4/2/2016	4/1/2016
tblConstructionPhase	PhaseStartDate	10/1/2016	4/1/2016
tblConstructionPhase	PhaseStartDate	6/30/2016	6/1/2016
tblConstructionPhase	PhaseStartDate	8/27/2016	8/16/2016
tblConstructionPhase	PhaseStartDate	8/11/2016	8/15/2016
tblConstructionPhase	PhaseStartDate	4/30/2016	4/16/2016
tblGrading	MaterialImported	0.00	65,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblTripsAndVMT	HaulingTripNumber	4.00	20.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,000.00
tblTripsAndVMT	HaulingTripNumber	0.00	112.00
tblTripsAndVMT	HaulingTripNumber	0.00	126.00
tblTripsAndVMT	HaulingTripNumber	0.00	313.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	HaulingTripNumber	0.00	38.00
tblTripsAndVMT	HaulingTripNumber	11.00	28.00
tblTripsAndVMT	HaulingTripNumber	0.00	420.00
tblTripsAndVMT	HaulingTripNumber	0.00	92.00
tblTripsAndVMT	HaulingTripNumber	0.00	36.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00

tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	13.00	16.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	5.00	6.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.0207	0.2432	0.1827	4.7000e-004	9.6400e-003	8.3300e-003	0.0180	2.6300e-003	7.9800e-003	0.0106	0.0000	43.1828	43.1828	1.5200e-003	0.0000	43.2148
2016	0.3963	4.0854	3.0831	6.7000e-003	0.2335	0.1943	0.4278	0.0968	0.1853	0.2820	0.0000	603.2965	603.2965	0.0558	0.0000	604.4681
Total	**0.4170**	**4.3286**	**3.2657**	**7.1700e-003**	**0.2431**	**0.2027**	**0.4458**	**0.0994**	**0.1932**	**0.2926**	**0.0000**	**646.4794**	**646.4794**	**0.0573**	**0.0000**	**647.6829**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.0207	0.2432	0.1827	4.7000e-004	9.6400e-003	8.3300e-003	0.0180	2.6300e-003	7.9800e-003	0.0106	0.0000	43.1828	43.1828	1.5200e-003	0.0000	43.2148
2016	0.3963	4.0854	3.0831	6.7000e-003	0.1559	0.1943	0.3502	0.0554	0.1853	0.2406	0.0000	603.2962	603.2962	0.0558	0.0000	604.4678
Total	**0.4170**	**4.3286**	**3.2657**	**7.1700e-003**	**0.1656**	**0.2027**	**0.3682**	**0.0580**	**0.1932**	**0.2513**	**0.0000**	**646.4791**	**646.4791**	**0.0573**	**0.0000**	**647.6825**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**31.91**	**0.00**	**17.41**	**41.62**	**0.00**	**14.14**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	SAD Helipad and Water System	Building Construction	12/15/2015	1/25/2016	5	30	
2	SAD Armor Canyon/Dam	Building Construction	12/15/2015	12/28/2015	5	10	
3	SAD Repair Leaks	Building Construction	2/1/2016	2/12/2016	5	10	
4	SAD Remove/Replace Jib Crane	Building Construction	2/13/2016	2/26/2016	5	10	
5	SAD Hoist	Building Construction	3/1/2016	3/28/2016	5	20	
6	SAHW Demo	Demolition	3/7/2016	3/11/2016	5	5	
7	SAHW Rubber Dam	Building Construction	3/12/2016	3/18/2016	5	5	
8	SAHW Construct Levee	Building Construction	3/19/2016	4/1/2016	5	10	
9	SAD Construct New Spillway	Grading	4/1/2016	9/30/2016	5	131	
10	SADD Construct New Spillway	Grading	4/1/2016	5/30/2016	5	42	
11	WPB Demo	Demolition	4/2/2016	4/15/2016	5	10	
12	SAD Install Valves	Building Construction	4/2/2016	4/15/2016	5	10	
13	SAD Electrical	Building Construction	4/2/2016	4/29/2016	5	20	
14	WPB Clear/Grub	Site Preparation	4/16/2016	5/14/2016	5	20	
15	WPB Grading	Grading	5/15/2016	5/28/2016	5	10	
16	WPB Abutments and Wing Walls	Building Construction	5/29/2016	6/29/2016	5	23	
17	SADD Construct Downstream Buttress	Grading	6/1/2016	8/15/2016	5	54	
18	WPB Construct Deck	Building Construction	6/30/2016	8/10/2016	5	30	
19	WPB Pave Bridge	Paving	8/15/2016	8/26/2016	5	10	
20	SADD Construct New Subdrain	Grading	8/16/2016	9/15/2016	5	23	
21	SADD Remove Outlet Tower	Grading	9/16/2016	9/30/2016	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
SAHW Demo	Concrete/Industrial Saws	1	8.00	81	0.73
SAHW Demo	Excavators	1	6.00	162	0.38
SAHW Demo	Tractors/Loaders/Backhoes	1	6.00	97	0.37
SAHW Rubber Dam	Tractors/Loaders/Backhoes	2	8.00	97	0.37
SAHW Construct Levee	Pumps	1	8.00	84	0.74
SAHW Construct Levee	Tractors/Loaders/Backhoes	1	8.00	97	0.37
WPB Demo	Concrete/Industrial Saws	1	8.00	81	0.73
WPB Demo	Excavators	1	6.00	162	0.38
WPB Demo	Tractors/Loaders/Backhoes	1	6.00	97	0.37
WPB Clear/Grub	Tractors/Loaders/Backhoes	1	8.00	97	0.37
WPB Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
WPB Abutments and Wing Walls	Pumps	2	8.00	84	0.74
WPB Construct Deck	Pumps	1	8.00	84	0.74
SAD Helipad and Water System	Pumps	1	6.00	84	0.74
SAD Helipad and Water System	Tractors/Loaders/Backhoes	1	8.00	97	0.37
SAD Armor Canyon/Dam	Pumps	1	8.00	84	0.74
WPB Pave Bridge	Rollers	1	7.00	80	0.38
SAD Repair Leaks	Pumps	1	8.00	84	0.74
SAD Remove/Replace Jib Crane	Cranes	1	4.00	226	0.29
SAD Hoist	Cranes	1	4.00	226	0.29
SAD Construct New Spillway	Concrete/Industrial Saws	1	8.00	81	0.73
SAD Construct New Spillway	Cranes	1	4.00	226	0.29
SAD Construct New Spillway	Pumps	1	8.00	84	0.74
SAD Construct New Spillway	Tractors/Loaders/Backhoes	2	6.00	97	0.37
SADD Construct New Spillway	Bore/Drill Rigs	1	6.00	205	0.50
SADD Construct New Spillway	Concrete/Industrial Saws	1	8.00	81	0.73

SADD Construct New Spillway	Pumps	1	6.00	84	0.74
SAD Install Valves	Cranes	1	4.00	226	0.29
SAD Electrical	Cranes	1	4.00	226	0.29
SADD Construct Downstream Buttress	Excavators	1	6.00	162	0.38
SADD Construct Downstream Buttress	Rubber Tired Dozers	1	6.00	255	0.40
SADD Construct Downstream Buttress	Tractors/Loaders/Backhoes	2	6.00	97	0.37
SADD Construct New Subdrain	Tractors/Loaders/Backhoes	2	8.00	97	0.37
SADD Remove Outlet Tower	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
SAHW Demo	3	10.00	0.00	20.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAHW Rubber Dam	2	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAHW Construct Levee	2	6.00	0.00	38.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Demo	3	10.00	0.00	28.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Clear/Grub	1	6.00	0.00	420.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Grading	2	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Abutments and Wing Walls	2	8.00	0.00	92.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Construct Deck	1	6.00	0.00	36.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Helipad and Water System	2	10.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Armor Canyon/Dam	1	6.00	0.00	1,000.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
WPB Pave Bridge	1	6.00	3.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Repair Leaks	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Remove/Replace Jib Crane	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Hoist	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Construct New Spillway	5	16.00	0.00	112.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SADD Construct New Spillway	3	10.00	0.00	126.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Install Valves	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SAD Electrical	1	6.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

SADD Construct Downstream Buttress	4	10.00	0.00	8,125.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SADD Construct New Subdrain	2	6.00	0.00	313.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
SADD Remove Outlet Tower	2	10.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 SAD Helipad and Water System - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9700e-003	0.0482	0.0348	5.0000e-005		3.6900e-003	3.6900e-003		3.5500e-003	3.5500e-003	0.0000	4.6865	4.6865	8.7000e-004	0.0000	4.7048
Total	**5.9700e-003**	**0.0482**	**0.0348**	**5.0000e-005**		**3.6900e-003**	**3.6900e-003**		**3.5500e-003**	**3.5500e-003**	**0.0000**	**4.6865**	**4.6865**	**8.7000e-004**	**0.0000**	**4.7048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-005	6.7000e-004	8.3000e-004	0.0000	4.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.1308	0.1308	0.0000	0.0000	0.1308
Worker	3.2000e-004	4.6000e-004	4.7800e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.7190	0.7190	4.0000e-005	0.0000	0.7199

Total	**3.9000e-004**	**1.1300e-003**	**5.6100e-003**	**1.0000e-005**	**7.5000e-004**	**2.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.2000e-004**	**0.0000**	**0.8499**	**0.8499**	**4.0000e-005**	**0.0000**	**0.8508**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9700e-003	0.0482	0.0348	5.0000e-005		3.6900e-003	3.6900e-003		3.5500e-003	3.5500e-003	0.0000	4.6865	4.6865	8.7000e-004	0.0000	4.7048
Total	**5.9700e-003**	**0.0482**	**0.0348**	**5.0000e-005**		**3.6900e-003**	**3.6900e-003**		**3.5500e-003**	**3.5500e-003**	**0.0000**	**4.6865**	**4.6865**	**8.7000e-004**	**0.0000**	**4.7048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-005	6.7000e-004	8.3000e-004	0.0000	4.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.1308	0.1308	0.0000	0.0000	0.1308
Worker	3.2000e-004	4.6000e-004	4.7800e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.7190	0.7190	4.0000e-005	0.0000	0.7199
Total	**3.9000e-004**	**1.1300e-003**	**5.6100e-003**	**1.0000e-005**	**7.5000e-004**	**2.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.2000e-004**	**0.0000**	**0.8499**	**0.8499**	**4.0000e-005**	**0.0000**	**0.8508**

3.2 SAD Helipad and Water System - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.1600e-003	0.0590	0.0451	7.0000e-005		4.4000e-003	4.4000e-003		4.2300e-003	4.2300e-003	0.0000	6.0991	6.0991	1.1000e-003	0.0000	6.1222
Total	**7.1600e-003**	**0.0590**	**0.0451**	**7.0000e-005**		**4.4000e-003**	**4.4000e-003**		**4.2300e-003**	**4.2300e-003**	**0.0000**	**6.0991**	**6.0991**	**1.1000e-003**	**0.0000**	**6.1222**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	7.8000e-004	1.0100e-003	0.0000	5.0000e-005	1.0000e-005	6.0000e-005	1.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.1692	0.1692	0.0000	0.0000	0.1693
Worker	3.7000e-004	5.4000e-004	5.6500e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.4000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.9089	0.9089	5.0000e-005	0.0000	0.9100
Total	**4.5000e-004**	**1.3200e-003**	**6.6600e-003**	**1.0000e-005**	**9.8000e-004**	**2.0000e-005**	**1.0000e-003**	**2.6000e-004**	**2.0000e-005**	**2.9000e-004**	**0.0000**	**1.0781**	**1.0781**	**5.0000e-005**	**0.0000**	**1.0792**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.1600e-003	0.0590	0.0451	7.0000e-005		4.4000e-003	4.4000e-003		4.2300e-003	4.2300e-003	0.0000	6.0991	6.0991	1.1000e-003	0.0000	6.1222
Total	**7.1600e-003**	**0.0590**	**0.0451**	**7.0000e-005**		**4.4000e-003**	**4.4000e-003**		**4.2300e-003**	**4.2300e-003**	**0.0000**	**6.0991**	**6.0991**	**1.1000e-003**	**0.0000**	**6.1222**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	7.8000e-004	1.0100e-003	0.0000	5.0000e-005	1.0000e-005	6.0000e-005	1.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.1692	0.1692	0.0000	0.0000	0.1693
Worker	3.7000e-004	5.4000e-004	5.6500e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.4000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.9089	0.9089	5.0000e-005	0.0000	0.9100
Total	**4.5000e-004**	**1.3200e-003**	**6.6600e-003**	**1.0000e-005**	**9.8000e-004**	**2.0000e-005**	**1.0000e-003**	**2.6000e-004**	**2.0000e-005**	**2.9000e-004**	**0.0000**	**1.0781**	**1.0781**	**5.0000e-005**	**0.0000**	**1.0792**

3.3 SAD Armor Canyon/Dam - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.7200e-003	0.0265	0.0195	3.0000e-005		2.0000e-003	2.0000e-003		2.0000e-003	2.0000e-003	0.0000	2.8260	2.8260	3.0000e-004	0.0000	2.8324
Total	**3.7200e-003**	**0.0265**	**0.0195**	**3.0000e-005**		**2.0000e-003**	**2.0000e-003**		**2.0000e-003**	**2.0000e-003**	**0.0000**	**2.8260**	**2.8260**	**3.0000e-004**	**0.0000**	**2.8324**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0104	0.1672	0.1206	3.7000e-004	8.5600e-003	2.6200e-003	0.0112	2.3500e-003	2.4100e-003	4.7600e-003	0.0000	34.4886	34.4886	2.8000e-004	0.0000	34.4945
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	2.1000e-004	2.2100e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3319	0.3319	2.0000e-005	0.0000	0.3323
Total	**0.0106**	**0.1674**	**0.1228**	**3.7000e-004**	**8.8900e-003**	**2.6200e-003**	**0.0115**	**2.4400e-003**	**2.4100e-003**	**4.8500e-003**	**0.0000**	**34.8205**	**34.8205**	**3.0000e-004**	**0.0000**	**34.8268**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.7200e-003	0.0265	0.0195	3.0000e-005		2.0000e-003	2.0000e-003		2.0000e-003	2.0000e-003	0.0000	2.8260	2.8260	3.0000e-004	0.0000	2.8324
Total	**3.7200e-003**	**0.0265**	**0.0195**	**3.0000e-005**		**2.0000e-003**	**2.0000e-003**		**2.0000e-003**	**2.0000e-003**	**0.0000**	**2.8260**	**2.8260**	**3.0000e-004**	**0.0000**	**2.8324**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0104	0.1672	0.1206	3.7000e-004	8.5600e-003	2.6200e-003	0.0112	2.3500e-003	2.4100e-003	4.7600e-003	0.0000	34.4886	34.4886	2.8000e-004	0.0000	34.4945
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	2.1000e-004	2.2100e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3319	0.3319	2.0000e-005	0.0000	0.3323
Total	**0.0106**	**0.1674**	**0.1228**	**3.7000e-004**	**8.8900e-003**	**2.6200e-003**	**0.0115**	**2.4400e-003**	**2.4100e-003**	**4.8500e-003**	**0.0000**	**34.8205**	**34.8205**	**3.0000e-004**	**0.0000**	**34.8268**

3.4 SAD Repair Leaks - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.3400e-003	0.0246	0.0193	3.0000e-005		1.7800e-003	1.7800e-003		1.7800e-003	1.7800e-003	0.0000	2.8260	2.8260	2.7000e-004	0.0000	2.8318
Total	**3.3400e-003**	**0.0246**	**0.0193**	**3.0000e-005**		**1.7800e-003**	**1.7800e-003**		**1.7800e-003**	**1.7800e-003**	**0.0000**	**2.8260**	**2.8260**	**2.7000e-004**	**0.0000**	**2.8318**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	4.6000e-004	5.9000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.0995	0.0995	0.0000	0.0000	0.0996
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**1.7000e-004**	**6.5000e-004**	**2.5900e-003**	**0.0000**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**1.0000e-004**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**0.4203**	**0.4203**	**2.0000e-005**	**0.0000**	**0.4207**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.3400e-003	0.0246	0.0193	3.0000e-005		1.7800e-003	1.7800e-003		1.7800e-003	1.7800e-003	0.0000	2.8260	2.8260	2.7000e-004	0.0000	2.8318
Total	**3.3400e-003**	**0.0246**	**0.0193**	**3.0000e-005**		**1.7800e-003**	**1.7800e-003**		**1.7800e-003**	**1.7800e-003**	**0.0000**	**2.8260**	**2.8260**	**2.7000e-004**	**0.0000**	**2.8318**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	4.6000e-004	5.9000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.0995	0.0995	0.0000	0.0000	0.0996
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**1.7000e-004**	**6.5000e-004**	**2.5900e-003**	**0.0000**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**1.0000e-004**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**0.4203**	**0.4203**	**2.0000e-005**	**0.0000**	**0.4207**

3.5 SAD Remove/Replace Jib Crane - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0213	7.4600e-003	1.0000e-005		9.7000e-004	9.7000e-004		8.9000e-004	8.9000e-004	0.0000	1.3296	1.3296	4.0000e-004	0.0000	1.3380
Total	**1.8000e-003**	**0.0213**	**7.4600e-003**	**1.0000e-005**		**9.7000e-004**	**9.7000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**1.3296**	**1.3296**	**4.0000e-004**	**0.0000**	**1.3380**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	4.6000e-004	5.9000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.0995	0.0995	0.0000	0.0000	0.0996
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**1.7000e-004**	**6.5000e-004**	**2.5900e-003**	**0.0000**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**1.0000e-004**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**0.4203**	**0.4203**	**2.0000e-005**	**0.0000**	**0.4207**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0213	7.4600e-003	1.0000e-005		9.7000e-004	9.7000e-004		8.9000e-004	8.9000e-004	0.0000	1.3296	1.3296	4.0000e-004	0.0000	1.3380
Total	**1.8000e-003**	**0.0213**	**7.4600e-003**	**1.0000e-005**		**9.7000e-004**	**9.7000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**1.3296**	**1.3296**	**4.0000e-004**	**0.0000**	**1.3380**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	4.6000e-004	5.9000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.0995	0.0995	0.0000	0.0000	0.0996
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**1.7000e-004**	**6.5000e-004**	**2.5900e-003**	**0.0000**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**1.0000e-004**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**0.4203**	**0.4203**	**2.0000e-005**	**0.0000**	**0.4207**

3.6 SAD Hoist - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6000e-003	0.0427	0.0149	3.0000e-005		1.9400e-003	1.9400e-003		1.7800e-003	1.7800e-003	0.0000	2.6591	2.6591	8.0000e-004	0.0000	2.6760
Total	**3.6000e-003**	**0.0427**	**0.0149**	**3.0000e-005**		**1.9400e-003**	**1.9400e-003**		**1.7800e-003**	**1.7800e-003**	**0.0000**	**2.6591**	**2.6591**	**8.0000e-004**	**0.0000**	**2.6760**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0000e-005	9.1000e-004	1.1900e-003	0.0000	6.0000e-005	1.0000e-005	8.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.1991	0.1991	0.0000	0.0000	0.1991
Worker	2.6000e-004	3.8000e-004	3.9900e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	1.0000e-005	1.8000e-004	0.0000	0.6416	0.6416	4.0000e-005	0.0000	0.6423
Total	**3.5000e-004**	**1.2900e-003**	**5.1800e-003**	**1.0000e-005**	**7.2000e-004**	**2.0000e-005**	**7.4000e-004**	**1.9000e-004**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**0.8407**	**0.8407**	**4.0000e-005**	**0.0000**	**0.8415**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6000e-003	0.0427	0.0149	3.0000e-005		1.9400e-003	1.9400e-003		1.7800e-003	1.7800e-003	0.0000	2.6591	2.6591	8.0000e-004	0.0000	2.6760
Total	**3.6000e-003**	**0.0427**	**0.0149**	**3.0000e-005**		**1.9400e-003**	**1.9400e-003**		**1.7800e-003**	**1.7800e-003**	**0.0000**	**2.6591**	**2.6591**	**8.0000e-004**	**0.0000**	**2.6760**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0000e-005	9.1000e-004	1.1900e-003	0.0000	6.0000e-005	1.0000e-005	8.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.1991	0.1991	0.0000	0.0000	0.1991
Worker	2.6000e-004	3.8000e-004	3.9900e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	1.0000e-005	1.8000e-004	0.0000	0.6416	0.6416	4.0000e-005	0.0000	0.6423
Total	**3.5000e-004**	**1.2900e-003**	**5.1800e-003**	**1.0000e-005**	**7.2000e-004**	**2.0000e-005**	**7.4000e-004**	**1.9000e-004**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**0.8407**	**0.8407**	**4.0000e-005**	**0.0000**	**0.8415**

3.7 SAHW Demo - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.2000e-004	0.0000	4.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9800e-003	0.0260	0.0204	3.0000e-005		1.7500e-003	1.7500e-003		1.6800e-003	1.6800e-003	0.0000	2.8301	2.8301	5.8000e-004	0.0000	2.8423
Total	**2.9800e-003**	**0.0260**	**0.0204**	**3.0000e-005**	**4.2000e-004**	**1.7500e-003**	**2.1700e-003**	**6.0000e-005**	**1.6800e-003**	**1.7400e-003**	**0.0000**	**2.8301**	**2.8301**	**5.8000e-004**	**0.0000**	**2.8423**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.8000e-004	2.9500e-003	2.2400e-003	1.0000e-005	1.7000e-004	4.0000e-005	2.1000e-004	5.0000e-005	4.0000e-005	9.0000e-005	0.0000	0.6822	0.6822	1.0000e-005	0.0000	0.6823
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	1.6000e-004	1.6600e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	8.0000e-005	0.0000	0.2673	0.2673	2.0000e-005	0.0000	0.2676
Total	**2.9000e-004**	**3.1100e-003**	**3.9000e-003**	**1.0000e-005**	**4.4000e-004**	**4.0000e-005**	**4.9000e-004**	**1.2000e-004**	**4.0000e-005**	**1.7000e-004**	**0.0000**	**0.9495**	**0.9495**	**3.0000e-005**	**0.0000**	**0.9499**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.6000e-004	0.0000	1.6000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9800e-003	0.0260	0.0204	3.0000e-005		1.7500e-003	1.7500e-003		1.6800e-003	1.6800e-003	0.0000	2.8301	2.8301	5.8000e-004	0.0000	2.8422
Total	**2.9800e-003**	**0.0260**	**0.0204**	**3.0000e-005**	**1.6000e-004**	**1.7500e-003**	**1.9100e-003**	**2.0000e-005**	**1.6800e-003**	**1.7000e-003**	**0.0000**	**2.8301**	**2.8301**	**5.8000e-004**	**0.0000**	**2.8422**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.8000e-004	2.9500e-003	2.2400e-003	1.0000e-005	1.7000e-004	4.0000e-005	2.1000e-004	5.0000e-005	4.0000e-005	9.0000e-005	0.0000	0.6822	0.6822	1.0000e-005	0.0000	0.6823
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	1.6000e-004	1.6600e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	8.0000e-005	0.0000	0.2673	0.2673	2.0000e-005	0.0000	0.2676
Total	**2.9000e-004**	**3.1100e-003**	**3.9000e-003**	**1.0000e-005**	**4.4000e-004**	**4.0000e-005**	**4.9000e-004**	**1.2000e-004**	**4.0000e-005**	**1.7000e-004**	**0.0000**	**0.9495**	**0.9495**	**3.0000e-005**	**0.0000**	**0.9499**

3.8 SAHW Rubber Dam - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7000e-003	0.0163	0.0121	2.0000e-005		1.2500e-003	1.2500e-003		1.1500e-003	1.1500e-003	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775
Total	**1.7000e-003**	**0.0163**	**0.0121**	**2.0000e-005**		**1.2500e-003**	**1.2500e-003**		**1.1500e-003**	**1.1500e-003**	**0.0000**	**1.4682**	**1.4682**	**4.4000e-004**	**0.0000**	**1.4775**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	2.3000e-004	3.0000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0498	0.0498	0.0000	0.0000	0.0498
Worker	7.0000e-005	1.0000e-004	1.0000e-003	0.0000	1.6000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1604	0.1604	1.0000e-005	0.0000	0.1606
Total	**9.0000e-005**	**3.3000e-004**	**1.3000e-003**	**0.0000**	**1.8000e-004**	**0.0000**	**1.9000e-004**	**4.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2102**	**0.2102**	**1.0000e-005**	**0.0000**	**0.2104**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7000e-003	0.0163	0.0121	2.0000e-005		1.2500e-003	1.2500e-003		1.1500e-003	1.1500e-003	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775
Total	**1.7000e-003**	**0.0163**	**0.0121**	**2.0000e-005**		**1.2500e-003**	**1.2500e-003**		**1.1500e-003**	**1.1500e-003**	**0.0000**	**1.4682**	**1.4682**	**4.4000e-004**	**0.0000**	**1.4775**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	2.3000e-004	3.0000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0498	0.0498	0.0000	0.0000	0.0498
Worker	7.0000e-005	1.0000e-004	1.0000e-003	0.0000	1.6000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1604	0.1604	1.0000e-005	0.0000	0.1606
Total	**9.0000e-005**	**3.3000e-004**	**1.3000e-003**	**0.0000**	**1.8000e-004**	**0.0000**	**1.9000e-004**	**4.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2102**	**0.2102**	**1.0000e-005**	**0.0000**	**0.2104**

3.9 SAHW Construct Levee - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0500e-003	0.0408	0.0314	5.0000e-005		3.0300e-003	3.0300e-003		2.9300e-003	2.9300e-003	0.0000	4.2942	4.2942	7.2000e-004	0.0000	4.3093
Total	**5.0500e-003**	**0.0408**	**0.0314**	**5.0000e-005**		**3.0300e-003**	**3.0300e-003**		**2.9300e-003**	**2.9300e-003**	**0.0000**	**4.2942**	**4.2942**	**7.2000e-004**	**0.0000**	**4.3093**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5000e-004	5.6100e-003	4.2500e-003	1.0000e-005	3.3000e-004	8.0000e-005	4.0000e-004	9.0000e-005	7.0000e-005	1.6000e-004	0.0000	1.2961	1.2961	1.0000e-005	0.0000	1.2963
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**4.8000e-004**	**5.8000e-003**	**6.2500e-003**	**1.0000e-005**	**6.6000e-004**	**8.0000e-005**	**7.3000e-004**	**1.8000e-004**	**7.0000e-005**	**2.5000e-004**	**0.0000**	**1.6169**	**1.6169**	**3.0000e-005**	**0.0000**	**1.6175**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0500e-003	0.0408	0.0314	5.0000e-005		3.0300e-003	3.0300e-003		2.9300e-003	2.9300e-003	0.0000	4.2942	4.2942	7.2000e-004	0.0000	4.3093
Total	**5.0500e-003**	**0.0408**	**0.0314**	**5.0000e-005**		**3.0300e-003**	**3.0300e-003**		**2.9300e-003**	**2.9300e-003**	**0.0000**	**4.2942**	**4.2942**	**7.2000e-004**	**0.0000**	**4.3093**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5000e-004	5.6100e-003	4.2500e-003	1.0000e-005	3.3000e-004	8.0000e-005	4.0000e-004	9.0000e-005	7.0000e-005	1.6000e-004	0.0000	1.2961	1.2961	1.0000e-005	0.0000	1.2963
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**4.8000e-004**	**5.8000e-003**	**6.2500e-003**	**1.0000e-005**	**6.6000e-004**	**8.0000e-005**	**7.3000e-004**	**1.8000e-004**	**7.0000e-005**	**2.5000e-004**	**0.0000**	**1.6169**	**1.6169**	**3.0000e-005**	**0.0000**	**1.6175**

3.10 SAD Construct New Spillway - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1432	1.2235	0.8351	1.3300e-003		0.0834	0.0834		0.0804	0.0804	0.0000	118.5045	118.5045	0.0210	0.0000	118.9444
Total	**0.1432**	**1.2235**	**0.8351**	**1.3300e-003**	**0.0000**	**0.0834**	**0.0834**	**0.0000**	**0.0804**	**0.0804**	**0.0000**	**118.5045**	**118.5045**	**0.0210**	**0.0000**	**118.9444**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0300e-003	0.0165	0.0125	4.0000e-005	9.6000e-004	2.3000e-004	1.1900e-003	2.6000e-004	2.1000e-004	4.8000e-004	0.0000	3.8200	3.8200	3.0000e-005	0.0000	3.8206
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5800e-003	6.6900e-003	0.0697	1.5000e-004	0.0115	1.1000e-004	0.0116	3.0500e-003	1.0000e-004	3.1500e-003	0.0000	11.2061	11.2061	6.4000e-004	0.0000	11.2194
Total	**5.6100e-003**	**0.0232**	**0.0822**	**1.9000e-004**	**0.0124**	**3.4000e-004**	**0.0128**	**3.3100e-003**	**3.1000e-004**	**3.6300e-003**	**0.0000**	**15.0261**	**15.0261**	**6.7000e-004**	**0.0000**	**15.0401**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1432	1.2235	0.8351	1.3300e-003		0.0834	0.0834		0.0804	0.0804	0.0000	118.5044	118.5044	0.0210	0.0000	118.9442
Total	**0.1432**	**1.2235**	**0.8351**	**1.3300e-003**	**0.0000**	**0.0834**	**0.0834**	**0.0000**	**0.0804**	**0.0804**	**0.0000**	**118.5044**	**118.5044**	**0.0210**	**0.0000**	**118.9442**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0300e-003	0.0165	0.0125	4.0000e-005	9.6000e-004	2.3000e-004	1.1900e-003	2.6000e-004	2.1000e-004	4.8000e-004	0.0000	3.8200	3.8200	3.0000e-005	0.0000	3.8206
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5800e-003	6.6900e-003	0.0697	1.5000e-004	0.0115	1.1000e-004	0.0116	3.0500e-003	1.0000e-004	3.1500e-003	0.0000	11.2061	11.2061	6.4000e-004	0.0000	11.2194
Total	**5.6100e-003**	**0.0232**	**0.0822**	**1.9000e-004**	**0.0124**	**3.4000e-004**	**0.0128**	**3.3100e-003**	**3.1000e-004**	**3.6300e-003**	**0.0000**	**15.0261**	**15.0261**	**6.7000e-004**	**0.0000**	**15.0401**

3.11 SADD Construct New Spillway - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0296	0.2570	0.1724	3.7000e-004		0.0153	0.0153		0.0151	0.0151	0.0000	33.1628	33.1628	5.8700e-003	0.0000	33.2860
Total	**0.0296**	**0.2570**	**0.1724**	**3.7000e-004**	**0.0000**	**0.0153**	**0.0153**	**0.0000**	**0.0151**	**0.0151**	**0.0000**	**33.1628**	**33.1628**	**5.8700e-003**	**0.0000**	**33.2860**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1500e-003	0.0186	0.0141	5.0000e-005	1.0800e-003	2.6000e-004	1.3400e-003	3.0000e-004	2.4000e-004	5.4000e-004	0.0000	4.2976	4.2976	3.0000e-005	0.0000	4.2982
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.2000e-004	1.3400e-003	0.0140	3.0000e-005	2.3000e-003	2.0000e-005	2.3200e-003	6.1000e-004	2.0000e-005	6.3000e-004	0.0000	2.2455	2.2455	1.3000e-004	0.0000	2.2482
Total	**2.0700e-003**	**0.0200**	**0.0281**	**8.0000e-005**	**3.3800e-003**	**2.8000e-004**	**3.6600e-003**	**9.1000e-004**	**2.6000e-004**	**1.1700e-003**	**0.0000**	**6.5430**	**6.5430**	**1.6000e-004**	**0.0000**	**6.5464**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0296	0.2570	0.1724	3.7000e-004		0.0153	0.0153		0.0151	0.0151	0.0000	33.1628	33.1628	5.8700e-003	0.0000	33.2859
Total	**0.0296**	**0.2570**	**0.1724**	**3.7000e-004**	**0.0000**	**0.0153**	**0.0153**	**0.0000**	**0.0151**	**0.0151**	**0.0000**	**33.1628**	**33.1628**	**5.8700e-003**	**0.0000**	**33.2859**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1500e-003	0.0186	0.0141	5.0000e-005	1.0800e-003	2.6000e-004	1.3400e-003	3.0000e-004	2.4000e-004	5.4000e-004	0.0000	4.2976	4.2976	3.0000e-005	0.0000	4.2982
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.2000e-004	1.3400e-003	0.0140	3.0000e-005	2.3000e-003	2.0000e-005	2.3200e-003	6.1000e-004	2.0000e-005	6.3000e-004	0.0000	2.2455	2.2455	1.3000e-004	0.0000	2.2482
Total	**2.0700e-003**	**0.0200**	**0.0281**	**8.0000e-005**	**3.3800e-003**	**2.8000e-004**	**3.6600e-003**	**9.1000e-004**	**2.6000e-004**	**1.1700e-003**	**0.0000**	**6.5430**	**6.5430**	**1.6000e-004**	**0.0000**	**6.5464**

3.12 WPB Demo - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1500e-003	0.0000	1.1500e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9700e-003	0.0519	0.0408	6.0000e-005		3.4900e-003	3.4900e-003		3.3500e-003	3.3500e-003	0.0000	5.6602	5.6602	1.1600e-003	0.0000	5.6845
Total	**5.9700e-003**	**0.0519**	**0.0408**	**6.0000e-005**	**1.1500e-003**	**3.4900e-003**	**4.6400e-003**	**1.7000e-004**	**3.3500e-003**	**3.5200e-003**	**0.0000**	**5.6602**	**5.6602**	**1.1600e-003**	**0.0000**	**5.6845**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.6000e-004	4.1300e-003	3.1300e-003	1.0000e-005	2.4000e-004	6.0000e-005	3.0000e-004	7.0000e-005	5.0000e-005	1.2000e-004	0.0000	0.9550	0.9550	1.0000e-005	0.0000	0.9552
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.2000e-004	3.3300e-003	1.0000e-005	5.5000e-004	1.0000e-005	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5346	0.5346	3.0000e-005	0.0000	0.5353
Total	**4.8000e-004**	**4.4500e-003**	**6.4600e-003**	**2.0000e-005**	**7.9000e-004**	**7.0000e-005**	**8.5000e-004**	**2.2000e-004**	**5.0000e-005**	**2.7000e-004**	**0.0000**	**1.4897**	**1.4897**	**4.0000e-005**	**0.0000**	**1.4904**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.5000e-004	0.0000	4.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9700e-003	0.0519	0.0408	6.0000e-005		3.4900e-003	3.4900e-003		3.3500e-003	3.3500e-003	0.0000	5.6602	5.6602	1.1600e-003	0.0000	5.6845
Total	**5.9700e-003**	**0.0519**	**0.0408**	**6.0000e-005**	**4.5000e-004**	**3.4900e-003**	**3.9400e-003**	**7.0000e-005**	**3.3500e-003**	**3.4200e-003**	**0.0000**	**5.6602**	**5.6602**	**1.1600e-003**	**0.0000**	**5.6845**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.6000e-004	4.1300e-003	3.1300e-003	1.0000e-005	2.4000e-004	6.0000e-005	3.0000e-004	7.0000e-005	5.0000e-005	1.2000e-004	0.0000	0.9550	0.9550	1.0000e-005	0.0000	0.9552
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.2000e-004	3.3300e-003	1.0000e-005	5.5000e-004	1.0000e-005	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5346	0.5346	3.0000e-005	0.0000	0.5353
Total	**4.8000e-004**	**4.4500e-003**	**6.4600e-003**	**2.0000e-005**	**7.9000e-004**	**7.0000e-005**	**8.5000e-004**	**2.2000e-004**	**5.0000e-005**	**2.7000e-004**	**0.0000**	**1.4897**	**1.4897**	**4.0000e-005**	**0.0000**	**1.4904**

3.13 SAD Install Valves - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0213	7.4600e-003	1.0000e-005		9.7000e-004	9.7000e-004		8.9000e-004	8.9000e-004	0.0000	1.3296	1.3296	4.0000e-004	0.0000	1.3380
Total	**1.8000e-003**	**0.0213**	**7.4600e-003**	**1.0000e-005**		**9.7000e-004**	**9.7000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**1.3296**	**1.3296**	**4.0000e-004**	**0.0000**	**1.3380**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	4.6000e-004	5.9000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.0995	0.0995	0.0000	0.0000	0.0996
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**1.7000e-004**	**6.5000e-004**	**2.5900e-003**	**0.0000**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**1.0000e-004**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**0.4203**	**0.4203**	**2.0000e-005**	**0.0000**	**0.4207**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0213	7.4600e-003	1.0000e-005		9.7000e-004	9.7000e-004		8.9000e-004	8.9000e-004	0.0000	1.3296	1.3296	4.0000e-004	0.0000	1.3380
Total	**1.8000e-003**	**0.0213**	**7.4600e-003**	**1.0000e-005**		**9.7000e-004**	**9.7000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**1.3296**	**1.3296**	**4.0000e-004**	**0.0000**	**1.3380**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	4.6000e-004	5.9000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.0995	0.0995	0.0000	0.0000	0.0996
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**1.7000e-004**	**6.5000e-004**	**2.5900e-003**	**0.0000**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**1.0000e-004**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**0.4203**	**0.4203**	**2.0000e-005**	**0.0000**	**0.4207**

3.14 SAD Electrical - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6000e-003	0.0427	0.0149	3.0000e-005		1.9400e-003	1.9400e-003		1.7800e-003	1.7800e-003	0.0000	2.6591	2.6591	8.0000e-004	0.0000	2.6760
Total	**3.6000e-003**	**0.0427**	**0.0149**	**3.0000e-005**		**1.9400e-003**	**1.9400e-003**		**1.7800e-003**	**1.7800e-003**	**0.0000**	**2.6591**	**2.6591**	**8.0000e-004**	**0.0000**	**2.6760**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0000e-005	9.1000e-004	1.1900e-003	0.0000	6.0000e-005	1.0000e-005	8.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.1991	0.1991	0.0000	0.0000	0.1991
Worker	2.6000e-004	3.8000e-004	3.9900e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	1.0000e-005	1.8000e-004	0.0000	0.6416	0.6416	4.0000e-005	0.0000	0.6423
Total	**3.5000e-004**	**1.2900e-003**	**5.1800e-003**	**1.0000e-005**	**7.2000e-004**	**2.0000e-005**	**7.4000e-004**	**1.9000e-004**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**0.8407**	**0.8407**	**4.0000e-005**	**0.0000**	**0.8415**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6000e-003	0.0427	0.0149	3.0000e-005		1.9400e-003	1.9400e-003		1.7800e-003	1.7800e-003	0.0000	2.6591	2.6591	8.0000e-004	0.0000	2.6760
Total	**3.6000e-003**	**0.0427**	**0.0149**	**3.0000e-005**		**1.9400e-003**	**1.9400e-003**		**1.7800e-003**	**1.7800e-003**	**0.0000**	**2.6591**	**2.6591**	**8.0000e-004**	**0.0000**	**2.6760**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0000e-005	9.1000e-004	1.1900e-003	0.0000	6.0000e-005	1.0000e-005	8.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.1991	0.1991	0.0000	0.0000	0.1991
Worker	2.6000e-004	3.8000e-004	3.9900e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	1.0000e-005	1.8000e-004	0.0000	0.6416	0.6416	4.0000e-005	0.0000	0.6423
Total	**3.5000e-004**	**1.2900e-003**	**5.1800e-003**	**1.0000e-005**	**7.2000e-004**	**2.0000e-005**	**7.4000e-004**	**1.9000e-004**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**0.8407**	**0.8407**	**4.0000e-005**	**0.0000**	**0.8415**

3.15 WPB Clear/Grub - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4100e-003	0.0326	0.0241	3.0000e-005		2.5100e-003	2.5100e-003		2.3100e-003	2.3100e-003	0.0000	2.9364	2.9364	8.9000e-004	0.0000	2.9550
Total	**3.4100e-003**	**0.0326**	**0.0241**	**3.0000e-005**	**0.0000**	**2.5100e-003**	**2.5100e-003**	**0.0000**	**2.3100e-003**	**2.3100e-003**	**0.0000**	**2.9364**	**2.9364**	**8.9000e-004**	**0.0000**	**2.9550**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8500e-003	0.0620	0.0470	1.6000e-004	3.5900e-003	8.7000e-004	4.4700e-003	9.9000e-004	8.0000e-004	1.7900e-003	0.0000	14.3252	14.3252	1.1000e-004	0.0000	14.3274
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	3.8000e-004	3.9900e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	1.0000e-005	1.8000e-004	0.0000	0.6416	0.6416	4.0000e-005	0.0000	0.6423
Total	**4.1100e-003**	**0.0624**	**0.0510**	**1.7000e-004**	**4.2500e-003**	**8.8000e-004**	**5.1300e-003**	**1.1600e-003**	**8.1000e-004**	**1.9700e-003**	**0.0000**	**14.9667**	**14.9667**	**1.5000e-004**	**0.0000**	**14.9697**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4100e-003	0.0326	0.0241	3.0000e-005		2.5100e-003	2.5100e-003		2.3100e-003	2.3100e-003	0.0000	2.9364	2.9364	8.9000e-004	0.0000	2.9550
Total	**3.4100e-003**	**0.0326**	**0.0241**	**3.0000e-005**	**0.0000**	**2.5100e-003**	**2.5100e-003**	**0.0000**	**2.3100e-003**	**2.3100e-003**	**0.0000**	**2.9364**	**2.9364**	**8.9000e-004**	**0.0000**	**2.9550**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8500e-003	0.0620	0.0470	1.6000e-004	3.5900e-003	8.7000e-004	4.4700e-003	9.9000e-004	8.0000e-004	1.7900e-003	0.0000	14.3252	14.3252	1.1000e-004	0.0000	14.3274
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	3.8000e-004	3.9900e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	1.0000e-005	1.8000e-004	0.0000	0.6416	0.6416	4.0000e-005	0.0000	0.6423
Total	**4.1100e-003**	**0.0624**	**0.0510**	**1.7000e-004**	**4.2500e-003**	**8.8000e-004**	**5.1300e-003**	**1.1600e-003**	**8.1000e-004**	**1.9700e-003**	**0.0000**	**14.9667**	**14.9667**	**1.5000e-004**	**0.0000**	**14.9697**

3.16 WPB Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5500e-003	0.0244	0.0181	2.0000e-005		1.8800e-003	1.8800e-003		1.7300e-003	1.7300e-003	0.0000	2.2023	2.2023	6.6000e-004	0.0000	2.2162
Total	**2.5500e-003**	**0.0244**	**0.0181**	**2.0000e-005**	**0.0000**	**1.8800e-003**	**1.8800e-003**	**0.0000**	**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.2023**	**2.2023**	**6.6000e-004**	**0.0000**	**2.2162**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.2000e-004	3.3300e-003	1.0000e-005	5.5000e-004	1.0000e-005	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5346	0.5346	3.0000e-005	0.0000	0.5353
Total	**2.2000e-004**	**3.2000e-004**	**3.3300e-003**	**1.0000e-005**	**5.5000e-004**	**1.0000e-005**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.5346**	**0.5346**	**3.0000e-005**	**0.0000**	**0.5353**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5500e-003	0.0244	0.0181	2.0000e-005		1.8800e-003	1.8800e-003		1.7300e-003	1.7300e-003	0.0000	2.2023	2.2023	6.6000e-004	0.0000	2.2162
Total	**2.5500e-003**	**0.0244**	**0.0181**	**2.0000e-005**	**0.0000**	**1.8800e-003**	**1.8800e-003**	**0.0000**	**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.2023**	**2.2023**	**6.6000e-004**	**0.0000**	**2.2162**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.2000e-004	3.3300e-003	1.0000e-005	5.5000e-004	1.0000e-005	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5346	0.5346	3.0000e-005	0.0000	0.5353
Total	**2.2000e-004**	**3.2000e-004**	**3.3300e-003**	**1.0000e-005**	**5.5000e-004**	**1.0000e-005**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.5346**	**0.5346**	**3.0000e-005**	**0.0000**	**0.5353**

3.17 WPB Abutments and Wing Walls - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0154	0.1129	0.0888	1.5000e-004		8.1900e-003	8.1900e-003		8.1900e-003	8.1900e-003	0.0000	12.9998	12.9998	1.2600e-003	0.0000	13.0262
Total	**0.0154**	**0.1129**	**0.0888**	**1.5000e-004**		**8.1900e-003**	**8.1900e-003**		**8.1900e-003**	**8.1900e-003**	**0.0000**	**12.9998**	**12.9998**	**1.2600e-003**	**0.0000**	**13.0262**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.4000e-004	0.0136	0.0103	3.0000e-005	7.9000e-004	1.9000e-004	9.8000e-004	2.2000e-004	1.8000e-004	3.9000e-004	0.0000	3.1379	3.1379	2.0000e-005	0.0000	3.1384
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	5.9000e-004	6.1200e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.9837	0.9837	6.0000e-005	0.0000	0.9849
Total	**1.2400e-003**	**0.0142**	**0.0164**	**4.0000e-005**	**1.8000e-003**	**2.0000e-004**	**2.0000e-003**	**4.9000e-004**	**1.9000e-004**	**6.7000e-004**	**0.0000**	**4.1216**	**4.1216**	**8.0000e-005**	**0.0000**	**4.1233**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0154	0.1129	0.0888	1.5000e-004		8.1900e-003	8.1900e-003		8.1900e-003	8.1900e-003	0.0000	12.9998	12.9998	1.2600e-003	0.0000	13.0262
Total	**0.0154**	**0.1129**	**0.0888**	**1.5000e-004**		**8.1900e-003**	**8.1900e-003**		**8.1900e-003**	**8.1900e-003**	**0.0000**	**12.9998**	**12.9998**	**1.2600e-003**	**0.0000**	**13.0262**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.4000e-004	0.0136	0.0103	3.0000e-005	7.9000e-004	1.9000e-004	9.8000e-004	2.2000e-004	1.8000e-004	3.9000e-004	0.0000	3.1379	3.1379	2.0000e-005	0.0000	3.1384
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	5.9000e-004	6.1200e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.9837	0.9837	6.0000e-005	0.0000	0.9849
Total	**1.2400e-003**	**0.0142**	**0.0164**	**4.0000e-005**	**1.8000e-003**	**2.0000e-004**	**2.0000e-003**	**4.9000e-004**	**1.9000e-004**	**6.7000e-004**	**0.0000**	**4.1216**	**4.1216**	**8.0000e-005**	**0.0000**	**4.1233**

3.18 SADD Construct Downstream Buttress - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1256	0.0000	0.1256	0.0676	0.0000	0.0676	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0467	0.5024	0.3795	4.1000e-004		0.0276	0.0276		0.0254	0.0254	0.0000	38.9584	38.9584	0.0118	0.0000	39.2052
Total	**0.0467**	**0.5024**	**0.3795**	**4.1000e-004**	**0.1256**	**0.0276**	**0.1533**	**0.0676**	**0.0254**	**0.0930**	**0.0000**	**38.9584**	**38.9584**	**0.0118**	**0.0000**	**39.2052**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0744	1.1998	0.9093	3.0300e-003	0.0695	0.0169	0.0864	0.0191	0.0155	0.0346	0.0000	277.1237	277.1237	2.0600e-003	0.0000	277.1670
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1800e-003	1.7200e-003	0.0180	4.0000e-005	2.9600e-003	3.0000e-005	2.9900e-003	7.9000e-004	3.0000e-005	8.1000e-004	0.0000	2.8871	2.8871	1.6000e-004	0.0000	2.8905
Total	**0.0756**	**1.2015**	**0.9273**	**3.0700e-003**	**0.0725**	**0.0169**	**0.0894**	**0.0199**	**0.0156**	**0.0354**	**0.0000**	**280.0107**	**280.0107**	**2.2200e-003**	**0.0000**	**280.0575**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0490	0.0000	0.0490	0.0264	0.0000	0.0264	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0467	0.5024	0.3795	4.1000e-004		0.0276	0.0276		0.0254	0.0254	0.0000	38.9583	38.9583	0.0118	0.0000	39.2051
Total	**0.0467**	**0.5024**	**0.3795**	**4.1000e-004**	**0.0490**	**0.0276**	**0.0766**	**0.0264**	**0.0254**	**0.0518**	**0.0000**	**38.9583**	**38.9583**	**0.0118**	**0.0000**	**39.2051**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0744	1.1998	0.9093	3.0300e-003	0.0695	0.0169	0.0864	0.0191	0.0155	0.0346	0.0000	277.1237	277.1237	2.0600e-003	0.0000	277.1670
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1800e-003	1.7200e-003	0.0180	4.0000e-005	2.9600e-003	3.0000e-005	2.9900e-003	7.9000e-004	3.0000e-005	8.1000e-004	0.0000	2.8871	2.8871	1.6000e-004	0.0000	2.8905
Total	**0.0756**	**1.2015**	**0.9273**	**3.0700e-003**	**0.0725**	**0.0169**	**0.0894**	**0.0199**	**0.0156**	**0.0354**	**0.0000**	**280.0107**	**280.0107**	**2.2200e-003**	**0.0000**	**280.0575**

3.19 WPB Construct Deck - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0100	0.0736	0.0579	1.0000e-004		5.3400e-003	5.3400e-003		5.3400e-003	5.3400e-003	0.0000	8.4781	8.4781	8.2000e-004	0.0000	8.4953
Total	**0.0100**	**0.0736**	**0.0579**	**1.0000e-004**		**5.3400e-003**	**5.3400e-003**		**5.3400e-003**	**5.3400e-003**	**0.0000**	**8.4781**	**8.4781**	**8.2000e-004**	**0.0000**	**8.4953**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3000e-004	5.3200e-003	4.0300e-003	1.0000e-005	3.1000e-004	7.0000e-005	3.8000e-004	8.0000e-005	7.0000e-005	1.5000e-004	0.0000	1.2279	1.2279	1.0000e-005	0.0000	1.2281
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	5.7000e-004	5.9900e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.9624	0.9624	5.0000e-005	0.0000	0.9635
Total	**7.2000e-004**	**5.8900e-003**	**0.0100**	**2.0000e-005**	**1.3000e-003**	**8.0000e-005**	**1.3800e-003**	**3.4000e-004**	**8.0000e-005**	**4.2000e-004**	**0.0000**	**2.1902**	**2.1902**	**6.0000e-005**	**0.0000**	**2.1916**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0100	0.0736	0.0579	1.0000e-004		5.3400e-003	5.3400e-003		5.3400e-003	5.3400e-003	0.0000	8.4781	8.4781	8.2000e-004	0.0000	8.4953
Total	**0.0100**	**0.0736**	**0.0579**	**1.0000e-004**		**5.3400e-003**	**5.3400e-003**		**5.3400e-003**	**5.3400e-003**	**0.0000**	**8.4781**	**8.4781**	**8.2000e-004**	**0.0000**	**8.4953**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3000e-004	5.3200e-003	4.0300e-003	1.0000e-005	3.1000e-004	7.0000e-005	3.8000e-004	8.0000e-005	7.0000e-005	1.5000e-004	0.0000	1.2279	1.2279	1.0000e-005	0.0000	1.2281
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	5.7000e-004	5.9900e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.9624	0.9624	5.0000e-005	0.0000	0.9635
Total	**7.2000e-004**	**5.8900e-003**	**0.0100**	**2.0000e-005**	**1.3000e-003**	**8.0000e-005**	**1.3800e-003**	**3.4000e-004**	**8.0000e-005**	**4.2000e-004**	**0.0000**	**2.1902**	**2.1902**	**6.0000e-005**	**0.0000**	**2.1916**

3.20 WPB Pave Bridge - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4700e-003	0.0136	8.8100e-003	1.0000e-005		1.0000e-003	1.0000e-003		9.2000e-004	9.2000e-004	0.0000	1.0815	1.0815	3.3000e-004	0.0000	1.0883
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4700e-003**	**0.0136**	**8.8100e-003**	**1.0000e-005**		**1.0000e-003**	**1.0000e-003**		**9.2000e-004**	**9.2000e-004**	**0.0000**	**1.0815**	**1.0815**	**3.3000e-004**	**0.0000**	**1.0883**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3000e-004	1.3700e-003	1.7800e-003	0.0000	9.0000e-005	2.0000e-005	1.1000e-004	3.0000e-005	2.0000e-005	5.0000e-005	0.0000	0.2986	0.2986	0.0000	0.0000	0.2987
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**2.6000e-004**	**1.5600e-003**	**3.7800e-003**	**0.0000**	**4.2000e-004**	**2.0000e-005**	**4.4000e-004**	**1.2000e-004**	**2.0000e-005**	**1.4000e-004**	**0.0000**	**0.6194**	**0.6194**	**2.0000e-005**	**0.0000**	**0.6198**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4700e-003	0.0136	8.8100e-003	1.0000e-005		1.0000e-003	1.0000e-003		9.2000e-004	9.2000e-004	0.0000	1.0815	1.0815	3.3000e-004	0.0000	1.0883
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4700e-003**	**0.0136**	**8.8100e-003**	**1.0000e-005**		**1.0000e-003**	**1.0000e-003**		**9.2000e-004**	**9.2000e-004**	**0.0000**	**1.0815**	**1.0815**	**3.3000e-004**	**0.0000**	**1.0883**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3000e-004	1.3700e-003	1.7800e-003	0.0000	9.0000e-005	2.0000e-005	1.1000e-004	3.0000e-005	2.0000e-005	5.0000e-005	0.0000	0.2986	0.2986	0.0000	0.0000	0.2987
Worker	1.3000e-004	1.9000e-004	2.0000e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3208	0.3208	2.0000e-005	0.0000	0.3212
Total	**2.6000e-004**	**1.5600e-003**	**3.7800e-003**	**0.0000**	**4.2000e-004**	**2.0000e-005**	**4.4000e-004**	**1.2000e-004**	**2.0000e-005**	**1.4000e-004**	**0.0000**	**0.6194**	**0.6194**	**2.0000e-005**	**0.0000**	**0.6198**

3.21 SADD Construct New Subdrain - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.8300e-003	0.0749	0.0555	7.0000e-005		5.7600e-003	5.7600e-003		5.3000e-003	5.3000e-003	0.0000	6.7536	6.7536	2.0400e-003	0.0000	6.7964
Total	**7.8300e-003**	**0.0749**	**0.0555**	**7.0000e-005**	**0.0000**	**5.7600e-003**	**5.7600e-003**	**0.0000**	**5.3000e-003**	**5.3000e-003**	**0.0000**	**6.7536**	**6.7536**	**2.0400e-003**	**0.0000**	**6.7964**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8700e-003	0.0462	0.0350	1.2000e-004	2.6800e-003	6.5000e-004	3.3300e-003	7.3000e-004	6.0000e-004	1.3300e-003	0.0000	10.6757	10.6757	8.0000e-005	0.0000	10.6773
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	4.4000e-004	4.5900e-003	1.0000e-005	7.6000e-004	1.0000e-005	7.6000e-004	2.0000e-004	1.0000e-005	2.1000e-004	0.0000	0.7378	0.7378	4.0000e-005	0.0000	0.7387
Total	**3.1700e-003**	**0.0467**	**0.0396**	**1.3000e-004**	**3.4400e-003**	**6.6000e-004**	**4.0900e-003**	**9.3000e-004**	**6.1000e-004**	**1.5400e-003**	**0.0000**	**11.4135**	**11.4135**	**1.2000e-004**	**0.0000**	**11.4160**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.8300e-003	0.0749	0.0555	7.0000e-005		5.7600e-003	5.7600e-003		5.3000e-003	5.3000e-003	0.0000	6.7536	6.7536	2.0400e-003	0.0000	6.7964
Total	**7.8300e-003**	**0.0749**	**0.0555**	**7.0000e-005**	**0.0000**	**5.7600e-003**	**5.7600e-003**	**0.0000**	**5.3000e-003**	**5.3000e-003**	**0.0000**	**6.7536**	**6.7536**	**2.0400e-003**	**0.0000**	**6.7964**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8700e-003	0.0462	0.0350	1.2000e-004	2.6800e-003	6.5000e-004	3.3300e-003	7.3000e-004	6.0000e-004	1.3300e-003	0.0000	10.6757	10.6757	8.0000e-005	0.0000	10.6773
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	4.4000e-004	4.5900e-003	1.0000e-005	7.6000e-004	1.0000e-005	7.6000e-004	2.0000e-004	1.0000e-005	2.1000e-004	0.0000	0.7378	0.7378	4.0000e-005	0.0000	0.7387
Total	**3.1700e-003**	**0.0467**	**0.0396**	**1.3000e-004**	**3.4400e-003**	**6.6000e-004**	**4.0900e-003**	**9.3000e-004**	**6.1000e-004**	**1.5400e-003**	**0.0000**	**11.4135**	**11.4135**	**1.2000e-004**	**0.0000**	**11.4160**

3.22 SADD Remove Outlet Tower - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8100e-003	0.0269	0.0199	3.0000e-005		2.0700e-003	2.0700e-003		1.9000e-003	1.9000e-003	0.0000	2.4225	2.4225	7.3000e-004	0.0000	2.4378
Total	**2.8100e-003**	**0.0269**	**0.0199**	**3.0000e-005**	**0.0000**	**2.0700e-003**	**2.0700e-003**	**0.0000**	**1.9000e-003**	**1.9000e-003**	**0.0000**	**2.4225**	**2.4225**	**7.3000e-004**	**0.0000**	**2.4378**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	1.4800e-003	1.1200e-003	0.0000	9.0000e-005	2.0000e-005	1.1000e-004	2.0000e-005	2.0000e-005	4.0000e-005	0.0000	0.3411	0.3411	0.0000	0.0000	0.3411
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	3.5000e-004	3.6600e-003	1.0000e-005	6.0000e-004	1.0000e-005	6.1000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	0.5881	0.5881	3.0000e-005	0.0000	0.5888
Total	**3.3000e-004**	**1.8300e-003**	**4.7800e-003**	**1.0000e-005**	**6.9000e-004**	**3.0000e-005**	**7.2000e-004**	**1.8000e-004**	**3.0000e-005**	**2.1000e-004**	**0.0000**	**0.9292**	**0.9292**	**3.0000e-005**	**0.0000**	**0.9299**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8100e-003	0.0269	0.0199	3.0000e-005		2.0700e-003	2.0700e-003		1.9000e-003	1.9000e-003	0.0000	2.4225	2.4225	7.3000e-004	0.0000	2.4378
Total	**2.8100e-003**	**0.0269**	**0.0199**	**3.0000e-005**	**0.0000**	**2.0700e-003**	**2.0700e-003**	**0.0000**	**1.9000e-003**	**1.9000e-003**	**0.0000**	**2.4225**	**2.4225**	**7.3000e-004**	**0.0000**	**2.4378**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	1.4800e-003	1.1200e-003	0.0000	9.0000e-005	2.0000e-005	1.1000e-004	2.0000e-005	2.0000e-005	4.0000e-005	0.0000	0.3411	0.3411	0.0000	0.0000	0.3411
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	3.5000e-004	3.6600e-003	1.0000e-005	6.0000e-004	1.0000e-005	6.1000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	0.5881	0.5881	3.0000e-005	0.0000	0.5888
Total	**3.3000e-004**	**1.8300e-003**	**4.7800e-003**	**1.0000e-005**	**6.9000e-004**	**3.0000e-005**	**7.2000e-004**	**1.8000e-004**	**3.0000e-005**	**2.1000e-004**	**0.0000**	**0.9292**	**0.9292**	**3.0000e-005**	**0.0000**	**0.9299**

APPENDIX B

BIOLOGICAL TECHNICAL REPORT

Biological Technical Report

Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California

Prepared for
Los Angeles County Flood Control District
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October 15, 2014

Balancing the Natural and Built Environment

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J Jurisdictional Delineation Report

1.0 INTRODUCTION

This Biological Technical Report has been prepared to support California Environmental Quality Act (CEQA) documentation for the proposed actions relating to the Santa Anita Stormwater Flood Management and Seismic Strengthening (Project). This information has been reported in accordance with accepted scientific and technical standards that are consistent with the requirements of the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW).[1]

1.1 PROJECT LOCATION AND PHYSICAL ENVIRONMENTAL SETTING

The study area is located in Los Angeles County at the northeast edge of the City of Arcadia, the northwest edge of the City of Monrovia, and the Angeles National Forest (Exhibit 1). It is located on the U.S. Geological Survey's (USGS') Mt. Wilson 7.5-minute quadrangle map (Exhibit 2). Elevations in the study area range from 725 to 1,850 feet above mean sea level (msl). The study area is approximately 115.50 acres and includes habitat from the Santa Anita Reservoir downstream along Santa Anita Wash to the Santa Anita Debris Dam. Private residences occur along the western boundary of the debris dam along Highland Oaks Boulevard. Open spaces in the City of Arcadia's Wilderness Park (Wilderness Park) and the Angeles National Forest occur north and east of the study area (Exhibit 3). Additional County of Los Angeles Department of Public Works (LACDPW) flood-control facilities are located south of the study area.

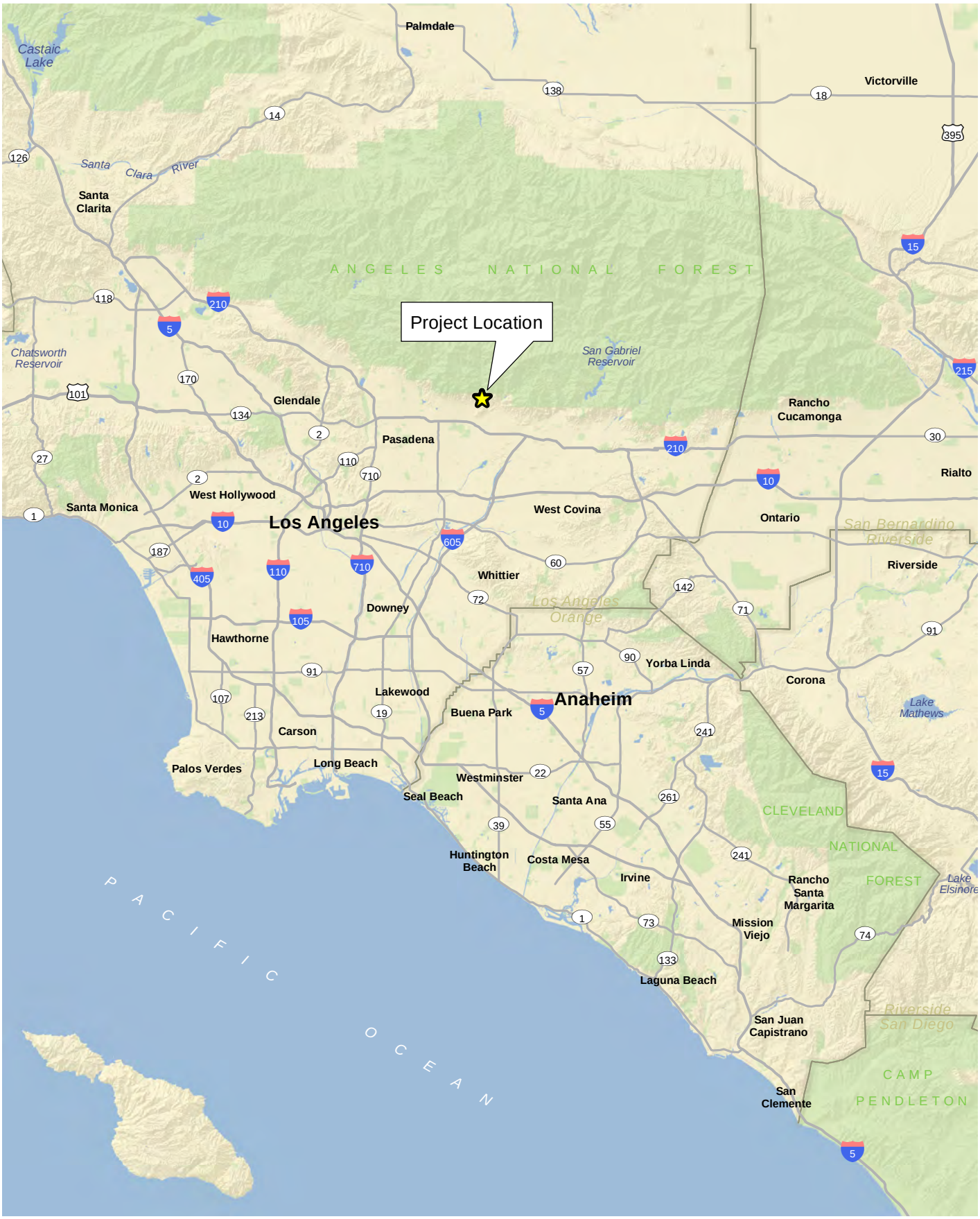
Soil types in the study area generally consist of the Trigo family soils, which have a granitic substratum on 60 to 90 percent slopes in the northern portion of the study area. No data is available for the soils in the southern portion of the study area (USDA NRCS 2012).

1.1.1 Regional Environmental Setting

Santa Anita Canyon is located in the San Gabriel Mountains in and adjacent to the Angeles National Forest. The Angeles National Forest includes over 650,000 acres of open space that are managed for flood control, water conservation, and recreation (USFS 2012). The study area is located on the south side of Angeles Crest Highway (within the Los Angeles River Ranger District), approximately 1.5 miles southeast of Mt. Wilson. It is located approximately 2.5 miles southwest of the Cogswell Reservoir and approximately 10 miles southeast of Big Tujunga Reservoir. Habitat in the Angeles National Forest is composed primarily of chaparral, with pine and fir forests at higher elevations (USFS 2012).

The region experiences a Mediterranean climate characterized by mild, rainy winters and hot, dry summers. The temperature is moderated by the coastal influence of the Pacific Ocean, which creates mild conditions throughout most of the year. The most distinguishing characteristic of a Mediterranean climate is its seasonal precipitation. In Southern California, precipitation is characterized by brief, intense storms between November and March. It is not unusual for a majority of the annual precipitation to fall during a few storms over a short span of time. Rainfall patterns in the region are subject to extreme variations from year to year and longer-term wet and dry cycles. The average annual rainfall for the area is approximately 16.29 inches based on 1939–2012 averages (WRCC 2012).

[1] As of January 1, 2013, the California Department of Fish and Game (CDFG) changed its name to the California Department of Fish and Wildlife (CDFW). Please note that references to previous publications use the name under which the document was published (i.e., CDFG), while discussions relating to the agency refer to the current name (i.e., CDFW).



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Regional Location

Exhibit 1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

10 5 0 10 Miles

BonTerra PSOMAS

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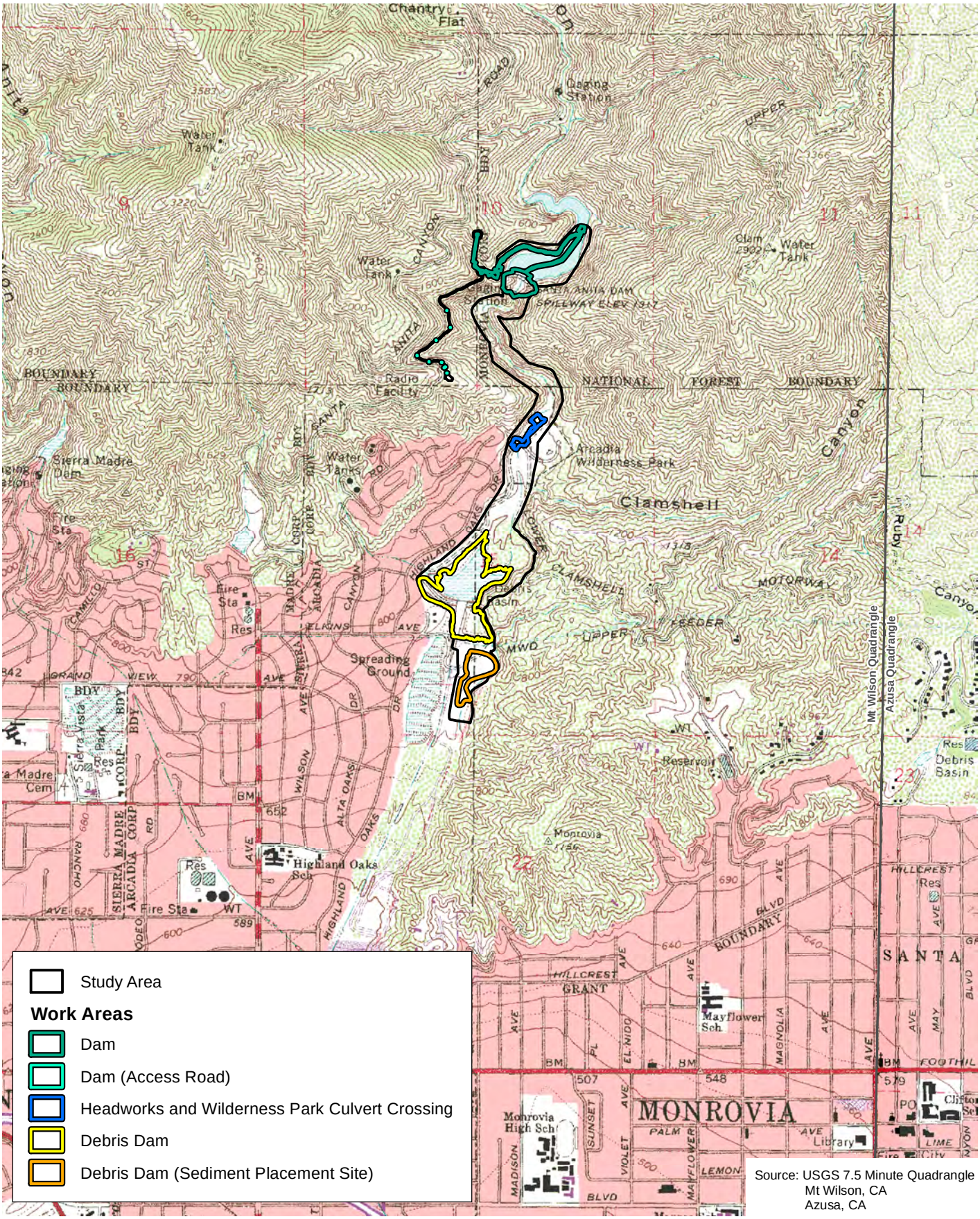

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Local Vicinity

Exhibit 2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

2,000 1,000 0 2,000 Feet

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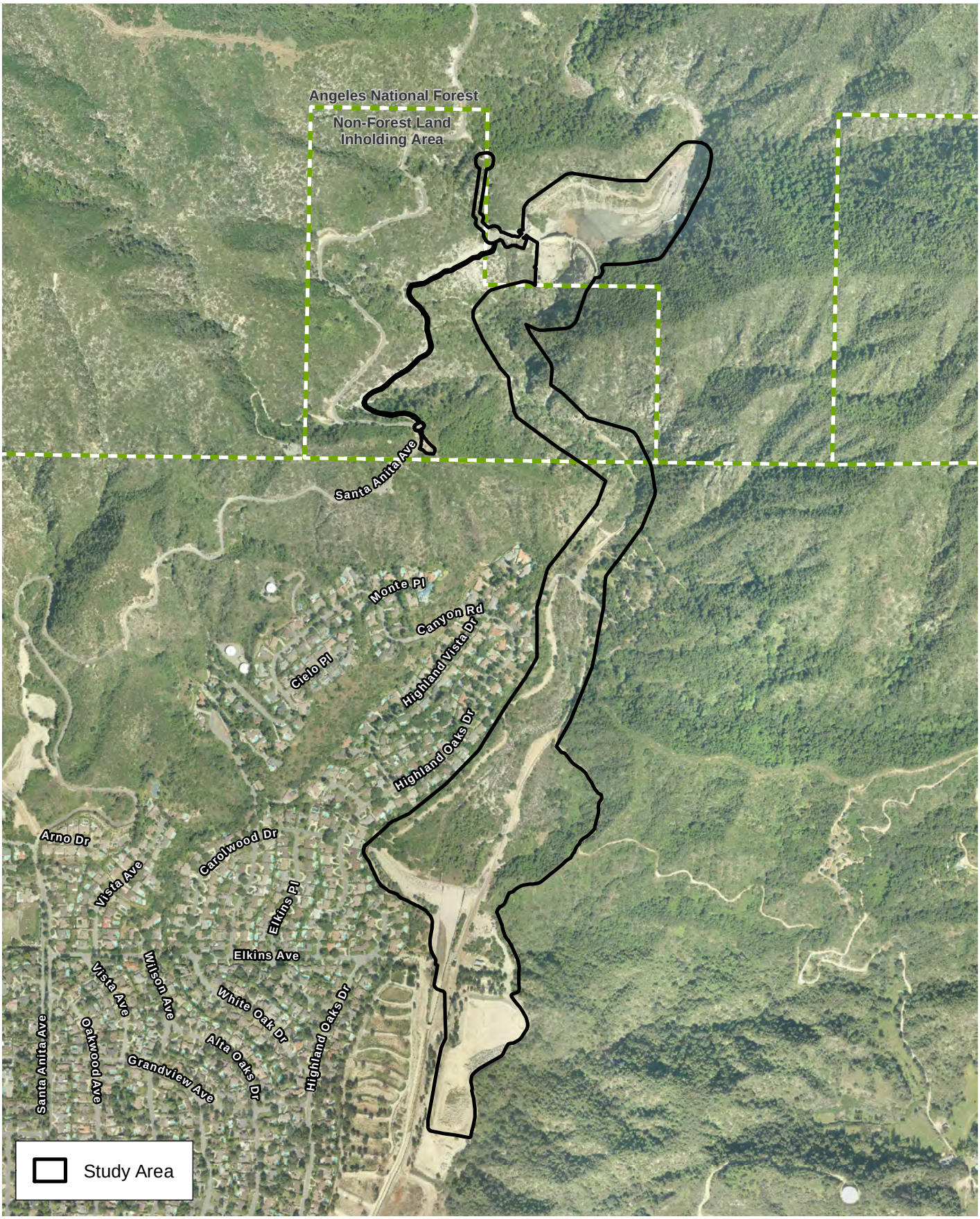

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Study Area

Exhibit 3

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

1,000 500 0 1,000 Feet

BonTerra PSOMAS

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1.2 PROJECT DESCRIPTION AND BACKGROUND

The Project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed: the Santa Anita Dam (Dam), the Santa Anita Headworks (Headworks), Wilderness Park Culvert Crossing, and the Santa Anita Debris Dam (Debris Dam). These facilities, which are described in further detail below, are operated and maintained by the Los Angeles County Flood Control District (LACFCD) and serve to control and conserve the floodwaters of the Santa Anita Canyon Watershed. In 1985, the responsibilities and authority vested to the LACFCD were transferred to the LACDPW. The Watershed Management Division is the planning and policy arm of the LACFCD. The Flood Maintenance and Water Resources Divisions, respectively, oversee LACFCD's maintenance and operational efforts.

The Santa Anita Canyon Watershed is mostly undeveloped; the majority of it is located in the Angeles National Forest within the San Gabriel Mountains, which are very steep and among the most highly erosive mountains in the world. This watershed is also susceptible to wildfires, which can result in substantial debris flows during subsequent storm events. The Project's facilities are located within 1 mile of the Sierra Madre Fault, which is capable of a producing a maximum credible earthquake (MCE) of magnitude 7.5.

The Project would improve the LACFCD's facilities to better reduce flood risk to downstream communities by modifying the Dam spillway to safely pass the Probable Maximum Flood (PMF) and remediate seismic safety issues at the Dam and Debris Dam. It would also enhance the sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre feet per year (afy) by restoring storage capacity at the Debris Dam, rehabilitate the Headworks for more reliable diversion of stormwater runoff to the spreading grounds, and modernize facilities and implement new monitoring and control systems. The Project would also improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing. The Project would be partially funded by a State of California Proposition 1E Stormwater Flood Management Grant, as well as assistance from the City of Arcadia, the City of Sierra Madre, and the Raymond Basin Management Board.

In addition to improving infrastructure for flood protection, the Project would contribute to regional efforts to reduce dependence on imported water supplies by providing increased opportunities to recharge storm flows emanating from the Santa Anita Canyon Watershed into the groundwater basin. The Metropolitan Water District of Southern California has estimated that Southern California could face a potential gap between water demand and supply of up to 1,300,000 afy by the year 2025 if new water supply projects are not developed (LACFCD 2011).

The Greater Los Angeles County Integrated Regional Water Management Plan (IRWMP) includes regional objectives to promote an integrated, multi-benefit, inter-regional approach to water management and planning. Objectives of the IRWMP include (1) sustaining infrastructure for local communities to maintain and enhance public infrastructure related to flood protection, water resources, and water quality and (2) improving water supply to optimize local water resources to reduce the Greater Los Angeles Region's reliance on imported water. The Project had been identified in the IRWMP as one of the regional-level projects that could help to increase recharge of the local groundwater basin and thereby increase local water supplies (Leadership Committee 2006).

1.2.1 Project Description

The Project has multiple components, including the Dam, Headworks and Wilderness Park Culvert Crossing, and Debris Dam. The following describes each of the Project's components.

Dam

The Dam would be structurally altered to accommodate a new spillway with sufficient capacity to pass the probable maximum flood (PMF) of 26,100 cubic feet per second (cfs) in order to reduce the risk of Dam failure from uncontrolled overtopping during major storm events. The proposed improvements to the Dam would not result in changes to the existing maximum water surface elevation restrictions; therefore, the reservoir's capacity to retain water would not be altered by Project implementation.

The spillway modification would consist of cutting a "notch" in the Dam crest to allow the PMF to overtop in a controlled manner. The existing auxiliary spillway bowl and trash rack and existing emergency crest spillway would be removed. The proposed notch would be centered on the crest of the Dam, similar to the existing emergency crest spillway, and would require concrete removal from the Dam. An existing spillway on the far western edge of the Dam would remain and be unaltered by the Project; however, the existing auxiliary orifice spillway beneath the proposed new spillway would be removed.

A new pedestrian bridge would be constructed over the notch, and the existing hoist system would be upgraded to have a higher load capacity and re-aligned to accommodate the new spillway, including relocation of the lower hoist tower along the Dam crest (and potentially cantilevered of the back side, if necessary. The proposed improvements would not change the height of the Dam; the crest of the Dam will remain at an elevation of 1,325 feet above msl and the parapet wall would remain at an elevation of 1,328 feet above msl.

To better manage stormwater runoff and to ensure reliability and efficiency of operations, six of the existing valves will be replaced (three control valves and three backup valves), along with new electrical and control systems. The Dam's structural concrete would be repaired to ensure that it meets acceptable standards consistent with the required seismic performance of the Dam.

The downstream canyon walls and the toe of the Dam would be re-armored with additional reinforced gunite or equivalent concrete erosion protection to dissipate the energy from the overtopping water as the flow cascades through the spillway notch and the orifice spillway or sluiceway. The flow would be directed onto the downstream armoring before flowing into the channel downstream of the Dam. The new re-amoring would reinforce the existing armoring that extends approximately 100 feet downstream from the toe of the Dam. The re-armoring would be held in position with tie-back anchors to be drilled and grouted into the bedrock. The tie-ins for the re-armoring may include superficial rock excavation, grading, and subsurface pressure grouting. The color of the material used for re-armoring would be the same as the existing concrete.

The Project would also include improvements to ancillary facilities of the Dam. The existing garage/storage shed would be demolished and replaced with a new three-bay garage (the third bay would house a new back-up generator). Additionally, the existing Dam Operator's house would be removed and replaced with a helipad to provide aerial access to the Dam in the event of an emergency. It is anticipated that the helipad would only be used one or two times per year. The addition of a helipad would allow for improved emergency access to the Dam, as well as the other facilities downstream, especially if access roads get obstructed. The existing relief quarters and control house would remain to serve as an office. Although the Dam Operator would no longer

reside at the Dam, he/she would still be on-site daily and available on-call after hours. The Project would include remote control capabilities that provide redundant control options from multiple off-site locations. The Dam also has a built-in safety mechanism to automatically pass water through the Dam once the reservoir surface level reaches the DSOD restriction.

The existing potable water system that serves the Dam site would be replaced. The water system currently consists of a 60,000 gallon upper tank located off Chantry Flats Road that connects to two 5,000 gallon lower tanks located near the Dam access road via a pipeline that runs down the mountainside. The slope adjacent to the upper tank has erosion damage and would be repaired as part of the Project. To repair the slope, an approximately 216 square foot eroded gully located near the tank's foundation would be grubbed and stabilized with engineered fill and geotextile fabric, or the installation of support piles. The exposed portions of the existing water pipeline would be removed while any underground portions would be capped and abandoned in place. The replacement pipeline would run along the same general alignment as the existing pipeline. The two lower tanks would be removed and would not require replacement.

The existing manual swing gate at Chantry Flats Road that provides secured entry to the Dam access road would be replaced with a new electric slide gate. In order to provide electricity to the gate and new lighting/intercom systems, a power line would be strung on up to seven new power poles to be installed along the outer edge of the Dam's access road, or where possible, in conduit along the inner slope of the access road.

Headworks and Wilderness Park Culvert Crossing

Headworks

The Headworks structure would be replaced and the associated earthen levee would be partially reconstructed to better manage the diversion of flows to the downstream spreading grounds and the downstream Debris Dam. A rehabilitation of the Headworks is needed to protect facilities from stormwater damage and to direct stormwater runoff to the spreading grounds for groundwater recharge.

Redevelopment of the Headworks would include reconstruction of the levee to ensure it can withstand flows produced by a 25-year storm event and replacement of the existing tainter gate (used to divert flows) with a new rubber diversion structure. The new rubber diversion structure would be a pneumatically operated (through the use of compressed air or compressed gas), bottom hinged, spillway gate system.

The majority of the existing Headworks structure would be demolished and removed, including the tainter gate, supporting walls, catwalk, and keys. The new facility would increase the width of the structure by approximately 20 feet in order to house the 34-foot rubber diversion structure. Operation of the rubber diversion structure would result in the retention of waters behind the levee to allow for the diversion of flows through the intake gates and into the existing 30-inch reinforced concrete pipe (RCP) leading to the Santa Anita Spreading Grounds and/or Sierra Madre Spreading Grounds. The pool created by the new rubber diversion structure would remain the same as under existing conditions. Construction of the new diversion structure would require work in the creekbed extending approximately 25 feet downstream of the Headworks, including the placement of new riprap on the downstream side.

The rehabilitation of the Headworks would also include a new control system, including remote operation capabilities, to increase efficiency of water conservation operations. Currently, the response time required for County personnel to drive to the Headworks and manually operate the tainter gate, along with the limited flow rates that can be bypassed, results in the loss of a water conservation opportunity. A new control system integrated with the control system of the other

Project components would optimize water conservation. A control house for the rubber diversion structure would be constructed on the other side of the channel next to the access road.

The earthen levee would be reinforced and raised approximately five feet higher to match the height of the Headworks structure by removing and under-excavating the existing levee and rebuilding the new levee using a combination of imported fill and suitable material from the existing levee. It would then be recompacted to the proposed height. The access road leading to the facility would be modified to match the height of the reinforced earthen levee. The existing riprap on the upstream side of the levee would be reinforced. A subsurface conduit would be installed along the length of the levee to connect the rubber diversion structure to the control house on the other side.

Wilderness Park Culvert Crossing

In addition to the improvements at the Headworks, armoring of the roadway and construction of a replacement culvert crossing to the Wilderness Park is needed to ensure that the structure can withstand flows produced by a larger storm event. The existing culvert crossing located approximately 450 feet downstream of the Headworks, including the concrete slab and corrugated metal culverts, would be removed and replaced with a new crossing structure.

The new culvert crossing may be wider than the existing structure by up to approximately ten feet. The new culvert crossing would be built on top of a new abutment and would be designed with a permanent guard rail and flexible pavement driving surface adequate for emergency vehicles. The new roadway elevation of the culvert crossing would be raised above the existing roadway elevation by approximately 4.5 feet to accommodate higher flows. Approximately 1,800 square feet of the roadways leading to and from the Culvert Crossing would be repaved and sloped to join the existing grade.

Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing would be grubbed and graded to accommodate the new Culvert Crossing. It is anticipated that adequate vehicular and pedestrian access could be provided to the Arcadia Wilderness Park for the majority of the construction period for the Culvert Crossing, with only occasional closures required for periods of about a week or less at any given time during construction. Notification of any temporary closures would be posted at the entrance to the Wilderness Park. Those brief closures would avoid important events at the Wilderness Park, such as the overnight Boy Scout campouts every Friday and Saturday and youth day camps every weekday between mid-June to late-August. However, in order to provide a conservative analysis for impacts to Biological Resources (see Section 4.4 of this MND), the assembly of a temporary bypass crossing located north of the existing Culvert Crossing, which would require removal of a sycamore tree, has been assumed and assessed, to account for the event that the temporary crossing is used. Therefore, access to the Wilderness Park would be maintained throughout construction with minimal interruption to access. Two existing sycamore trees located adjacent to the crossing on the eastern shore of the Wash, south of the culvert crossing, would need to be removed. One sycamore located on the eastern shore of the Wash, north of the culvert crossing, may need to be removed, depending on whether or not the temporary bypass crossing is installed. In order to provide a conservative analysis, this technical report assumes that all three of the upstream and downstream sycamore trees would be removed.

The LACFCD may transplant the root ball(s) of the sycamores to a suitable riparian location, and/or utilize the woody debris from the sycamore to enhance habitat value at another nearby location, if determined to be feasible and if approved by the County and other appropriate parties. In addition, new sycamore trees would be planted within a 100-foot radius of the original location of any removed existing trees.

New riprap would be installed upstream and downstream of the culvert crossing. The roadways leading to and from the culvert crossing would be armored, 36 feet on the upstream side and 84 feet on the downstream side, to withstand flows and sloped to join the existing grade. The existing water and sewer lines that run through the current culvert crossing would need to be relocated to the new height of the structure. The sewer force main is on the downstream surface of the Culvert Crossing and the water line is on the upstream surface of the Culvert Crossing. Additionally, the fire hydrant, vault, water valve and standpipe would be demolished and relocated approximately 15 feet to the north in the case that the temporary bypass crossing is utilized. All utility trenching and relocations would remain within the area anticipated for impacts by the culvert crossing construction activities, and there would be no changes in water/sewer quantities or demands as a result of the Project.

Debris Dam

Remediation of the seismic deficiencies at the Debris Dam would involve minor improvements to the existing structures, including the intake tower and embankment. As a result of the loss of water conservation capacity from the California Department of Water Resources, Division of Safety of Dams (DSOD) restrictions on the Dam, there is an increased need to capture as much stormwater runoff as possible in facilities below the Dam. As a result, the Debris Dam would also be enlarged by raising the existing spillway by 4 feet. Remediating the seismic deficiencies at the Debris Dam would result in the DSOD removing the operational restrictions on the facility, thereby restoring 119 acre-feet of water conservation capacity. Enlarging the Debris Dam would create an additional 40 acre-feet of additional storage capacity, for a total of 159 acre-feet. When captured stormwater is released from the Dam to the spreading grounds for groundwater recharge, the Debris Dam can then capture more runoff, which would allow for water storage capacity multiple times in a single season depending on the frequency, duration, and intensity of storm events.

The intake tower located in the Debris Dam is unable to resist seismic loading and would be strengthened or replaced. The improved intake tower would be connected to the existing 48-inch outlet pipe (being lined as part of this project). The outlet pipe has an existing junction box which is used to deliver water either into the spillway channel or into the spreading grounds. The upstream and downstream portions of the Debris Dam embankment and alluvial foundation material that are subject to potential liquefaction would be reinforced with structural buttressing. Currently, a cross-section of the Debris Dam resembles a triangle (e.g. sloped sides on the upstream and downstream sides of the dam) with a flat top (e.g. flattened to accommodate vehicular access). The top of the embankment ranges from an elevation of 796 feet above msl at its center to an elevation of 811 feet above msl at the western edge. The construction activities would involve the removal of the existing rip-rap exterior surface on portions of both the upstream (approximately 0.69 acres) and downstream (approximately 0.89) slopes. Engineered fill materials beneath the riprap would be excavated and removed, and an engineered buttress would be constructed. Upon completion of construction activities, the sloped upstream and downstream surfaces of the Debris Dam would be reconfigured into a single stair-stepped terrace. The surface of the Debris Dam would be completed with a rip-rap similar to the existing condition.

As part of the improvements, six non-native deodar cedar trees (*Cedrus deodara*) located at the downstream toe of the embankment would be removed as mandated by DSOD to ensure the structural integrity of the Debris Dam.

A new automated outlet gate and control system would be constructed to modernize operations and to ensure compatibility with other Project components. Upon completion of these improvements, DSOD would issue a new certificate for the facility and remove the current

operating restriction on the Debris Dam, which would increase the Debris Dam's available and allowable water conservation storage capacity from 0 acre-feet to 159 acre-feet.

In addition to the DSOD design approval requirements, the modification of the Debris Dam requires approval under 33 USC 408 (hereafter referred to as Section 408), which requires obtaining a permit from the U.S. Army Corps of Engineers (USACE). Under the terms of Section 408, any proposed modification to a USACE facility requires a determination that the proposed alterations is not injurious to the public interest and will not impair the usefulness of the facility. Consultation with the USACE will be required to determine whether the modifications would be considered a "Minor" (Minor 408) or "Major" (Major 408) Modification.

An existing disturbed area south of the Debris Dam would be used as a Sediment Placement Site.

1.2.2 Project Construction Phasing and Schedule

Project construction would include several components that would occur in phases with some overlap in schedules. Each component of the Project is not dependent on the implementation of other components. Each component can operate on a fully functional stand-alone basis. While each component has its own benefits, the overall Project is designed to maximize those benefits by integrating the operation and functioning of the components so they work together more efficiently.

In compliance with the County Code and consistent with the City of Arcadia Municipal Code, all construction activity must be limited to the hours of 7:00 AM to 7:00 PM Monday through Saturday. However, in order to reduce construction-related impacts to nearby residences, the Project will only be under construction during the weekdays (Monday through Friday) and work would not occur on Saturdays.

The projected construction start dates and duration for the various Project components are shown in Table 1. Construction of the Project is anticipated to commence in the summer of 2015 and end in the fall of 2016. Certain elements of each Project component would likely not be performed during the wet season (October to April) in order to ensure flood control and water conservation efforts can proceed satisfactorily. While the schedule may be modified due to the date of Project approval and receipt of required permits, this table illustrates the approximate duration of major Project activities. As shown, it is anticipated that work would proceed at multiple facilities at one time.

It is possible that the Debris Dam construction would require longer than the 6-month time period shown in Table 1. If the construction period of the Debris Dam were to be extended, this would spread out the construction activities over a longer period of time, resulting in less "intensity" of impacts. All Project-related impacts (e.g., air quality and noise) would be less than significant (some requiring mitigation), and extending the duration of construction activities at the Debris Dam would not increase the level of significance. Decreasing the intensity and spreading out construction activities would generally reduce impacts to the topical sections listed above. Therefore, in order to provide a more conservative impact analysis, the more condensed construction period for the Debris Dam, as shown in Table 1, has been assumed.

TABLE 1
PROJECT CONSTRUCTION SCHEDULE

Construction Phase	Estimated Construction Start	Anticipated Duration
Dam	**December 2015**	**10 months**
Armor Canyon/Dam	December 2015	2 weeks
Garage, Helipad, Water System	December 2015	6 weeks
Remove/Replace Jib Crane	February 2016	2 weeks
Repair Concrete	February 2016	2 weeks
Hoist	March 2016	4 weeks
Construct New Spillway	April 2016	6 months
Install Valves	April 2016	2 weeks
Electrical	April 2016	4 weeks
Headworks and Wilderness Park Culvert Crossing	**March 2016**	**6 months**
Headworks Demolition	March 2016	1 week
Rubber Dam	March 2016	1 week
Construct Levee	March 2016	2 weeks
Culvert Crossing Demolition	April 2016	2 weeks
Site Clear/Grub	April 2016	4 weeks
Grading/ Implement Temporary Access	May 2016	2 weeks
Abutments and Wing Walls	June 2016	4 weeks
Construct Culvert Crossing Deck	July 2016	6 weeks
Paving Culvert Crossing	August 2016	2 weeks
Debris Dam	**April 2016**	**6 months**
Modify Spillway	April 2016	2 months
Construct Buttresses	June 2016	2.5 months
Construct New Subdrain	August 2016	1 month
Remove/Construct Outlet Tower(s)	September 2016	2 weeks

Dam

Improvements at the Dam would include construction of a new spillway; removal and relocation of the jib crane and hoist; installation of new valves; installation of new electrical and control systems; reinforcement of the existing armoring at the toe of the Dam and downstream canyon walls; construction of the helipad; repair of concrete; improvements to the water distribution system; and installation of a new secured access gate and associated electrical connection. For the notch option, including demolition of the Dam Operations house and garage, site preparation and demolition would result in approximately 894 cubic yards of concrete export. Construction of the notch option and the helipad would require approximately 4,130 cubic yards of concrete import.[2] The majority of the work on the actual Dam structure would be performed during the dry season (i.e., April 16 through October 15) when the water level is at the lowest, but dewatering of the reservoir is anticipated. A small cofferdam would be constructed within the Reservoir, where a temporary plastic bypass pipeline (sized to accommodate a certain flow dependent on the time of year) would carry water around the work and into the sluiceway tunnel so that it can proceed downstream. The coffer dam would be approximately 50 feet wide, 8 feet high, and would span from bank to bank. If any construction activity coincides with rain events, small collection points

[2] The “notch” spillway would require cutting and removal of concrete from the Dam; therefore, for the purposes of this technical report, the “notch” option will be analyzed as it is the more construction-intensive option.

may be required within the reservoir area footprint to ensure all water is diverted around the Dam during construction activities.

Headworks and Wilderness Park Culvert Crossing

Construction activities for the Headworks improvements would include demolition and removal of the existing facilities (i.e., concrete slab, wall, keys, catwalk, and tainter gate); installation of the rubber diversion structure; and reconstruction of the levee. Demolition of the existing facilities would result in approximately 73 cubic yards of concrete export. Approximately five cubic yards of metal would need to be removed as well. Reconstruction of the Headworks and installation of the new rubber diversion structure would require approximately 155 cubic yards of concrete import. Construction of the Wilderness Park Culvert Crossing would generate approximately 215 cubic yards of export materials and would require approximately 508 cubic yards of import material. While work at the Headworks would occur during the dry season, dewatering is anticipated. A small cofferdam would be constructed at the uppermost bounds of the existing impact area and a temporary plastic bypass pipeline (sized to accommodate a certain flow dependent on the time of year) would carry water either into the permanent diversion pipes or around the site to be discharged at the downstream limits of the Wilderness Park Culvert Crossing work area.

Debris Dam

Rehabilitation of the Debris Dam would include repair or replacement of the outlet tower; construction of new structural buttresses on both upstream and downstream sides of the embankment; and installation of a new outlet pipe under the new spillway. Site preparation would include demolition of the existing outlet tower and removal of the existing riprap exterior surface on portions of both the upstream and downstream slopes, as well as the underlying engineered fill. Removal of the existing outlet tower would result in 80 cubic yards of concrete export, but most of the concrete from the tower would be reused on-site. Approximately 65,000 cubic yards of import material would be required for the new structural buttressing, as well as 1,000 cubic yards of concrete import for the new spillway buttress and outlet tower, and 2,500 cubic yards of base material import for the new subdrain system. Due to the proximity of residential homes, dust, erosion, and noise mitigation measures would be implemented to minimize adverse impacts. While the majority of work at the Debris Dam would occur during the dry season, dewatering is anticipated. A small cofferdam would be constructed within the Debris Basin and a temporary plastic bypass pipeline (sized to accommodate a certain flow dependent on the time of year) would carry water around the work to be discharged into the outlet pipe so that it can proceed downstream.

No construction activities are expected to occur within the City of Monrovia. However, temporary access/impact areas would be located within the City of Monrovia, including areas that may be subject to traversing vehicles or other mobile equipment, staging of equipment, placing stockpiles of soil, and excavating soil from the Sediment Placement Site for use in the buttressing backfill for the Debris Dam. No vegetation or tree removal would occur within the City of Monrovia. All of these activities would be limited to the LACFCD fee-owned right-of-way.

Construction Equipment and Workforce

Trip generation for employees and delivery trucks would vary depending on the phase of construction. During the peak of construction, a typical day would include the transportation of workers; movement of heavy equipment; and transportation of materials. Detailed construction equipment and trip generation estimates are shown in Table 2.

TABLE 2
PROJECT CONSTRUCTION EQUIPMENT AND TRIP GENERATION

Construction Phase	Off-Road Equipment	Worker Trips[a]	Truck Trips[a]
Dam			
Armor Canyon/Dam	1 Concrete Pump	3	500
Garage, Helipad, Water System	1 Concrete Pump, 1 Loader/Backhoe	5	10
Remove/Replace Jib Crane	1 Crane	3	5
Repair Concrete	1 Concrete Pump	3	5
Hoist	1 Crane	3	10
Construct New Spillway	1 Backhoe, 1 Concrete Pump, 1, Crane, 1 Loader, 1 Concrete Saw	8	56
Install Valves	1 Crane	3	5
Electrical	1 Crane	3	10
Headworks and Wilderness Park Culvert Crossing			
Headworks Demolition	1 Concrete Saw, 1 Excavator, 1 Backhoe	5	10
Rubber Dam	2 Backhoes	3	3
Construct Levee	1 Backhoe, 1 Concrete Pump	3	19
Culvert Crossing Demolition	1 Concrete Saw, 1 Excavator, 1 Backhoe	5	14
Site Clear/Grub	1 Backhoe	3	210
Grading/ Implement Temporary Access	2 Backhoes	5	--
Abutments and Wing Walls	2 Concrete Pumps	4	46
Construct Culvert Crossing Deck	1 Concrete Pump	3	18
Paving Culvert Crossing	1 Roller	3	15
Debris Dam			
Modify Spillway	1 Concrete Pump, 1 Concrete Saw, 1 Drilling Rig	4	63
Construct Buttresses[b]	1 Excavator, 1 Dozer, 1 Backhoe, 1 Loader, 1 Water Truck	5	4,063
Construct New Subdrain	2 Loaders	3	157
Remove Outlet Tower	2 Backhoes, 1 Water Truck	3	5

a All trips are round trips.

b The 4,063 number of trips was estimated based on 65,000 cubic yards of material required for the buttressing, assuming use of 16 cubic yard trucks occurring over 55 workdays (i.e. 2.5 months). Approximately half of this material (32,500 cubic yards) is estimated to be harvested from the adjacent Sediment Placement Site (SPS); therefore, the first 27 workdays (i.e. 5 weeks) of the sediment/fill truck trips would occur on-site between the SPS and the Debris Dam, and would not affect local residential roadways. Once fill from the SPS is exhausted, the remaining fill amount would be imported to the Debris Dam site, requiring off-site trucking for approximately 5 weeks.

Project Operations and Maintenance

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Dam, Headworks, or Debris Dam.

1.3 REGULATORY SETTING

1.3.1 Federal

Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (FESA, 16 *United States Code* [USC] 153 et seq.) protects plants and animals that are listed by the federal government as "Endangered" or "Threatened". The FESA is implemented by enforcing Sections 7 and 9 of the Act. A federally listed species is protected from unauthorized "take" pursuant to Section 9 of the FESA. "Take", as defined by the FESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or to attempt to engage in any such conduct". All persons are presently prohibited from taking a federally listed species unless and until (1) the appropriate Section 10(a) permit has been issued by the USFWS or (2) an Incidental Take Statement is obtained as a result of formal consultation between a federal agency and the USFWS pursuant to Section 7 of the FESA and the implementing regulations that pertain to it (50 *Code of Federal Regulations* [CFR] 402). It should be noted that the proposed project must have a federal nexus in order to request "take" pursuant to Section 7. If there is no federal nexus and there are impacts to federally listed species, preparation of a Habitat Conservation Plan will likely be required. "Person" is defined in the FESA as "an individual, corporation, partnership, trust, association, or any private entity; any officer, employee, agent, department or instrument of the federal government; any State, Municipality, or political subdivision of the state; or any other entity subject to the jurisdiction of the United States". The Project Applicant is a "person" for purposes of the FESA.

Section 404 and 401 of the Clean Water Act of 1972

Section 404 of the Clean Water Act (CWA, 33 USC 1251 et seq.) regulates the discharge of dredged or filled material into "Waters of the U.S.", including wetlands. "Waters of the U.S." include navigable coastal and inland waters, lakes, rivers, streams, and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce. The USACE is the designated regulatory agency responsible for administering the 404 permit program and for making jurisdictional determinations. This permitting authority applies to all "Waters of the U.S." where the material has the effect of (1) replacing any portion of "Waters of the U.S." with dry land or (2) changing the bottom elevation of any portion of "Waters of the U.S.". These fill materials would include sand, rock, clay, construction debris, wood chips, and materials used to create any structure or infrastructure in the "Waters of the U.S.". Dredge and fill activities are typically associated with development projects; water-resource related projects; infrastructure development and wetland conversion to farming; forestry; and urban development.

Under Section 401 of the CWA, an activity requiring a USACE Section 404 permit must obtain a State Water Quality Certification (or waiver thereof) to ensure that the activity will not violate established State water quality standards. The U.S. Environmental Protection Agency (USEPA) is the federal regulatory agency responsible for implementing the CWA. However, the State Water Resources Control Board (SWRCB), in conjunction with the 9 California Regional Water Quality Control Boards (RWQCBs), has been delegated the responsibility for administering the Section 401 water quality certification program.

The RWQCB is the primary agency responsible for protecting water quality in California through the regulation of discharges to surface waters under the CWA and the California Porter-Cologne Water Quality Control Act. The RWQCB's jurisdiction extends to all "Waters of the State" and to all "Waters of the U.S.", including wetlands (isolated and non-isolated). Section 401 requires the RWQCB to provide "certification that there is reasonable assurance that an activity which may

result in the discharge to 'waters of the U.S.' will not violate water quality standards". Water Quality Certification must be based on a finding that the proposed discharge will comply with water quality standards, which contain numeric and narrative objectives that can be found in each of the 9 Regional Boards' Basin Plans.

Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act of 1918 (MBTA), as amended in 1972 (MBTA, 16 USC 703–711), makes it unlawful, unless permitted by regulations, to "pursue; hunt; take; capture; kill; attempt to take, capture or kill; possess; offer for sale; sell; offer to purchase; purchase; deliver for shipment; ship; cause to be shipped; deliver for transportation; transport; cause to be transported; carry or cause to be carried by any means whatever; receive for shipment, transportation, or carriage; or export, at any time, or in any manner, any migratory bird…for the protection of migratory birds…or any part, nest, or egg of any such bird" (16 USC 703).

In 1972, the MBTA was amended to include protection for migratory birds of prey (e.g., raptors). The following 6 families of raptors that occur in North America were included in the amendment: *Accipitridae* (kites, hawks, and eagles), *Cathartidae* (New World vultures), *Falconidae* (falcons and caracaras), *Pandionidae* (ospreys), *Strigidae* (typical owls), and *Tytonidae* (barn owls). The provisions of the 1972 amendment to the MBTA protect all species and subspecies of these families.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668) provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*) by prohibiting—except under certain specified conditions—the taking, possession, and commerce of these 2 bird species. The 1972 amendments increased penalties for violating provisions of the Act and strengthened other enforcement measures. A 1978 amendment authorizes the Secretary of the Interior to permit the taking of golden eagle nests that interfere with resource development or recovery operations. A 1994 Memorandum (59 CFR 22953, April 29, 1994) from President William J. Clinton to the heads of Executive Agencies and Departments sets out the policy concerning collection and distribution of eagle feathers for Native American religious purposes.

1.3.2 State

California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA, *California Fish and Game Code,* Section 2050 et seq.) and Section 2081 of the *California Fish and Game Code,* an Incidental Take Permit from the CDFW is required for projects that could result in the take of a State-listed Threatened or Endangered species. Under CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species, but the definition does not include "harm" or "harass", as the federal act does. As a result, the threshold for take under the CESA is higher than that under the FESA. A CDFW-authorized Incidental Take Permit would be required where a project could result in the take of a State-listed Threatened or Endangered Species. The application for an Incidental Take Permit under Section 2081(b) has a number of requirements, including the preparation of a conservation plan, generally referred to as a Habitat Conservation Plan.

The State of California considers an Endangered Species to be one whose prospects of survival and reproduction are in immediate jeopardy; a Threatened Species as one present in such small numbers throughout its range that it is likely to become an Endangered Species in the near future

in the absence of special protection or management; and a Rare Species as one present in such small numbers throughout its range that it may become Endangered if its present environment worsens. The Rare Species designation applies only to California native plants. The CESA authorizes the CDFW to issue permits authorizing incidental take of Threatened and Endangered Species. A California Species of Special Concern is an informal designation that the CDFW uses for some declining wildlife species that are not State Candidates for listing. This designation does not provide legal protection, but signifies that these species are recognized as special status by the CDFW.

California Environmental Quality Act

State law (*California Fish and Game Code,* Section 1802) confers upon the CDFW the trustee responsibility and authority for the public trust resource of wildlife in California. The CDFW may play various roles under the CEQA process. By State law, the CDFW has jurisdiction over the conservation, protection, and management of the wildlife, native plants, and habitat necessary to maintain biologically sustainable populations. The CDFW is responsible for consulting with CEQA lead and responsible agencies and provides the requisite biological expertise to review and comment upon environmental documents and impacts arising from project activities.

As a trustee agency, the CDFW has jurisdiction over certain resources held in trust for the people of California. Trustee agencies are generally required to be notified of CEQA documents relevant to their jurisdiction, whether or not these agencies have actual permitting authority or approval power over aspects of the underlying project (14 *California Code of Regulations* [CCR], Section 15386). The CDFW, as a trustee agency, must be notified of CEQA documents regarding projects involving fish and wildlife of the state, as well as Rare and Endangered native plants, wildlife areas, and ecological reserves. Although, the CDFW, as a trustee agency, cannot approve or disapprove a project, CEQA lead and responsible agencies are required to consult with the CDFW. The CDFW, as the trustee agency, has the authority to make recommendations regarding those resources held in trust for the people of California (*California Fish and Game Code,* Section 1802).

Lake and Streambed Alteration Program

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that support wildlife resources and/or riparian vegetation are subject to CDFW regulations, pursuant to Sections 1600 through 1616 of the *California Fish and Game Code.* Under Section 1602, it is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream, or lake designated by CDFW as waters within their jurisdiction without first notifying CDFW of such activity. Additionally, a person cannot use any material from the streambeds without first notifying the CDFW of such activity. For a project that may affect stream channels and/or riparian vegetation regulated under Sections 1600 through 1616 of the *California Fish and Game Code,* CDFW authorization is required in the form of a Streambed Alteration Agreement.

Native Plant Protection Act

The Native Plant Protection Act (*California Fish and Game Code,* Section 1900 et seq.) provides for the preservation, protection, and enhancement of Endangered or Rare native plants in California. These sections also allow for the adoption of regulations governing the taking, possession, propagation, transportation, exportation, importation, or sale of any Endangered or Rare native plants.

California Fully Protected Species

Bird, mammal, reptile, amphibian, and fish species are defined as California Fully Protected Species in Sections 3511, 4700, 5050, and 5515 of the *California Fish and Game Code*. Fully protected animals may not be harmed, taken, or possessed.

Nesting Bird Protection

Nesting birds are protected in Sections 3503, 3503.5, and 3513 of the *California Fish and Game Code.* These sections state that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by or any regulation made pursuant to this code. Section 3503.5 explicitly provides protection for all birds of prey, including their eggs and nests. Section 3513 makes it unlawful to take or possess any migratory non-game bird as designated in the MBTA.

Threatened and Endangered Species

The *California Code of Regulations* (Sections 670.2 and 670.5) lists species, subspecies, and varieties of plants (Section 670.2) and animals (Section 670.5) that are designated as Threatened or Endangered (as defined by Section 2067 of the *California Fish and Game Code*) or Rare (as defined by Section 1901 of the *California Fish and Game Code*) in California.

California Porter-Cologne Water Quality Control Act

Pursuant to the California Porter-Cologne Water Quality Control Act, the SWRCB and the 9 RWQCBs may require permits (known as “Waste Discharge Requirements” or “WDRs”) for the fill or alteration of the “Waters of the State”. The term “Waters of the State” is defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (*California Water Code,* Section 13050[e]). The State and Regional Boards have interpreted their authority to require WDRs to extend to any proposal to fill or alter “Waters of the State”, even if those same waters are not under USACE jurisdiction. Pursuant to this authority, the State and Regional Boards may require the submission of a “report of waste discharge” under Section 13260 of the *California Water Code*, which is treated as an application for WDRs.

2.0 SURVEY METHODOLOGIES

This section describes the methodology used to conduct a literature review; perform general and focused biological surveys; and assess the potential for each portion of the study area to support special status species.

2.1 LITERATURE REVIEW

A literature review was performed prior to the initiation of surveys to identify special status plants, wildlife, and habitats known to occur (or that historically occurred) in the vicinity of the study area. These searches included a review of the USGS' Mt. Wilson, Azusa, El Monte, Pasadena, and Baldwin Park 7.5-minute quadrangles[3] in the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2012, 2013, 2014) and the CDFW's California Natural Diversity Database (CNDDB) (CDFG 2012; CDFW 2013a, 2014a). A review of FESA critical habitat documents was used to identify any portions of the study area occurring within proposed or designated critical habitat. The literature review also included a review of the Angeles National Forest Threatened, Endangered, Proposed, Candidate, and Forest Service Sensitive Plants and Animals (USFS 2014). Additionally, all previous biological documentation for the study area including a Biological Technical Report (UltraSystems 2007), an Environmental Impact Report (EDAW 2009), and various focused survey reports (BonTerra Consulting 2009a, 2009b, 2009c, 2009d, 2010, 2011, 2012a, 2012b, 2012c, 2012d, 2012e) were reviewed prior to field surveys.

2.2 VEGETATION MAPPING AND GENERAL BIOLOGICAL SURVEYS

General biological surveys were conducted by Senior Botanist Sandy Leatherman and Senior Biologist Amber Oneal on April 25, 2012, to describe and map vegetation in the study area. A small additional area southeast of the Debris Dam was mapped by Ms. Leatherman and Biologist Nathan Moffett on January 30, 2013; a small additional area east of the Debris Dam was mapped by Mr. Moffett on April 16, 2014; and a small additional area west of the Dam was mapped by Ms. Leatherman and Allison Rudalevige on May 5, 2014. The surveys also included an evaluation of the potential of habitats to support special status plant and wildlife species. Vegetation was mapped in the field on an aerial photograph at a scale of 1 inch equals 200 feet (1″=200′). Nomenclature for vegetation types generally follows that of *The Vegetation Classification and Mapping Program: List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2010); the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) was also used to provide a more descriptive characterization of the habitat for some of the vegetation types. Representative photographs of the study area are included as Attachment A.

Plant species were identified in the field or collected for subsequent identification using keys in Jepson Flora Project (2012), Munz (1974), Abrams (1923, 1944 1951), and Abrams and Ferris (1960). Taxonomy follows Baldwin et al. (2012) and current scientific data (e.g., scientific journals) for scientific and common names. A list of plant species observed is included as Attachment B-1.

Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic sign, including scat, footprints, burrows, and trails. Taxonomy and nomenclature for wildlife generally follows American Fisheries Society (1991) for fish, Crother (2008) for amphibians and reptiles,

[3] These quadrangles were selected based on their proximity and topographic similarity to the project study area. Additional quadrangles were not considered necessary as they would provide minimal additional value.

American Ornithologists' Union (AOU 2011) for birds, and Baker et al. (2003) for mammals. All species observed were recorded in field notes. A list of wildlife species observed is included as Attachment B-2.

2.3 FOCUSED BIOLOGICAL SURVEYS

BonTerra conducted focused biological surveys in 2012. These included focused surveys for special status plant species, Santa Ana sucker (*Catostomus santaanae*), Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3), arroyo chub (*Gila orcutti*), Pacific [western] pond turtle (*Actinemys* [*Emys*] *marmorata*), Coast Range newt (*Taricha torosa torosa*), two-striped garter snake (*Thamnophis hammondii*), silvery legless lizard (*Aniella pulchra*), coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*). A native tree survey and a pre-construction bat roost survey were conducted in late summer 2014. Focused survey reports are attached in their entirety in Attachments C through I.

Focused biological surveys for special status plants and wildlife species were previously conducted between 2007 and 2011 (UltraSystems 2007–2009; EDAW 2009–2011; BonTerra Consulting 2009–2011) for various projects at the Debris Dam. Although the survey areas for the previous surveys generally overlap with the current study area, the boundaries of each study vary depending on the focal area for each additional project. This report focuses on the most current focused survey results (2012) and survey results related to geotechnical investigations (2013), but incorporates previous survey results where available.

2.3.1 Special Status Plant Species

Special status plant surveys were floristic in nature and conducted following the Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFG 2009).

Prior to conducting the field surveys, reference populations were monitored for annual and difficult-to-detect target species with potential to occur in the study area to ensure that the scheduled surveys were comprehensive and conducted during the appropriate blooming period for the species. Reference populations with a California Rare Plant Rank (CRPR) of 3 and 4 and perennial species that are readily observable were not monitored. A summary of reference population checks is provided in Table 3; reference plants were observed in bloom on the date of the reference population check.

According to the National Weather Service, Burbank Valley Pump Plant (located about 20 miles from of the study area) received 10.37 inches of precipitation over the survey year (July 1, 2011–July 1, 2012), which is about 61 percent of the normal 16.29 inches based on 1939–2012 averages (WRCC 2012). Rainfall for the survey year appeared to be adequate to support blooming of special status plant species; based on the reference population monitoring, target plant species were observable at the time the surveys were conducted.

Consulting Botanist Sandra Leatherman conducted special status plant surveys on April 25; May 2, 16, and 30; June 4; and August 8 and 24, 2012. Ms. Leatherman was assisted by Consulting Biologists Brian Leatherman, James Huelsman, and Adam DeLuna. Ms. Leatherman and Ms. Rudalevige surveyed a small additional area west of the Dam on May 5, 2014 concurrently with vegetation mapping. A systematic walking survey was conducted, and all plant species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified to the taxonomic level necessary to determine whether or not they were a special status species. Special status species locations were recorded using a

handheld Global Positioning System (GPS). Any voucher specimens collected were deposited with the herbarium at Rancho Santa Ana Botanic Gardens in Claremont, California. The Special Status Plant Species Report is included in Attachment C.

TABLE 3
SPECIAL STATUS SPECIES REFERENCE POPULATIONS
CHECKED PRIOR TO FOCUSED SURVEYS

Species	Date and Location
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	April 10, 2012 Las Virgenes Canyon (flowering)
Dodecahema leptoceras slender-horned spineflower	April 20, 2012 Lake Elsinore Area (flowering)
Calochortus clavatus var. *gracilis* slender mariposa lily	May 18, 2012 Santa Clarita Area (flowering)
Calochortus plummerae Plummer's mariposa lily	June 8, 2012 Big Tujunga Dam (flowering)
Centromadia parryi ssp. *australis* southern tarplant	June 12, 2012 Riverside Area (flowering)
Pseudognaphalium leucocephalum rabbit-tobacco	August 13, 2012 San Juan Capistrano Area (flowering)

2.3.2 Native Tree Survey

Native trees within 50 feet of Project Work Areas were included within the tree survey area. BonTerra Psomas Certified Arborists David Hughes (International Society of Arboriculture [ISA] Certificate Number WE-7752A) and Trevor Bristle (ISA Certificate Number WE-10233A) surveyed trees within the tree survey area on August 28, 2014, and by Mr. Hughes on September 2 and 15, 2014. All trees within the tree survey area boundaries that are subject to regulation by a city/county tree ordinance and/or the California Fish and Game Code were identified and mapped in the field. During the survey, each tree was tagged and the following data were collected: diameter at breast height (dbh), tree height, and canopy width, as well as qualitative ratings on aesthetics and overall health. Each tree that was surveyed was mapped on a 100-scale (1 inch = 100 feet) aerial photograph in the field and each location was recorded using a hand-held global positioning system (GPS) device. Using a diameter tape, measurements were taken at four and one-half feet above mean natural grade (two feet above grade for trees within the City of Monrovia boundaries); multiple trunks were measured separately. The diameter of the largest two trunks was combined to determine the total diameter of each tree. In addition, the total number of trunks was recorded. The diameter was estimated for trees that were not accessible (e.g., surrounded by poison oak (*Toxicodendron diversilobum*) or located on a steep slope). The height of each tree was estimated from mean natural grade to the highest branch. Also, the diameter of each tree's canopy was estimated at its widest point. Each tree assessed was inspected and compared to an archetype tree (considered excellent on all points mentioned below) of the same species. Tree aesthetics were evaluated with respect to overall form and symmetry, crown balance, branching pattern, and broken branches. The health of each tree was assessed based on visual evidence of vigor, such as the amount of foliage; leaf color and size; presence of branch or twig dieback; severity of insect infestation; the presence of disease; heart rot; fire damage; mechanical damage; amount of new growth; appearance of bark; and rate of callous development over wounds. The

tree's structural integrity was also evaluated with respect to branch attachment, branch placement, root health, and stability. In addition, the health assessment considered such elements as the presence of decay, weak branch attachments, and the presence of exposed roots due to soil erosion. The Tree Survey Report is included in Attachment D.

2.3.3 Special Status Fish

Surveys for Santa Ana sucker, Santa Ana speckled dace, and arroyo chub were conducted by Consulting Fisheries Biologists Justin Wood (TE-37481A-0) and Cynthia Hitchcock from Aspen Environmental Group with BonTerra Senior Fisheries Biologist Dr. Carl Demetropoulos. Prior to the surveys, Mr. Wood consulted John O'Brien from the CDFW for approval to conduct the surveys for special status fish species in the study area. Survey methods included underwater video recording, dip netting, seining, and snorkeling depending on the location/stream morphology within the study area. All fish observed during the surveys were recorded in field notes.

Surveys followed the current presence/absence protocol for the Santa Ana sucker and were conducted on August 23 and August 30, 2012, from Dam downstream to the upper end of Debris Dam. During the first survey, all accessible areas of the creek between the Dam and the Headworks facility were surveyed using dip nets, seine nets, and underwater videography. During the second survey, dip nets were used along with snorkel surveys of 2 large pools: 1 below the Headworks and 1 below the Wilderness Park Culvert Crossing. While using underwater video and seining, care was taken to avoid algal mats and dense vegetation in the creek to avoid impacts on refugia for potential young fish.

Netting

Dip netting and seining methods were used in shallow water down to depths of approximately 3 feet. Seining was conducted using a 20-foot-long by 4-foot-deep nylon knotless delta weave bagged seine with ¼-inch mesh. Captured fishes were immediately transferred into a container of clean water taken from the creek and were visually identified. Native fishes were released unharmed at the point of capture. Non-native fish and invertebrates were not returned to Santa Anita Wash.

Underwater Videography

For the purpose of this study, deep creek habitat was defined as portions of the creek where depth was greater than what could effectively be surveyed using dip or seine nets (approximately 3 feet) and where underwater cameras would be more effective at determining presence/absence of fish species. Depending on the habitat type, the 2 following underwater cameras with high lumen light-emitting diode (LED) lighting systems and weighted platforms were used to observe pool and deep creek habitat: (1) high definition remote underwater color video camera (Aqua Vu, Inc AV760cz Color Underwater Video Camera) providing depth, temperature, and time on an underwater video monitor and (2) a high definition 360-degree view camera (Aqua Vu, Inc AV360 Black/White Underwater Video Camera) with a selectable 4-way split screen.

Surveyors viewed the creek in real time and could simultaneously record targets for later review on a Digital Video Recorder (DVR) output from the video camera. The location of the image (in Universal Transverse Mercator [UTM]) could be correlated to the GPS location by a time stamp. After the survey and in order to validate and map the location of fish that may not have been seen during the survey, video targets were analyzed on a computer at 0.25 real time speed.

Snorkel/Swim Surveys Transects

To establish in visual identification and assessment of fish species and description of habitat preferences in large pools (e.g., 15 feet wide by 30 feet long by approximately 6 feet deep), snorkel surveys were conducted by a single person (Permitted Biologist, Justin Wood) swimming zigzag transects and taking underwater photographs of any suspect fish targets.

The Special Status Fish Report is included in Attachment E.

2.3.4 Special Status Herpetofauna

BonTerra Senior Herpetologist Samuel Stewart (CDFG Scientific Collecting Permit SC-004421) and Herpetologist Jason Mintzer conducted focused surveys for Pacific [western] pond turtle, Coast Range newt, two-striped garter snake, and silvery legless lizard from June 19, 2012 to June 23, 2012. Mr. Stewart has experience with all 4 species and has the appropriate CDFG authorization for trapping and handling.

The Pacific pond turtle survey methodology was based on survey and census recommendations made by Holland (1991) and survey protocols developed by Reese and Welsh (1988) and Goodman (1999). Surveys incorporated both visual encounter and live-trapping. Live trapping consists of placing live-catch turtle traps (i.e., floating net mesh box traps) at 4 trapping stations in Santa Anita Wash for a total of 4 trapping periods lasting up to 24 hours each. Net mesh box traps are 24-inch (in) by 18-in by 8-in framed, $^{5}/_{16}$-in mesh in square mesh boxes with two 1-way funnel entrances. Floats were placed inside the traps to allow submergence of 1 trap entrance and flotation of approximately 4 inches of trap enclosure. All 4 net mesh box traps were firmly secured to banks or exposed vegetation within larger pools in the stream using nylon rope. The traps were baited with fresh mackerel. Turtles attracted by the scent of the bait would enter the submerged entrance and surface within the enclosure to breathe. All traps were fitted with tags listing the Scientific Collecting Permit number under which live trapping was being conducted. Trap station locations were recorded with a handheld GPS unit.

Mr. Stewart and Mr. Mintzer conducted 5 diurnal visual encounter surveys for Pacific pond turtle, two-striped garter snake, and Coast Range newt during setting and checking/removal of traps. Additionally, 2 nocturnal visual encounter surveys for Coast Range newt and two-striped garter snake were conducted. Biologists conducted “visual encounter” surveys during weather conditions most conducive to Pacific pond turtle, two-striped garter snake, and Coast Range newt activity and avoided adverse conditions that may inhibit activity, including high winds (greater than 16 miles per hour), heavy precipitation, and temperature extremes less than 50 degrees Fahrenheit (°F) or greater than 90°F. The visual encounter methodology involved walking along the creek banks checking the stream and pools for Pacific pond turtle, two-striped garter snake, and Coast Range newt; periodically scanning upstream and downstream using binoculars to detect two-striped garter snakes and Pacific pond turtles that may be basking or actively foraging; and inspecting crevices and under ledges for two-striped garter snakes at rest. Surveyors wore polarized sunglasses during diurnal surveys to reduce glare and to improve visibility in the stream and pools.

The survey methodology for silvery legless lizard was based on an approach previously approved by the CDFG in a Memorandum of Understanding for a silvery-legless lizard focused survey and translocation effort (BonTerra Consulting 2004). Methods included flipping rocks/debris, gently raking, and actively searching duff below oaks and western sycamores in areas with sandy substrate. The survey effort focused on areas with deeper sandy deposits and leaf litter beneath oaks and sycamores in, and adjacent to, the Debris Dam.

The Special Status Herpetofauna Report is included as Attachment F.

2.3.5 Coastal California Gnatcatcher

Surveys for the California gnatcatcher followed the current presence/absence protocol (USFWS 1997). Between March 15 and June 30, 6 surveys were conducted in suitable habitat at least 7 days apart. Surveys were conducted between dawn and noon under suitable weather conditions. Focused surveys were conducted by James Huelsman (USFWS permit No. TE 827493-7) on May 16 and 25 and June 1, 11, 18, and 25, 2012. The protocol allows coverage of 80 acres of suitable habitat per survey day; 1 field day was sufficient to survey all potentially suitable habitat in the study area. Surveys were conducted by walking slowly within and along the perimeter of coastal sage scrub stands while watching and listening for California gnatcatcher activity. Recorded vocalizations were used conservatively to solicit a response from any gnatcatcher's potential presence. The frequency of recorded playback used varied with site conditions such as habitat patch size, topography, and ambient noise levels. The purpose of the surveys was to detect and identify the California gnatcatcher, but all wildlife incidentally observed or detected in the study area was recorded. Locations of special status species observed incidentally were recorded using a handheld GPS unit.

The Focused Gnatcatcher Survey Report is included in Attachment G.

2.3.6 Least Bell's Vireo/Southwestern Willow Flycatcher

The USFWS protocol for the least Bell's vireo requires that at least 8 surveys be conducted from April 10 to July 31 with a 10-day interval between each site visit. The USFWS protocol for the southwestern willow flycatcher requires a total of 5 surveys, with the first survey conducted between May 15 and May 31; the second and third surveys between June 1 and June 24; and the fourth and fifth surveys between June 25 and July 17. Due to similar ecological requirements, surveys for these 2 species can be conducted concurrently. A total of 8 surveys were conducted to satisfy the survey requirements of both species. BonTerra Senior Biologist Brian Daniels (Permit No. TE 821401-4) conducted the 5 southwestern willow flycatcher surveys on May 24; June 4, 14, and 25; and July 6, 2012. BonTerra Senior Biologist Amber Oneal (Permit No. TE 148554-2) conducted the first 2 least Bell's vireo surveys on May 2 and 14, 2012, and Mr. Daniels conducted the remaining surveys on May 24; June 4, 14, and 25; and July 6 and 16, 2012.

All riparian habitats from the Debris Dam upstream to the outlet of the sediment transport tunnel were surveyed. The approximate 4,000 foot length of riparian habitats was systematically surveyed by walking slowly and methodically along the margins of riparian habitat or by using meandering transects through riparian habitat at the Debris Dam. Following the willow flycatcher protocol, recorded vocalizations were used to elicit a response from any potentially territorial southwestern willow flycatchers. If no southwestern willow flycatchers were detected after the initial playing of the recorded vocalization, the recording was replayed at least once, but often multiple times. The least Bell's vireo survey protocol does not require the playback of least Bell's vireo vocalizations; therefore, recorded least Bell's vireo vocalizations were not used during the surveys.

All surveys were conducted under optimal weather conditions (i.e., between 55°F and 95°F with wind speeds between 0 and 15 miles per hour) and during the early morning hours when bird activity is at a peak.

The Focused Least Bell's Vireo/Southwestern Willow Flycatcher Survey Report is included in Attachment H.

2.3.7 Roosting Bat Survey

The roosting bat survey area focused on areas within the proposed Project Work Areas. At the Dam, the survey focused on the Dam structure, gunite slopes adjacent to the Dam, and facility structures associated with the Dam. At the Headworks, the survey focused on the facility structure. At the Wilderness Park Culvert Crossing, the survey focused on the culverts and wing walls associated with the bridge. At the Debris Dam, the survey focused on the inlet structure and ornamental vegetation adjacent to the Debris Dam.

The focused daytime survey involved inspecting all proposed impact areas for sign of bat roosting. Signs of roosting include audible social calls; observation of individuals roosting; and presence of guano, urine staining, or Lepidopteron (moth) wings. The absence of sign does not preclude potential roosting features from additional survey efforts, but rather aids in final determinations. The focused daytime survey is also used to identify suitable roosting features in the survey area, including natural and artificial crevices in rocks and buildings. Various factors contribute to suitable day-roost sites, including structural opportunities (e.g., crevices), microclimate, thermal conductivity (the roost's ability to passively regulate temperature), protection from predators, and proximity to resources such as open water for drinking. The daytime survey was conducted by BonTerra Psomas biologist Steve Norton on July 31, 2014 from 8:30 AM to 5:00 PM.

The emergence survey (also known as the exit or evening survey) involved visually monitoring all potential roost sites for evening emergence. The evening emergence surveys were conducted on July 31 and August 6, 7, and 12, 2014, by BonTerra Psomas Biologists Steve Norton, Dani Henning, Jonathan Aguayo, and Jason Mintzer. Just before dusk, Biologists were staged at different locations near each Project Work Area with suitable roost features. Many of the suitable features along the canyon walls at the Dam were inaccessible and visibility was limited; monitoring of these features was conducted at remote distances and the findings were accompanied by monitoring bat activity entering and leaving the downstream Dam area. This effort was achieved by stationing two biologists at the top of the Dam and two biologists at the bottom of the Dam.

Visual monitoring and bat exit counts extended from 30 minutes before sunset to approximately 1 hour after sunset, for a duration of approximately 90 minutes, depending on the amount of ambient light available. When environmental conditions (such as previously existing artificial light or moonlight) allowed for additional visual survey times, the visual survey window was extended. Alternatively, when environmental conditions were not favorable due to significant shading from dense canopy cover or canyon walls, the visual survey time was reduced. Surveys were scheduled to accommodate favorable emergence conditions, which include wind speeds less than 10 miles per hour, moderate day and evening temperatures, no rain, and avoiding the full moon.

The emergence survey also included stationing an ultrasonic acoustic recording device at locations likely to aid in determining roost occupancy. An acoustic recording device adds further useful data by (1) recording individuals that may have not been visually observed; (2) allowing passive species identification to associate roosting preferences with habitat present in the survey area; and (3) documenting the time of arrival of a species in the survey area. The purpose of conducting ultrasonic acoustic recording in this effort is not to provide a comprehensive inventory of all bat species utilizing the survey area, but rather to identify the potential for bats to utilize the survey area (i.e., project impact areas) for day-roosting. The acoustic recording occurred during each evening survey and extended for approximately 3.5 hours (30 minutes before sunset to 3 hours after sunset).

A Wildlife Acoustics EchoMeter 3+ unit was used to collect acoustic data. The acoustic data collected was recorded in full spectrum .wav files and segregated into regular files and noise files by the acoustic recording unit. The files not disqualified as "noise" were analyzed using SonoBat 3.2.1 software using the "United States West Region" classifier. These files were analyzed using the SonoBatch process, then visually verified using Echolocation Call Characteristics of Western US Bats (Humboldt State University 2011). Any recordings potentially classified as a sensitive species—specifically Townsend's big-eared bat (*Corynorhinus townsendii*) or fringed myotis (*Myotis thysanodes*)—received additional analysis by Senior Biologist Ed West, an expert bat biologist with a specialty in acoustic monitoring.

The Roosting Bat Survey Report is included in Attachment I.

2.4 REGULATORY SURVEYS

2.4.1 Jurisdictional Delineation

A jurisdictional delineation was conducted by BonTerra Regulatory Technicians David Hughes and Allison Rudalevige on April 23, 2013, and by Mr. Hughes and BonTerra Regulatory Specialist Gary Medeiros on April 25, 2013, to describe and map the extent of resources under the jurisdiction of the USACE, the RWQCB, and the CDFW. The delineation followed guidelines presented in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). This regional supplement is designed for use with the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Both the 1987 Wetlands Manual and the Arid West Supplement to the manual provide technical methods and guidelines for determining the presence of "Waters of the U.S." and wetland resources. A 3-parameter approach—which requires evidence of wetland hydrology, hydrophytic vegetation, and hydric soils—was used to identify wetlands in the study area. In order to be considered a wetland, an area must exhibit at least minimal hydric characteristics within the 3 parameters. However, problem areas may periodically or permanently lack certain indicators due to seasonal or annual variability of the nature of the soils or plant species in a study area. Atypical wetlands lack certain indicators due to recent human activities or natural events. Guidance for determining the presence of wetlands in these situations is presented in the regional supplement. Non-wetland "Waters of the U.S." are delineated based on the limits of the Ordinary High Water Mark (OHWM), which can be determined by a number of factors including erosion, the deposition of vegetation or debris, and changes in vegetation.

It should be noted that the RWQCB shares the USACE jurisdiction unless isolated conditions are present. If isolated waters conditions are present, the RWQCB takes jurisdiction using the USACE's definition of the OHWM and/or the 3-parameter wetlands methodology pursuant to the 1987 Wetlands Manual. The CDFW's jurisdiction is defined as the top of the bank of the stream, channel, or basin or the outer limit of riparian vegetation located within or immediately adjacent to the river, stream, creek, pond, or lake.

A complete description of the survey methodology is included in the Jurisdictional Delineation, which is Attachment J of this document.

3.0 EXISTING BIOLOGICAL RESOURCES

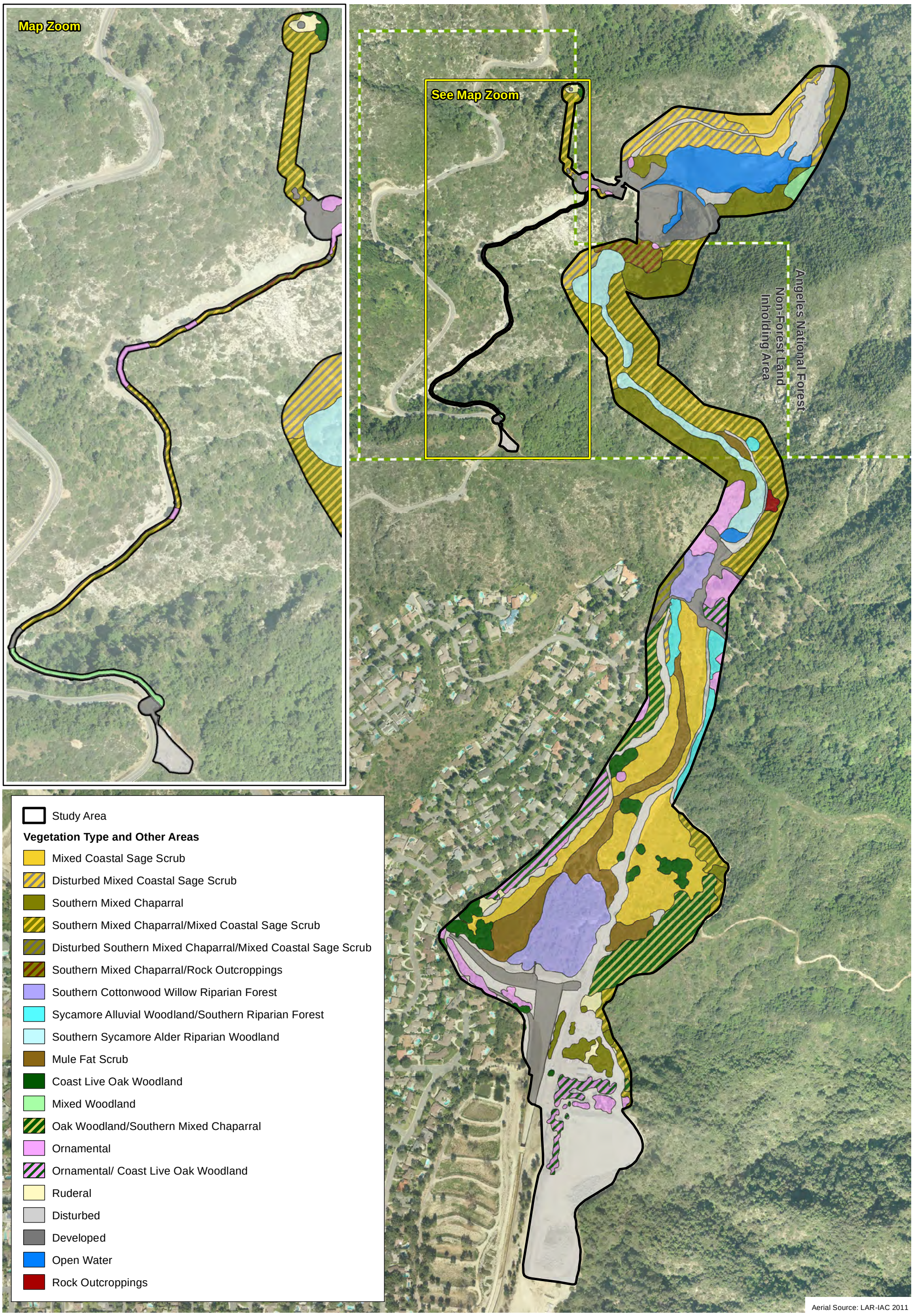
This section describes the biological resources that occur or potentially occur in the study area based on the surveys discussed in Section 2. Vegetation types, wildlife populations and movement patterns, special status vegetation types, and special status plant and wildlife species that are either known to occur or have the potential to occur in the study area are discussed below.

3.1 VEGETATION TYPES AND OTHER AREAS

Twenty vegetation types and other areas (i.e., unvegetated areas that were mapped) occur in the study area: mixed coastal sage scrub, disturbed mixed coastal sage scrub, southern mixed chaparral, southern mixed chaparral/mixed coastal sage scrub, disturbed southern mixed chaparral/mixed coastal sage scrub, southern mixed chaparral/rock outcroppings, southern cottonwood willow riparian forest, sycamore alluvial woodland/southern riparian forest, southern sycamore alder riparian woodland, mule fat scrub, coast live oak woodland, mixed woodland, oak woodland/southern mixed chaparral, ornamental, ornamental/coast live oak woodland, ruderal, disturbed, developed, open water, and rock outcroppings (Exhibit 4, Table 4). Where vegetation overlaps another type of mapping unit (e.g., a tree canopy over water or roads), the areas was mapped according to the uppermost canopy of vegetation.

TABLE 4
VEGETATION TYPES AND OTHER AREAS MAPPED WITHIN THE STUDY AREA

Vegetation Types or Other Areas	Amount (Acres)
Mixed Coastal Sage Scrub	14.09
Disturbed Mixed Coastal Sage Scrub	4.99
Southern Mixed Chaparral	9.08
Southern Mixed Chaparral/Mixed Coastal Sage Scrub	12.72
Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub	0.50
Southern Mixed Chaparral/Rock Outcroppings	1.15
Southern Cottonwood Willow Riparian Forest	6.36
Sycamore Alluvial Woodland/Southern Riparian Forest	1.80
Southern Sycamore Alder Riparian Woodland	3.83
Mule Fat Scrub	5.99
Coast Live Oak Woodland	2.61
Mixed Woodland	0.55
Oak Woodland/Southern Mixed Chaparral	6.03
Ornamental	3.86
Ornamental/Coast Live Oak Woodland	3.38
Ruderal	0.63
Disturbed	23.87
Developed	8.90
Open Water	4.99
Rock Outcroppings	0.17
Total	**115.50**



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Biological Resources

Exhibit 4

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

550 275 0 550 Feet

BonTerra PSOMAS

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3.1.1 Mixed Coastal Sage Scrub

Mixed coastal sage scrub occurs in the northern portion of the study area above the Dam, in the upper portion of the Debris Dam, and east of the Debris Dam. This vegetation type is dominated by California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*) in most areas with a diversity of shrub species varying from the northern portion of the study area to the southern portion of the study area. The variation is due to the elevation range and steepness of the slopes in which the vegetation is growing. Other common shrub species include black sage (*Salvia mellifera*), white sage (*Salvia apiana*), Our Lord's candle (*Hesperoyucca whipplei* [*Yucca whipplei*]), deerweed (*Acmispon glaber* [*Lotus scoparius*]), laurel sumac (*Malosma laurina*), and California bricklebush (*Brickellia californica*). Annual species present include truncate-leaved lupine (*Lupinus truncatus*), wild Canterbury bells (*Phacelia minor*), windmill pink (*Silene gallica*), and golden-yarrow (*Eriophyllum confertiflorum*). In the large wash area below the Arcadia Wilderness Park, the mixed sage scrub also contains components that could fit in an alluvial sage scrub category and includes western sycamore and scale-broom (*Lepidospartum squamatum*). A few non-native species are also present in this vegetation type and include wild oat (*Avena* sp.) and crimson fountain grass (*Pennisetum setaceum*). Per the CDFG (2010), this vegetation type would be considered *Artemisia californica – Eriogonum fasciculatum* (California sagebrush – California buckwheat scrub) Alliance.

3.1.2 Disturbed Mixed Coastal Sage Scrub

Disturbed mixed coastal sage scrub occurs in the northern portion of the study area along the spur road to the Dam, downslope of the spur road, and along the dirt road south of Wilderness Park. These areas have been disturbed by their proximity to the road (e.g., non-native species are sometimes spread by vehicles, or non-native species become established at the disturbed edge of the roadway and spread into the adjacent vegetation). These areas are dominated by shrub species similar to those described above under mixed coastal sage scrub; however there is a large percentage of non-native species present, including crimson fountain grass, shortpod mustard (*Hirschfeldia incana*) and ripgut brome (*Bromus diandrus*). Per the CDFG (2010), this vegetation type would be considered Disturbed *Artemisia californica – Eriogonum fasciculatum* (California sagebrush – California buckwheat scrub) Alliance.

3.1.3 Southern Mixed Chaparral

Southern mixed chaparral occurs throughout the steep slopes of the study area mostly north of the Headworks facility and Wilderness Park; it also occurs east of the Debris Dam. This vegetation is dominated by larger evergreen native shrubs, including laurel sumac, sugar bush (*Rhus ovata*), birch-leaved mountain mahogany (*Cercocarpus betuloides*), holly-leaved redberry (*Rhamnus crocea*), blue elderberry (*Sambucus nigra* ssp. *caerulea* [*S. mexicana*]), holly-leaved cherry (*Prunus ilicifolia*), Our Lord's candle, toyon (*Heteromeles arbutifolia*), and heart-leaved penstemmon (*Keckiella cordifolia*). A few areas also contain chamise (*Adenostoma fasciculatum*), coast live oak (*Quercus agrifolia*), and canyon live oak (*Quercus chrysolepis*). Per the CDFG (2010), this vegetation type would be the *Malosma laurina* (laurel sumac scrub) Shrubland Alliance.

3.1.4 Southern Mixed Chaparral/Mixed Coastal Sage Scrub

Southern mixed chaparral/mixed coastal sage scrub occurs primarily on the steep slopes along Santa Anita Canyon between the Dam and the Headworks facility, and east of the Debris Dam. This vegetation type is a mixture of native species described above in southern mixed chaparral and mixed coastal sage scrub. The dominant species include laurel sumac, California sagebrush, sugar bush, California buckwheat, black sage, white sage, and Our Lord's candle. Annual species

present include truncate-leaved lupine, wild Canterbury bells, windmill pink, and golden-yarrow. Per the CDFG (2010), this vegetation type would be the *Malosma laurina* (laurel sumac scrub) Shrubland Alliance/*Artemisia californica – Eriogonum fasciculatum* (California sagebrush – California buckwheat scrub) Alliance.

3.1.5 Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub

Disturbed southern mixed chaparral/mixed coastal sage scrub occurs in an area just south of the Headworks facility. This area is dominated by shrub species similar to those mentioned for southern mixed chaparral/mixed coastal sage scrub, including laurel sumac, California sagebrush, California buckwheat, black sage, and white sage. However, there is a large percentage of non-native species present, including crimson fountain grass, shortpod mustard, and ripgut grass. Per the CDFG (2010), this vegetation type would be the *Malosma laurina* (Laurel sumac scrub) Shrubland Alliance/*Artemisia californica – Eriogonum fasciculatum* (California sagebrush – California buckwheat scrub) Alliance.

3.1.6 Southern Mixed Chaparral/Rock Outcroppings

The southern mixed chaparral/rock outcroppings vegetation type occurs in an area just downstream of the Dam along Santa Anita Canyon. These areas are very steep with large rock outcroppings and cliff faces and contain an open mixed chaparral comprised of toyon, sugar bush, and chamise. There are club mosses and dudleyas (*Dudleya* spp.) present on these cliff faces. Per the CDFG (2010), this vegetation type would be the *Heteromeles arbutifolia* (toyon chaparral) Alliance/rock outcroppings.

3.1.7 Southern Cottonwood Willow Riparian Forest

The southern cottonwood willow riparian forest occurs downstream of the Headworks facility and in the Debris Dam. This vegetation type is dominated by a mix of arroyo willow (*Salix lasiolepis*) and Goodding's black willow (*Salix gooddingii*) with an understory containing tree tobacco (*Nicotiana glauca*), ripgut brome, and chaparral nightshade (*Solanum xanti*). A few scattered white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) are also present. The understory is basically bare in this area due to the high volume of water; however, fumitory (*Fumaria officinalis*), a non-native species, dominates the slope on the eastern side of the Debris Dam. Per the CDFG (2010), this vegetation type would be the *Salix gooddignii* (black willow thickets) Alliance.

3.1.8 Sycamore Alluvial Woodland/Southern Riparian Forest

Sycamore alluvial woodland/southern riparian forest occurs in the southern portion of the study area south of the Wilderness Park and on the northeastern edge of the Debris Dam. These areas are fed by the creek, but are drier and more upland in composition. The species present include large western sycamore, mule fat (*Baccharis salicifolia*), California buckwheat, and California sagebrush. Other species present include chia (*Salvia columbariae*) and phacelia (*Phacelia* spp.). Per the CDFG (2010), this vegetation type would be the *Platanus racemosa* (California sycamore woodlands) Alliance.

3.1.9 Southern Sycamore Alder Riparian Woodland

Southern sycamore alder riparian woodland is the dominant riparian vegetation type along Santa Anita Canyon between the Dam and the Headworks facility. This area is dominated by a mix of mature trees, including California sycamore and white alder. Understory species include California blackberry (*Rubus ursinus*) and western poison oak; however, the understory is

dominated by crofton weed (*Ageratina adenophora*), a non-native weed species. Per the CDFG (2010), this vegetation type would be the *Alnus rhombifolia* (white alder groves) Alliance.

3.1.10 Mule Fat Scrub

Mule fat scrub occurs primarily along the active channel in the upper and middle portions of the Debris Dam, at the lower end of the basin, and on the terrace east of the Debris Dam. Large boulders are present within this vegetation type along the upper portion of the basin. There is very little understory likely because of the large flow of water during the wet season. Per the CDFG (2010), this vegetation type would be the *Baccharis salicifolia* (mule fat thickets) Alliance.

3.1.11 Coast Live Oak Woodland

Stands of coast live oak and Engelmann oak (*Quercus engelmannii*) individuals occur in on the outer edges of the Debris Dam in the study area. The majority of these oak trees are relatively large trees, with a few scattered seedlings also occurring. The understory is comprised of oak leaf litter. Per the CDFG (2010), this vegetation type would be the *Quercus agrifolia* (coast live oak woodland) Alliance.

3.1.12 Mixed Woodland

Mixed woodland occurs north of the Dam on a steep east-facing slope. This area is comprised of large native trees including California bay (*Umbellularia californica*) and big-leafed maple (*Acer macrophyllum*), with a chaparral species in the understory. There is no corresponding vegetation type in the *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program* (CDFG 2010).

3.1.13 Oak Woodland/Southern Mixed Chaparral

Oak woodland/southern mixed chaparral occurs on the northwest (adjacent to the homes) and southeast sides of the Debris Dam. This vegetation type consists of coast live oak, Engelmann oak, and scrub oak (*Quercus berberidifolia*) trees with a diverse mix of species in the understory. Chaparral species present in the understory commonly include laurel sumac, blue elderberry, and toyon. There is no corresponding vegetation type in the *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program* (CDFG 2010).

3.1.14 Ornamental

Ornamental vegetation occurs primarily near the Headworks facility and adjacent to the residential areas and maintenance facilities in Wilderness Park. These areas contain non-native species planted for aesthetic or erosion-control purposes. Dominant species in this vegetation type include oleander (*Nerium oleander*), gum (*Eucalyptu*s sp.), and Canary Island pine (*Pinus canariensis).* Per the CDFG (2010), this vegetation type would be semi-natural stands.

3.1.15 Ornamental/Coast Live Oak Woodland

Ornamental/coast live oak woodland occurs in Wilderness Park, along the residences west of the Debris Dam, and north and west of the Sediment Placement Site. In these areas, ornamental species (e.g., Canary Island pine) are planted among the existing native coast live oak. Per the CDFG (2010), this vegetation type would be the semi-natural stands/*Quercus agrifolia* (coast live oak woodland) Alliance.

3.1.16 Ruderal

Ruderal vegetation occurs in a few small areas north of the Santa Anita Reservoir and in the upland areas east and west of the Debris Dam. These areas are dominated by non-native vegetation, predominantly comprised of short-pod mustard with scattered non-native grasses including ripgut grass. There is no corresponding vegetation type in the *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program* (CDFG 2010).

3.1.17 Disturbed

Disturbed areas occur throughout the study area and consist of dirt roads around the Dam, Headworks facility, Debris Dam, and Sediment Placement Site. These areas also include the area that recently underwent sediment removal within the upper portion of Santa Anita Reservoir. Disturbed areas consist of bare ground and contain little to no vegetation. Because this area contains no vegetation, it is considered an “other area” rather than a vegetation type, and there is no corresponding vegetation type in the *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program* (CDFG 2010).

3.1.18 Developed

Developed areas occur at the Dam, Headworks facility, and Debris Dam. These areas include paved roads, residential areas, dams, and other structures. These areas do not contain vegetation or other landscaping (developed areas that contain landscaping were mapped as “ornamental”). Because this area contains no vegetation, it is considered an “other area” rather than a vegetation type, and there is no corresponding vegetation type in the *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program* (CDFG 2010).

3.1.19 Open Water

Open water is mapped within Santa Anita Reservoir, at the base of the Dam and adjacent to the Headworks facility. It should be noted that open water also occurs along Santa Anita Canyon, but is a component of the other riparian vegetation types mapped along the canyon. Open water is mapped in areas that do not contain emergent vegetation or a tree canopy. The extent of open water varies based on the rainfall conditions of the year, time of year, and (in the lower portions of the study area) the amount of water being released from the Dam. The mapping represents the extent on the day of the vegetation mapping in 2012; the extent of open water in recent years is less than shown on the map since the area has received lower than average rainfall in 2013 and 2014. Because these areas contain no vegetation, open water is considered an “other area” rather than a vegetation type, and there is no corresponding vegetation type in the *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program* (CDFG 2010).

3.1.20 Rock Outcroppings

Rock outcroppings occur in an area along Santa Anita Canyon, upstream of the Headworks facility. The rock outcroppings are on cliff faces or are at the base of the cliffs. They generally lack vegetation, likely due to the steep cliff slopes and continuous erosion of the rock faces; however, a few of the rock outcroppings contain dudleyas. Because this area generally contains no vegetation, it is considered an “other area” rather than a vegetation type, and there is no corresponding vegetation type in the *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program* (CDFG 2010).

3.2 COMMON WILDLIFE

The study area is comprised primarily of native habitats and provides suitable habitat for several wildlife species. Common wildlife species observed or expected to occur in the study area are discussed below.

3.2.1 Fish

Two fish species were observed in the study area during the surveys: rainbow trout (*Onocorhynchus mykiss*), a native game fish, and green sunfish (*Lepomis cyanellus*), a non-native species. Four rainbow trout, averaging approximately 6 inches in length, were observed in the large pool (15 feet wide by 30 feet long by 6 feet deep) below the Headworks facility. Rainbow trout were stocked in this stream system from 1930 to 1945 (CDFG 1945, 1952), and likely continue to reproduce when conditions are favorable. Approximately 10 green sunfish were also observed in the pool below the Headworks facility; a range of size classes were observed, indicating that the species is actively reproducing.

3.2.2 Amphibians

Amphibians require moisture for at least a portion of their lifecycle, and many require standing or flowing water for reproduction. Terrestrial species may or may not require standing water for reproduction; they survive in dry areas by aestivating (i.e., remaining beneath the soil in burrows or under logs and leaf litter, and emerging only when temperatures are low and humidity is high). Many of these species' habitats are associated with water and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year in some habitat types depending on factors such as amount of vegetation cover, elevation, and slope aspect.

Suitable habitat for amphibians is present throughout the study area. Three native amphibian species were observed during the surveys, including California [western] toad (*Anaxyrus boreas halophilus* [*Bufo boreas*]), California treefrog (*Pseudacris* [*Hyla*] *cadaverina*), and Baja California treefrog (*Pseudacris hypochondriaca* [*Hyla regilla*]).

3.2.3 Reptiles

Reptilian diversity and abundance typically vary with vegetation type. Some species prefer only one or two vegetation types, while others forage in a variety of habitats. Most reptile species that occur in open areas use rodent burrows for cover, protection from predators, and refuge during extreme weather conditions.

Reptile species observed in the study area include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus tigris*), southern alligator lizard (*Elgaria multicarinata*), two-striped garter snake, gopher snake (*Pituophis catenifer*), and western rattlesnake (*Crotalus viridis*).

3.2.4 Birds

A variety of bird species are expected to be residents in the study area and to use the habitats throughout the year while other species are present only during certain seasons. For example, the white-crowned sparrow (*Zonotrichia leucophrys*) is expected to occur in the study area during the winter and migrate to the northern forests for breeding in the spring.

The following resident bird species were observed: great blue heron (*Ardea herodias*), killdeer (*Charadrius vociferus*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*),

Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), bushtit (*Psaltriparus minimus*), house wren (*Troglodytes aedon*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), common yellowthroat (*Geothlypis trichas*), spotted towhee (*Pipilo maculatus*), California towhee (*Melozone* [*Pipilo*] *crissalis*), song sparrow (*Melospiza melodia*), house finch (*Carpodacus mexicanus*), and lesser goldfinch (*Spinus* [*Carduelis*] *psaltria*).

Species that are present in the region during the nesting season include black-chinned hummingbird (*Archilochus alexandri*), Pacific-slope flycatcher (*Empidonax difficilis*), ash-throated flycatcher (*Myiarchus cinerascens*), phainopepla (*Phainopepla nitens*), western tanager (*Piranga ludoviciana*), black-headed grosbeak (*Pheucticus melanocephalus*), hooded oriole (*Icterus cucullatus*), and Bullock's oriole (*Icterus bullockii*). Wintering species that would be expected to occur include ruby-crowned kinglet (*Regulus calendula*), cedar waxwing (*Bombycilla cedrorum*), yellow-rumped warbler (*Setophaga coronata* [*Dendroica coronata*]), Townsend's warbler (*Setophaga townsendi* [*Dendroica townsendi*]), and white-crowned sparrow.

Raptors (birds of prey) observed in the study area include Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), barn owl (*Tyto alba*), and great horned owl (*Bubo virginianus*). The turkey vulture (*Cathartes aura*), a scavenger, was observed in the study area. These raptor species are expected to nest in large oak or sycamore trees, or on rocky cliff ledges. A red-tailed hawk was observed nesting on the cliff face east of Santa Anita Reservoir during the surveys.

3.2.5 Mammals

Small-sized mammals observed in the study area include western gray squirrel (*Sciurus griseus*), California ground squirrel (*Spermophilus beecheyi*), Merriam's chipmunk (*Neotamius* [*Tamias*] *merriami*), and Botta's pocket gopher (*Thomomys bottae*). Medium-sized mammals observed in the study area include desert cottontail (*Sylvilagus audubonii*), coyote (*Canis latrans*), and striped skunk (*Mephitis mephitis*). Large-sized mammals observed or detected in the study area include black bear (*Ursus americanus*) and mule deer (*Odocoileus hemionus*); mountain lion (*Puma concolour*) would also be expected.

Bats occur throughout most of Southern California and may use any portion of the study area as foraging habitat. Most of the bats that could potentially occur in the study area are inactive during the winter and either hibernate or migrate, depending on the species. An acoustical survey was conducted to determine which bats occur within or adjacent to Project Work Areas (Attachment I). The following common bat species were observed: big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), canyon bat (*Parastrellus hesperus*), hoary bat (*Lasiurus cinereus*), yuma myotis (*Myotis yumanensis*), little brown bat (*Myotis lucifigus*), and California myotis (*Myotis californicus*). Bats may roost in the rocky outcroppings along Santa Anita Canyon, in crevices of structures, or in large oak or sycamore trees in the study area. Acoustical surveys are initiated before dusk and record sonar calls of bats as they emerge from their roosts; it is assumed that bats that are recorded within the first hour are roosting in or around the recording site while those that first appear over an hour into the recording are assumed to have traveled to the area to forage from a roost site out of the immediate area. Based on the acoustical recordings, the big brown bat, Brazilian free-tailed bat, canyon bat, yuma myotis, little brown bat, and California myotis have a moderate to high potential to roost in crevices and structures in and around Project Work Areas.

3.2.6 Wildlife Movement

Wildlife corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because they prohibit the infusion of new individuals and genetic information (MacArthur and Wilson 1967; Soule 1987; Harris and Gallagher 1989; Bennett 1990). Corridors mitigate the effects of this fragmentation by (1) allowing animals to move between remaining habitats, thereby permitting depleted populations to be replenished and promoting genetic exchange; (2) providing routes for wildlife to escape from fire, predators and human disturbances, thus reducing the risk that catastrophic events (such as fire or disease) will result in population or local species extinction; and (3) serving as travel routes for individual animals as they move in their home ranges in search of food, water, mates, and other necessary resources (Noss 1983; Fahrig and Merriam 1985; Simberloff and Cox 1987; Harris and Gallagher 1989).

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (e.g., juvenile animals from natal areas or individuals extending range distributions); (2) seasonal migration; and (3) movements related to home range activities (e.g., foraging for food or water, defending territories or searching for mates, breeding areas, or cover). A number of terms such as "wildlife corridor", "travel route", "habitat linkage", and "wildlife crossing" have been used in various wildlife movement studies to refer to areas in which wildlife move from one area to another. To clarify the meaning of these terms and to facilitate the discussion on wildlife movement in this analysis, these terms are defined as follows:

- **Travel Route –** a landscape feature (such as a ridgeline, drainage, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and to provide access to necessary resources (e.g., water, food, cover, den sites). The travel route is generally preferred because it provides the least amount of topographic resistance in moving from one area to another. It contains adequate food, water, and/or cover while moving between habitat areas and it provides a relatively direct link between target habitat areas.
- **Wildlife Corridor –** a piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bound by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, and/or water to support species and to facilitate movement while in the corridor. Larger, landscape-level corridors (often referred to as "habitat linkages" or "landscape linkages") can provide both transitory and resident habitat for a variety of species.
- **Wildlife Crossing –** a small, narrow area, relatively short in length and generally constricted in nature that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. Crossings typically are man-made and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These often represent "choke points" along a movement corridor, which may impede wildlife movement and increase the risk of predation.

It is important to note that, in a large open space area where there are few or no man-made or naturally occurring physical constraints to wildlife movement, wildlife corridors (as defined above) may not yet exist. Given an open space area that is both large enough to maintain viable

populations of species and to provide a variety of travel routes (e.g., canyons, ridgelines, trails, riverbeds, and others), wildlife will use these "local" routes while searching for food, water, shelter, and mates and will not need to cross into other large open space areas. Based on their size, location, vegetative composition and availability of food, some of these movement areas (e.g., large drainages and canyons) are used for longer lengths of time and serve as source areas for food, water and cover, particularly for small- and medium-sized animals. This is especially true if the travel route is within a larger open space area. However, once open space areas become constrained and/or fragmented as a result of urban development or construction of physical obstacles (such as roads and highways), the remaining landscape features or travel routes that connect the larger open space areas become corridors as long as they provide adequate space, cover, food and water, and do not contain obstacles or distractions (e.g., man-made noise, lighting) that would generally hinder wildlife movement.

In general, animals discussed within the context of movement corridors typically include larger, more mobile species (such as mule deer, black bear, mountain lion, fox [*Urocyon* sp.], and coyote). Most of these species have relatively large home ranges through which they move to find adequate food, water, and breeding and wintering habitat. It is assumed that corridors that serve larger, more vagile species (those that can move freely, such as birds) also serve as corridors for many smaller, less mobile species, such as reptiles, amphibians, and rodents (generally discussed within the context of local movement). For smaller species, these local movements are compared to "stepping stones" as individuals move between populations; this facilitated gene flow on the regional scale.

The availability of open space corridors is generally considered less important for bird species. Most bird species are believed to fly in more or less direct paths to desired locations; however, some habitat-specific species may not move great distances from their preferred habitat types, and are believed to be less inclined to travel across unsuitable areas.

Ideally, an open space corridor should encompass a heterogeneous mix of vegetation types to accommodate the ecological requirements of a wide variety of resident species in any particular region. Most species typically prefer adequate vegetation cover during movement, which can serve as both a food source and as protection from weather and predators. Drainages, riparian areas, and forested canyon bottoms typically serve as natural movement corridors because these features provide cover, food, and often water for a variety of species. Very few species will move across large expanses of open, uncovered habitat unless it is the only option available to them. For some species, landscape linkages must be able to support animals for sustained periods, not just for travel. Smaller or less mobile animals (such as rodents and reptiles) require long periods to traverse a corridor, so the corridor must contain adequate food and cover for survival.

The study area is located at the southern edge of the Angeles National Forest. Development is located to the west and south of the Debris Dam, and Santa Anita Wash is channelized downstream of the study area. Therefore wildlife is expected to move relatively freely between the study area and open space areas to the north, but are not expected to move into the developed areas south of the study area (with exception of urban-tolerant species such as coyotes and striped skunks).

Santa Anita Canyon is naturally very steep sided and restricts many species to traveling either up the canyon bottom or along the ridgelines. For species that travel along riparian corridors, the Dam is a barrier to movement between the Reservoir and Santa Anita Canyon below. However, the ridgelines adjacent to the Dam are undeveloped and would allow species to move around the Dam if they could travel in upland habitats. Aquatic species would either be restricted to Santa Anita Reservoir or Santa Anita Canyon from below the Dam to the northern end of Debris Dam (where the stream dries).

3.3 SPECIAL STATUS BIOLOGICAL RESOURCES

The following section addresses special status biological resources reported from the region. These resources include plant and wildlife species that have been afforded special status and/or are recognized by federal and State resource agencies, as well as private conservation organizations. In general, the principal reason an individual taxon (i.e., species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size, geographic range, and/or distribution resulting in most cases from habitat loss. This list includes species reported by the CNDDB, CNPS, and U.S. Forest Service (USFS) and is supplemented with species from the author's experience that could occur based on the presence of suitable habitat. In addition, special status biological resources include vegetation types and habitats that are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. These resources have been defined by federal, State, and local government conservation programs. Sources used to determine the special status of biological resources are listed below.

- **Habitats** – the CNDDB (CDFG 2012; CDFW 2013a) and the CDFG's *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program* (CDFG 2010).
- **Plants** – the Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2012, 2013); the CNDDB (CDFG 2012; CDFW 2013a); various USFWS *Federal Register* notices regarding listing status of plant species; the CDFG's *List of Special Vascular Plants, Bryophytes, and Lichens* (CDFW 2013c); and the USFS' Regional Forester's Sensitive Plant Species List (USFS 2014).
- **Wildlife** – the CNDDB (CDFG 2012; CDFW 2013a); various USFWS *Federal Register* notices regarding listing status of wildlife species; the CDFG's *List of Special Animals* (CDFG 2011); and the USFS' Sensitive Animal Species by Forest list (USFS 2013b).

3.3.1 Special Status Vegetation Types

In addition to providing an inventory of special status plant and wildlife species, the CNDDB also provides an inventory of vegetation types that are considered special status by the State and federal resource agencies, academic institutions, and various conservation groups (such as the CNPS). Determination of the level of imperilment is based on the NatureServe Heritage Program Status Ranks that rank both species and vegetation types on a global (**G**) and statewide (**S**) basis according to their rarity; trend in population size or area; and recognized threats (e.g., proposed developments, habitat degradation, and non-native species invasion). The ranks are scaled from 1 to 5. NatureServe considers **G1 or S1** communities to be critically imperiled and at a very high risk of extinction or elimination due to extreme rarity, very steep declines, or other factors; **G2 or S2** communities to be imperiled and at high risk of extinction or elimination due to very restricted range, very few populations or occurrences, steep declines, or other factors; **G3 or S3** communities to be vulnerable and at moderate risk of extinction or elimination due to a restricted range, relatively few populations or occurrences, recent and widespread declines, or other factors; **G4 or S4** communities to be apparently secure and uncommon but not rare with some cause for long-term concern due to declines or other factors; and **G5 or S5** communities to be secure (Faber-Langendoen et al. 2009).

All vegetation alliances[4] that have State ranks of S1 to S3 are considered to be highly imperiled. Currently, association ranks are not provided, but associations ranked as S3 or rarer are noted. Three vegetation types in the study area would be considered special status: southern mixed chaparral/rock outcroppings, southern cottonwood willow riparian forest, and sycamore alluvial woodland/southern riparian forest (Table 5). These vegetation types should be avoided to the extent practicable.

TABLE 5
VEGETATION TYPES AND OTHER AREAS MAPPED WITHIN THE STUDY AREA

Vegetation Types or Other Areas	Amount (Acres)	Threat Ranking
Mixed Coastal Sage Scrub	14.09	G4, S4
Disturbed Mixed Coastal Sage Scrub	4.99	G4, S4
Southern Mixed Chaparral	9.08	G4, S4
Southern Mixed Chaparral/Mixed Coastal Sage Scrub	12.72	G4, S4
Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub	0.50	G4, S4
Southern Mixed Chaparral/Rock Outcroppings	**1.15**	**G5, S3**
Southern Cottonwood Willow Riparian Forest	**6.36**	**G4, S3**
Sycamore Alluvial Woodland/Southern Riparian Forest	**1.80**	**G3, S3**
Southern Sycamore Alder Riparian Woodland	3.83	G4, S4
Mule Fat Scrub	5.99	G5, S4
Coast Live Oak Woodland	2.61	G5, S4
Mixed Woodland	0.55	–
Oak Woodland/Southern Mixed Chaparral	6.03	G5, S4/G4, S4
Ornamental	3.86	–
Ornamental/Coast Live Oak Woodland	3.38	–/G5, S4
Ruderal	0.63	–
Disturbed	23.87	–
Developed	8.90	–
Open Water	4.99	–
Rock Outcroppings	0.17	–
Total	**115.50**	

Vegetation types in **boldface type** are considered "special status".

[4] A vegetation alliance is "a classification unit of vegetation, containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover" (Sawyer et al. 2009).

3.3.2 Definitions of Special Status Species

A federally **Endangered** species is one facing extinction throughout all or a significant portion of its geographic range. A federally **Threatened** species is one likely to become Endangered within the foreseeable future throughout all or a significant portion of its range. The presence of any federally Threatened or Endangered species within a project impact area generally imposes severe constraints on development, particularly if an action would result in "take" of the species or its habitat. The FESA defines the term "take" as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct. Harm, in this sense, can include any disturbance of habitats used by the species during any portion of its life history.

Proposed species or **Candidate** species are those officially proposed by the USFWS for addition to the federal Threatened and Endangered species list. Because proposed species may soon be listed as Threatened or Endangered, the presence of a Proposed or Candidate species may impose constraints on development if they are listed prior to an action, particularly if the action would result in "take" of the species or its habitat.

The State of California considers an Endangered species as one whose prospects of survival and reproduction are in immediate jeopardy; a Threatened species as one present in such small numbers throughout its range that it is likely to become an Endangered species in the near future in the absence of special protection or management; and a Rare species as one present in such small numbers throughout its range that it may become Endangered if its present environment worsens. Rare species applies only to California native plants; these species are treated as State-listed species. State-listed Threatened and Endangered species are fully protected against take unless an Incidental Take Permit is obtained from the resource agencies. The presence of any State-listed Rare, Threatened, or Endangered species generally imposes constraints on proposed actions, particularly if the action would result in "take" of the species or its habitat.

California Species of Special Concern is an informal designation used by the CDFW for some declining wildlife species that are not State Candidates. This designation does not provide legal protection, but signifies that these species are recognized as special status by the CDFW.

Species that are **California Fully Protected** and **Protected** include those protected by special legislation for various reasons, such as the mountain lion and white tailed kite (*Elanus leucurus*). Fully Protected species may not be taken or possessed at any time. California Protected species include those species that may not be taken or possessed at any time except under special permit from the CDFW issued pursuant to the *California Code of Regulations* (Title 14, Sections 650, 670.7) or Section 2081 of the *California Fish and Game Code*.

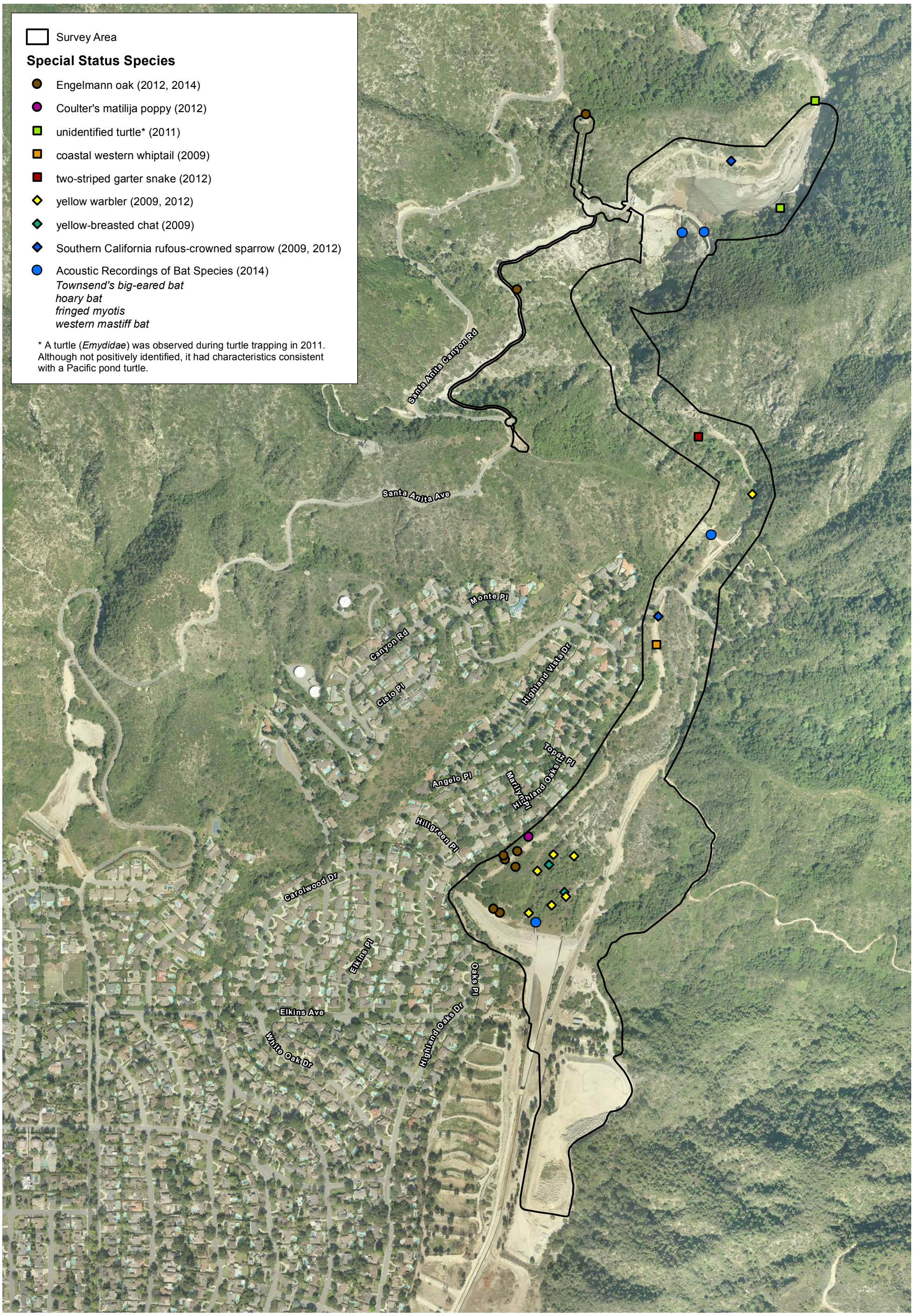
The California Rare Plant Rank (CRPR), formerly known as CNPS List, is a ranking system by the Rare Plant Status Review group[5] and managed by the CNPS and the CDFW. A CRPR summarizes information on the distribution, rarity, and endangerment of California's vascular plants. Plants with a CRPR of **1A** are presumed extinct in California because they have not been seen in the wild for many years. Plants with a CRPR of **1B** are Rare, Threatened, or Endangered throughout their range. Plants with a CRPR of **2A** are presumed extirpated from California, but are more common elsewhere. Plants with a CRPR of **2B** are considered Rare, Threatened, or Endangered in California, but are more common elsewhere. Plants with a CRPR of **3** require more information before they can be assigned to another rank or rejected; this is a "review" list. Plants with a CRPR of **4** are of limited distribution or infrequent throughout a broader area in California; this is a "watch" list. The Threat Rank is an extension added onto the CRPR to designate the level

[5] A group of over 300 botanical experts from the government, academia, non-governmental organizations, and the private sector.

of endangerment by a 1 to 3 ranking. An extension of **.1** is assigned to plants that are considered to be "seriously threatened" in California (i.e., over 80 percent of the occurrences are threatened or having a high degree and immediacy of threat). Extension **.2** indicates the plant is "fairly threatened" in California (i.e., between 20 and 80 percent of the occurrences are threatened or have a moderate degree and immediacy of threat). Extension **.3** is assigned to plants that are considered "not very threatened" in California (i.e., less than 20 percent of occurrences are threatened or have a low degree and immediacy of threat or no current threats known). The absence of a threat code extension indicates plants lacking any threat information.

3.3.3 Special Status Plant Species

Based on the results of the literature review described above, 96 special status plant species have been reported from the Project area. Table 6 provides a list of these species; their listing status; their potential to occur in each portion of the study area; and whether or not they were observed during focused surveys. Species that were observed during the 2009–2012 focused surveys are included in Exhibit 5 (BonTerra Consulting 2009a, 2010, 2012a). Note that they are grouped alphabetically according to their scientific name.



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Special Status Species Observed

Exhibit 5

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

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TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Acanthoscyphus parishii var. *abramsii* Abrams' oxytheca	Occurs in sandy soils between 5,577 and 6,562 feet above msl. Known from the San Rafael Mountains, Topatopa Mountains, and Mount Pinos.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range.
Acanthoscyphus parishii var. *parishii* Parish's oxytheca	Occurs in dry granite slopes and flats, mostly in yellow pine forest between 6,200 feet and 8,500 feet above msl. Known from the San Gabriel and San Bernardino Mountains.	–	–	4.2	–	–	Not expected to occur; study area is outside elevation range.
Androsace elongata ssp. *acuta* California androsace	Occurs in dry grassy slopes, chaparral, and cismontane woodland between sea level and 4,000 feet above msl. Known from the Western Transverse Ranges, the San Bernardino Mountains, and the Peninsular Ranges.	–	–	4.2	WL	–	Not expected to occur; potentially suitable habitat; not observed during 2012 focused surveys.
Arctostaphylos glandulosa ssp. *gabrielensis* San Gabriel manzanita	Occurs in rocky outcrops and chaparral at approximately 3,000 to 6,500 feet above msl. Known from the San Gabriel Mountains and the Mill Creek Summit area.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range.
Arctostaphylos parryana ssp. tumescens interior manzanita	Occurs in montane chaparral between 6,890 and 7,546 feet above msl. Known from the San Gabriel and San Bernardino mountains.	–	–	4.3	FSS	–	Not expected to occur; study area is outside elevation range.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Astragalus bicristatus crested milk-vetch	Occurs in rocky or sandy places between 5,500 and 9,000 feet above msl. Known from the montane coniferous forests in the Eastern San Gabriel Mountains and the San Bernardino Mountains.	–	–	4.3	FSS	–	Not expected to occur; study area is outside elevation range.
Astragalus brauntonii Braunton's milk-vetch	Occurs in brushy habitats, along fire-breaks, or in disturbed areas (e.g., landslides, road clearings). Occurs in sandstone soils with carbonate layers between sea level and 2,100 feet above msl. Known from the hills bordering the Los Angeles Basin.	FE	–	1B.1	–	No; however, study area is immediately adjacent to critical habitat.	May occur; potentially suitable habitat; species is not observable except after fires or other disturbances. Not expected to occur within Santa Anita Reservoir or Debris Dam in areas disturbed repeatedly for sediment removal. Not observed during 2012 focused surveys; not observed during previous surveys in 2007, 2008, 2009, or 2010.
Astragalus lentiginosus var. *antonius* San Antonio milk-vetch	Occurs in open slopes in yellow pine forest between 5,000 and 8,500 feet above msl. Known from the Eastern San Gabriel Mountains.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Astragalus lentiginosus var. *sierrae* Bear Valley woollypod	Occurs in openings in sandy woods and stony lake-shores in the mountains overlooking the desert, yellow pine forest, and sagebrush scrub between 5,500 and 10,500 feet above msl. Known from the Eastern San Gabriel, San Bernardino and Santa Rosa Mountains.	–	–	1B.2	–	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Berberis nevinii Nevin's barberry	Occurs in coastal sage scrub with sandy or gravelly soils between sea level and 4,000 feet above msl. Known from Northern Los Angeles County in San Francisquito Canyon; in the San Fernando Valley and Arroyo Seco; in San Timoteo Canyon near Redlands; and near Vail Lake in Riverside County.	FE	SE	1B.1	–	No	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys.
Botrychium crenulatum scalloped moonwort	Occurs in saturated hard water seeps and stream margins between 5,000 and 12,000 feet above msl. Known from the High North Coast Ranges, the High Cascade Range, the High Sierra Nevada, the San Gabriel and San Bernardino Mountains, the Warner Mountains, and East of Sierra Nevada to Washington, Montana, Utah.	–	–	2B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Brodiaea filifolia thread-leaved brodiaea	Occurs in valley grassland, foothill woodland, coastal sage scrub, freshwater wetlands, and wetland-riparian habitats between 80 and 2,800 feet above msl.	FT	SE	1B.1	–	No	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys.
California macrophylla round-leaved filaree	Occurs in valley grasslands and foothill woodlands between sea level and 4,000 feet above msl.	–	–	1B.1	–	–	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Calochortus clavatus var. *clavatus* club-haired mariposa lily	Occurs in serpentine soils between sea level and 4,265 feet above msl. Known from the southern Outer South Coast Ranges, northern Inner South Coast Ranges, Western Transverse Ranges, and San Gabriel Mountains.	–	–	4.3	FSS	–	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys.
Calochortus clavatus var. *gracilis* slender mariposa lily	Occurs in canyons, chaparral, and slopes between sea level and 3,200 feet above msl. Known from the south base of the San Gabriel Mountains.	–	–	1B.2	FSS	–	Not expected to occur; potentially suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2007, 2008, 2009, or 2010.
Calochortus fimbriatus [*Calochortus weedii* var. *vestus*] late-flowered mariposa lily	Occurs in dry, open coastal woodland, chaparral between sea level and 3,000 feet above msl. Known from the Outer South Coast Ranges and Western Transverse Ranges.	–	–	1B.3	FSS	–	Not expected to occur; limited suitable habitat present; not observed during 2012 focused surveys.
Calochortus palmeri var. *palmeri* Palmer's mariposa lily	Occurs in meadows and places that are moist in early spring. Also occurs in chaparral and yellow pine forest between 3,900 and 7,200 feet above msl.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Calochortus plummerae Plummer's mariposa lily	Occurs in dry rocky places, often in brush, coastal sage scrub, and yellow pine forest between sea level and 5,500 feet above msl. Known from the Santa Monica Mountains to the south face of the San Gabriel and San Bernardino Mountains, to San Jacinto Mountains.	–	–	4.2	–	–	Not expected to occur; potentially suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2007, 2008, 2009, or 2010.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Calochortus striatus alkali mariposa lily	Occurs in alkaline meadows and springs and creosote bush scrub between 2,500 and 4,500 feet above msl. Known from the Western Mojave Desert and western Nevada.	–	–	1B.2	FSS	–	Not expected to occur; no suitable habitat for this species.
Calochortus weedii var. *intermedius* intermediate mariposa lily	Occurs in coastal sage scrub and grassland on dry, rocky, open slopes between sea level and approximately 2,200 feet above msl.	–	–	1B.2	–	–	Not expected to occur; limited suitable habitat present; not observed during 2012 focused surveys; not observed during previous focused surveys in 2010.
Canbya candida pygmy poppy	Occurs in sandy flats, creosote bush scrub, and Joshua tree woodland between 1,900 and 4,400 feet above msl.	–	–	4.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Castilleja gleasoni Mount Gleason paintbrush	Occurs in rocky places and yellow pine forest between 5,000 and 7,100 feet above msl. Known from Mt. Gleason and the San Gabriel Mountains.	–	SR	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Castilleja plagiotoma Mojave Indian paintbrush	Occurs in dry flats and ridges, sagebrush scrub, Joshua tree woodland, yellow pine woodland, and pinyon-juniper woodland between 1,500 and 8,200 feet above msl. Known from the northern base of the San Bernardino and San Gabriel Mountains to Piute Mountains and into San Luis Obispo County.	–	–	4.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Centromadia parryi ssp. *australis* southern tarplant	Occurs in saline, seasonally moist grasslands between sea level and 600 feet above msl,	–	–	1B.1	–	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	Occurs in coastal sage scrub with sandy soils between 300 and 1,600 feet above msl. Known from the Western Transverse Ranges.	FC	SE	1B.1	FSS	No	Not expected to occur; limited suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Chorizanthe parryi var. *parryi* Parry's spineflower	Occurs in sand between 300 and 2,600 feet above msl. Known from the central and eastern South Coast, the eastern Transverse Ranges, and the northwestern edge of the Sonoran Desert.	–	–	1B.1	FSS	–	Not expected to occur; limited suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2007, 2008, 2009, or 2010.
Cladium californicum California saw-grass	Occurs in alkaline marshes and swamps between sea level and 7,000 feet above msl.	–	–	2B.2	FSS	–	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Claytonia lanceolata var. *peirsonii* Peirson's spring beauty	Occurs in dry ridges and lodgepole pine forest between 4,900 and 8,500 feet above msl. Known from the slopes of the San Gabriel Mountains' eastern peaks.	–	–	3.1	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Clinopodium mimuloides monkey-flower savory	Occurs in moist places, stream banks, and chaparral woodland between 1,200 and 6,000 feet above msl. San Gabriel Mountains the Transverse Ranges.	–	–	4.2	–	–	Not expected to occur; limited suitable habitat on edge of elevational range; not observed during 2012 focused surveys.
Cuscuta obtusiflora var. *glandulosa* Peruvian dodder	Occurs in freshwater marshes and swamps between sea level and 1,500 feet above msl.	–	–	2B.2	–	–	Not expected to occur; limited suitable habitat; not observed during 2012 focused surveys.
Deinandra mohavensis Mojave tarweed	Occurs on moist sites in openings in chaparral, desert scrub, and woodland habitats between 1,500 and 5,250 feet above msl. Known from the Southern High Sierra Nevada, the North San Bernardino Mountains (extirpated), the Peninsular Ranges, and the west edge Mojave Desert.	–	SE	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Dodecahema leptoceras slender-horned spineflower	Occurs in chaparral and coastal sage scrub in alluvial fans between 600 and 2,300 feet above msl.	FE	SE	1B.1	–	No	Not expected to occur; potentially suitable habitat present, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2007, 2008, 2009, or 2010.
Drymocallis cuneifolia var. ewanii [*Potentilla glandulosa* ssp. *ewanii*] Ewan's cinquefoil	Occurs in steep slopes and yellow pine forest from 6,200 to 8,000 feet above msl. Known from the Mt. Islip area and the San Gabriel Mountains.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Dudleya cymosa ssp. *crebrifolia* San Gabriel River dudleya	Occurs in granitic slopes at approximately 1,300 feet above msl. Known from Fish Canyon and the San Gabriel Mountains.	–	–	1B.2	FSS	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Dudleya densiflora San Gabriel Mountains dudleya	Occurs in steep canyon walls, rocky cliffs, and chaparral between 980 and 1,700 feet above msl. Known from the San Gabriel Mountains.	–	–	1B.1	FSS	–	Not expected to occur; potentially suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2007, 2008, 2009, or 2010.
Dudleya multicaulis many-stemmed dudleya	Occurs in dry, stony places on heavy clay soils, coastal sage scrub, and chaparral habitats between sea level and 2,000 feet above msl. Known from Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties.	–	–	1B.2	FSS	–	Not expected to occur; limited suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Eremogone macradenia var. *arcuifolia* [*Arenaria macradenia* var. *kuschei*] Forest Camp sandwort	Occurs in dry, gravelly canyon slopes, dry yellow-pine, and oak forests, ridges, and summits between 2,100 and 7,900 feet above msl. Known from the Western Transverse Ranges and the San Gabriel Mountains.	–	–	–	FSS	–	Not expected to occur; study area is outside elevation range.
Eriogonum kennedyi var. *alpigenum* southern alpine buckwheat	Occurs in dry granitic slopes and ridges between 8,200 and 11,500 feet above msl. Known from Mt. Pinos and the San Gabriel and the San Bernardino Mountains.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Eriogonum microthecum var. *johnstonii* Johnston's buckwheat	Occurs in dry, rocky places and montane coniferous forest between 8,500 and 9,500 feet above msl. Known from the San Gabriel and San Bernardino Mountains.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Galium angustifolium ssp. *gabrielense* San Antonio Canyon bedstraw	Occurs in dry rocky places, slopes, ridges, canyons, and montane coniferous forest between 3,937 and 8,694 feet above msl. Known from the San Gabriel Mountains (near San Antonio Canyon).	–	–	4.3	–	–	Not expected to occur; study area is outside the elevation range.
Galium grande San Gabriel bedstraw	Occurs in chaparral and oak woodland between 1,300 and 4,000 feet above msl. Known from the San Gabriel Mountains.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside the elevation range.
Galium johnstonii Johnston's bedstraw	Occurs in lower montane coniferous forest, partial shade beneath conifers, and dry slopes between 5,400 and 7,500 feet above msl. Known from the San Gabriel, San Bernardino, and San Jacinto Mountains.	–	–	4.3	–	–	Not expected to occur; study area is outside the elevation range.
Helianthus nuttallii ssp. *parishii* Los Angeles sunflower	Occurs in marshes; historically occurred in Los Angeles, San Bernardino, and Orange Counties between sea level and 1,600 feet above msl.	–	–	1A	–	–	Not expected to occur; presumed extinct; potentially suitable habitat, but not observed during 2012 focused surveys.
Heuchera abramsii Abram's alumroot	Occurs in upper montane coniferous forest between 9,100 and 11,400 feet above msl. Known from the San Gabriel Mountains.	–	–	4.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Heuchera caespitosa [*Heuchera elegans*] urn-flowered alumroot	Occurs in rocky areas between 6,200 and 7,500 feet above msl. Known from the San Gabriel Mountains.	–	–	4.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Hordeum intercedens vernal barley	Occurs in saline flats and depressions in grasslands or within vernal pool basins between sea level and 1,600 feet above msl.	–	–	3.2	–	–	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Horkelia cuneata var. *puberula* mesa horkelia	Occurs in dry, sandy, coastal chaparral between 230 and 2,850 feet above msl. Known from the Outer South Coast Ranges, the South Coast (especially foothill edge of Los Angeles Basin), and Peninsular Ranges.	–	–	1B.1	FSS	–	Not expected to occur; limited suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2007, 2008, 2009, or 2010.
Hulsea vestita ssp. *gabrielensis* San Gabriel Mountains sunflower	Occurs in montane forest between 4,900 and 8,200 feet above msl. Known from Mt. Pinos and the San Gabriel Mountains.	–	–	4.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Hulsea vestita ssp. *pygmaea* pygmy hulsea	Occurs in open gravel, talus slopes, subalpine forest, and alpine barrens between 10,500 and 12,800 feet above msl. Known from the Southern High Sierra Nevada and San Bernardino Mountains.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Imperata brevifolia California satintail	Occurs in wet springs, meadows, stream banks, and floodplains between sea level and 1,640 feet above msl. Known from the Outer North Coast Ranges, the Cascade Range Foothills, the southern Sierra Nevada Foothills, the San Joaquin Valley, the South Coast, the Transverse Ranges, and the Desert to Utah, Texas, and Mexico.	–	–	2B.1	FSS	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Juglans californica [*Juglans californica* var. *californica*] Southern California black walnut	Occurs in hillsides and canyons between 100 and 3,000 feet above msl. Known from the Outer South Coast Ranges and Southwestern California (except Channel Islands and the San Bernardino Mountains).	–	–	4.2	WL	–	Not expected to occur; not observed during 2012 focused surveys.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	Occurs in salt marshes, vernal pools, and wet places between sea level and 3,300 feet above msl.	–	–	1B.1	–	–	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Lepechinia fragrans fragrant pitcher sage	Occurs in canyons and chaparral between sea level and 4,200 feet above msl. Known from the San Gabriel and Santa Monica Mountains and the Santa Cruz, Santa Rosa, and Santa Catalina Islands.	–	–	4.2	FSS	–	Not expected to occur; potentially suitable habitat present, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2007 or 2008.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Lepechinia rossii Ross' pitcher sage	Occurs in chaparral between 1,542 and 3,937 feet above msl. Known from the Liebre and Topatopa mountains.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside known range of the species.
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	Occurs in dry soils in shrublands of southwestern California and Baja California, Mexico between sea level and 9,100 feet above msl.	–	–	4.3[d]	–	–	Not expected to occur; limited suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Lewisia brachycalyx short-sepaled lewisia	Occurs in sandy, wet meadows and seeps in open conifer forest between 4,495 and 8,038 feet above msl. Known from the San Bernardino Mountains and Peninsular Ranges to Utah, Arizona, and northern Baja California, Mexico.	–	–	2B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Lilium humboldtii ssp. *ocellatum* ocellated Humboldt lily	Occurs in gravelly soil, gullies and canyons, and chaparral between sea level and 5,900 feet above msl. Known from the San Gabriel, San Bernardino, San Jacinto and Santa Ana Mountains and from Santa Cruz Island.	–	–	4.2	WL	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys.
Lilium parryi lemon lily	Occurs in springy places, wet banks, and montane coniferous forests between 4,200 and 8,500 feet above msl. Known from the San Gabriel Mountains to San Diego County and Arizona.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Linanthus concinnus San Gabriel linanthus	Occurs in dry, rocky slopes and montane coniferous forest between 5,500 and 9,100 feet above msl. Known from the San Gabriel Mountains.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Linanthus orcuttii Orcutt's linanthus	Occurs in montane chaparral and lower montane coniferous forest between 3,600 and 7,050 feet above msl.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Lupinus peirsonii Peirson's lupine	Occurs in loose, gravelly and rocky slopes, pinyon-juniper, Joshua tree, yellow pine woodlands, and desert slopes between 3,200 and 6,500 feet above msl. Known from the San Gabriel and Tehachapi Mountains.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Malacothamnus davidsonii Davidson's bush-mallow	Occurs in chaparral, coastal sage scrub, and riparian areas between 1,600 and 2,300 feet above msl.	–	–	1B.2	–	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys.
Mimulus johnstonii Johnston's monkey flower	Occurs in dry gravelly slopes, roadbanks, disturbed areas, scree, and mostly yellow pine forest between 3,200 and 9,500 feet above msl. Known from the San Gabriel Mountains to Kern, Santa Barbara, and San Diego Counties	–	–	4.3	–	–	Not expected to occur; study area is outside the elevation range.
Monardella australis ssp. *jokerstii* Jokerst's monardella	Occurs on steep scree or talus, stony benches on canyon bottoms in montane forests between 4,429 and 5,741 feet above msl. Known from the eastern San Gabriel Mountains.	–	–	1B.1	FSS	–	Not expected to occur; study area is outside known range of the species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Monardella macrantha ssp. *hallii* Hall's monardella	Occurs in dry slopes and ridges, chaparral, and yellow pine forest between 1,900 and 6,500 feet above msl. Known from the San Gabriel and San Bernardino Mountains and Peninsular Ranges.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Monardella saxicola [*Mondardella viridis* ssp.*saxicola*] rock monardella	Occurs in dry, rocky places, chaparral, and yellow pine forest between 1,400 and 6,000 feet above msl. Known from the San Gabriel Mountains.	–	–	4.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Muhlenbergia californica California muhly	Occurs in chaparral, yellow pine forest, coastal sage scrub, wetland-riparian, riparian, stream banks, and seeps and meadows between 300 and 6,500 feet above msl.	–	–	4.3	–	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Navarretia peninsularis Baja navarretia	Occurs in wet areas in open forest between 4,500 and 7,500 feet above msl. Known from the Tehachapi Mountain Area, Transverse Ranges, Peninsular Ranges, Arizona, and Baja California.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Nemacladus secundiflorus var. *robbinsii* Robbins' nemacladus	Occurs on dry, gravelly slopes between 1,148 and 5,577 feet above msl. Known from the southern High Sierra Nevadas, Inner South Coast Ranges, and Western Transverse Ranges.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside known range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Opuntia basilaris var. *brachyclada* short-joint beavertail	Occurs in dry slopes, Joshua tree woodland, and pinyon juniper woodland between 4,000 and 5,900 feet above msl. Known from the San Gabriel and eastern San Bernardino Mountains.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Oreonana vestita woolly mountain-parsley	Occurs in dry or gravel talus and upper montane coniferous forest between 5,400 and 11,400 feet above msl. Known from the San Gabriel and San Bernardino Mountains.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Orobanche valida ssp. *valida* Rock Creek broomrape	Occurs in gravelly granitic talus, chaparral, and yellow pine forests between 4,000 and 6,500 feet above msl. Known from the San Gabriel Mountains.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range and this species.
Oxytropis oreophila var. *oreophila* rock-loving oxytrope	Occurs on open gravelly or rocky ground and talus at or above the treeline between 8,858 and 12,467 feet above msl. Known from the San Bernardino Mountains to Utah and Arizona.	–	–	2B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Parnassia cirrata var. *cirrata* fringed grass-of-Parnassus	Occurs in wet places between 2,300 and 8,200 feet above msl. Known from the San Gabriel Mountains and San Bernardino Mountains and Mexico.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Perideridia gairdneri ssp. *gairdneri* California Gairdner's yampah	Occurs in the moist soil of flats, meadows, streamsides, grasslands, and pine groves between sea level and 8,200 feet above msl. Known from the Southern North Coast, the Klamath Ranges, the High North Coast Ranges, the Central Coast, the South Coast, and the Warner Mountains.	–	–	4.2	WL	–	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys.
Phacelia exilis Transverse Range phacelia	Occurs in sandy or rocky slopes, flats, and meadows between 3,600 and 8,900 feet above msl. Known from the Southern Sierra Nevada, the Western Transverse Ranges, the San Gabriel Mountains, and the San Bernardino Mountains.	–	–	4.3	–	–	Not expected to occur; study area is outside elevation range for this species.
Phacelia stellaris Brand's star phacelia	Occurs in coastal sage scrub and coastal dunes between sea level and 1,300 feet above msl.	FC	–	1B.1	–	No	Not expected to occur; limited suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
Pickeringia montana var. *tomentosa* woolly chaparral-pea	Occurs in chaparral and washes from sea level to 5,500 feet above msl. Known from the San Bernardino Mountains, the Peninsular Ranges, and from San Diego County, south to Baja California, Mexico.	–	–	4.3	–	–	Not expected to occur; limited suitable habitat, but not observed during 2012 focused surveys.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Pseudognaphalium leucocephalum white rabbit-tobacco	Occurs in sandy soils near creek banks between sea level and 1,600 feet above msl.	–	–	2B.2	–	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.
***Quercus engelmannii* Engelmann oak**	**Occurs in chaparral, cismontane woodland, riparian woodland, and valley and foothill grasslands in Los Angeles, Orange, and Riverside counties and in Baja California, Mexico between sea level and 4,200 feet above msl.**	**–**	**–**	**4.2**	**–**	**–**	**Engelmann oaks were observed during the 2012 focused plant surveys and 2014 tree survey. 2 trees were recorded near the Dam Work Area, 6 trees were recorded near the Debris Dam Work Area.**
Ribes divaricatum var. *parishii* Parish's gooseberry	Occurs in coastal sage scrub and wetland-riparian between 200 and 1,000 feet above msl.	–	–	1A	–	–	Not expected to occur; species presumed extinct; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Romneya coulteri **Coulter's matilija poppy**	**Inhabits dry washes and canyons in coastal sage scrub and chaparral away from the immediate coast between sea level and 4,000 feet above msl.**	**–**	**–**	**4.2**	**–**	**–**	**17 clumps of poppy were observed during the 2012 focused plant surveys. The species was observed west of the western Debris Dam access road in the southern portion of the study area. This species spreads by rhizomes and it is difficult to identify individual plants.**
Rupertia rigida Parish's rupertia	Occurs in lower montane coniferous forest and montane chaparral; grows in semi-shade beneath a coniferous canopy at the edge of montane meadows between sea level and 8,200 feet above msl.	–	–	4.3	–	–	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys.
Scutellaria bolanderi ssp. *austromontana* southern mountains skullcap	Occurs in gravelly soils, stream banks, oak or pine woodland between 2,000 and 6,500 feet above msl. Known from the San Bernardino Mountains, the Peninsular Ranges, and the southern Mojave Desert.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Senecio astephanus San Gabriel ragwort	Known only from the rocky slopes of the Transverse Ranges and adjacent Coast Ranges between 1,300 and 5,000 feet above msl.	–	–	4.3	–	–	Not expected to occur; limited suitable habitat present, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	Occurs in chaparral, woodland and open conifer forest between 3,200 and 7,200 feet above msl. Known from the outer South Coast Ranges, the Western Transverse Ranges (Santa Barbara County), and the San Bernardino Mountains.	–	SR	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Sidalcea neomexicana Salt Spring checkerbloom	Occurs in alkaline springs and marshes between sea level and 4,921 feet above msl. Known from the South Coast, Western Transverse Ranges, San Gabriel Mountains, San Bernardino Mountains, Peninsular Ranges, and southwestern Mojave Desert to New Mexico and northern Mexico.	–	–	2B.2	FSS	–	Not expected to occur; no suitable habitat; not observed during 2012 focused surveys.
Sidotheca caryophylloides [*Oxytheca caryophylloides*] chickweed oxytheca	Occurs in yellow pine forest between 4,200 and 8,500 feet above msl. Known from Ventura County, the San Gabriel Mountains, and the San Jacinto Mountains.	–	–	4.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Streptanthus bernardinus Laguna Mountains jewelflower	Occurs in dry slopes and yellow pine forest between 4,000 and 8,500 feet above msl. Known from the Eastern San Gabriel Mountains and the Laguna Mountains.	–	–	4.3	–	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Streptanthus campestris southern jewelflower	Occurs in open, rocky conifer forest, chaparral, and woodland between 3,000 and 7,500 feet above msl. Known from the Transverse Ranges, the Peninsular Ranges, and northern Baja California, Mexico.	–	–	1B.3	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Stylocline masonii Mason's neststraw	Occurs in open, loose sand of washes and flats between 328 and 3,937 feet above msl. Known from the southern Sierra Nevada Foothills, southern San Joaquin Valley, Outer South Coast Ranges, and Western Transverse Ranges.	–	–	1B.1	FSS	–	Not expected to occur; study area is outside known range range for this species.
Symphyotrichum defoliatum San Bernardino aster	Occurs in grassland and disturbed places between sea level and 6,700 feet above msl. Known from the San Gabriel Mountains, the San Bernardino Mountains, and the Peninsular Ranges.	–	–	1B.2	FSS	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2010.
Symphyotrichum greatae Greata's aster	Occurs in damp soils in canyons between sea level and 6,500 feet above msl. Known from the San Gabriel Mountains.	–	–	1B.3	–	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]
Syntrichopappus lemmonii Lemon's syntrichopappus	Occurs in sandy places, chaparral, Joshua tree woodland, and pinyon juniper woodland between 3,000 and 5,000 feet above msl. Known from the Transmontane San Gabriel Mountains.	–	–	4.3	WL	–	Not expected to occur; study area is outside elevation range for this species.
Thelypteris puberula var. *sonorensis* Sonoran maiden fern	Occurs along streams and in seepage areas from sea level to 2,600 feet above msl. Known from the South coast, the western Transverse Ranges, the San Gabriel Mountains, and the San Jacinto Mountains, into Arizona and Mexico.	–	–	2B.2	FSS	–	Not expected to occur; potentially suitable habitat, but not observed during 2012 focused surveys; not observed during previous focused surveys in 2007, 2008, 2009, or 2010.
Thysanocarpus rigidus rigid fringepod	Occurs on rocky slopes of oak or pine woodlands between 1,968 and 7,218 feet above msl. Known from the Peninsular Ranges, southwest desert, and Baja California, Mexico.	–	–	1B.2	FSS	–	Not expected to occur; study area is outside elevation range for this species.

TABLE 6
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description[a]	USFWS	CDFW	CRPR	USFS	Critical Habitat Present in the Study Area[b]	Potential for Occurrence[c]

USFWS: United States Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; CRPR: California Rare Plant Rank; USFS: United States Forest Service; –: no status for this agency; msl: mean sea level.

Status Definitions

Federal (USFWS)		State (CDFW)		Federal (USFS)	
FE	Endangered	SE	Endangered	FSS	Forest Service Sensitive
FC	Candidate	SR	Rare	WL	Watch List
FT	Threatened				

CRPR List Categories

List 1A	Plants Presumed Extinct in California
List 1B	Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2B	Plants Rare, Threatened, or Endangered in California But More Common Elsewhere
List 3	Plants that require more information before they can be assigned to another rank or rejected
List 4	Plants of Limited Distribution – A Watch List

CRPR Threat Code Extensions

None	Plants lacking any threat information
.1	Seriously Endangered in California (over 80% of occurrences threatened; high degree and immediacy of threat)
.2	Fairly Endangered in California (20–80% of occurrences threatened)
.3	Not Very Threatened in California (less than 20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

Note: Species that were observed on site are shown in **boldface type.**

[a] Source for General Habitat/Range Descriptions: Allen et al.1995 and Baldwin et al. 2012.

[b] Critical Habitat only applies to USFWS-listed species. As such, any species without a USFWS listing, will have a "–".

[c] All previous biological documentation for the study area including a Biological Technical Report (UltraSystems 2007), an Environmental Impact Report (EDAW 2009), and various focused survey reports (BonTerra Consulting 2009a, 2010, 2012e) were reviewed to compile this table. Results of previous surveys are only listed for species for which the respective report specifically mentioned that species. The targets of each survey may vary based on the habitats present in each respective survey area. Also, the CRPR ranking changes with time and these surveys typically focus on the species with the highest rankings at the time of the survey. Additionally, it should be noted that while the survey areas for previous surveys partially overlapped with the study area for this report, the boundaries varied from project to project. Repeated negative survey results contribute to increasing the strength of an absence finding.

[d] Though not currently recognized by Baldwin et al. (2012), this variety is still tracked by the CNDDB.

3.3.4 Special Status Wildlife

Based on the results of the literature review described above, 64 special status wildlife species have been reported from the Project area. Table 7 provides a list of these species; their listing status; their potential to occur in each portion of the study area; and whether or not they were observed during focused surveys. Species that have been observed during 2009–2014 focused surveys are included in Exhibit 5. Note that they are grouped by type and listed in taxonomic order.

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Invertebrates						
Plebejus saepiolus aureolus San Gabriel Mountains blue butterfly	Wet meadows and seeps in yellow pine forest with hostplant of clover (*Trifolium* spp.). Known from only one location in the Angeles National Forest.	–	–	FSS	–	Not expected to occur; believed to be extinct. Formerly known from only one location (now developed).
Plebulina emigdionis San Emigdio blue butterfly	Occurs in the montane desert regions of southern California from Inyo County southwest through the Mojave Desert and Southern Sierra Nevada to Los Angeles County. It is found only in desert canyons with its host plant, shadscale (*Atriplex canescens*).	–	–	FSS	–	Not expected to occur; no suitable habitat.
Fish						
Gila orcuttii arroyo chub	Occurs in coastal freshwater streams and rivers with sustained flows and emergent vegetation with substrates consisting primarily of sand or mud.	–	SSC	FSS	–	Suitable habitat, but not observed during 2011 (reservoir) or 2012 (creek below the reservoir) focused surveys.
Rhinichthys osculus ssp. 3 Santa Ana speckled dace	Occurs in perennial streams with riffle habitats in clean, rocky-bottomed streams and rivers.	—	SSC	FSS	–	Suitable habitat, but not observed during 2011 (reservoir) or 2012 (creek below reservoir) focused surveys.
Catostomus santaanae Santa Ana sucker	Occurs in shallow streams with flows that run from slow to swift. Stream substrates consist of boulders, gravel, and cobble where there are growths of filamentous algae. This species is occasionally found on sandy or muddy substrates.	FT	SSC	—	No	Marginally suitable habitat, but not observed during 2011 (reservoir) or 2012 (creek below reservoir) focused surveys.
Gasterosteus aculeatus williamsoni unarmored threespine stickleback	Occurs in weedy, permanent pools or backwaters and in slow moving water along the margins of a stream. This species primarily occurs in cool and clear water with muddy or sandy substrates.	FE	SE	—	No	Not expected to occur; study area is outside the range for this species.

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Amphibians						
Taricha torosa Coast Range newt	Found in wet forests, oak forests, chaparral, and rolling grasslands. In Southern California, drier chaparral, oak woodland, and grasslands are used.	–	SSC	–	–	Potentially suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2009 or 2010. Previously observed upstream of the study area, ½ mile upstream of the reservoir, along Santa Anita Wash in 2009.
Batrachoseps gabrieli San Gabriel Mountain slender salamander	Closely associated with extensive rock talus on forested slopes, often near a stream at elevations between 2,800 and 7,800 feet above msl.	–	–	FSS	–	Not expected to occur; study area is outside elevation range for this species.
Ensatina eschscholtzii croceater yellow-blotched salamander	Occurs in evergreen and deciduous forests; under rocks, logs, and other surface debris; and near creeks or streams. It is most common where there is a lot of woody debris on the forest floor. Known from lower Kern River Canyon, the Paiute Mountains, Breckenridge Mountain, the Tehachapi Mountains, on Mt. Pinos, near Fort Tejon, and near Frazier-Alamo Mountain.	–	SSC	FSS	–	Not expected to occur; outside the range for this species.
Anaxyrus [*Bufo*] *californicus* arroyo toad	Occurs in semi-arid regions near washes or intermittent streams. Streams must be of low velocity with sand or gravel substrate.	FE	SSC	–	No	Not expected to occur; no suitable habitat.
Rana boylii foothill yellow-legged frog	Frequents rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands. Sometimes found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools. Occurs in areas between sea level and 6,700 feet above msl.	–	SSC	–	–	Not expected to occur; outside the range for this species.

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Rana draytonii California red-legged frog	Occurs in deep ponds and slow-moving streams with emergent vegetation in forests, woodlands, grasslands, streams, wetlands, ponds, and lakes from sea level to 8,000 feet above msl.	FT	SSC	–	No	Not expected to occur; no suitable habitat.
Rana muscosa Sierra Madre yellow-legged frog	Occurs in small, isolated populations in the San Gabriel, San Bernardino, and San Jacinto Mountains in narrow, rock-walled rivers, perennial creeks, and permanent plunge pools with intermittent creeks and pools in montane riparian and/or chaparral between 1,200 and 7,500 feet above msl.	FE	SSC	–	No	Not expected to occur; outside the range for this species.
Reptiles						
Emys [*Actinemys*] *marmorata* [*pallida*] Pacific [western] pond turtle	Occurs in ponds, lakes, marshes, rivers, streams, and irrigation ditches with a rocky or muddy bottom and aquatic vegetation at elevations from sea level to approximately 6,696 feet above msl.	–	SSC	FSS	–	Not expected to occur along Santa Anita Canyon because not observed during 2012 focused turtle trapping; previously observed in Santa Anita Reservoir during focused turtle trapping in 2011.
Gopherus agassizii desert tortoise	Occurs in desert scrub with soils ranging from sand to sandy-gravel and scattered shrubs with abundant inter-shrub space.	FT	ST	–	No	Not expected to occur; study area is outside species known range.
Phrynosoma blainvillii coast horned lizard	Occurs in scrubland, grassland, coniferous forests, and broadleaf woodland vegetation types.	–	SSC	–	–	May occur; suitable habitat; not observed during 2007 or 2012 focused surveys.
Aspidoscelis tigris stejnegeri **coastal western whiptail**	**Occurs in hot and dry areas with sparse foliage and open areas. Found in forests, woodland, chaparral, and riparian areas.**	**–**	**–**	**–**	**–**	**Observed, suitable habitat; incidentally observed during 2012 surveys; previously observed during 2009 surveys.**

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Anniella pulchra pulchra silvery [California] legless lizard	Requires areas with loose sandy soil, moisture, warmth, and plant cover. Occurs in chaparral, pine-oak woodland, beach, and riparian vegetation types at elevations between sea level and approximately 5,100 feet above msl.	–	SSC	FSS	–	Not expected to occur; suitable habitat, but not observed during 2012 focused surveys; not observed during previous surveys in 2007.
Charina umbratica southern rubber boa	Inhabits oak-conifer and mixed-conifer forests at elevations between approximately 5,000 to 8,200 feet above msl where rocks and logs or other debris provide shelter.	–	ST	–	–	Not expected to occur; study area is outside elevation range for this species.
Diadophis punctatus modestus [San Bernardino] ringneck snake	Occurs in moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, and woodlands.	–	–	FSS	–	May occur; potentially suitable habitat.
Lampropeltis zonata parvirubra San Bernardino Mountain kingsnake	Occurs in diverse habitats including coniferous forest, oak-pine woodlands, riparian woodland, chaparral, manzanita, and coastal sage scrub from 800 to 9,000 feet above msl.	–	–	FSS	–	May occur; potentially suitable habitat.
Lichanura orcutti [*Charina trivirgata roseofusca]* northern three-lined boa [coastal rosy boa]	Inhabits arid scrublands, semi-arid shrublands, rocky shrublands, rocky deserts, canyons, and other rocky areas. May be common in riparian areas, but does not require permanent water.	–	–	FSS	–	May occur; potentially suitable habitat.
Salvadora hexalepis virgultea coast patch-nosed snake	Occurs in semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains at elevations from sea level to around 7,000 feet above msl.	–	SSC	–	–	May occur; potentially suitable habitat.
***Thamnophis hammondii* two-striped garter snake**	**Occurs in wetlands, freshwater marsh, and riparian habitats with perennial water.**	**–**	**SSC**	**FSS**	**–**	**Observed during 2012 focused surveys; suitable habitat.**

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Birds						
Gymnogyps californianus California condor	Occurs in mountainous country at low to moderate elevations, especially rocky and brushy areas with cliffs available for nest sites. Foraging habitat includes grasslands, oak savannas, mountain plateaus, ridges, and canyons. In lower elevation mountains, they require areas where wind conditions are suitable for take-offs.	FE	SE	–	No	Not expected to occur; no suitable habitat.
***Accipiter cooperii* Cooper's hawk (nesting)**	**Preferred nesting habitats are oak and riparian woodlands dominated by sycamores and willows.**	**–**	**WL**	**–**	**–**	**Observed foraging during 2012 focused surveys; previously observed foraging during 2009 focused surveys; suitable nesting habitat.**
Accipiter gentilis northern goshawk	Nests in deciduous, old growth, coniferous, and mixed forests dominated by aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), or willow.	–	SSC	FSS	–	Not expected to occur; no suitable habitat.
Buteo swainsoni Swainson's hawk	Forages in savanna, open pine-oak woodland, and agricultural lands with scattered trees.	–	ST	–	–	Not expected to occur; no suitable habitat.
Elanus leucurus white-tailed kite (nesting)	Occurs in savanna, open woodlands, marshes, desert grassland, partially cleared lands, and cultivated fields.	–	FP	–	–	Limited potential to occur; not observed during focused bird surveys in 2012 or in 2009; marginally suitable foraging and nesting habitat.
Haliaeetus leucocephalus bald eagle	Nests in areas close to rivers, lakes, and reservoirs, near food sources including fish and waterfowl.	Delisted	SE	FSS	–	Not expected to occur; limited suitable foraging habitat.
Falco columbarius merlin (wintering)	Winters in open woodland, grasslands, open cultivated fields, marshes, estuaries, and seacoasts. Does not breed locally; breeds in the boreal forests.	–	WL	–	–	Limited potential to occur in winter; marginally suitable foraging habitat.

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Falco mexicanus prairie falcon	Occurs in grasslands, shrub-steppe, deserts, and other open areas up to about 10,000 feet above msl. In the winter, they also occur in cultivated fields, lakeshores, and desert scrub.	–	WL	–	–	Limited potential to occur; limited suitable foraging habitat; potentially suitable nesting habitat.
Falco peregrinus anatum American peregrine falcon (nesting)	Nests in inaccessible areas such as cliffs, high building ledges, bridges, or other such structures.	Delisted	Delisted/ FP	–	–	May occur; limited suitable foraging and nesting habitat.
Coccyzus americanus occidentalis western yellow-billed cuckoo	Requires broad areas of old-growth riparian habitats dominated by willows and cottonwoods with dense understory vegetation.	FC	SE	FSS	No	Not expected to occur; limited suitable habitat.
Asio otus long-eared owl	Occurs in dense vegetation adjacent to open grassland or shrubland, and open forests.	–	SSC	–	–	May occur; suitable foraging and nesting habitat.
Athene cunicularia burrowing owl (burrow sites; wintering in northern counties)	Breeds and forages in grasslands and prefers flat to low, rolling hills in treeless terrain. Nests in burrows, typically in open habitats, most often along banks and roadsides.	–	SSC	–	–	Not expected to occur; no suitable habitat.
Strix occidentalis occidentalis California spotted owl	Occurs in mature dense, multi-layered evergreen forests with a diversity of tree species, size, and tree health with open areas under canopy.	–	SSC	FSS	–	Not expected to occur; no suitable habitat.
Cypseloides niger black swift	Nesting typically occurs in a moist crevice or cave on a sea cliff above the surf or on cliffs behind or adjacent to waterfalls in deep canyons.	–	SSC	–	–	May occur for foraging only; no suitable nesting habitat.
Empidonax traillii extimus southwestern willow flycatcher (nesting)	Occurs in riparian habitats along rivers, streams, or other wetlands where dense growth of willows, mule fat, arrow-weed (*Pluchea sericea*), tamarisk (*Tamarix* sp.), or other plants are present, often with a scattered overstory of cottonwood	FE	SE	–	No	Not expected to occur; not observed during 2012 focused surveys; not observed during previous focused surveys in 2007 or 2009.

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Lanius ludovicianus loggerhead shrike	Occurs in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground.	–	SSC	–	–	May occur; suitable habitat.
Vireo bellii pusillus least Bell's vireo (nesting)	Riparian habitats dominated by willows with dense understory vegetation between sea level and 1,500 feet above msl.	FE	SE	–	No	Not expected to occur; not observed during 2012 focused surveys; not observed during previous focused surveys in 2007 or 2009.
Vireo vicinior gray vireo (nesting)	Occurs in shrublands such as chaparral, sagebrush, or pinyon-juniper woodland; closely associated with littleleaf elephant tree (*Bursera microphylla*) in the winter.	–	SSC	FSS	–	Not expected to occur; no suitable habitat.
Riparia riparia bank swallow	Breeds in riparian areas with vertical cliffs and banks with fine-textured sandy soil in which it digs nesting holes.	–	ST	–	–	Not expected to occur; no suitable habitat.
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren (San Diego and Orange Counties)	Coastal sage scrub and alluvial sage scrub with sufficient amounts of coastal prickly-pear (*Opuntia littoralis*) and/or coastal cholla (*Cylindropuntia* [*Opuntia*] *prolifera*).	–	SSC	FSS	–	Not expected to occur; no suitable habitat.
Polioptila californica californica coastal California gnatcatcher	Coastal sage scrub between sea level and 2,000 feet above msl.	FT	SSC	–	No	Not expected to occur, limited suitable habitat; not observed during 2012 focused surveys; not observed during previous focused surveys in 2008–2009.
***Setophaga petechia* [*Dendroica petechia*] yellow warbler**	**Riparian habitats dominated by willows with dense understory vegetation between sea level and 9,000 feet above msl.**	**–**	**SSC**	**–**	**–**	**Observed during 2012 focused surveys; previously observed during 2009 focused surveys; suitable habitat.**
***Icteria virens* yellow-breasted chat**	**For nesting, this species requires dense, brushy tangles near water and riparian woodlands that support a thick understory.**	**–**	**SSC**	**–**	**–**	**May occur; not observed during 2012 surveys; previously observed during 2009 focused surveys; suitable habitat.**

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Aimophila ruficeps canescens **Southern California rufous-crowned sparrow**	**Occurs in shrublands on hillsides and in canyons with rocky, dry slopes.**	**–**	**WL**	**–**	**–**	**Observed during 2012 focused surveys; previously observed during 2009 focused surveys; suitable habitat.**
Mammals						
Antrozous pallidus pallid bat	Occurs in grasslands, shrublands, and woodlands and in open habitats with rocky areas for roosting.	–	SSC	FSS	–	May occur; potentially suitable foraging and roosting habitat; one unidentified acoustical recording may have been pallid bat.
Corynorhinus townsendii **Townsend's big-eared bat**	**Occurs in oak woodlands, arid deserts, grasslands, and high-elevation forests and meadows. Roosts in limestone caves, lava tubes, and man-made structures.**	**–**	**SC/SSC**	**FSS**	**–**	**Observed foraging at the Dam (acoustical analysis results); not expected to roost at the Dam (first observation recorded over an hour into the survey so bat likely traveled to the Dam from its roosting location); potentially suitable foraging and roosting habitat (prefers caves; would not be expected to roost on the structures).**
Lasionycteris noctivagans silver-haired bat	Typically hibernates in small tree hollows, beneath sections of tree bark, in buildings, rock crevices, in wood piles, and on cliff faces. Occasionally will hibernate in the entrances to caves, especially in northern regions of their range.	–	SA	–	–	May occur; potentially suitable foraging and roosting habitat; not observed during acoustical surveys.
Lasiurus blossevillii western red bat	Occurs in riparian habitats dominated by cottonwoods, oaks, sycamores, and walnuts.	–	SSC	–	–	May occur; potentially suitable foraging and roosting habitat; not observed during acoustical surveys.

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Lasiurus cinereus **hoary bat**	**Occurs in open habitats or habitat mosaics with access to trees for cover and roosts in dense foliage of medium to large trees. Also uses trees in urban areas several miles away from undeveloped habitat.**	**–**	**SA**	**–**	**–**	**Observed foraging at the Dam (acoustical analysis results); not expected to roost at the Dam (tree roosting species); potentially suitable foraging and roosting habitat.**
Lasiurus xamtjomis western yellow bat	Little is known about its habitat, but it is known to roost in leafy vegetation. This species is associated with dry thorny vegetation in the deserts of the southwestern U.S., the Mexican Plateau, and coastal western Mexico.	–	SSC	–	–	Not expected to occur; study area is outside the range of this species; not observed during acoustical surveys.
Myotis thysanodes **fringed myotis**	**Occurs in a variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe, but mostly commonly in drier woodlands (i.e., oak, pinyon-juniper, and ponderosa pine). Forages in forest interior and along forest edges. Roosts in crevices in buildings, underground mines, rocks, cliff faces, bridges, decadent trees, and snags.**	**–**	**–**	**FSS**	**–**	**Observed foraging at the Dam (acoustical survey results); expected to roost in the Dam (crevices); potentially suitable foraging and roosting habitat.**
Eumops perotis californicus **western mastiff bat**	**Found in many open semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, palm oases, chaparral, desert scrub, and urban areas. Typically forages in open areas with high cliffs and roosts in small colonies in crevices on cliff faces.**	**–**	**SSC**	**–**	**–**	**Observed foraging at the Dam (acoustical survey results); limited potential to roost in the Dam (first observation recorded over an hour into the survey so bat likely traveled to the Dam from its roosting location); potentially suitable foraging and roosting habitat.**

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Nyctinomops femorosaccus pocketed free-tailed bat	Occurs in areas with ponds or streams or in arid deserts that provide suitable foraging habitat. It primarily roosts in crevices in rugged cliffs, slopes, and tall rocky outcrops.	–	SSC	–	–	May occur; potentially suitable foraging and roosting habitat; not observed during acoustical surveys.
Nyctinomops macrotis big free-tailed bat	Feeds primarily on moths caught while flying over water sources in suitable habitat in the southwestern U.S. This species prefers rugged, rocky terrain and roosts in crevices in high cliffs or rocky outcrops.	–	SSC	–	–	May occur; potentially suitable foraging and roosting habitat; not observed during acoustical surveys.
Lepus californicus bennettii San Diego black-tailed jackrabbit	Occurs in herbaceous and desert-shrub areas and open, early stages of forest and chaparral habitats	–	SSC	–	–	Not expected to occur; no suitable habitat.
Perognathus alicolus alticolus white-eared pocket mouse	Occurs in grassy flats with an overstory of yellow pine forest, in sagebrush scrub, and in pinyon-juniper woodland between 5,400 and 6,000 feet above msl. Known from Strawberry Peak in the western San Gabriel Mountains.	–	SSC	–	–	Not expected to occur; study area is outside the elevation range for this species.
Perognathus alticolus inexpectatus Tehachapi pocket mouse	Occurs in chaparral and sage scrub between 3,400 and 6,000 feet above msl. Known from Tehachapi Pass to Elizabeth Lake along San Gabriel Mountains.	–	SSC	FSS	–	Not expected to occur; study area is outside the elevation range for this species.
Onychomys torridus ramona southern grasshopper mouse	Occurs in grassland and sparse scrub vegetation types and prefers sandy soils.	–	SSC	–	–	Limited potential to occur; potentially suitable habitat.
Perognathus longimembris brevinasus Los Angeles pocket mouse	Occurs in lower elevation grasslands and coastal sage scrub vegetation with open ground and fine sandy soils between 550 and 2,650 feet above msl.	–	SSC	–	–	May occur; potentially suitable habitat.

TABLE 7
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROJECT AREA

Species	General Habitat/Range Description	USFWS	CDFW	USFS	Critical Habitat Present in the Study Area[a]	Potential for Occurrence[b]
Ovis canadensis nelsoni San Gabriel Mountains bighorn sheep	Occurs in suitable escape terrain (e.g., cliffs, talus slopes) with Chaparral for foraging between 4,000 and 6,000 feet above msl.	–	–	FSS	–	Not expected to occur; study area is outside the elevation range for this species.

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; USFS: U.S. Forest Service; msl: mean sea level

Status Definitions

Federal (USFWS) Status
FE Endangered
FT Threatened
FC Candidate

State (CDFW) Status
SE Endangered
ST Threatened
SC Candidate
SSC Species of Special Concern
FP California Fully Protected
WL Watch List
SA Special Animal

USFS Status
FSS Forest Service Sensitive Species

Species that were observed on site are shown in **boldface type.**

[a] Critical Habitat only applies to USFWS-listed species. As such, any species without a USFWS listing, will have a "–".

[b] All previous biological documentation for the study area including a Biological Technical Report (UltraSystems 2007), an Environmental Impact Report (EDAW 2009), and various focused survey reports (BonTerra Consulting 2009b, 2009c, 2009d, 2011, 2012a, 2012b, 2012c, 2012d, 2014) were reviewed to compile this table. Results of previous surveys are only listed for species for which the respective report specifically mentioned that species. It should be noted that while the survey areas for previous surveys partially overlapped with the study area for this report, the boundaries varied from project to project. Repeated negative survey results contribute to increasing the strength of an absence finding.

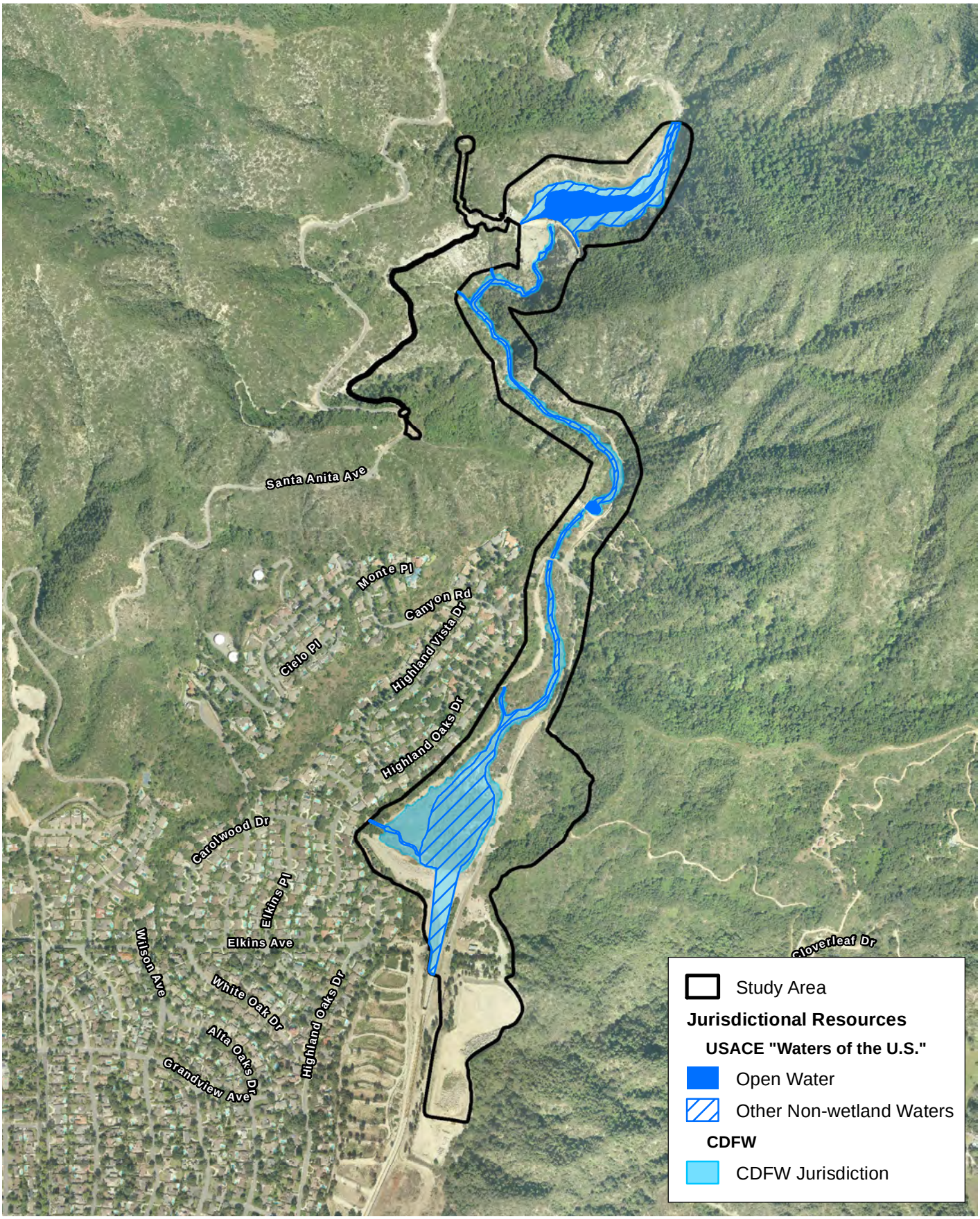
3.3.5 Jurisdictional Resources

Riparian habitats in the study area include southern cottonwood willow riparian forest, southern sycamore alder riparian woodland, mule fat scrub, and open water. Riparian habitats are often under the jurisdiction of the USACE, the RWQCB, and/or the CDFW due to their association with wetlands, "Waters of the U.S.", or streambeds. However, it should be noted that the riparian habitats described above are not equivalent to delineated areas subject to the jurisdiction of the USACE, the RWQCB, and/or the CDFW. Only the portion of these habitats associated within a discernible streambed and/or adjacent wetlands that meet certain criteria are within the jurisdiction of these regulatory agencies. Similarly, upland habitat types (e.g., mixed coastal sage scrub and mixed chaparral) or disturbed and developed areas may be within the jurisdiction of these agencies if they occur within a discernible streambed.

Multiple features in the study area are under the jurisdiction of the USACE, the RWQCB, and/or the CDFW. These features include Santa Anita Reservoir, Wash, Headworks, and Debris Dam. The delineation of the study area identified a total of 19.421 acres of "Waters of the U.S." (3.003 acres of open water, 16.418 acres of non-wetland waters) under the jurisdiction of the USACE and the RWQCB and 26.985 acres under the jurisdiction of the CDFW present in the study area (Exhibit 6, Table 8, Attachment H). No wetlands were determined to be present in the study area.

TABLE 8
SUMMARY OF EXISTING JURISDICTIONAL RESOURCES IN THE STUDY AREA

Jurisdiction	Existing Resources (Acres)
Total USACE Jurisdiction	**19.421**
Open Water	3.003
Other Non-wetland "Waters of the U.S."	16.418
Total RWQCB Jurisdiction	**19.421**
Total CDFW Jurisdiction	**26.985**
Source: BonTerra Consulting 2014b.	



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Jurisdictional Resources

Exhibit 6

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

1,000 500 0 1,000 Feet

BonTerra PSOMAS

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4.0 PROJECT WORK AREAS

4.1 INTRODUCTION

This section presents a general impact analysis of the Project. The determination of impacts in this analysis is based on a comparison of maps depicting Project Work Areas and maps of biological resources in the study area. All construction activities, including equipment areas, are assumed to be within the permanent and temporary impact areas (called "Project Work Areas") identified on Exhibits 7A–C. Permanent impact areas are defined as changes to or removal of an existing vegetation type or "other areas," including disturbed or developed (e.g. paved) that are permanent as a result of Project implementation. These impact areas are labeled with a red boundary on relevant graphics. Temporary access/impact areas are defined as areas that may be subject to traversing vehicles or other mobile equipment, staging of equipment, stockpiles of soil, minor soil disturbance where there is no permanent alteration to the existing grade (e.g. no permanent holes, trenches, or berms), and no vegetation or tree removal. These impact areas are labeled with a yellow boundary on relevant graphics.

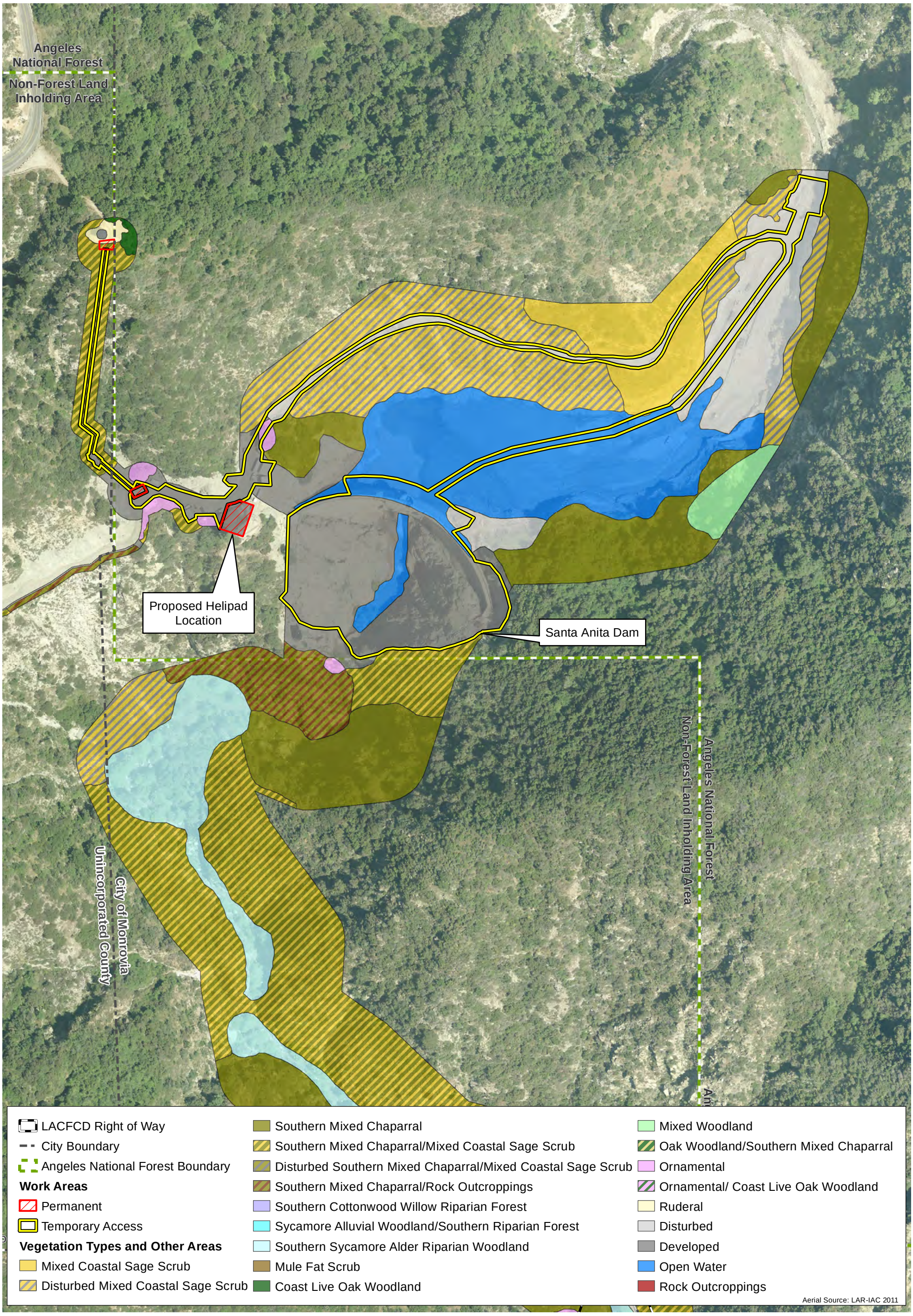
Both direct and indirect impacts on biological resources have been evaluated. Direct impacts are those that involve the initial loss of habitats due to grading, construction, and construction-related activities. Indirect impacts are those that would be related to impacts on the adjacent remaining habitat due to construction activities (e.g., noise, dust) or operation of the Project (e.g., human activity, operational noise, indirect lighting).

Biological impacts associated with the Project were evaluated with respect to the following special status biological issues:

- Federally or State-listed Endangered or Threatened plant or wildlife species;
- Non-listed species that meet the criteria in the definition of "Rare" or "Endangered" in the CEQA Guidelines (i.e., 14 *California Code of Regulations,* Section 15380)[6];
- Species designated as California Species of Special Concern;
- Species designated as Forest Service Sensitive Species;
- Streambeds, wetlands, and their associated vegetation;
- Habitats suitable to support a federally or State-listed Endangered or Threatened plant or wildlife species;
- Habitats, other than wetlands, considered special status by regulatory agencies (e.g., the USFWS, the CDFW) or resource conservation organizations;
- Other species or issues of concern to regulatory agencies or conservation organizations.

The actual and potential occurrence of these resources in the Project Work Areas was correlated with the significance criteria listed in the next section in order to determine whether Project impacts on these resources would be considered significant.

[6] Section 15380 of the CEQA Guidelines indicates that a lead agency can consider a non-listed species (e.g., CNPS List 1B plants) to be Endangered, Rare, or Threatened if the species can be shown to meet the criteria in the definition of Rare or Endangered. For the purposes of this discussion, the current scientific knowledge on the population size and distribution for each special status species was considered in determining if a non-listed species meets the definitions for Rare and Endangered according to Section 15380 of the CEQA Guidelines.



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Project Work Areas – Dam

Exhibit 7A

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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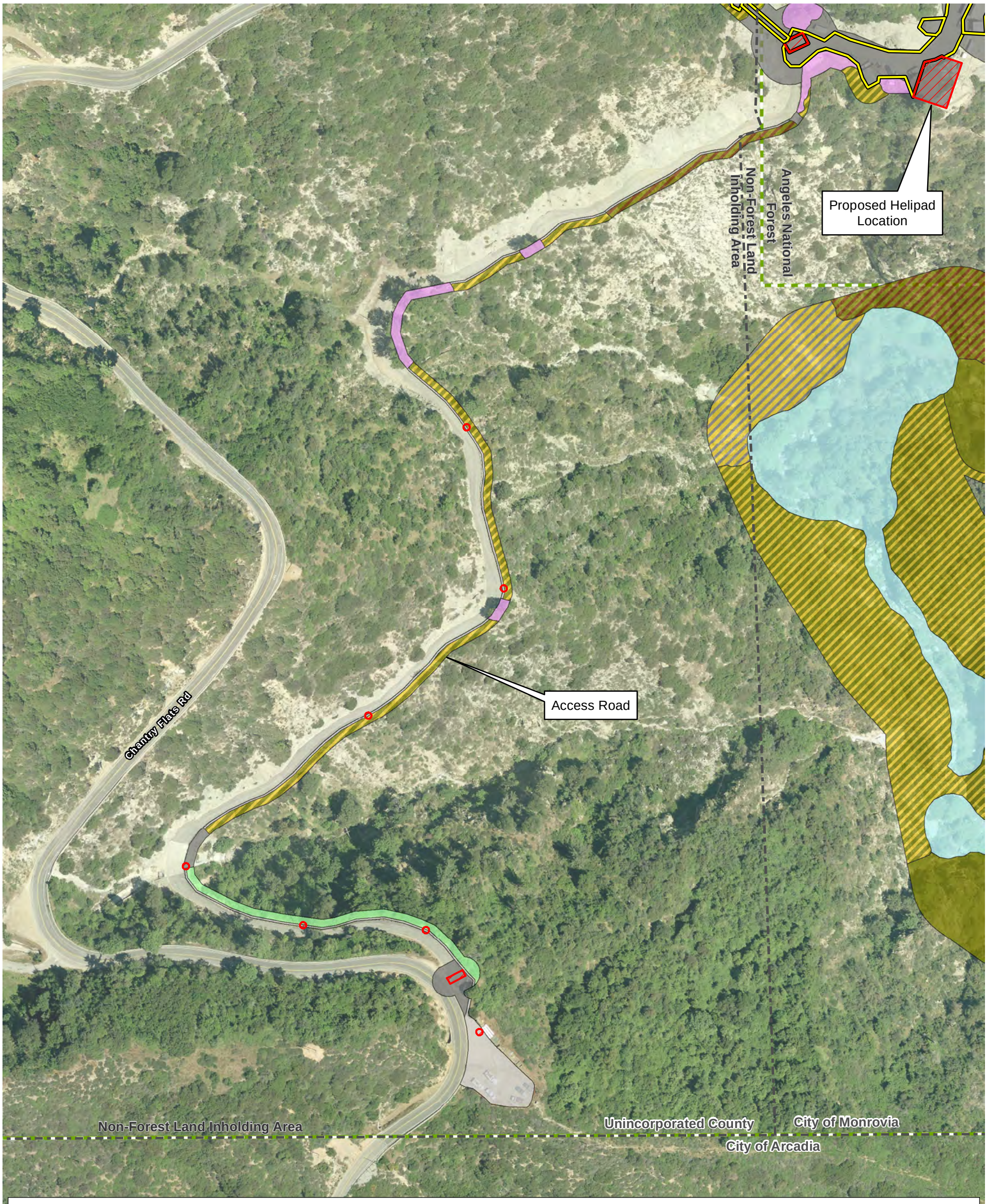

LACFCD Right of Way
City Boundary
Angeles National Forest Boundary

Work Areas

Permanent
Temporary Access

Vegetation Types and Other Areas

Mixed Coastal Sage Scrub
Disturbed Mixed Coastal Sage Scrub
Southern Mixed Chaparral
Southern Mixed Chaparral/Mixed Coastal Sage Scrub
Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub
Southern Mixed Chaparral/Rock Outcroppings
Southern Cottonwood Willow Riparian Forest
Sycamore Alluvial Woodland/Southern Riparian Forest
Southern Sycamore Alder Riparian Woodland
Mule Fat Scrub
Coast Live Oak Woodland
Mixed Woodland
Oak Woodland/Southern Mixed Chaparral
Ornamental
Ornamental/ Coast Live Oak Woodland
Ruderal
Disturbed
Developed
Open Water
Rock Outcroppings

Aerial Source: LAR-IAC 2011

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Project Work Areas – Dam (Access Road)

Exhibit 7B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

150 75 0 150 Feet

BonTerra PSOMAS

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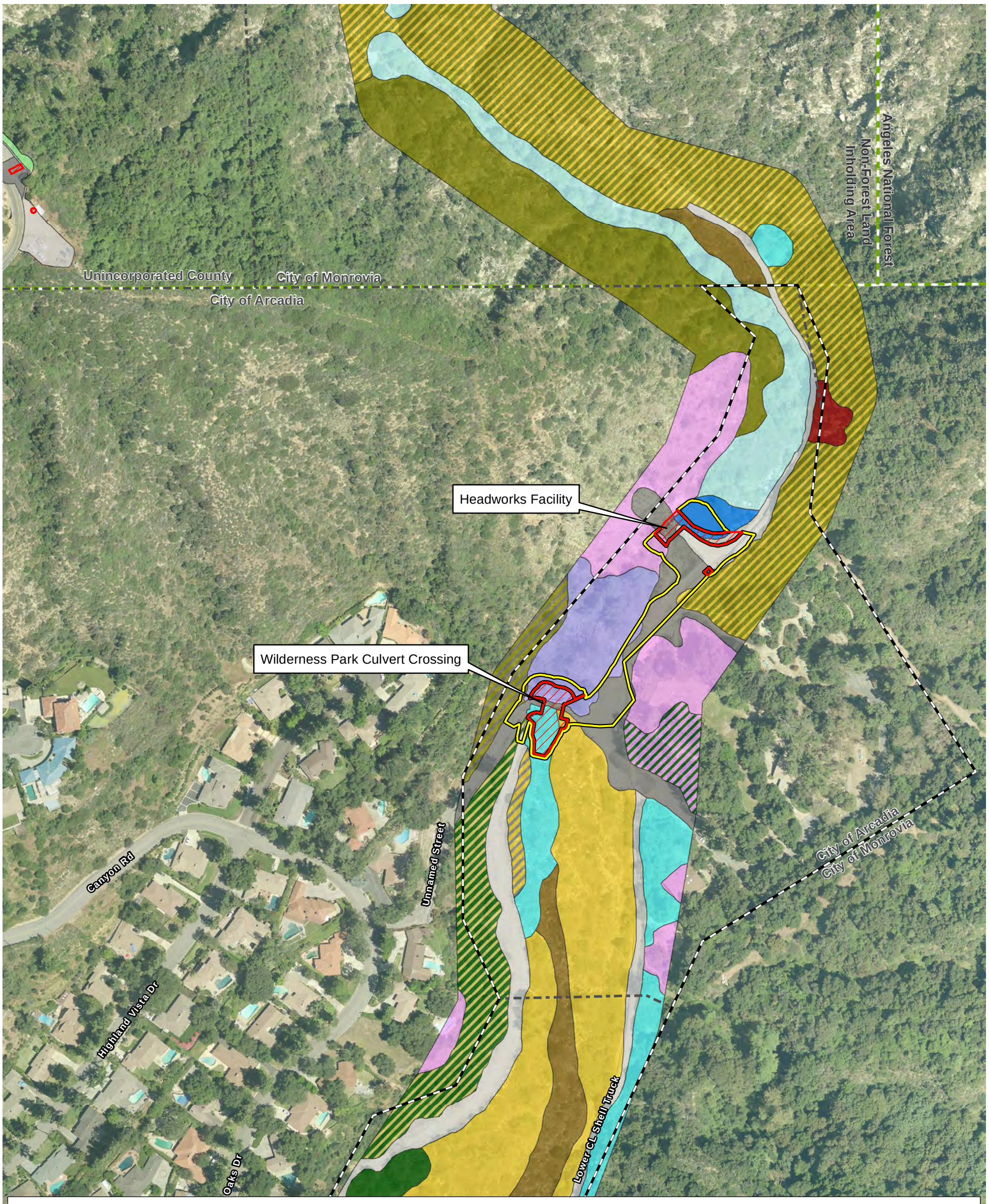

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Project Work Areas – Headworks and Wilderness Park Culvert Crossing

Exhibit 7C

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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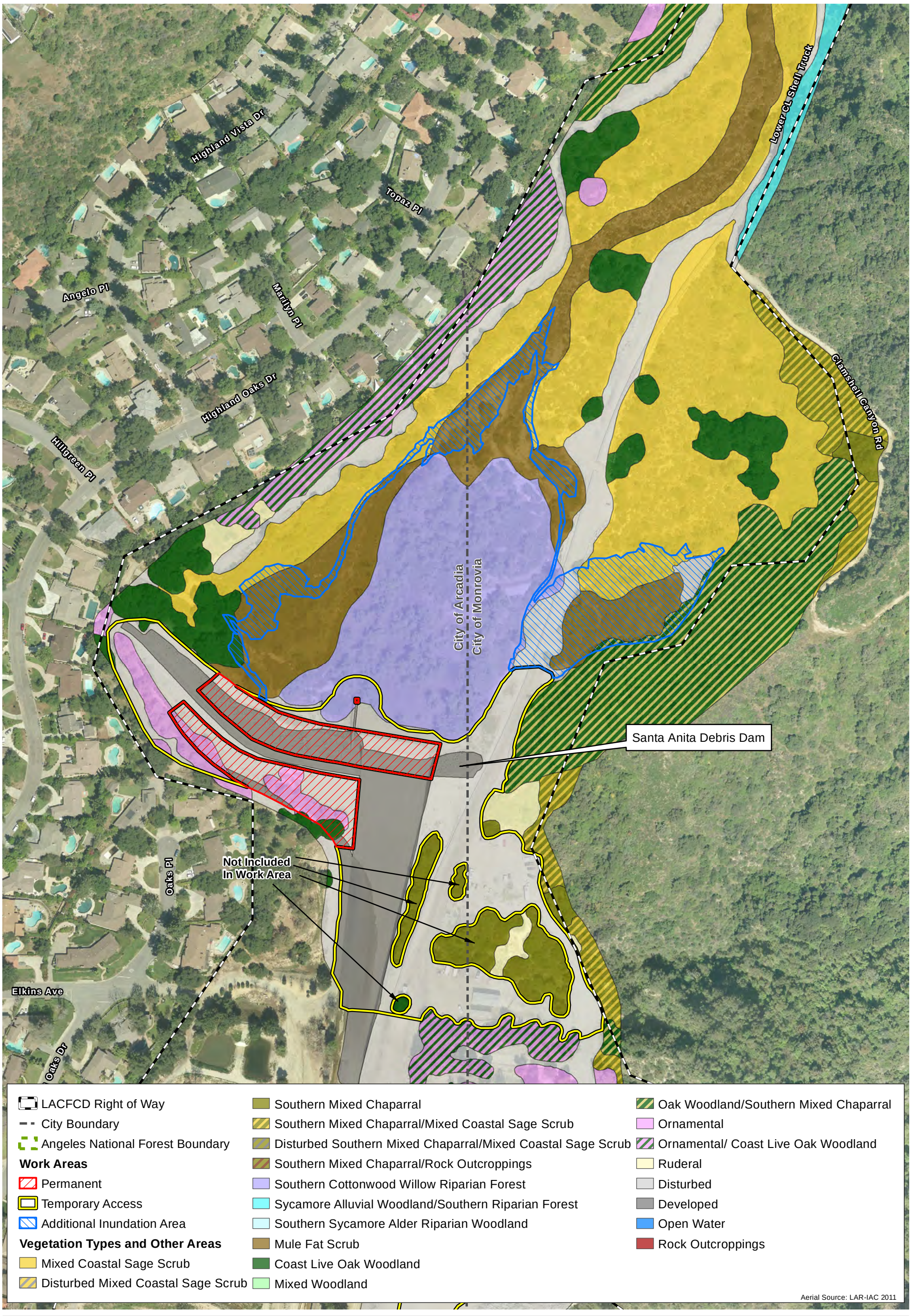

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Project Work Areas – Debris Dam

Exhibit 7D

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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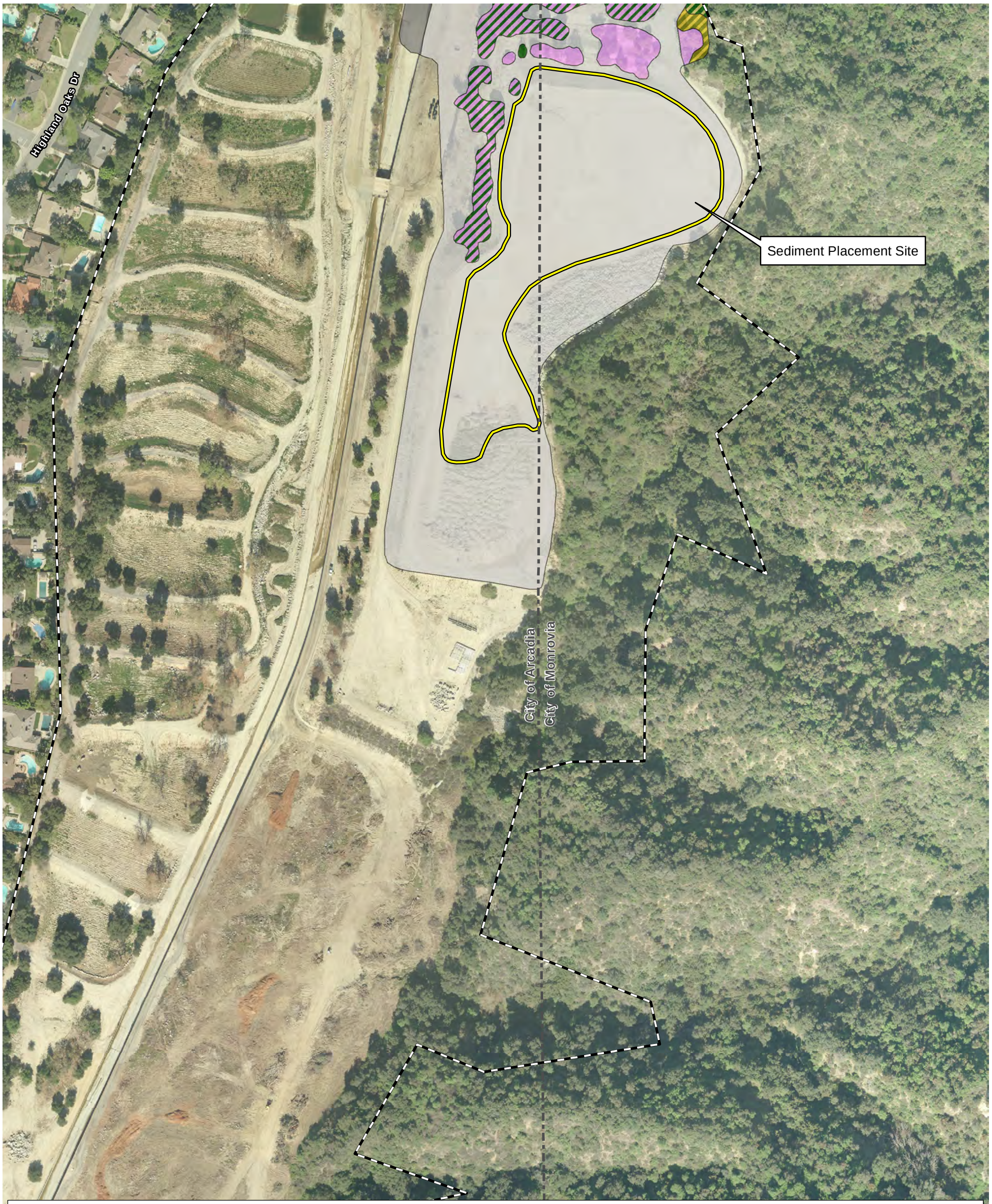

LACFCD Right of Way
City Boundary
Angeles National Forest Boundary

Work Areas

Permanent
Temporary Access

Vegetation Types and Other Areas

Mixed Coastal Sage Scrub
Disturbed Mixed Coastal Sage Scrub
Southern Mixed Chaparral
Southern Mixed Chaparral/Mixed Coastal Sage Scrub
Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub
Southern Mixed Chaparral/Rock Outcroppings
Southern Cottonwood Willow Riparian Forest
Sycamore Alluvial Woodland/Southern Riparian Forest
Southern Sycamore Alder Riparian Woodland
Mule Fat Scrub
Coast Live Oak Woodland
Mixed Woodland
Oak Woodland/Southern Mixed Chaparral
Ornamental
Ornamental/ Coast Live Oak Woodland
Ruderal
Disturbed
Developed
Open Water
Rock Outcroppings

Aerial Source: LAR-IAC 2011

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Project Work Areas – Debris Dam (Sediment Placement Site)

Exhibit 7E

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

(Rev: 9-22-2014 CJS) H:\PAS\Projects\CoLADPW\J166\Graphics\BioTech\Ex7_impacts_veg.pdf

4.2 SIGNIFICANCE CRITERIA

The environmental impacts relative to biological resources are assessed using impact significance criteria that mirror the policy contained in CEQA (*California Public Resources Code* Section21001[c]). Accordingly, the State Legislature has established it to be the policy of the State to:

> Prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities.

Determining whether or not a project may have a significant effect or impact plays a critical role in the CEQA process. According to Section 15064.7 of the CEQA Guidelines (Thresholds of Significance), each public agency is encouraged to develop and adopt—by ordinance, resolution, rule or regulation—their own significance thresholds that the agency would use in determining the impact of environmental effects. A significance threshold defines the quantitative, qualitative, or performance limits of a particular environmental effect. If these thresholds are exceeded, the agency would consider it to be significant.

In the development of significance thresholds for impacts to biological resources, CEQA provides guidance primarily in Section 15065, Mandatory Findings of Significance, and Appendix G, the Environmental Checklist Form, of the CEQA Guidelines. Section 15065(a) states that a project may have a significant effect where:

> The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, reduce the number or restrict the range of an endangered, rare, or threatened species.

Appendix G of the CEQA Guidelines is more specific in addressing biological resources and encompasses a broader range of resources to be considered, including candidate, sensitive, or special status species; riparian habitat or other special status natural communities; federally protected wetlands; fish and wildlife movement corridors; local policies or ordinances protecting biological resources; and adopted habitat conservation plans. These factors are considered through the checklist of questions answered during the Initial Study process used to determine a Project's appropriate environmental documentation (i.e., Negative Declaration, Mitigated Negative Declaration [MND], or Environmental Impact Report [EIR]). Because these questions are derived from standards employed in other laws, regulations and commonly used thresholds, it is reasonable to use these standards as a basis for defining significance thresholds in an MND. For each of the thresholds identified below, the section of the CEQA Guidelines upon which the threshold is based has been provided. For the purpose of this analysis, impacts to biological resources are considered significant (before calculating the offsetting impacts of mitigation measures [MMs]) if 1 or more of the following conditions would result from implementation of the Project:

1. The project has the potential to substantially degrade the quality of the environment (Section 15065[a]).
2. The project has the potential to substantially reduce the habitat of any fish or wildlife species (Section 15065[a]).

3. The project will cause fish or wildlife populations to drop below self-sustaining levels (Section 15065[a]).
4. The project will threaten to eliminate a plant or animal community (Section 15065[a]).
5. The project will reduce the number or restrict the range of an Endangered, Rare, or Threatened species (Section 15065[a]).[7]
6. The project has a substantial adverse effect, either directly or through habitat modifications, on any species identified as a Candidate or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS (Appendix G, IV[a]).
7. The project has a substantial adverse effect on any riparian habitat or other special status natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS (Appendix G, IV[b]).
8. The project has a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means (Appendix G, IV[c]).
9. The project interferes substantially with the movement of any native or migratory fish or wildlife species; inhibits established native resident or migratory wildlife corridors; or impedes the use of native wildlife nursery sites (Appendix G, IV[d]).
10. The project conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (Appendix G, IV[e]).
11. The project conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State Habitat Conservation Plan (Appendix G, IV[f]).

In order to evaluate whether an impact on biological resources would result in a “substantial adverse effect”, both the resource itself and how that resource fits into a regional context must be considered. The Project’s regional setting includes the Angeles National Forest (ANF), the northeast edge of the City of Arcadia, and the northwest edge of the City of Monrovia. For impact analysis purposes, a “substantial adverse effect” is defined as the loss or harm of a magnitude which, based on current scientific data and knowledge, would (1) substantially diminish population numbers of a species or distribution of a habitat type within the region or (2) eliminate the functions and values of a biological resource in the region.

4.3 DIRECT IMPACTS

The actual and potential occurrence of biological resources in the Project Work Areas was correlated with the significance criteria described above to determine whether impacts from the Project on these resources would be significant. Potential direct impacts are described below.

[7] “Endangered” and “Threatened” species, as used in this threshold, are those listed by the USFWS and/or CDFW as Threatened or Endangered. Section 15380 of the CEQA Guidelines indicates that a lead agency can consider a non-listed species (e.g., CNPS List 1B plants) to be Endangered, Rare, or Threatened for the purposes of CEQA if the species can be shown to meet the criteria in the definition of “Rare” or “Endangered”. For the purposes of this discussion, the current scientific knowledge on the population size and distribution for each special status species was considered in determining if a non-listed species met the definitions for “Rare” and “Endangered” according to Section 15380 of the CEQA Guidelines.

4.3.1 Vegetation Types and Other Areas

The vegetation types and other areas that are within Project Work Areas are shown in Table 9 and illustrated on Exhibits 7A–7C. The following vegetation types and other areas would be affected by the Project: mixed coastal sage scrub, southern mixed chaparral/mixed coastal sage scrub, disturbed southern mixed chaparral/mixed coastal sage scrub, southern cottonwood willow riparian forest, sycamore alluvial woodland/southern riparian forest, mule fat scrub, coast live oak woodland, oak woodland/southern mixed chaparral, ornamental, ruderal, disturbed, developed, and open water. Each vegetation type that would be affected is discussed further below.

The following vegetation types and other areas occur within the study area but are outside of Project Work Areas: disturbed mixed coastal sage scrub, southern mixed chaparral, southern mixed chaparral/rock outcroppings, southern sycamore alder riparian woodland, mixed woodland, ornamental/coast live oak woodland, and rock outcroppings. These vegetation types and other areas are not discussed further.

Potential impacts on special status vegetation types were evaluated by considering the CEQA Guidelines checklist (at IV[b]) for vegetation types of special concern (i.e., S1–S3 rank). The amount and quality of the vegetation type to be impacted relative to extent of this vegetation type in the region was considered. The highest quality vegetation types are expected to lack invasive non-native species; have no evidence of human-caused disturbance such as roads or excessive livestock grazing; show evidence of reproduction (e.g., sprouts, seedlings, adults of reproductive age); and have no significant insect or disease damage. Small impacts on low quality habitat, when it lacks an associated special status species, are unlikely to be considered significant (CDFW 2013b).

TABLE 9
VEGETATION TYPES AND OTHER AREAS WITHIN PROJECT WORK AREAS

Vegetation Types and Other Areas	Existing Vegetation in the Study Area (acres)	Dam		Headworks[a]		Debris Dam			Total Permanent Structure (acres)	Total Temporary Access (acres)	Total Additional Inundation Area (acres)	Total (acres)
		Permanent Structure (acres)	Temporary Access (acres)	Permanent Structure Headworks (acres)	Temporary Access (acres)	Permanent Structure (acres)	Temporary Access (acres)	Additional Inundation Area (acres)				
Mixed Coastal Sage Scrub	14.09	0.00	0.00	0.01	0.02	0.00	0.00	0.58	**0.01**	**0.02**	**0.58**	**0.61**
Disturbed Mixed Coastal Sage Scrub	4.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Southern Mixed Chaparral	9.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Southern Mixed Chaparral/ Mixed Coastal Sage Scrub	12.72	0.01	0.12	0.00	0.02	0.00	0.00	0.00	**0.01**	**0.14**	**0.00**	**0.15**
Disturbed Southern Mixed Chaparral/Mixed Coastal Sage Scrub	0.50	0.00	0.00	0.00	0.01	0.00	0.00	0.00	**0.00**	**0.01**	**0.00**	**0.01**
Southern Mixed Chaparral/Rock Outcroppings	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Southern Cottonwood Willow Riparian Forest	6.36	0.00	0.00	0.06	0.14	0.00	0.20	0.08	**0.06**	**0.34**	**0.08**	**0.48**
Sycamore Alluvial Woodland/Southern Riparian Forest	1.80	0.00	0.00	0.10	0.03	0.00	0.00	0.00	**0.10**	**0.03**	**0.00**	**0.13**
Southern Sycamore Alder Riparian Woodland	3.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Mule Fat Scrub	5.99	0.00	0.00	0.00	0.00	0.00	0.00	1.78	**0.00**	**0.00**	**1.78**	**1.78**
Coast Live Oak Woodland	2.61	0.00	0.00	0.00	0.00	0.04	0.03	0.05	**0.04**	**0.03**	**0.05**	**0.12**
Mixed Woodland	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Oak Woodland/Southern Mixed Chaparral	6.03	0.00	0.00	0.00	0.01	0.00	0.00	0.12	**0.00**	**0.01**	**0.12**	**0.13**
Ornamental	3.86	0.00	0.02	0.01	0.03	0.31	0.38	0.00	**0.32**	**0.43**	**0.00**	**0.75**
Ornamental/ Coast Live Oak Woodland	3.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Ruderal	0.63	0.01	0.00	0.00	0.00	0.00	0.00	0.00	**0.01**	**0.00**	**0.00**	**0.01**
Disturbed	23.87	0.01	0.97	0.03	0.13	0.81	8.70	0.49	**0.85**	**9.80**	**0.49**	**11.14**
Developed	8.90	0.11	3.22	0.04	0.49	0.73	2.23	0.00	**0.88**	**5.94**	**0.00**	**6.82**
Open Water	4.99	0.00	0.76*	0.04*	0.09*	0.00	0.00	0.00	**0.04**	**0.85**	**0.00**	**0.89***
Rock Outcroppings	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Total Work Area Acreages	**115.50**	**0.14**	**5.09**	**0.29**	**0.97**	**1.89**	**11.54**	**3.10**	**2.32**	**17.60**	**3.10**	**23.02**

[a] The Headworks column includes impacts for construction of both the Headworks facility and the Wilderness Park Culvert Crossing. As these facilities are close together, they share a temporary access footprint.

*Although shown on the graphic and in this table as an impact, the work area would be dewatered during construction but would be allowed to refill this area following construction; therefore, this impact is an artifact of mapping and is described as such in the text below.

Coastal Sage Scrub

A total of 0.61 acre of mixed coastal sage scrub would be impacted by all elements of the Project. The majority of this impact is located within the additional inundation area (0.58 acre) at the Debris Dam; this impact would not remove vegetation but may infrequently inundate the habitat in the event of a very large storm. As this vegetation type is on the outer edge of the inundation footprint, it would be expected to be inundated for the least amount of time (i.e., a few days). In addition to the inundation area impacts, 0.03 acre of mixed coastal sage scrub is within the Wilderness Park Culvert Crossing Work Area (0.01 acre permanent structural, 0.02 acre temporary access). Ranked G4 S4, this vegetation type is considered apparently secure. The minimal loss of this vegetation type (0.3 percent of coastal sage scrub vegetation types in the study area) would be considered less than significant in relation to the total amount of these vegetation types available in the study area and in the Project region. In Southern California, the forests collectively (i.e., Angeles, Cleveland, Los Padres, and San Bernardino National Forests) support more than 550,000 acres of coastal sage scrub (USFS 2005a). Impacts on mixed coastal sage scrub would be considered less than significant and no mitigation would be required.

Chaparral

A total of 0.15 acre of southern mixed chaparral/mixed coastal sage scrub and 0.01 acre of disturbed southern mixed chaparral/mixed coastal sage scrub is within the Project Work Areas. A total of 0.13 acre would be within the Dam Work Area (0.01 acre permanent, 0.12 acre temporary access) and 0.03 acre would be disturbed for temporary access in the Headworks/Wilderness Park Culvert Crossing Work Area. The minimal loss of this vegetation type (less than 0.01 percent of chaparral vegetation types in the study area) would be considered less than significant in relation to the total amount of these vegetation types available in the study area and in the Project region. In Southern California, the forests collectively (i.e., Angeles, Cleveland, Los Padres, and San Bernardino National Forests) support more than 830,000 acres of chaparral (USFS 2005a). Impacts on southern mixed chaparral/mixed coastal sage scrub would be considered less than significant and no mitigation would be required.

Riparian/Open Water

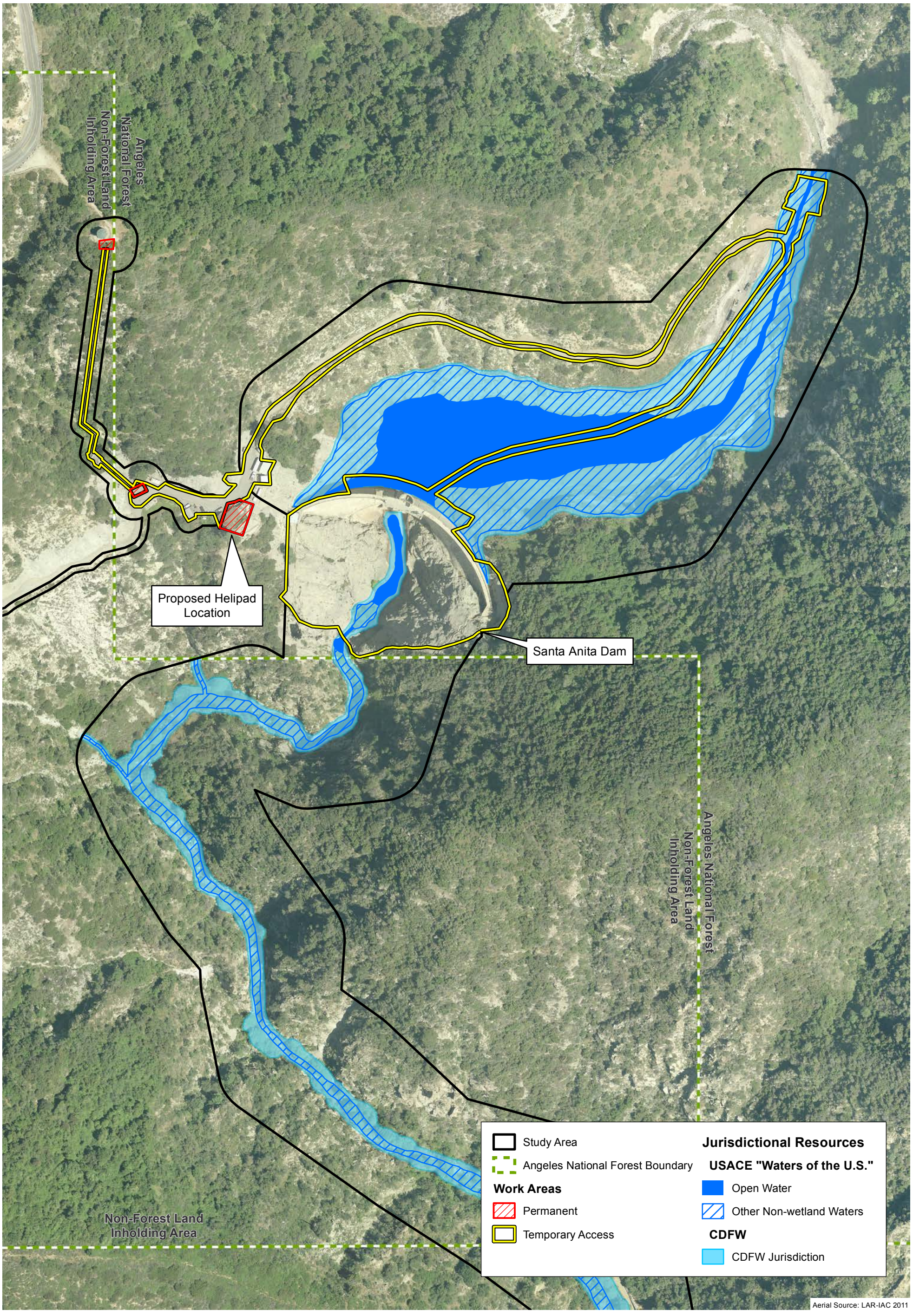
A total of 2.39 acres of riparian vegetation types would be impacted by all elements of the Project. The majority of this impact is located within the additional inundation area (1.86 acres comprised of 0.08 acre of southern cottonwood willow riparian forest and 1.78 acre of mule fat scrub) at the Debris Dam; this impact would not remove vegetation but may inundate the habitat in the event of a large storm. This vegetation type is located in the center of the inundation footprint and would be expected to be inundated the longest (i.e., a few weeks) during inundation events. However, riparian vegetation is adapted to periodic flooding and is expected to be able to withstand flooding events. Additionally, much of the riparian vegetation is within the basin and may be cleared periodically under existing permits for flood maintenance. In addition to the inundation area impacts, a total of 0.53 acre of southern cottonwood willow riparian forest and sycamore alluvial woodland/southern riparian forest is within the Project Work Areas. A total of 0.40 acre of southern cottonwood willow riparian forest would be disturbed: 0.20 acre for construction of the Wilderness Park Culvert Crossing (0.06 acre permanent structural, 0.14 acre temporary access); and 0.20 acre would be disturbed for temporary access in the Debris Dam Work Area. A total of 0.13 acre of sycamore alluvial woodland/southern riparian forest would be disturbed for construction of the Wilderness Park Culvert Crossing (0.10 acre permanent structural, 0.03 acre temporary access). Southern cottonwood willow riparian forest is a G4 S3 special status vegetation type and sycamore alluvial woodland/southern riparian woodland is a G3 S3 special status vegetation type; both are considered vulnerable by the State. These resources are also within the jurisdiction of the USACE, CDFW, and RWQCB. The loss of 0.53 acre (0.16 acre

permanent structural, 0.37 acre temporary access) is considered significant. Implementation of MM-1 would reduce this impact to less than significant.

A total of 0.89 acre of open water would be within Project Work Areas. A total of 0.76 acre is within the Dam Work Area. It should be noted that the amount of open water varies substantially based on the rainfall of the year, the season (winter versus summer), and the amount of water being released from the Reservoir. During construction of the Project, it is anticipated that the Reservoir will have been previously drained and there would likely be no water released from the Reservoir; therefore, during construction the amount of open water impacted downstream of the Dam would likely be substantially less than mapped for the Project in April 2012. Although 0.76 acre is shown in the Dam Work Area, this area would be expected to be dry during construction and would be allowed to refill with water following Project construction. A total of 0.04 acre of open water would be permanently impacted by construction of the new structures at the Headworks facility; a portion of this open water would be affected by the placement of riprap on the slope north of the structure. Additionally, 0.09 acre would be temporarily disturbed within the work area for the Headworks. Open water would be dewatered from the Headworks Work Area during construction; open water would be allowed to refill (over the riprap) following Project construction. Though some of the areas would be affected by bank protection, open water would occur over the riprap/gunite and therefore, the impact is partially an artifact of mapping.

Jurisdictional Resources

Within riparian areas, the Project would impact a total of 3.392 acres of “Waters of the U.S.” under the jurisdiction of the USACE and the RWQCB, including 0.576 acre of open water and 2.816 acres of non-wetland Waters of the U.S. (Exhibits 8A–8C, Table 10). The Project would impact a total of 3.708 acres of waters under the jurisdiction of the CDFW. Jurisdictional resources are protected by Sections 401 and 404 of the CWA and by the *California Fish and Game Code* (Sections 1600 through 1616). Impacts on jurisdictional resources could be significant and would require permitting with each of the resource agencies. Implementation of MM 1 would reduce this impact to less than significant.



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Project Work Areas – Jurisdictional Resources – Dam

Exhibit 8A

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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Project Work Areas – Jurisdictional Resources – Dam (Access Road)

Exhibit 8B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

150 75 0 150 Feet

BonTerra PSOMAS

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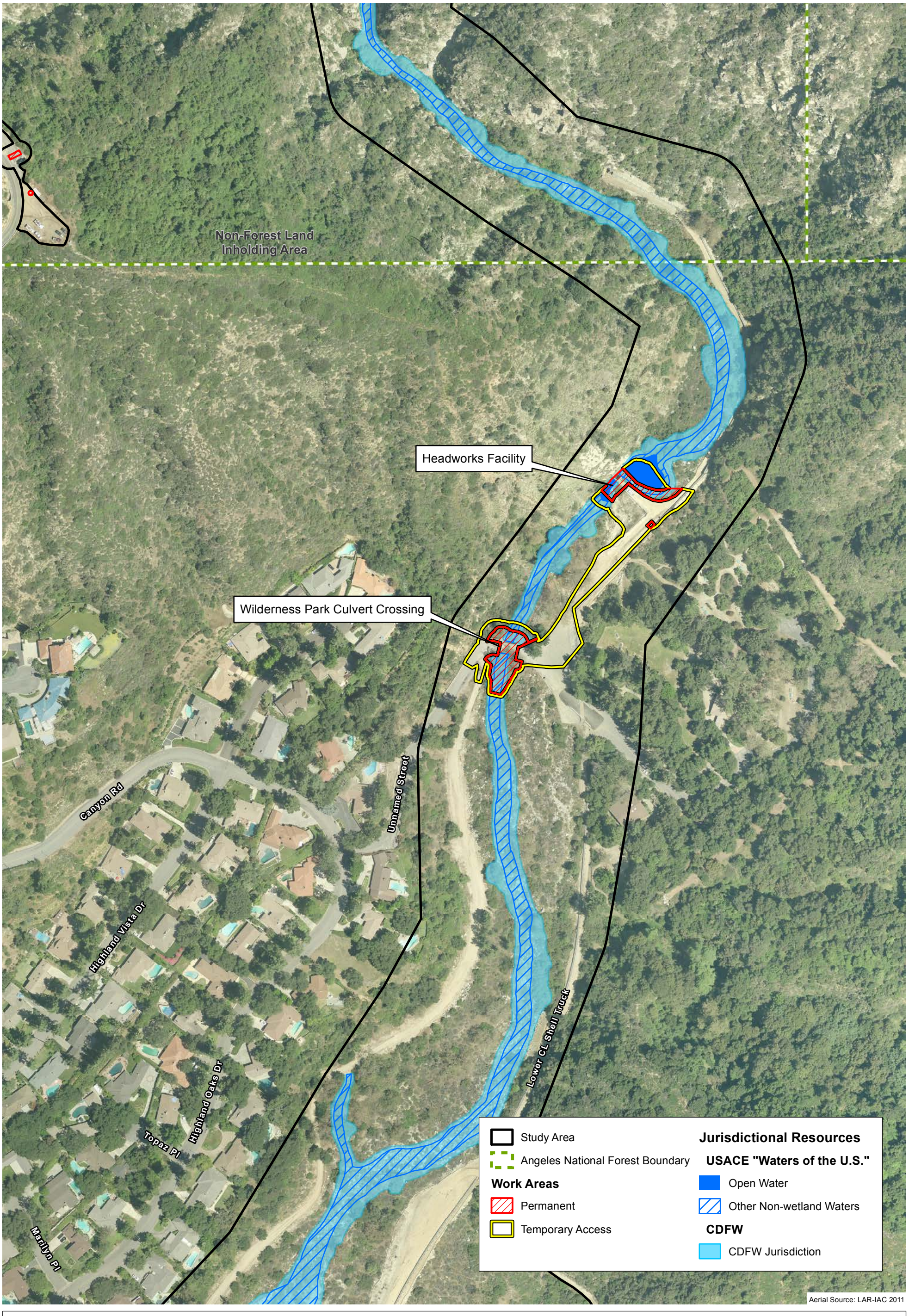

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Project Work Areas – Jurisdictional Resources – Headworks and Wilderness Park Culvert Crossing Exhibit 8C

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

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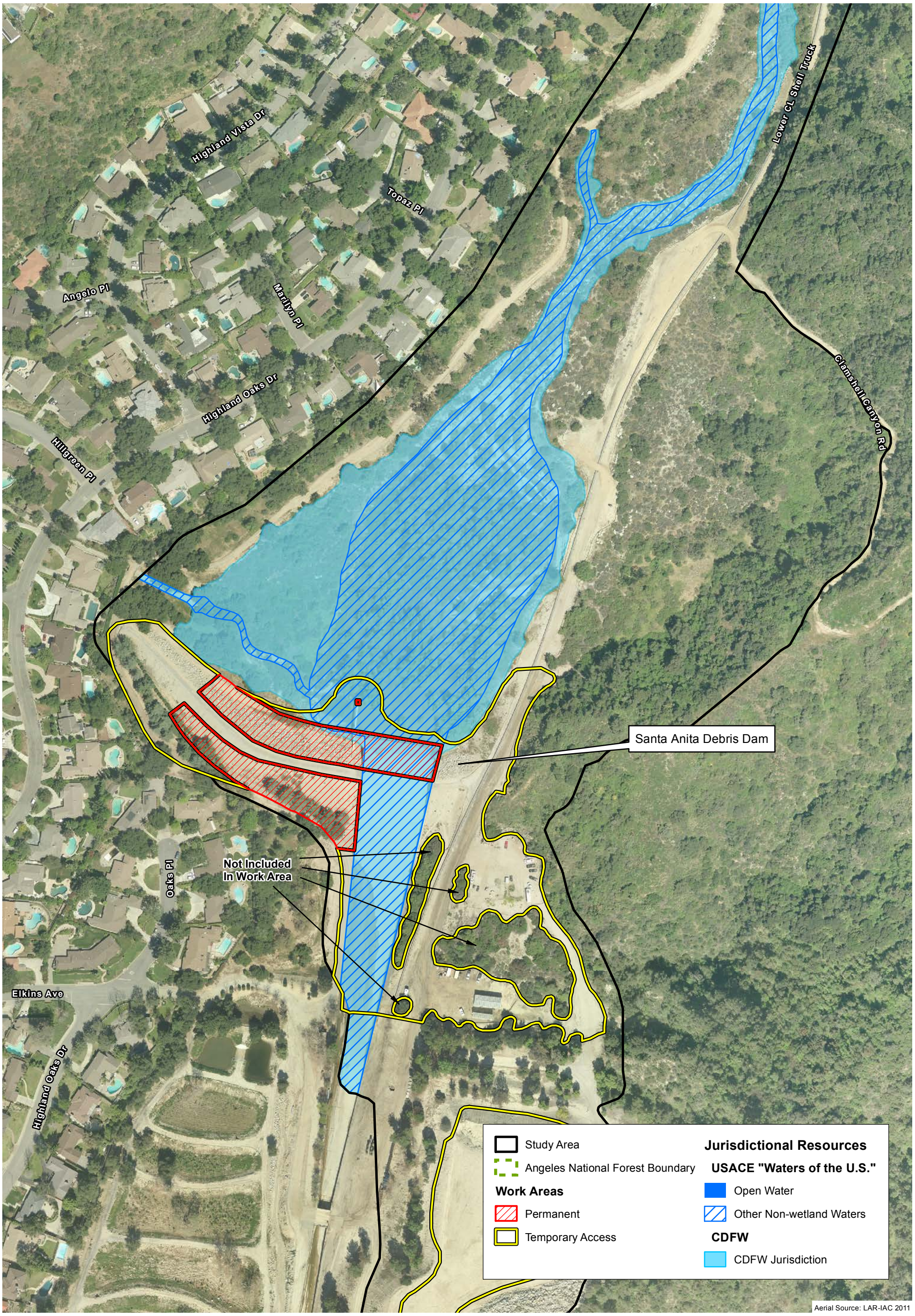

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Project Work Areas – Jurisdictional Resources – Debris Dam

Exhibit 8D

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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Project Work Areas – Jurisdictional Resources – Debris Dam (Sediment Placement Site) Exhibit 8E

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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TABLE 10
SUMMARY OF JURISDICTIONAL RESOURCES IN PROJECT WORK AREAS

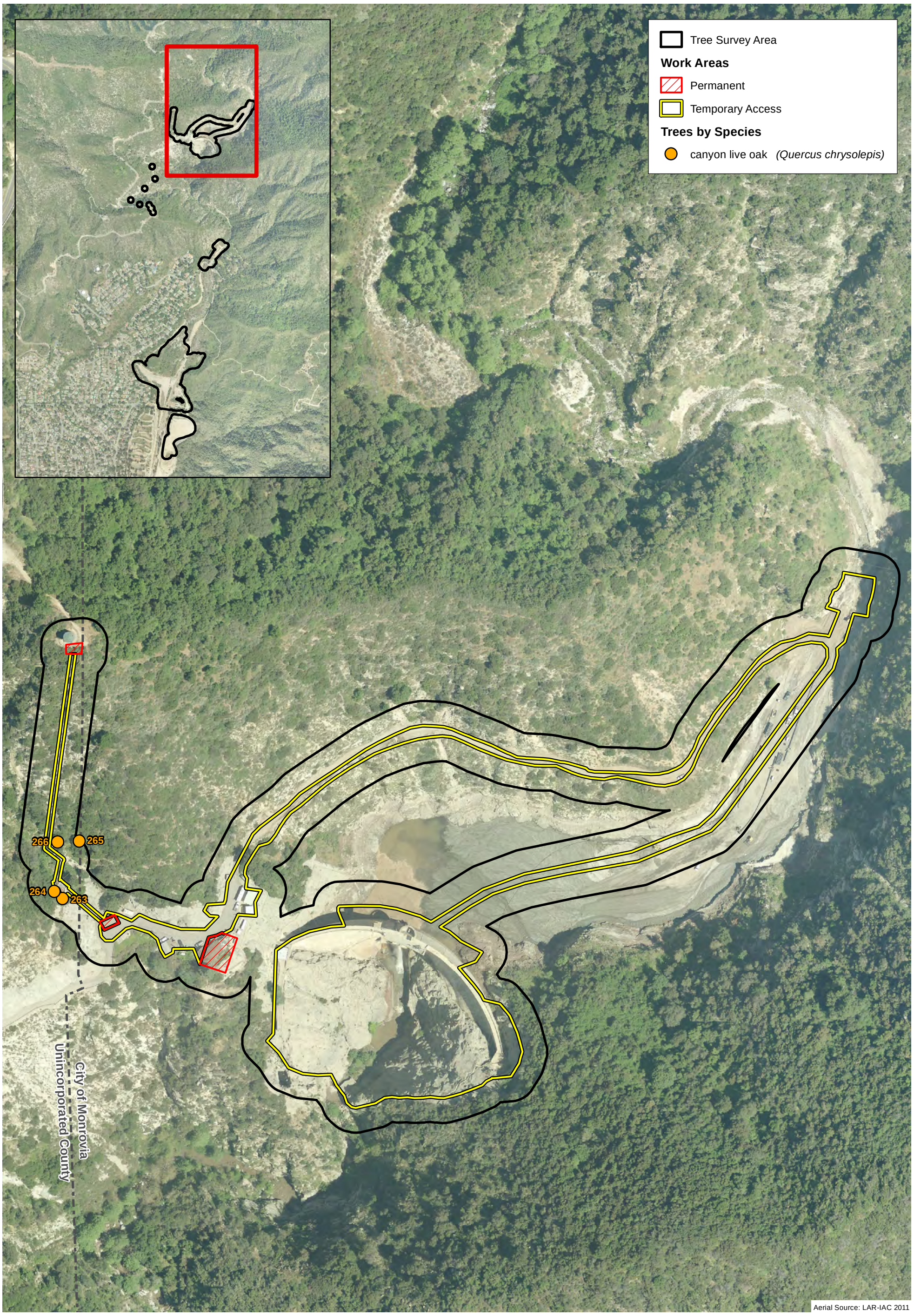
Jurisdictional Resources	Existing (acres)	Dam		Headworks[a]		Debris Dam		Total Permanent Structure	Total Temporary Access	Total (acres)
		Permanent Structure (acres)	Temporary Access (acres)	Permanent Structure Headworks (acres)	Temporary Access (acres)	Permanent Structure (acres)	Temporary Access (acres)			
Total USACE Jurisdiction	19.421	0.000	0.958	0.100	0.113	0.324	1.897	0.424	2.968	3.392
Open Water	3.003	0.000	0.482	0.011	0.083	0.000	0.000	0.011	0.565	0.576
Other Non-wetland "Waters of the U.S."	16.418	0.000	0.476	0.089	0.030	0.324	1.897	0.413	2.403	2.816
Total RWQCB Jurisdiction	19.421	0.000	0.958	0.100	0.113	0.324	1.897	0.424	3.533	3.392
Total CDFW Jurisdiction	26.985	0.000	1.125	0.172	0.138	0.353	1.920	0.525	3.183	3.708

[a] The Headworks column includes impacts for construction of both the Headworks facility and the Wilderness Park Culvert Crossing. As these facilities are close together, they share a temporary access footprint.

Oak Woodland

A total of 0.25 acre of oak woodland vegetation types would be impacted by all elements of the Project. The majority of this impact is located within the additional inundation area (0.17 acre) at the Debris Dam, which is discussed below. A total of 0.08 acre of coast live oak woodland is within the Project Work Areas. A total of 0.07 acre (0.04 permanent structural, 0.03 temporary access) of coast live oak woodland would be disturbed to construct the Debris Dam, and 0.01 acre of oak woodland/southern mixed chaparral would be disturbed for temporary access to construct the Wilderness Park Culvert Crossing. It should be noted that the impacts resulting from temporary access (0.04 acre) is largely an artifact of mapping. Where oak branches extend over existing access roads, the vegetation was mapped as the canopy layer. Within the temporary access footprint, construction vehicles would drive along the existing access roads under the oak branches; no trees would be removed. However, branches may need to be trimmed for construction access; therefore, to provide for a conservative analysis, these areas were considered potentially impacted. Ranked G5 S4, oak woodlands are considered apparently secure. The minimal loss of coast live oak woodland vegetation types (0.04 acre of direct oak removal; 0.01 percent of all oak woodland vegetation types in the study area) would be considered less than significant in relation to the total amount of these vegetation types available in the study area and in the Project region. In Southern California, the forests collectively (i.e., Angeles, Cleveland, Los Padres, and San Bernardino National Forests) support more than 489,000 acres of Foothill Woodland, which includes coast live oak, blue oak woodland, Engelmann oak woodland, valley oak woodland, California walnut woodland, and Alvord oak woodland (USFS 2005a). Impacts on coast live oak woodland would be considered less than significant and mitigation would not be required for the loss of the vegetation community. However, the City of Arcadia, City of Monrovia, and County of Los Angeles have oak tree ordinances and require mitigation for removal of oak trees; LACFCD typically requires mitigation consistent with local City or County ordinances. Additionally, CDFW requires replacement of trees within their jurisdiction. Of the 162 trees documented within the tree survey area, a total of four trees are located within Project Work Areas; all are within the footprint for the Wilderness Park Culvert Crossing (Exhibits 9A–E). Three of the trees are western sycamores (Tree Numbers 220-222) and one is a coast live oak tree (Tree Number 219); all are located within CDFW jurisdiction and the oak tree is also located with the jurisdiction of the City of Arcadia. Two sycamore trees (Trees Numbers 220 and 221) located downstream of the culvert crossing would be removed in order to construct the Project. One sycamore tree (Tree Number 222) is located at the edge of the permanent impact area and would likely not need to be removed; however, to provide for a conservative analysis, this tree is considered impacted. The oak tree (Tree Number 219) is also located on the permanent impact boundary; however, this tree would not need to be removed. Grading for the culvert crossing would remain outside of the edge of the oak tree's canopy wherever possible. Construction activities occurring directly adjacent to the oak tree, and the sycamore tree (Tree Number 222) if it is able to be preserved, could harm the trees' root systems and may affect the health of the trees. Oaks and other native trees are located near Project Work Areas and could also be inadvertently affected by construction activities (e.g., stockpiling soil or other construction materials). MM2 would be required to mitigate for impacts on individual trees that would be directly removed and to protect trees adjacent to Project Work Areas.

The additional inundation area would affect 0.17 acre of oak woodland; within this area, vegetation would not be removed, but the habitat may be infrequently inundated in the event of a very large storm. As this vegetation type is toward the outer edge of the inundation footprint, it would be expected to be inundated for a lesser amount of time (i.e., a few days). A total of 21 trees are within the additional inundation footprint (Exhibits 9A–E). This includes 10 coast live oak (Tree Numbers 126, 142-145, 147, 148, 150, 151, and 197), 1 Engelmann oak tree (Tree Number 149), 5 western sycamore trees (Tree Numbers 165, 177, 178, 181-184, 272) and two Goodding's black willow (Tree Number 179, 180). These trees are expected to be inundated infrequently and for



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Project Work Areas – Tree Locations – Dam

Exhibit 9A

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

180 90 0 180 Feet

BonTerra PSOMAS

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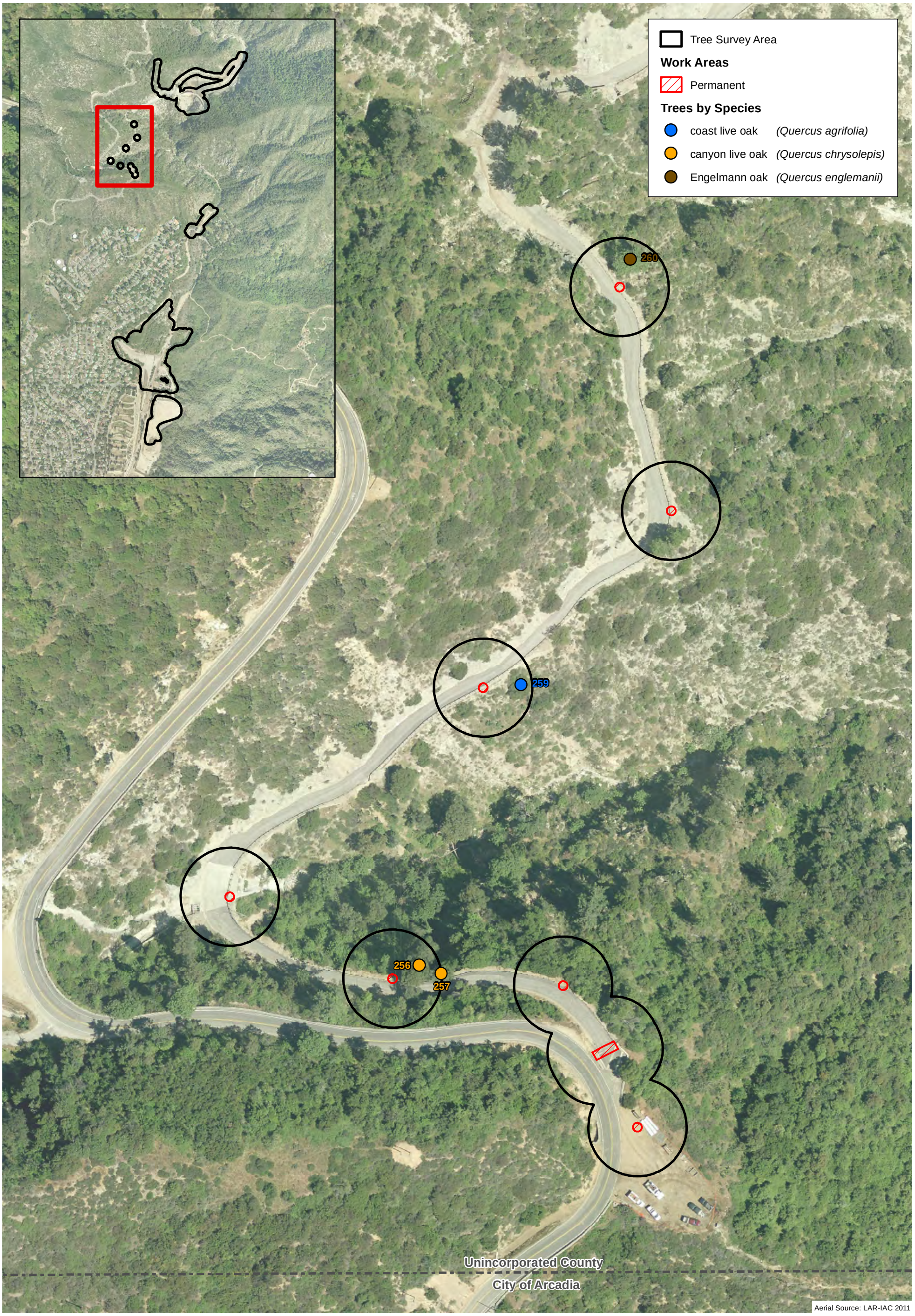

Project Work Areas – Tree Locations – Dam (Access Road)

Exhibit 9B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

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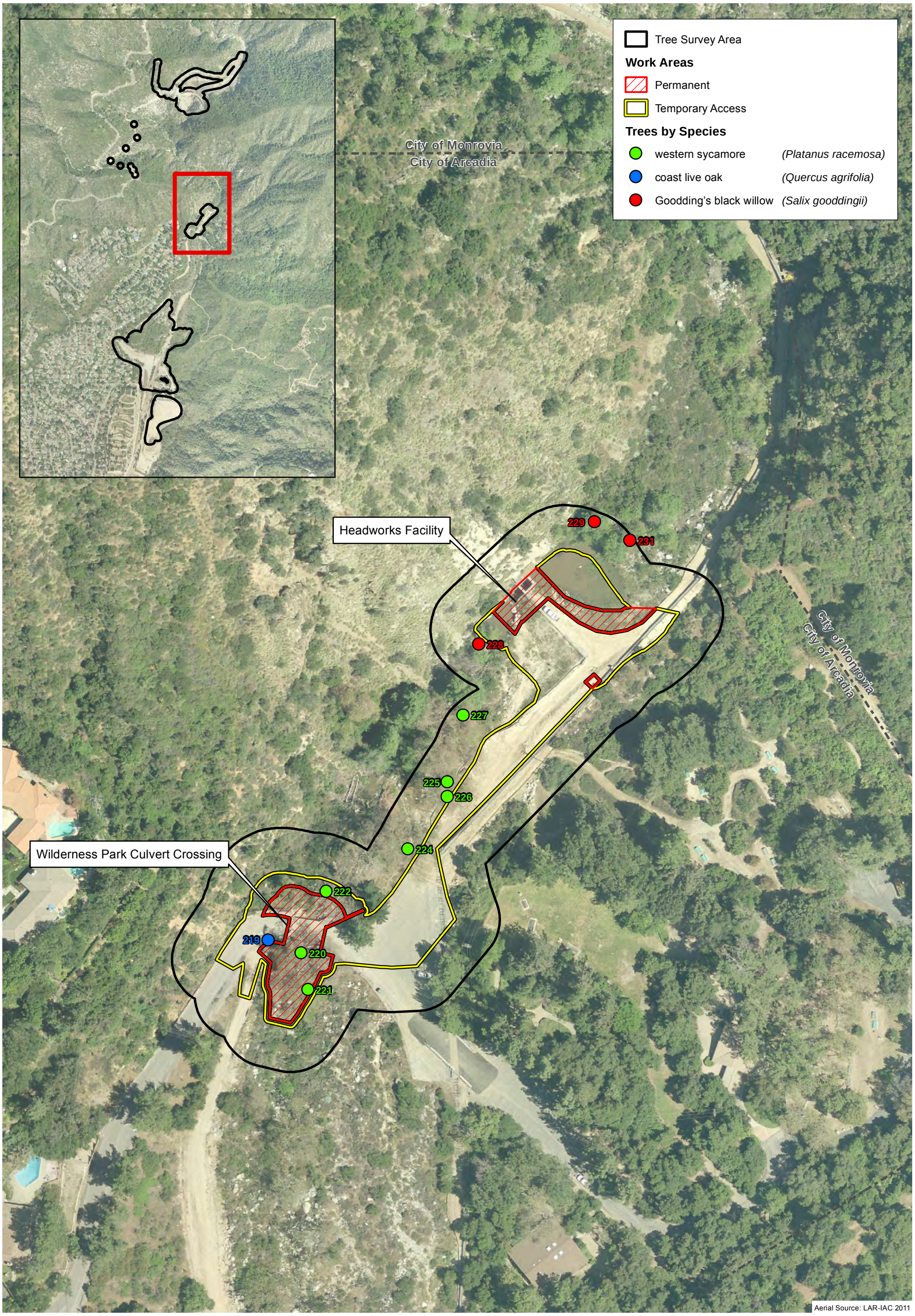

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Project Work Areas – Tree Locations – Headworks and Wilderness Park Culvert Crossing

Exhibit 9C

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

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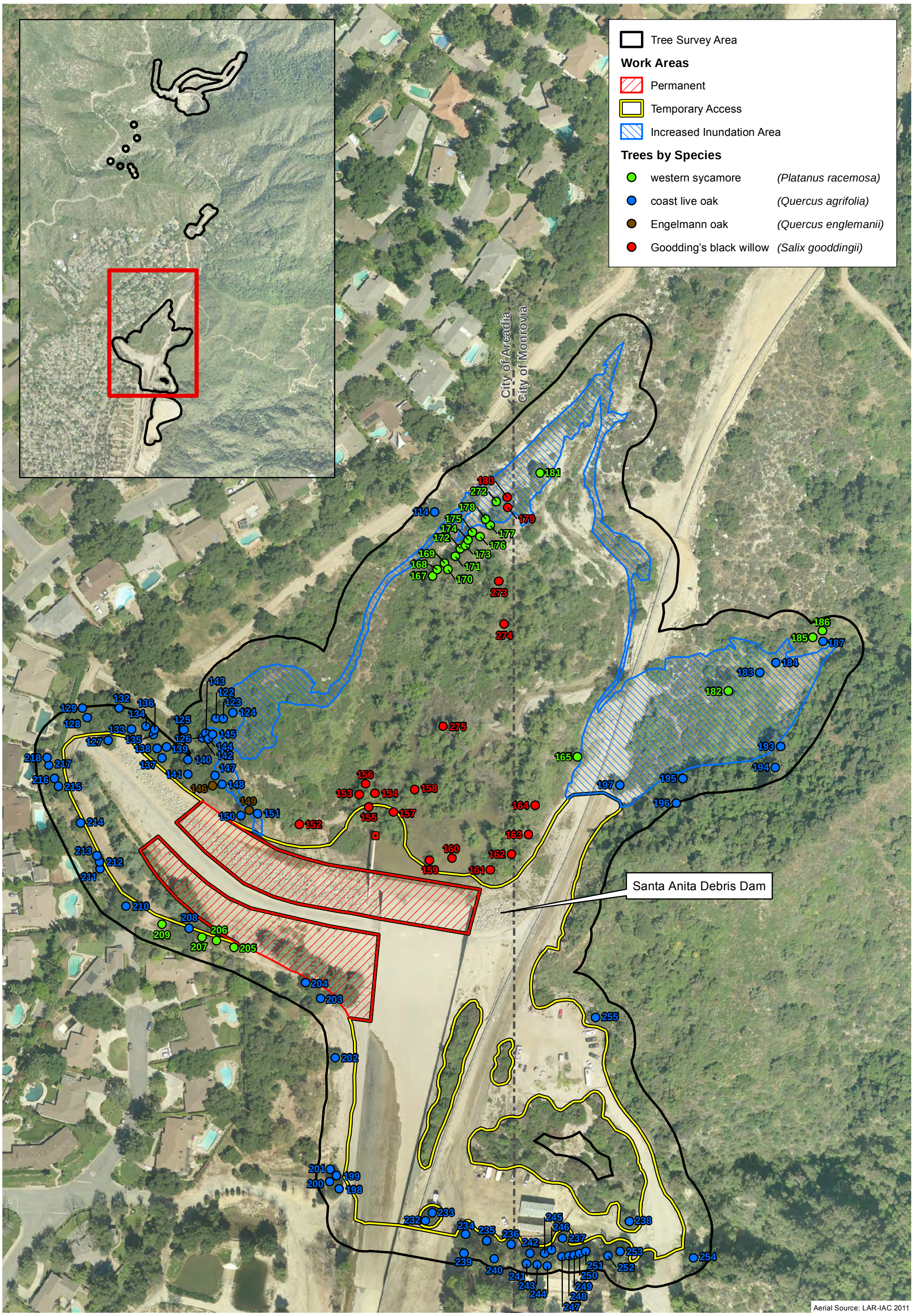

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Project Work Areas – Tree Locations – Debris Dam

Exhibit 9D

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

160 80 0 160 Feet

BonTerra PSOMAS

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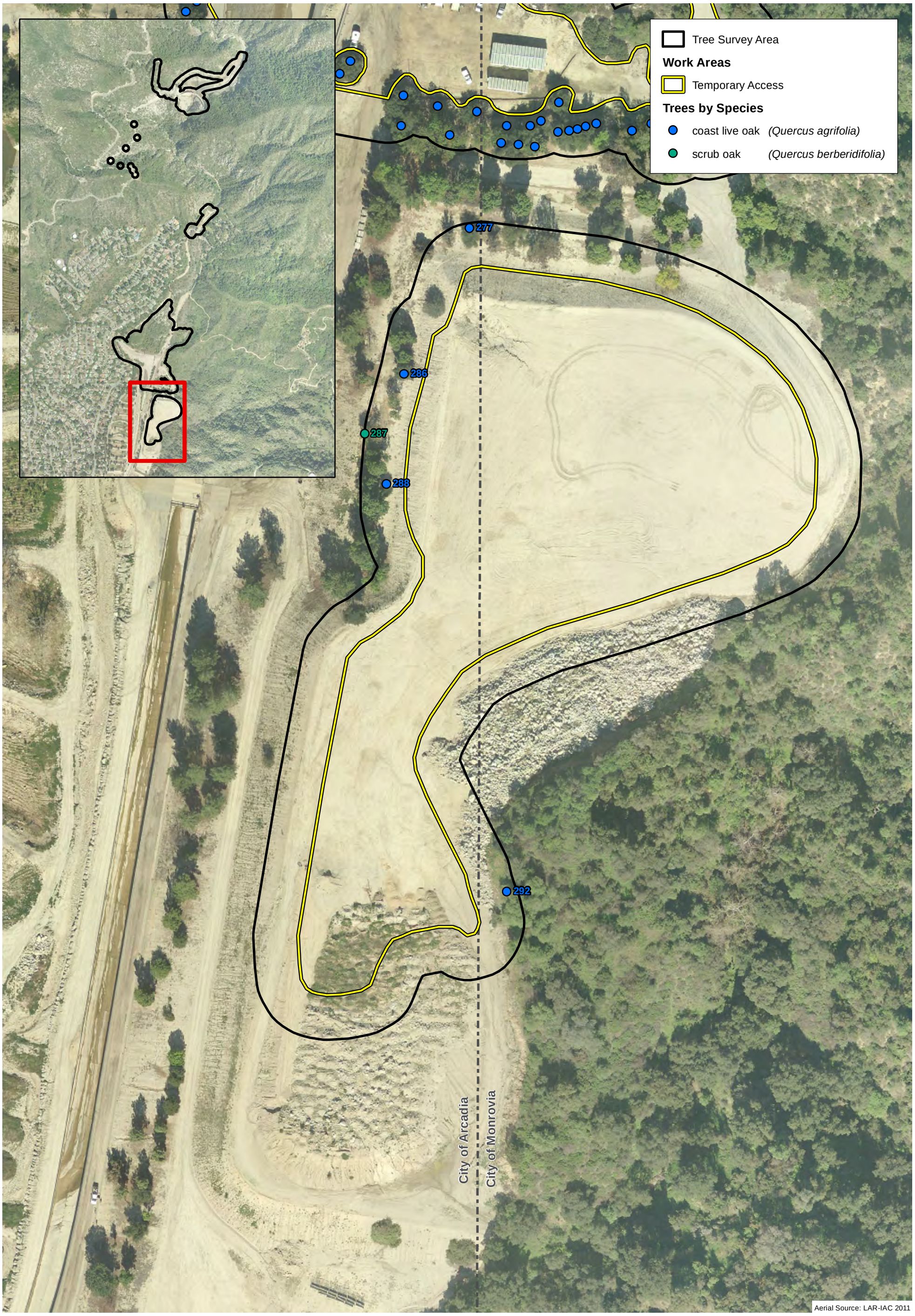

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Project Work Areas – Tree Locations – Debris Dam (Sediment Placement Site)

Exhibit 9E

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

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short durations; therefore, no long-term impact on them is expected. However, if natural rainfall events and/or management of the flood control facilities cause the trees to be inundated more frequently than expected or for longer durations, these trees could decline in health and may die over time. This impact would be considered potentially significant. Implementation of MM2 would reduce this impact to less than significant.

Ornamental

A total of 0.75 acre of ornamental areas would be within Project Work Areas. A total of 0.02 acre would be disturbed for temporary access within the Dam Work Area. A total of 0.04 acre would be disturbed within the Headworks Work Area (0.01 permanent structural; 0.03 acre temporary access). A total of 0.69 acre (0.31 permanent structural, 0.38 acre temporary access) of ornamental vegetation is would be disturbed for construction of the Debris Dam. The removal of 0.75 acre of ornamental vegetation is considered a beneficial impact of the Project, especially the removal of 0.01 acre of invasive fountain grass at the Headworks because it would remove a small portion of the seed source of non-native invasive species that could invade native habitat types in the study area.

Ruderal/Disturbed

A total of 11.15 acres of ruderal and disturbed vegetation types would be impacted by all elements of the Project. A total of 0.99 acre (0.02 acre permanent structural, 0.97 acre temporary access) would be disturbed in the Dam Work Area; 0.16 acre (0.03 acre permanent structural, 0.13 acre for temporary access) would be disturbed in the Headworks Work Area; and 9.51 acres (0.81 permanent structural, 8.70 acres temporary access) would be within the Debris Dam Work Area and Sediment Placement Site. In addition, 0.49 acre of disturbed areas would be within the additional inundation area. Disturbed areas are existing dirt access roads or unvegetated areas that consist of compacted soils previous disturbance has occurred; ruderal areas consists of weedy vegetation. These areas are of limited biological value. Therefore, impacts on ruderal and disturbed areas would be considered less than significant.

Developed

A total of 6.82 acres of developed areas would be with Project Work Areas. A total of 3.33 acres (0.11 acre permanent structural, 3.22 acres temporary access) of developed areas would be disturbed within the Dam Work Area, consisting primarily of existing paved roads or gunite. A total of 0.53 acre (0.04 acre permanent structural, 0.49 acre temporary access) of developed areas within the Headworks Work Area, consisting of existing paved roads and structures, would be impacted. A total of 2.96 acres (0.73 permanent structural, 2.23 acres temporary access) of developed areas within the Debris Dam Work Area, consisting of the existing spillway and existing paved access roads. In most cases, existing paved access roads would be used by construction but otherwise not disturbed. Developed areas lack vegetation and are of extremely limited biological value; therefore, impacts on developed areas would not be considered an impact on biological resources.

4.3.2 Wildlife

To assess impacts on wildlife, the total impact on particular vegetation types that provide habitat for wildlife was assessed. The following discussion of wildlife impacts focuses on the common species occurring in the study area that may be affected by the Project.

General Habitat and Wildlife Loss

Native vegetation provides valuable nesting, foraging, roosting, and denning opportunities for a variety of wildlife species. The Project would result in the loss of approximately 0.80 acre of native habitat that includes the permanent loss of 0.01 acre and the temporary loss of 0.12 acre for access to the Dam; a permanent loss of 0.17 acre and a temporary loss of 0.23 acre for the Headworks and Wilderness Park Culvert Crossing; and a permanent loss of 0.04 acre and temporary loss of 0.23 acre for the Debris Dam. The minimal loss of native vegetation type (less than 0.01 percent of native vegetation types in the study area) would be considered less than significant in relation to the total amount of these vegetation types available in the study area and in the Project region. Therefore, the loss of wildlife habitat would be considered less than significant. The Project would also impact 0.75 acre of ornamental vegetation (0.02 acre within the Dam Work Area; 0.04 acre within the Headworks Work Area, and 0.69 acre within the Debris Dam Work Area) and a total of 11.15 acres of ruderal and disturbed areas that primarily consist of existing dirt access roads. These areas are of limited value to wildlife; therefore, their loss would be considered less than significant. Most wildlife species that are now using the Project Work Areas would be expected to move into adjacent areas of open space, which would consequently increase competition for available resources in adjacent areas. This situation could result in the loss of individuals that cannot successfully compete. Additionally, construction may result in the limited loss of small mammals, reptiles, amphibians, and other slow-moving wildlife that live in the Project Work Areas if they cannot move out of the area quickly enough. However, because the disturbance of native habitat in each Work Area is limited, the Project would not be expected to affect many individuals. Therefore, the loss of wildlife would be considered less than significant.

Several common bird and raptor species may nest in the Project Work Areas (including on developed structures). The MBTA protects migratory birds, their nests, and eggs. If construction is initiated during the peak bird nesting season (i.e., March 15 to September 15), it could impact nesting birds protected by the MBTA. Additionally, Sections 3503, 3503.5, and 3513 of the *California Fish and Game Code* protect active raptor nests. If construction is initiated during the peak raptor nesting season (i.e., February 1 to June 30), it could impact nesting raptors protected by the *California Fish and Game Code.* The loss of any active bird or raptor nest would be considered a potentially significant impact. Implementation of MM 3 would reduce this impact to a less than significant level.

Wildlife Movement

The Project Work Area currently consists of existing LACFCD facilities surrounded by open space. Construction at the Dam would be on the existing dam structure, adjacent developed areas, and adjacent gunite slopes; these changes are not expected to change wildlife movement patterns at the Dam.

Construction at the Headworks facility would replace an existing structure with a slightly larger structure and would modify the existing access road, reinforcing the slope with riprap; it would not reconfigure the road/facility substantially. Therefore, the Headworks facility would not be expected to change wildlife movement patterns at the Headworks facility. The Wilderness Park Culvert Crossing would replace the existing structure and culverts, resulting in a culvert crossing of the creek. Riprap would be placed along the bottom of the creek, both upstream and downstream of the culvert crossing structure. The Wilderness Park Culvert Crossing is typically inundated with water; therefore, the species moving through the culverts are expected to be small aquatic species (e.g., fish, and amphibians), which would continue to be able to use the streambed beneath the proposed Wilderness Park Culvert Crossing following Project construction. Medium and large-sized mammals would be expected to cross either over or under the culvert crossing/access road; since the Project would not be expected to affect the low traffic volumes

into the Wilderness Park, no change to wildlife movement is expected at the Wilderness Park Culvert Crossing. If a temporary bypass crossing is constructed to allow passage to the Wilderness Park, it would not be expected to disrupt wildlife movement; wildlife would be expected to be able to move through or around the structure during construction.

Project improvements at the Debris Dam would slightly expand the footprint of the existing Debris Dam structure to the southeast to accommodate the new spillway; however, the existing concrete spillway would be demolished and filled with dirt creating a disturbed area that matches the rest of the area downstream of the existing Debris Dam. These modifications are not expected to change wildlife movement at the Debris Dam. The improvements at the Debris Dam would allow the basin to be inundated more frequently than it currently is inundated. With inundation of the Debris Dam basin, some terrestrial wildlife would have to circumnavigate the basin rather than crossing the basin bottom; this would not be substantively different than the existing conditions. Wildlife that fly or swim could continue to move freely in the basin even if it was inundated. While this effect would be adverse for some terrestrial wildlife, the basin edges would continue to be available for movement; thus, wildlife movement would not be substantially disrupted and less than significant impacts are anticipated.

Construction activities would create dust and noise within and adjacent to the impact area. During active construction, wildlife movement may be deterred by noise and human activity; however, most wildlife movement would occur at night while construction activities would occur during the day. In addition, construction activities would also be temporary in nature. Therefore, construction impacts on local wildlife movement would be considered adverse, but less than significant and no mitigation would be required.

4.3.3 Special Status Biological Resource Impacts

Implementation of the Project would result in impacts on special status plant and wildlife species that occur in Project Work Areas. Potential impacts on special status species were evaluated by determining the impacts on habitat that the species are expected to occupy or based on the results of focused surveys conducted for the Dam (Attachments C through I).

Special Status Plant Species

Focused surveys for special status plant species were conducted in spring/summer 2012. Of the 96 special status plant species listed in Table 6, 94 of these either have no potential to occur due to lack of suitable habitat or were determined to be absent because they were not observed during focused surveys for special status plant species (Attachment C). Therefore, there would be no impact on those species. Two special status plant species were observed during the surveys: Engelmann oak and Coulter's matilija poppy (*Romneya coulteri*). None of the Engelmann oaks or Coulter's matilija poppies are located in Project Work Areas; therefore, there would be no impact on these species. One Engelmann oak (Tree Number 149) is located within the additional inundation area within the basin of the Debris Dam; MM2 would ensure that there are no long-term impacts resulting from increased inundation of this tree.

Wildlife

Fish

Arroyo chub, Santa Ana speckled dace, and Santa Ana sucker were not observed in the study area (Attachment D). Therefore, there would be no impact on these species.

Amphibians

Coast Range newt was not observed during focused surveys in the study area. Therefore, there would be no impact on this species.

Reptiles

A turtle, not positively identified but consistent with a Pacific pond turtle, was observed in Santa Anita Reservoir during focused trapping surveys in 2011 (BonTerra Consulting 2011). Santa Anita Reservoir would be dewatered during work on the Dam, which would make this habitat unavailable to Pacific pond turtle during construction in the Dam Work Area. If the area upstream of the Headworks is ponded at the time of construction, this area would also be dewatered. Dewatering of the Reservoir and the pond upstream of the Headworks may affect this species and the impact would be considered potentially significant because this species meets the criteria to be considered under Section 15380 of CEQA. Implementation of MM 4 would reduce this impact to a less than significant level.

Coast horned lizard, coastal western whiptail, [San Bernardino] ringneck snake, San Bernardino mountain kingsnake, northern three-lined boa [coastal rosy boa] (*Lichanura orcutti* [*Charina trivirgata roseofusca*]), and coast patch-nosed snake have potential to occur or were observed in upland habitat types in the study area. The two-striped garter snake was observed along Santa Anita Canyon during surveys. As discussed above (under vegetation impacts), the loss of 0.80 acre of native habitat is limited compared to the amount of habitat available in the study area and Project region (662,983 acres of open space in the Angeles National Forest [USFS 2005a]). Therefore, impacts on these species would not be considered significant and no mitigation would be required. However, biological monitoring during vegetation clearing is recommended to relocate any individuals outside the Project Work Areas (RM 1).

Birds

Southwestern willow flycatcher, least Bell's vireo, and coastal California gnatcatcher are considered to be absent from the study area because they were not observed during focused surveys (Attachments G and H). Therefore, there would be no impact on these species.

Loggerhead shrike may occur in upland vegetation in the study area, and Southern California rufous-crowned sparrow was observed in upland vegetation in the study area. The Project Work Areas would impact approximately 0.19 acre of suitable habitat for these species (0.13 acre at the Dam and 0.06 acre at the Headworks facility). Due to the limited amount of habitat loss relative to the availability of habitat for these species in the study area and the Project region, impacts on loggerhead shrike and Southern California rufous-crowned sparrow would be considered adverse, but less than significant and no mitigation would be required. However, active nests of these species are protected by the MBTA and the loss of an active nest would be considered a significant impact. Implementation of MM 3 would reduce this impact to a less than significant level.

Yellow warbler and yellow-breasted chat were observed in the study area. The Project Work Areas would impact 0.53 acre of suitable habitat for these species (0.33 acre at the Headworks, 0.20 acre at the Debris Dam). Due to the limited amount of habitat loss relative to the availability of habitat for these species in the study area and the Project region, impacts on yellow warbler and yellow-breasted chat would be considered adverse, but less than significant and no mitigation would be required. However, active nests of these species are protected by the MBTA and the loss of an active nest would be considered a significant impact. Implementation of MM 3 would reduce this impact to a less than significant level.

Cooper's hawk, white-tailed kite, merlin, prairie falcon, American peregrine falcon, long-eared owl, and black swift may forage over several habitats in the study area; Cooper's hawk was observed in the study area. Of these species, Cooper's hawk, white-tailed kite, and long-eared owl may nest in trees in the study area while prairie falcon and American peregrine falcon may nest on cliffs in the study area. The Project would result in the loss of approximately 0.80 acre of native habitats and 11.41 acres of ornamental, ruderal, and disturbed areas of potential foraging habitat. The loss of foraging habitat for these species would contribute to the ongoing regional and local loss of foraging habitat. Although impacts on foraging habitat would be considered adverse, they would not be expected to appreciably affect the overall population of these species given the amount of suitable foraging habitat in the study area and Project region. Therefore, impacts on foraging habitat for these species would be considered adverse but less than significant and no mitigation would be required. However, the loss of any active raptor nest would be considered a potentially significant impact. Implementation of MM 3 would reduce this impact to a less than significant level.

Mammals

An acoustical survey was conducted to determine which bats occur within or adjacent to Project Work Areas (Attachment I). Townsend's big-eared bat, hoary bat, fringed myotis, and western mastiff bat were observed in the Dam Work Area; pallid bat was not positively identified but also may be present in the Dam Work Area based on a poor-quality call recorded during the survey. In addition, silver-haired bat, western red bat, pocketed free-tailed bat, and big free-tailed bat have potential to forage in the study area. Construction activities would only occur during daylight hours; therefore, foraging would continue to be available over the construction areas throughout the duration of construction.

Many bat species prefer to forage over water. During construction of each facility, water would be routed around the construction area. Although each Project Work Area would be lower quality foraging habitat during construction, it is expected that water (i.e., preferred foraging habitat) would be available upstream and/or downstream of each Project Work Area during construction. This, combined with the large areas of open space surrounding the Project Work Areas would continue to provide suitable foraging habitat for bats throughout construction. Additionally, following completion of each portion of the Project, open water would again be ponded within each facility. When natural rainfall allows, the modifications to the Debris Dam may increase the amount of open water ponded at the Debris Dam following completion of the project; a beneficial impact for foraging bats at the Debris Dam.

Dewatering of the reservoir would also temporarily reduce the amount of flat water available for these bat species to drink during construction; however, drinking water would continue to be available upstream and downstream of each Project Work Area. Following completion of construction in each Project Work Area, the reservoir/ponded area would be allowed to refill and flat water would be available for bats to drink.

Townsend's big-eared bat typically roosts in caves and is therefore not expected to roost in the Dam or other structures. Additionally, no caves were observed immediately adjacent to Project Work Areas during the roosting bat survey, and the acoustical surveys indicated that the Townsend's big-eared bat observed foraging at the Dam likely roosted some distance from the Project Work Area based on the timing of the first recorded call after dusk. Therefore, the Project is not expected to impact roosting Townsend's big-eared bat.

All of the other bat species listed above have potential to roost in or adjacent to Project Work Areas based on the presence of suitable habitat. Bats may roost in the rocky outcroppings along Santa Anita Canyon, in crevices of structures (e.g., Dam structure, gunite, Headworks facility

building, Debris Dam outlet tower), or in large oak or sycamore trees in the study area (e.g., those at the Wilderness Park Culvert Crossing). Acoustical surveys are initiated before dusk and record sonar calls of bats as they emerge from their roosts; it is assumed that bats that are recorded within the first hour are roosting in or around the recording site while those that first appear over an hour into the recording are assumed to have traveled to the area to forage from a roost site out of the immediate area. Based on the acoustical recordings, fringed myotis and western mastiff bat have a low potential to roost in crevices and structures of the Dam Work Area because they were recorded over an hour into the survey. The hoary bat is not likely to roost in the Dam Work Area because it roosts in trees, although it may roost in other Project Work Areas. No special status bats were recorded at the Headworks or Debris Dam Work Areas during the acoustical surveys; however, suitable habitat is present and they may occur for roosting in the future. The combined loss of 0.57 acre of southern cottonwood willow riparian forest, sycamore alluvial woodland/southern riparian forest, and coast live oak woodland would remove potential roosting habitat for bat species that roost in trees (i.e., silver-haired bat, western red bat, and hoary bat); bat species that roost on cliffs and rocky outcroppings could be affected by repair of gunite adjacent to the Dam and/or construction on structures at the Dam and Headworks (i.e., pallid bat, Townsend's big-eared bat, fringed myotis, western mastiff bat, pocketed free-tailed bat, and big free-tailed bat). Impacts on bats roosting in trees and structures would be considered potentially significant because repair would could directly impact roosting individuals. Implementation of MM 5 would reduce this impact to a less than significant level. The loss of 0.57 acre of habitat for bats that roost in trees, and the temporary loss of crevices in the Dam or other structures where they could roost, would be considered adverse but less than significant because there are plenty of available trees and crevices in the Project vicinity that roosting bats could use as an alternative to roosting in Project Work Areas. Therefore, no mitigation would be required for the loss of roosts.

Southern grasshopper mouse and Los Angeles pocket mouse may occur in sage scrub vegetation types in the study area. The Project would impact 0.03 acre of mixed sage scrub for construction of the Headworks facility; and 0.13 acre of southern mixed chaparral/mixed coastal sage scrub for the Dam and 0.02 acre of southern mixed chaparral/mixed coastal sage scrub for the Headworks. Due to the limited amount of habitat loss relative to the availability of habitat for these species in the study area and the Project region, impacts on southern grasshopper mouse and Los Angeles pocket mouse would be considered adverse, but less than significant and no mitigation would be required.

4.3.4 Significant Ecological Areas, Habitat Conservation Plan/Natural Community Conservation Plan

Significant Ecological Areas (SEAs) were established in 1980 by Los Angeles County based on a 1976 study (England and Nelson 1976) to designate areas with sensitive environmental conditions and/or resources in order to preserve biological diversity. SEA boundaries are general in nature, and broadly outline the biological resources of concern. The study area is not located in an SEA, however it is located approximately 1.8 miles from the Los Angeles County's San Gabriel Canyon SEA #62. This SEA is centered on the mouths of 3 major canyons, San Gabriel, Sawpit, and Santa Anita Canyon above the cities of Azusa, Duarte, Monrovia, Arcadia, and Sierra Madre, which flow from the mountains and the interconnecting terrain in between. In general, the topography of the SEA is severe, consisting of steep-walled canyons and narrow ridgelines. Elevations range from a high of approximately 5,710 feet above msl at Mount Wilson, to a low of approximately 660 feet above msl in San Gabriel Canyon. Several major drainages and numerous tributaries exit the San Gabriel Mountains through this SEA. The wide range of elevation, topography, slope aspect, and geology represent a wide array of physical habitats within this SEA. Consequently, a number of plant communities exist, including grasslands, riparian, shrublands, woodlands, and forests. Within these major community types, there are many sub-communities,

which vary according to plant species dominance. This SEA contains the last remaining relatively well-developed lower montane riparian habitats in the eastern County.

Updates to LA County's SEAs have been drafted and are currently under review. The updated SEA boundaries include the study area within the San Gabriel Canyon SEA (Los Angeles County Regional Planning 2011). However, the new boundaries will not be effective until the SEA boundaries are finalized; until then, the existing SEA boundaries will be in effect.

The study area is not located within a Los Angeles County adopted SEA, a habitat conservation plan (HCP), or natural community conservation plan (NCCP).

4.4 INDIRECT IMPACTS

4.4.1 Noise Impacts

Noise levels in the Project Work Areas would be expected to increase over present levels during construction of the Project. During construction, temporary noise impacts have the potential to disrupt foraging, nesting, roosting, and/or denning activities for wildlife species occurring within or adjacent to Project Work Areas. Wildlife species stressed by noise may disperse from the habitat located in the vicinity of the Project. Because the Project Work Areas are limited in extent, this impact is considered adverse but less than significant and no mitigation would be required. However, if raptor species are nesting in the vicinity of the Project Work Areas during construction, they may be temporarily displaced by construction noise. Indirect noise impacts on these species would be considered significant because nesting birds are protected by the *California Fish and Game Code.* Impacts on active nests would be reduced to a less than significant level with implementation of MM 3.

Each of the Project elements would modify an existing LACFCD facility; no new facilities would be created. Operational noise would be expected to be the same as current levels. Therefore, there would be no impact as a result of operational noise.

4.4.2 Increased Dust and Urban Pollutants

Grading and other construction activities would disturb soils and result in the accumulation of dust on the surface of the leaves of trees, shrubs, and herbs within or immediately adjacent to Project Work Areas. The respiratory function of the plants in these areas could be impaired if dust accumulation is excessive. Because the Project Work Areas are limited in extent, this indirect impact is considered adverse but less than significant. Therefore, no mitigation would be required.

During construction, excess silt, petroleum, or chemicals on the soil surface within the construction could be washed into drainages during storms and may affect areas downstream of the Project Work Areas. Adverse effects on water quality could indirectly impact species that use riparian areas within the watershed by affecting the food web interactions (e.g., abundance of insects or other prey) or through biomagnification (i.e., the buildup of pesticides to toxic levels in higher trophic levels). With implementation of standard Best Management Practices, this impact is expected to be less than significant. Therefore, no mitigation would be required.

No dust or urban pollutants would be expected during operation of the Project. Therefore, there would be no impact and no mitigation would be required.

4.4.3 Invasive Exotic Plant Species

There would be no landscaping associated with the Project. Therefore, there would be no impact as a result of invasive species and no mitigation would be required.

The Project would remove a limited amount of non-native invasive fountain grass for construction of the Headworks facility. This would be considered a beneficial impact of the Project.

4.4.4 Night Lighting

The Project would include upgrades to the lighting; however, these upgrades would reduce the spillover night lighting into the surrounding area. There would be no additional construction lighting associated with the Project. Therefore, there would be a beneficial impact as a result of night lighting and no mitigation would be required.

4.4.5 Human Activity

Each of the Project elements would modify an existing LACFCD facility; no new facilities would be created. Human activity would be expected to be the same as current levels, and may be less since the Project would allow remote operation of the Headworks facility. Therefore, there would be no impact as a result of human activity.

4.4.6 Increased Inundation

The Project would allow the Debris Dam to increase the inundation in the basin in order to capture water following rain events. Inundation behind the Debris Dam is reliant on releases from the Dam and the rainfall of the season, which would remain consistent with the conditions that currently exist in the basin and the time of year that the basin is inundated (winter/ early spring) would not substantially change. The Project would raise the Debris Dam height thereby expanding the water retention capacity of the facility and would allow the inundation area to expand 3.09 acres beyond the existing basin (Exhibit 7D).

Areas in the basin (currently within the existing inundation footprint) would be inundated more frequently and deeper than in the current condition. Additionally, the hillside slopes to the east of the basin would experience an increased inundation area. The vegetation within the existing basin is dominated by willows, which have a high to very high tolerance to inundation when willows shoots (trunks, stems, leaves) are not fully submerged (Glentz et al 2006, Tallent-Halsell and Walker 2002, Francis et al 2005, Good et al 1992). Glentz et al (2006) found that willows can withstand a flooding duration for as much as 40% of the growing season (spring/summer); the study area receives most rainfall outside the growing season in the winter and early spring when willows are dormant. Therefore, the increased inundation capability of the Debris Dam is not expected to affect the riparian vegetation that currently exists in the basin.

Some of the areas adjacent to the existing basin would be newly inundated; however, these fringe areas would be inundated the least often and for the shortest duration (e.g., a few days). Although inundation would not directly remove vegetation from the study area, habitat within the inundation area would be unavailable to most wildlife when flooded. If inundation occurred during the breeding season, it could flood burrows and nests causing them to fail. However, it is anticipated that most inundation events would occur during the storm season (October 1 to April 15), which is outside the breeding season for most animals. Following each inundation event, the habitat would again be available for use with areas along the periphery becoming available most quickly. Although inundation effects would be considered adverse, they would affect a limited amount of habitat (3.10 acres) compared to the amount of habitat available in the study area and Project region. Therefore, inundation effects would be considered less than significant.

5.0 PROJECT DESIGN FEATURE/MITIGATION MEASURES

This section lists Project Design Features (PDFs), Mitigation Measures (MMs), and Recommended Measures (RMs) for the Project. Strategies to mitigate each impact to a less than significant level are identified and described below.

5.1 PDF BIO-1 BIOLOGICAL MONITOR DURING VEGETATION CLEARING

A Biological Monitor shall be on site during vegetation clearing in Project Work Areas (e.g., limits of disturbance). The Biological Monitor shall confirm that the limits of Project Work Areas are clearly marked. The Biological Monitor shall provide environmental awareness training to the Contractor; the training shall include a discussion of native habitat types, special status species that may occur in the Project Work Areas, direction for what to do if a special status species is observed, and an overview of applicable permit conditions. Prior to construction, the Biological Monitor shall conduct a pre-clearing sweep of the Project Work Area and shall flush or move wildlife outside the Project Work Area to the extent practicable.

5.2 MM 1 – RIPARIAN VEGETATION/JURISDICTIONAL AREAS

Prior to initiation of Project activities, the Los Angeles County Flood Control District (LACFCD) shall obtain all necessary permits for impacts to USACE, the RWQCB, and/or the CDFW jurisdictional areas. Mitigation for the loss of jurisdictional resources shall be negotiated with the resource agencies during the regulatory permitting process. Potential mitigation options shall include one or more of the following: (1) payment to a mitigation bank or regional riparian enhancement program (e.g., invasive plant or wildlife species removal); and/or (2) restoration of riparian habitat either on site or off site at a ratio of no less than 1:1, determined through consultation with the above-listed resource agencies. If in-lieu mitigation fees are required, prior to the initiation of any construction related activities, the LACFCD shall pay the in-lieu mitigation fee to a mitigation bank/enhancement program for the in-kind (equivalent vegetation type and acreage) replacement of impacted jurisdictional resources. If a Restoration Program is required, prior to the initiation of any construction-related activities, LACFCD shall prepare and submit a [AH1]Riparian Habitat Mitigation and Monitoring Program (HMMP) for USACE and CDFW approval. If a Riparian HMMP is required, it shall contain the following items:

A. Responsibilities and qualifications of the personnel to implement and supervise the plan. The responsibilities of the Landowner, Specialists, and Maintenance Personnel that would supervise and implement the plan shall be specified.

B. Site selection. The mitigation site shall be determined in coordination with the USACE, CDFW, and RWQCB. The site shall either be located in a dedicated open space area on County land, USFS land, or off-site land shall be purchased.

C. Seed source. Seeds (or plantings) used shall be from local sources (within ten miles of the Project area) to ensure genetic integrity.

D. Site preparation and planting implementation. Site preparation shall include (1) protection of existing native species; (2) trash and weed removal; (3) native species salvage and reuse (i.e., duff); (4) soil treatments (i.e., imprinting, decompacting); (5) temporary irrigation installation; (6) erosion control measures (i.e., rice or willow wattles); (7) seed mix application; and (8) container species planting.

E. Schedule. A schedule shall be developed which includes planting in late fall and early winter, between October 1 and January 30.

F. Maintenance plan/guidelines. The Maintenance Plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement planting.

G. Monitoring plan. The Monitoring Plan shall include (1) qualitative monitoring (i.e., photographs and general observations); (2) quantitative monitoring (i.e., randomly placed transects); (3) performance criteria, as approved by the above-listed resource agencies; (4) monthly reports for the first year and reports quarterly thereafter; and (5) annual reports for five years, which shall be submitted to the resource agencies on an annual basis. The site shall be monitored and maintained for five years to ensure successful establishment of riparian habitat within the restored and created areas.

H. Long-term preservation. Long-term preservation of the site shall also be outlined in the conceptual Mitigation Plan to ensure the mitigation site is not impacted by future development.

5.3 MM 2 – OAK WOODLAND/OAK TREES

A. Replacement shall occur for the western sycamores (Tree Numbers 220-222) that are removed by construction of the Wilderness Park Culvert Crossing. At a minimum, impacted sycamore trees at the Culvert Crossing shall be replaced at no less than a 1:1 ratio, and the minimum box size of replacement trees shall be 24 inches. The replacement trees shall be incorporated into the Riparian Habitat Mitigation and Monitoring Plan (HMMP) or a separate Tree HMMP shall be prepared and shall contain the same required components.

B. The oak tree adjacent to the Wilderness Park Culvert Crossing (Tree Number 219) shall not be removed. This tree shall be protected as described in subsection “C” below. However, the protective fencing for this tree shall be placed at the edge of the canopy to allow for construction to occur immediately outside its canopy. When initial vegetation removal/ground disturbance is occurring within 1.5 times the dripline/root protection zone, the work shall be monitored by a Certified Arborist who shall oversee any removal/cutting of roots necessary and shall determine if trimming of the canopy is necessary to protect the health of the tree. The Certified Arborist shall monitor the health of this tree a minimum of once per month during construction of the Wilderness Park Culvert Crossing and once per month for a period of six-months following completion of construction. Photographs shall be taken monthly to compare the overall vigor of the tree over time. The tree shall be considered “impacted” if its health rating declines two or more rating levels as referenced in the Tree Survey Report (Attachment D). If this occurs, in coordination with CDFW and the City of Arcadia, the tree shall be mitigated at no less than a 1:1 ratio, and the minimum box size of replacement trees shall be 24 inches. If Tree Number 220 is also preserved, protection shall follow the same requirements that are specified herein for Tree Number 219.

C. To protect native trees adjacent to Project Work Areas, the following shall be implemented within each Project Work Area:

1. Brightly-colored construction fencing shall be placed around all native trees to be preserved that are located within 50 feet of Project Work Areas. The fencing shall be placed at 1.5 times the dripline/root protection zone (defined as the outer

canopy edge, at least 15 feet from the trunk). These areas shall be labeled as "Tree Protection Areas" and shall be regarded as Environmentally Sensitive Areas on construction plans. If an existing access road is within the Tree Protection Area, the Tree Protection Area may be adjusted to allow for access along the existing roadway.

2. Stockpiling of materials or vehicle operation shall be prohibited within the Tree Protection Areas. If a Tree Protection Area has been adjusted to allow for an existing access road, no stockpiles or materials shall be allowed within 1.5 times the dripline/root protection zone of the native tree.

3. Limbs of native trees can be pruned if necessary to allow construction equipment access. Small branches (less than three inches diameter) can be trimmed without the supervision of a Certified Arborist if less than ten percent of the total canopy shall be removed. If larger branches need to be removed or if more than ten percent of the total canopy shall be affected, these activities shall be supervised by a Certified Arborist.

4. Changes to the grade or drainage patterns in the areas surrounding a Tree Protection Area shall be avoided so that excess water does not drain to native trees, unless otherwise approved by a Certified Arborist.

5. Any activities (e.g., vehicle operation) occurring within a Tree Protection Area shall be coordinated with a Certified Arborist to ensure that activities would not affect the health of the tree(s). If construction would damage or remove any trees, the Certified Arborist shall contact the appropriate jurisdiction(s) to determine mitigation requirements before the tree is impacted.

6. An on-site pre-construction field meeting shall be held to inform all construction personnel of tree restrictions prior the initiation of work.

D. A subset of 20 of the native trees located within the increased inundation area shall be monitored for health over the course of 5 years following completion of the Debris Dam construction. A Certified Arborist shall monitor these trees annually each spring following the rainy season for a period of 5 years for signs of any negative health effects from flooding (e.g., yellowing leaves, lack of new growth, trunk decay, etc.) using the same health rating scale described to evaluate baseline conditions. Monitoring will distinguish if any changes in health may be from other outside factors. Each monitoring event shall measure and track the dbh of the trees to determine growth patterns, and other trees outside of the future inundation areas shall also be measured to compare growth rates. Photographs shall be taken annually to compare the overall vigor of each tree's crown over time. Monitoring events shall assess whether a tree has been "affected" by determining if a tree's health rating declines two or more rating levels. Any affected trees shall be monitored for a two year period, which may be in addition to the original 5-year monitoring period, to determine if their health condition subsequently improves. If an affected tree shows improvement in the health rating during this two year period, it shall be considered a "recovered" tree and would not require mitigation. If an affected tree's health condition does not improve during this 2-year period, then the tree would be considered "impacted" and would require mitigation. If this occurs, in coordination with CDFW, the tree shall be mitigated at no less than a 1:1 ratio. The replacement trees shall be incorporated into the Riparian HMMP, as set forth in MM 1, or a separate Tree HMMP shall be prepared and shall contain the same required components.

5.4 MM 3 – MIGRATORY BIRD TREATY ACT AND NESTING RAPTORS

The Project shall be conducted in compliance with the conditions set forth in the Migratory Bird Treaty Act (MBTA) and *California Fish and Game Code* with methods approved by USFWS and CDFW to protect active bird/raptor nests. The nature of the Project requires that work would be initiated during the breeding season for nesting birds (March 15–September 15) and nesting raptors (February 1–June 30). LACFCD, in consultation with a qualified biologist, may employ bird exclusionary measures (e.g., mylar flagging) prior to the start of bird breeding season to minimize opportunities for birds to nest within established boundaries of the Project. In order to avoid direct impacts on active nests, a pre-construction survey shall be conducted by a qualified Biologist for nesting birds and/or raptors within 3 days prior to clearing of any vegetation or any work near existing structures (i.e., within 50 feet for nesting birds and within 500 feet for nesting raptors). If the Biologist does not find any active nests within or immediately adjacent to the impact area, the vegetation clearing/construction work shall be allowed to proceed.

If the Biologist finds an active nest within or immediately adjacent to the construction area and determines that the nest may be impacted or breeding activities substantially disrupted, the Biologist shall delineate an appropriate buffer zone (at a minimum of 25 feet) around the nest depending on the sensitivity of the species and the nature of the construction activity. Any nest found during survey efforts shall be mapped on the construction plans. The active nest shall be protected until nesting activity has ended. To protect any nest site, the following restrictions to construction activities shall be required until nests are no longer active, as determined by a qualified Biologist: (1) clearing limits shall be established within a buffer around any occupied nest (the buffer shall be 25–100 feet for nesting birds and 300–500 feet for nesting raptors), unless otherwise determined by a qualified Biologist and (2) access and surveying shall be restricted within the buffer of any occupied nest, unless otherwise determined by a qualified Biologist. Encroachment into the buffer area around a known nest shall only be allowed if the Biologist determines that the proposed activity would not disturb the nest occupants. Construction can proceed when the qualified Biologist has determined that fledglings have left the nest or the nest has failed.

5.5 MM 4 – PACIFIC POND TURTLE TRAPPING

At least seven days prior to the initiation of dewatering/construction at the Dam and Headworks (and Debris Dam if ponded water is present at the time of construction), a five-day/four-night pre-construction trapping for the Pacific pond turtle shall be conducted by a qualified Biologist. Concurrently with the trapping effort, the Biologist shall also visually search for and capture two-striped garter snakes and any other special status species in the Project Work Areas. If any Pacific pond turtles, two-striped garter snakes, or other special status species are captured, they shall be relocated to a suitable site along Santa Anita Wash outside of the construction area. Prior to relocating any of these species, the USFS and the CDFW shall approve the potential relocation site(s) and methods for transferring the turtles/snakes to the relocation sites. Any non-native animal species encountered during pre-construction surveys shall be permanently removed from the reservoir.

Additionally, a qualified Biologist shall be present during the latter stages of dewatering to ensure that no Pacific pond turtles, two-striped garter snakes, or other special status species are stranded. If any of these species are observed during monitoring, they shall be captured by a qualified Biologist (i.e., one with the necessary approvals to handle these species) and released at the relocation site. Any non-native animal species encountered during dewatering of the reservoir shall be permanently removed from the reservoir. A Letter Report shall be prepared to document the results of the pre-construction surveys and monitoring; the Report shall be provided to the USFS and CDFW within 30 days of conclusion of the survey effort.

5.6 MM 5 – PRE-CONSTRUCTION ROOSTING BAT SURVEY

Water shall be drained or re-routed around Project Work Areas at least one month prior to construction to deter bats from roosting in the vicinity of the Work Areas.

If exclusionary measures have not already been installed on all potential roost structures within the Project Work Area, a pre-construction follow-up roosting bat survey (including both day and evening efforts) shall be conducted by a qualified biologist within two weeks prior to the initiation of construction to ensure that no active day-roosts would be impacted. The day survey will involve inspecting the structures for sign of bat roosting. The evening survey will involve monitoring each potential roost site for evening emergence, conducting exit counts, and acoustic monitoring (from a half an hour before sunset to at least one hour after sunset) near potential roosts. If active bat day-roosts occur within the Project Work Area, bat exclusion devices shall be installed under the supervision of a qualified biologist prior to the start of construction.

If active bat day-roosts occur within structures proposed for removal/repair (including gunite repair on hill slopes), then exclusionary measures, such as barriers with one-way doors or permanent exclusion (e.g., caulking or wire mesh), shall be installed under the supervision of a qualified biologist.

If active bat day-roosts occur within trees proposed for removal, then either tree removal shall be conducted between September and November (to avoid the bat maternity and the bat hibernation season), or the tree removal will occur under the supervision of a qualified biologist and will utilize phased tree trimming. If avoidance of bat hibernation and bat maternity season is not feasible, then exclusionary measures, such as netting or phased tree trimming, shall be implemented after the evening roost emergence under the supervision of a qualified biologist. Once bats have been excluded from the trees to be removed, then tree removal can proceed.

5.7 RM 1 – BIOLOGICAL MONITORING

A Biological Monitor will be on site during vegetation clearing in Project Work Areas (i.e., limits of disturbance). The Biological Monitor will confirm that the limits of Project Work Areas are clearly marked. The Biological Monitor shall provide environmental awareness training to the Contractor; the training will include a discussion of native habitat types, special status species that may occur in the Project Work Areas, direction for what to do if a special status species is observed, and an overview of applicable permit conditions. Prior to construction, the Biological Monitor will conduct a pre-clearing sweep of the Project Work Area and will flush or move wildlife outside of the Project Work Area to the extent practicable.

6.0 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of all the PDF and MMs listed above shall mitigate biological impacts to a level that is considered less than significant.

7.0 REFERENCES

Abrams, L. 1951. *Illustrated Flora of the Pacific States.* Vol. III: Geraniums to Figworts (*Geraniaceae* to *Scrophulariaceae*). Stanford, CA: Stanford University Press.

———. 1944. *Illustrated Flora of the Pacific States.* Vol. II: Buckwheats to Kramerias (*Polygonaceae* to *Krameriaceae*). Stanford, CA: Stanford University Press.

———. 1923. *Illustrated Flora of the Pacific States.* Vol. I: Ferns to Birthworts (*Ophioglossaceae* to *Aristolochiaceae*). Stanford, CA: Stanford University Press.

Abrams, L. and R. Ferris. 1960. *Illustrated Flora of the Pacific States.* Vol. IV: Bignonias to Sunflowers (*Bignoniaceae* to *Compositae*). Stanford, CA: Stanford University Press.

Allen, G.J., O. Mistretta, M. Tommerup, K. Blassey, and W.J. Brown. 1995. *A Field Guide to the Rare Plants of the Angeles National Forest* (PSW R5-BOT-TP-002). Berkeley, CA: Pacific Southwest Forest and Range Experiment Station.

American Fisheries Society. 1991*. Common and Scientific Names of Fishes from the United States and Canada* (5th edition). Bethesda, MD: American Fisheries Society.

American Ornithologists' Union (AOU). 2011 (August). *Check-list of North American Birds* (7th ed., as revised through 52nd Supplement). Washington, D.C.: AOU. http://www.aou.org/checklist/north/index.php.

Baker, R.J., L.C. Bradley, R.D. Bradley, J.W. Dragoo, M.D. Engstrom, R.S. Hoffmann, C.A. Jones, F. Reid, D.W. Rice, and C. Jones. 2003 (December). Revised Checklist of North American Mammals North of Mexico, 2003. *Occasional Papers (No. 229).* Waco, TX: Museum of Texas Tech University.

Baldwin, B.G., D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (Eds.). 2012. *The Jepson Manual: Vascular Plants of California* (Second ed.). Berkeley, CA: University of California Press.

Bennett, A.F. 1990. Habitat Corridors and the Conservation of Small Mammals in the Fragmented Forest Environment. *Landscape Ecology* 4(2–3):109–122. New York, NY: International Association for Landscape Ecology.

BonTerra Consulting. 2013a (March). *Bioloigcal Resources Report, Los Angeles County Department of Public Works Facilities in Santa Anita Canyon.* Pasadena, CA: BonTerra Consulting.

———. 2013b (May). *Jursdictional Delineation Report for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project, Los Angeles County, California.* Irvine, CA: BonTerra Consulting.

———. 2012a. *Results of the 2012 Least Bell's Vireo and Southwestern Willow Flycatcher Surveys for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California.* Pasadena, CA: BonTerra Consulting.

———. 2012b. *Results of Focused Presence/Absence Coastal California Gnatcatcher Survey for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County.* Pasadena, CA: BonTerra Consulting.

———. 2012c. *Results of Special Status Herpetofauna Surveys for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California.* Pasadena, CA: BonTerra Consulting.

———. 2012d. *Results of Focused Presence/Absence surveys for Special Status Fish Species for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California.* Pasadena, CA: BonTerra Consulting.

———. 2012e. *Results of Focused Presence/Absence surveys for Special Status Plant Species for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California.* Pasadena, CA: BonTerra Consulting.

———. 2011. *Results of Western Pond Turtle Trapping and Coast Range Newt Survey for the Santa Anita Dam Sediment Removal Project, Los Angeles County, California.* Pasadena, CA: BonTerra Consulting.

———. 2010. *Results of Special Status Plant Surveys for the Santa Anita Reservoir Middle Sediment Placement Site, Los Angeles County, California.* Pasadena, CA: BonTerra Consulting.

———. 2009a. *Results of Special Status Plant Surveys for the Santa Anita Reservoir Sediment Placement Site, Los Angeles County, California.* Pasadena, CA: BonTerra Consulting.

———. 2009b. *Coast Range Newt and Southwestern Pond Turtle Focused Survey Report for the Santa Anita Dam Project Site, Los Angeles County, California*. Pasadena, CA: BonTerra Consulting.

———. 2009c. *Results of Focused Presence/Absence Surveys for the Least Bell's Vireo and Southwestern Willow Flycatcher at the Santa Anita Debris Basin Projct Site, Los Angeles Count*y. Pasadena, CA: BonTerra Consulting.

———. 2009d. *Habitat Assessment for Santa Ana Sucker (Catostomus santaanae) in Santa Anita Creek, Los Angeles County*. Memorandum to Los Angeles County Department of Public Works. [Pasadena], CA: BonTerra Consulting.

———. 2004. *Relocation of Silvery Legless Lizards from Plum Canyon, Los Angeles County, to Shapell Industries-Owned Property.* (Unpublished letter to Shapell Industries).

California Department of Fish and Wildlife (CDFW). 2014a. California Natural Diversity Database. Records of Occurrence for the USGS Mt. Wilson, Azusa, El Monte, Pasadena, and Baldwin Park 7.5-minute Quadrangles. Sacramento, CA: CDFW, Natural Heritage Division.

———.2013a. California Natural Diversity Database. Records of Occurrence for the USGS Mt. Wilson, Azusa, El Monte, Pasadena, and Baldwin Park 7.5-minute Quadrangles. Sacramento, CA: CDFW, Natural Heritage Division.

———. 2013b (May, access date). Natural Communities — Background Information. Sacramento, CA: CDFW. http://www.dfg.ca.gov/biogeodata/vegcamp/natural_comm_background.asp.

———. 2013c. *Special Vascular Plants, Bryophytes, and Lichens List.* Sacramento, CA: CDFG, Natural Heritage Division.

California Department of Fish and Game (CDFG). 2012 (June). California Natural Diversity Database. Records of Occurrence for the USGS Mt. Wilson, Azusa, El Monte, Pasadena, and Baldwin Park 7.5-minute Quadrangles. Sacramento, CA: CDFG, Natural Heritage Division.

———. 2011 (January). *Special Animals.* Sacramento, CA: CDFG, Natural Heritage Division.

———. 2010 (September). *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program.* Sacramento, CA: CDFG.

———. 2009 (November 24). *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Sacramento, CA: CDFG.

———. 1952. Field Notes, Big Santa Anita Canyon Creek (Report by P.A. Douglas, W.A. Evans, and R.R. Bell). Sacramento, CA: CDFG.

———. 1945. Fish Stocking Record. Sacramento, CA: CDFG.

California Native Plant Society (CNPS). 2014. Electronic Inventory of Rare and Endangered Vascular Plants of California. Records of Occurrence for the USGS Mt. Wilson, Azusa, El Monte, Pasadena, and Baldwin Park 7.5-minute Quadrangles. Sacramento, CA: CNPS. http://www.cnps.org/inventory.

———.2013. Electronic Inventory of Rare and Endangered Vascular Plants of California. Records of Occurrence for the USGS Mt. Wilson, Azusa, El Monte, Pasadena, and Baldwin Park 7.5-minute Quadrangles. Sacramento, CA: CNPS. http://www.cnps.org/inventory.

———. 2012. Electronic Inventory of Rare and Endangered Vascular Plants of California. Records of Occurrence for the USGS Mt. Wilson, Azusa, El Monte, Pasadena, and Baldwin Park 7.5-minute Quadrangles. Sacramento, CA: CNPS. http://www.cnps.org/inventory.

Crother, B.I. (Ed.). 2008 (May 2011, last update). Scientific and Standard English Names of Amphibians and Reptiles of North American North of Mexico, with Comments Regarding Confidence in our Understanding (Edition 6.1). Shoreview, MN: Society for the Study of Amphibians and Reptiles. http://www.ssarherps.org/pages/comm_names/Index.php.

EDAW. 2009. *Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project Final Environmental Impact Report.* Los Anegeles, CA: EDAW, Inc.

England and Nelson. 1976.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1). Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Faber-Langendoen, D., L. Master, J. Nichols, K. Snow, A. Tomaino, R. Bittman, G. Hammerson, B. Heidel, L. Ramsay, and B. Young. 2009. *NatureServe Conservation Status Assessments: Methodology for Assigning Ranks*. Arlington, VA: NatureServe. http://www.natureserve.org/publications/ConsStatusAssess_RankMethodology.pdf.

Fahrig, L. and G. Merriam. 1985. Habitat Patch Connectivity and Population Survival. *Ecology* 66(6): 1762–1768. Tempe, AZ: Ecological Society of America.

Francis, Robert A. et al. 2005. Survival and Growth Responses of *Populus nigra, Salix elaeagnos and Alnus incana* cuttings to varying levels of hydric stress. *Forest Ecology and Management* 210:291–301. Cambridge, MA: Elsevier.Goodman, R.H. 1999. *Relocation Project of the Southwestern Pond Turtle (Clemmys marmorata pallida) from the San Gabriel Dam to the Upper West Fork of the San Gabriel River*. Irvine, CA: Chambers Group, Inc.

Glenz, C. et al. 2006. Flooding Tolerance of Central European Tree and Scrub Species. *Forest Ecology and Management* 235:1–13. Cambridge, MA: Elsevier.

Good, J.E.G. et al. 1992. Species and Clonal Variation in Growth Responses to Waterlogging and Submersion in the Genus *Salix.Proceedings of the Royal Society of Edinburgh* 98:21–48. Cambridge, England: Cambridge University Press.

Harris, L.D. and P.B. Gallagher. 1989. New Initiatives for Wildlife Conservation: The Need for Movement Corridors (pp. 11–34). *Preserving Communities and Corridors* (G. Mackintosh, Ed.). Washington, D.C.: Defenders of Wildlife.

Holland, D.C. 1991. Status and Reproductive Dynamics of a Population of Western Pond Turtles (*Clemmys marmorata*) in 1991. (Unpublished Report for the U.S. Fish and Wildlife Service, National Ecology Research Center, San Simeon, California).

Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: CDFG, Non-game Heritage Program.

Jepson Flora Project 2012 (v. 1.0). *Jepson eFlora*. Berkeley, CA: Regents of the University of California. http://ucjeps.berkeley.edu/IJM.html.

Leadership Committee of the Greater Los Angeles County Integrated Regional Water Management Plan (Leadership Committee). 2006 (December, adopted). *The Greater Los Angeles County Integrated Water Management Plan.* Los Angeles, CA: Leadership Committee. http://www.ladpw.org/wmd/irwmp/index.cfm?fuseaction=TopDocListing&directory=Adopted%20IRWMP,%20December%2013,%202006%20Lowres&ttl=Adopted%20IRWMP,%20December%2013,%202006.

Loboco, I. 2013 (March 7). Personal communication. Telephone conversation between I. Loboco, Associate Planner (City of Monrovia) and D. Hughes, Project Manager (BonTerra Consulting).

Los Angeles, County of, Department of Regional Planning (LACDRP). 2011 (October). County of Los Angeles General Plan Significant Ecological Areas and Coastal Resource Areas (Figure 6.2). Los Angeles, CA: LACDRP.

http://planning.lacounty.gov/assets/upl/project/gp_2035_FIG_6-2_significant_ecological_areas.pdf.

Los Angeles County Flood Control District (LACFCD). 2011 (April 14). *Application for grant funding pursuant to The Disaster Preparedness and Flood Prevention Bond Act 2006 (Proposition 1E) for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project.* Los Angeles, CA: District.

MacArthur, R.H. and E.O. Wilson. 1967. *The Theory of Island Biogeography*. Princeton, NJ: Princeton University Press.

Monrovia, City of. 2012 (November, current through). *Monrovia, California Code of Ordinances.* Cincinnati, OH: American Legal Publishing Corporation for the City.

Munz, P.A. 1974. *A Flora of Southern California*. Berkeley, CA: University of California Press.

Noss, R.F. 1983. A Regional Landscape Approach to Maintain Diversity. *BioScience.* 33(11): 700–706. Washington, D.C.: American Institute of Biological Sciences.

Reese, D.A. and H.H. Welsh. 1988 Use of Terrestrial Habitat by Western Pond Turtles, *Clemmys marmorata:* Implications for Management. *Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles* 352–357. New York, NY: New York Turtle and Tortoise Society.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation (Second Edition)*. Sacramento, CA: CNPS.

Simberloff, D. and J. Cox. 1987. Consequences and Costs of Conservation Corridors*.* *Conservation Biology* 1(1): 63–71. Boston, MA: Blackwell Scientific Publications.

Soule, M.E. 1987. *Viable Populations for Conservation*. New York, NY: Cambridge University Press.

Tallent-Halsell, N.G. and L.R. Walker. 2002 (December). Responses of *Salix Goodhingii* and *Tamarix Ramosissima* to Flooding. *Wetlands* 22(4):776–785. Fargo, ND: The Society of Wetland Scientists.

UltraSystems Environmental, Inc. 2007. *Biological Technical Report: Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, CA*. Prepared for County of Los Angeles Department of Public Works, Water Resources Division. November.

U.S. Army Corps of Engineers (USACE). *2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.).* Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2012 (September 5). Official Soil Series Descriptions. Fort Worth, TX: USDA, NRCS. http://soils.usda.gov/technical/classification/osd/index.html.U.S. Forest Service (USFS). 2012. Angeles National Forest: About the Forest. Arcadia, CA: USFS, Angeles National Forest. http://www.fs.usda.gov/main/angeles/about-forest.

———. 2005a (September). *Final Environmental Impact Statement for Revised Land Management Plans: Angeles National Forest, Cleveland National Forest, Los Padres National Forest, San Bernardino National Forest.* Vallejo, CA: USFS.

———. 2005b (September). *USDA Land Management Plan: Part 2 Angeles National Forest Strategy.* Arcadia, CA: USFS. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5166877.pdf.

U.S. Fish and Wildlife Service (USFWS). 1997 (July 28). *Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Protocol.* Washington, D.C.: USFWS.U.S. Forest Service (USFS). 2013 (July, as updated in March 2014). *Angeles National Forest Threatened, Endangered, Proposed, Candidate, and Forest Service Sensitive Plants and Animals Which May Occur Within the Angeles National Forest, Los Angeles and San Bernardino Counties, California.* Arcadia, CA: USFS, Angeles National Forest.

———.. 2013a. *Regional Forester's Sensitive Plant Species List*. Vallejo, CA: USFS, Pacific Southwest Region.

———. 2013b. *Sensitive Animal Species by Forest*. Vallejo, CA: USFS, Pacific Southwest Region.

———. 2011 (February, last updated). *Angeles National Forest Threatened, Endangered, Proposed, Candidate, and Forest Service Sensitive Plants and Animals Which May Occur Within the Angeles National Forest, Los Angeles and San Bernardino Counties, California*. Arcadia, CA: USFS, Angeles National Forest.

Western Regional Climate Center (WRCC). 2012. Burbank Valley Pump, PLA California. Reno, NV: WRCC. http://www.wrcc.dri.edu/cgi-bin/cliMONtpre.pl?ca1194.

ATTACHMENT A

SITE PHOTOGRAPHS

Photo 1. Facing east, view of willow riparian in the lower portion of Santa Anita Debris Basin.

Photo 2. Facing north, view of willow riparian in the Santa Anita Debris Basin.

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Site Photographs

Attachment A-1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

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Photo 3. Facing northwest, overview of coastal sage scrub and sycamore alluvial woodland in the upper portion of Santa Anita Debris Basin.

Photo 4. Facing north, overview of creek upstream of the headworks facility where the canyon begins to narrow.

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Site Photographs

Attachment A-2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

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Photo 5. Facing north, view of habitat along creek in the narrow portion of Santa Anita Canyon.

Photo 6. Facing west, view of alder riparian forest along creek in the narrow portion of Santa Anita Canyon. Note the steep slope on the opposite bank.

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Site Photographs

Attachment A-3

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

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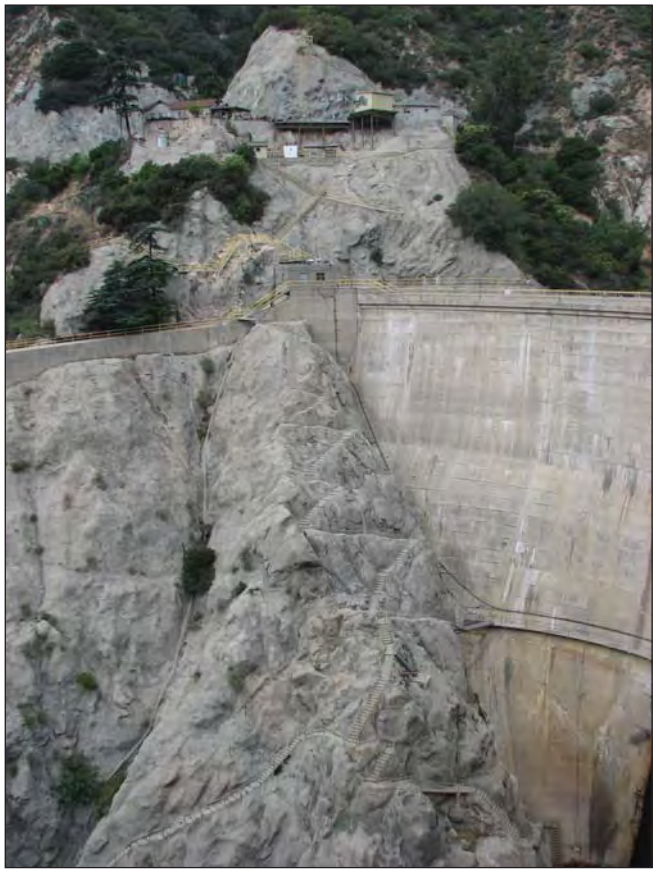

Photo 7. Facing west, view of the existing gunite banks adjacent to Santa Anita Dam.

Photo 8. Facing northwest, view of the existing Headworks Facility.

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Site Photographs

Attachment A-4

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

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Photo 9. Facing east, view of the existing Wilderness Park Bridge.

Photo 10. Facing north, view of the existing Santa Anita Debris Dam.

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Site Photographs

Attachment A-5

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

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ATTACHMENT B

PLANT AND WILDLIFE COMPENDIUM

ATTACHMENT B-1

PLANT COMPENDIA

PLANT SPECIES OBSERVED DURING 2012 FOCUSED SURVEYS

Species	
***PTERIDOPHYTES* – FERNS AND ALLIES**	
POLYPODIACEAE – POLYPODY FAMILY	
Polypodium californicum	California polypody
PTERIDACEAE – BRAKE FAMILY	
Pellaea andromedifolia	coffee fern
Pellaea mucronata	bird's foot fern
SELAGINELLACEAE – SPIKE-MOSS FAMILY	
Selaginella bigelovii	Bigelow's or bushy spike-moss
GYMNOSPERMS	
CUPRESSACEAE – CYPRESS FAMILY	
Juniperus sp.	ornamental juniper
PINACEAE – PINE FAMILY	
Pinus canariensis	Canary Island pine
***ANGIOSPERMAE* – FLOWERING PLANTS**	
DICOTYLEDONES	
ADOXACEAE – MUSKROOT FAMILY	
Sambucus nigra ssp. *caerulea*	blue elderberry
AMARANTHACEAE – AMARANTH FAMILY	
*Amaranthus albus**	tumbleweed
ANACARDIACEAE – SUMAC FAMILY	
Malosma laurina	laurel sumac
Rhus ovata	sugar bush
Rhus aromatica [*Rhus trilobata*]	skunkbush
*Schinus molle**	pepper tree
Toxicodendron diversilobum	western poison oak
APIACEAE (UMBELLIFERAE) – CARROT FAMILY	
Apiastrum angustifolium	wild celery
APOCYNACEAE – DOGBANE FAMILY	
Asclepias fascicularis	narrow-leaved milkweed
*Nerium oleander**	common oleander
*Vinca major**	greater periwinkle
ARALIACEAE – GINSENG FAMILY	
*Hedera helix**	English ivy
ASTERACEAE (COMPOSITAE) – SUNFLOWER FAMILY	
Achillea millefolium	common yarrow
*Ageratina adenophora**	crofton weed
Ambrosia acanthicarpa	annual bur-sage
Artemisia californica	California sagebrush
Artemisia douglasiana	mugwort
Baccharis salicifolia ssp. *salicifolia* [*Baccharis salicifolia*]	mule fat
Bidens frondosa	sticktight
Brickellia californica	California brickellbush
Carduus pycnocephalus var. *pycnocephalus**	Italian thistle
*Centaurea melitensis**	tocalote/Maltese star thistle
Chaenactis glabriuscula	yellow pincushion

PLANT SPECIES OBSERVED DURING 2012 FOCUSED SURVEYS (Continued)

Species	
Corethrogyne filaginifolia [*Lessingia filaginifolia*]	California-aster
Delairea odorata [*Senecio mikanioides*]*	German ivy
Helianthus annuus	western sunflower
Heterotheca grandiflora	telegraph weed
*Hypochaeris glabra**	smooth cat's-ear
Isocoma menziesii	goldenbush
*Lactuca serriola**	prickly lettuce
Lepidospartum squamatum	scale-broom
Logfia gallica [*Filago gallica*] *	daggerleaf cottonrose
Malacothrix saxatilis	cliff malacothrix
Pseudognaphalium biolettii [*Gnaphalium bicolor*]	bicolored everlasting/Bioletti's cudweed
Pseudognaphalium californicum [*Gnaphalium californicum*]	California everlasting
Pseudognaphalium canescens [*Gnaphalium canescens*]	everlasting
Pseudognaphalium luteoalbum [*Gnaphalium luteoalbum*]*	weedy cudweed
*Senecio vulgaris**	common groundsel
*Silybum marianum**	milk thistle
*Sonchus oleraceus**	common sow thistle
Uropappus lindleyi	silver puffs
BETULACEAE – BIRCH FAMILY	
Alnus rhombifolia	white alder
BORAGINACEAE – BORAGE FAMILY	
Amsinckia intermedia	common fiddleneck
Cryptantha sp.	cryptantha
Cryptantha intermedia	common cryptantha
Eriodictyon trichocalyx	hairy yerba santa
Eucrypta chrysanthemifolia	common eucrypta
Phacelia cicutaria	caterpillar phacelia
Phacelia distans	common phacelia
Phacelia minor	wild canterbury-bell
Phacelia ramosissima	branching phacelia
BRASSICACEAE (CRUCIFERAE) – MUSTARD FAMILY	
*Hirschfeldia incana**	shortpod mustard
Lepidium nitidum	peppergrass/shining peppergrass
Nasturtium officinale [*Rorippa nasturtium-aquaticum*]*	water cress
*Sisymbrium irio**	London rocket
CACTACEAE – CACTUS FAMILY	
*Opuntia ficus-indica**	mission prickly-pear
Opuntia littoralis	coastal prickly pear

PLANT SPECIES OBSERVED DURING 2012 FOCUSED SURVEYS (Continued)

Species	
CAPRIFOLIACEAE – HONEYSUCKLE FAMILY	
Lonicera subspicata var. *denudata*	southern honeysuckle
*Silene gallica**	small-flower catchfly
CHENOPODIACEAE – GOOSEFOOT FAMILY	
*Chenopodium album**	lamb's quarters
*Salsola tragus**	Russian thistle
CISTACEAE – ROCK-ROSE FAMILY	
Helianthemum scoparium	peak rush-rose
CONVOLVULACEAE – MORNING-GLORY FAMILY	
Calystegia macrostegia	morning-glory
Cuscuta californica	chaparral dodder
CRASSULACEAE – STONECROP FAMILY	
Crassula connata	pygmy-weed
Dudleya caespitosa (?)	capitates dudleya
Dudleya cymosa ssp. *pumila*	canyon dudleya
Dudleya lanceolata	lance-leaved dudleya
CUCURBITACEAE – GOURD FAMILY	
Marah macrocarpus	wild cucumber/chilicothe
EUPHORBIACEAE – SPURGE FAMILY	
Croton setigerus [*Eremocarpus setigerus*]	doveweed/turkey mullein
*Ricinus communis**	castor bean
FABACEAE (LEGUMINOSAE) – LEGUME FAMILY	
Acmispon strigosus [*Lotus strigosus*]	strigose lotus
Acmispon glaber [*Lotus scoparius* var. *scoparius*]	deerweed
Lupinus bicolor	miniature lupine
Lupinus hirsutissimus	stinging lupine
Lupinus truncatus	truncate lupine/collar lupine
*Melilotus indica**	sourclover
*Spartium junceum**	Spanish broom
Trifolium willdenovii	tomcat clover
FAGACEAE – OAK/BEECH FAMILY	
Quercus agrifolia	coast live oak
Quercus berberidifolia	scrub oak/California scrub oak
Quercus chrysolepis	maul oak/canyon live oak
Quercus engelmannii	Engelmann oak
Quercus lobata	valley oak
GERANIACEAE – GERANIUM FAMILY	
*Erodium cicutarium**	red-stemmed filaree
Geranium sp.* *(molle?)*	Carolina geranium
GROSSULARIACEAE – GOOSEBERRY FAMILY	
Ribes aureum	golden currant
Ribes speciosum	fuchsia-flowered gooseberry

PLANT SPECIES OBSERVED DURING 2012 FOCUSED SURVEYS (Continued)

Species	
LAMIACEAE (LABIATAE) – MINT FAMILY	
*Marrubium vulgare**	common horehound
Salvia apiana	white sage
Salvia columbariae	chia
Salvia mellifera	black sage
LAURACEAE – LAUREL FAMILY	
Umbellularia californica	California bay
Claytonia perfoliata ssp. *perfoliata*	common miner's-lettuce
MORACEAE – FIG FAMILY	
*Ficus carica**	edible fig
MYRSINACEAE – MYRSINE FAMILY	
*Anagallis arvensis**	scarlet pimpernel
MYRTACEAE – MYRTLE FAMILY	
Eucalyptus sp.*	gum
OLEACEAE – OLIVE FAMILY	
Fraxinus sp.	ash
ONAGRACEAE – EVENING PRIMROSE FAMILY	
Camissonia bistorta	California sun cup
Clarkia purpurea	four-spot
Epilobium canum	California fuchsia
Epilobium ciliatum	willow-herb
Eulobus californicus [*Camissonia californica*]	mustard-like evening primrose
PAPAVERACEAE – POPPY FAMILY	
Romneya coulteri	Coulter's matilija poppy
PHRYMACEAE – LOPSEED FAMILY	
Mimulus aurantiacus	bush monkeyflower
Mimulus guttatus	seep monkeyflower
Mimulus pilosus	downy monkeyflower
PLANTAGINACEAE – PLANTAIN FAMILY	
Keckiella cordifolia	heart-leaved bush-penstemon
Plantago arenaria [*Plantago indica*]*	sand plantain
*Veronica anagallis-aquatica**	water speedwell
PLATANACEAE – SYCAMORE FAMILY	
Platanus racemosa	western sycamore
POLYGONACEAE – BUCKWHEAT FAMILY	
Eriogonum elongatum var. *elongatum*	long-stemmed wild buckwheat
Eriogonum fasciculatum	California buckwheat
RHAMNACEAE – BUCKTHORN FAMILY	
Rhamnus ilicifolia	hollyleaf redberry
ROSACEAE – ROSE FAMILY	
Adenostoma fasciculatum	chamise
Cercocarpus betuloides var. *betuloides*	birch-leaf mountain-mahogany
Heteromeles arbutifolia	toyon/christmas berry
Prunus ilicifolia	holly-leaved cherry
Rosa californica	California rose

PLANT SPECIES OBSERVED DURING 2012 FOCUSED SURVEYS (Continued)

Species	
Rubus ursinus	California blackberry
RUBIACEAE – MADDER FAMILY	
Galium aparine	goose grass
SALICACEAE – WILLOW FAMILY	
Salix exigua	narrow-leaved willow
Salix gooddingii	Goodding's black willow
Salix laevigata	red willow
Salix lasiolepis	arroyo willow
SAPINDACEAE – SOAP BERRY FAMILY	
Acer macrophyllum	big-leaf maple
SCROPHULARIACEAE – FIGWORT FAMILY	
*Verbascum thapsus**	woolly mullein
SOLANACEAE – NIGHTSHADE FAMILY	
*Nicotiana glauca**	tree tobacco
Solanum douglasii	Douglas' nightshade
TAMARICACEAE – TAMARISK FAMILY	
*Tamarix ramosissima**	Mediterranean tamarix
URTICACEAE – NETTLE FAMILY	
Urtica dioica ssp. *holosericea*	hoary nettle
***MONOCOTYLEDONES* – MONOCOTS**	
AGAVACEAE – CENTURY PLANT FAMILY	
Hesperoyucca whipplei [*Yucca whipplei*]	Our Lord's candle
ARECACEAE (PALMAE) – PALM FAMILY	
*Washingtonia robusta**	Mexican fan palm
CYPERACEAE – SEDGE FAMILY	
Cyperus sp.	umbrella-sedge
POACEAE [GRAMINEAE] – GRASS FAMILY	
Stipa coronata [*Achnatherum coronatum*]	crested needlegrass
Avena sp.*	cultivated oat
*Bromus diandrus**	ripgut grass
Bromus madritensis ssp. *rubens**	red brome
Festuca myuros [*Vulpia myuros*] *	foxtail fescue
*Lamarckia aurea**	goldentop
Melica imperfecta	little California melic grass
*Pennisetum setaceum**	crimson fountain grass
*Piptatherum miliaceum**	smilo grass/millett ricegrass
*Poa annua**	annual bluegrass
THEMIDACEAE – BRODIAEA FAMILY	
Bloomeria crocea	common goldenstar
TYPHACEAE – CATTAIL FAMILY	
Typha sp.	cattail

* Non-native species
? specimen sent to herbarium for confirmation since out of known elevational range, may be a hybrid (UCSC Herbarium); confirmed that it is not any of the listed *Dudleya* species.

ATTACHMENT B-2

WILDLIFE COMPENDIA

WILDLIFE SPECIES OBSERVED DURING 2012 SURVEYS

Species	
FISH	
SALMONIDAE – TROUT AND SALMON	
Oncorhynchus mykiss	rainbow trout
CENTRACHIDAE – SUNFISH	
Lepomis cyanellus *	green sunfish
AMPHIBIANS	
BUFONIDAE – TRUE TOADS	
Anaxyrus boreas [*Bufo boreas*]	western toad
HYLIDAE – TREEFROGS	
Pseudacris [*Hyla*] *cadaverina*	California treefrog
Pseudacris hypochondriaca [*Hyla regilla*]	Baja California treefrog
REPTILES	
PHRYNOSOMATIDAE – ZEBRA-TAILED, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS	
Sceloporus occidentalis	western fence lizard
Uta stansburiana	side-blotched lizard
TEIIDAE – WHIPTAIL LIZARDS	
Aspidoscelis [*Cnemidophorus*] *tigris stejnegeri*	coastal western whiptail
ANGUIDAE – ALLIGATOR LIZARDS	
Elgaria multicarinata	southern alligator lizard
COLUBRIDAE – COLUBRID SNAKES	
Pituophis catenifer	gopher snake
Crotalus oreganus	western rattlesnake
BIRDS	
ANATIDAE – WATERFOWL	
Branta canadensis	Canada goose
Anas platyrhynchos	mallard
ODONTOPHORIDAE – QUAILS	
Callipepla californica	California quail
ARDEIDAE – HERONS, BITTERNS, AND ALLIES	
Ardea herodias	great blue heron
Ardea alba	great egret
CATHARTIDAE – NEW WORLD VULTURES	
Cathartes aura	turkey vulture
ACCIPITRIDAE – HAWKS, KITES, EAGLES, AND ALLIES	
Accipiter cooperii	Cooper's hawk
Buteo lineatus	red-shouldered hawk
Buteo jamaicensis	red-tailed hawk
CHARADRIIDAE – PLOVERS	
Charadrius vociferus	killdeer
COLUMBIDAE – PIGEONS AND DOVES	
*Columba livia**	rock pigeon
*Streptopelia decaocto**	Eurasian collared-dove
Patagioenas fasciata	band-tailed pigeon
Zenaida macroura	mourning dove

WILDLIFE SPECIES OBSERVED DURING 2012 FOCUSED SURVEYS (Continued)

Species	
TYTONIDAE – BARN OWLS	
Tyto alba	barn owl
STRIGIDAE – TRUE OWLS	
Bubo virginianus	great horned owl
APODIDAE – SWIFTS	
Aeronautes saxatalis	white-throated swift
TROCHILIDAE – HUMMINGBIRDS	
Archilochus alexandri	black-chinned hummingbird
Calypte anna	Anna's hummingbird
Calypte costae	Costa's hummingbird
Selasphorus sasin	Allen's hummingbird
ALCEDINIDAE - KINGFISHERS	
Megaceryle [*Ceryle*] *alcyon*	belted kingfisher
PICIDAE – WOODPECKERS	
Melanerpes formicivorus	acorn woodpecker
Picoides nuttallii	Nuttall's woodpecker
Colaptes auratus	northern flicker
PSITTACIDAE – PARROTS	
Amazona viridigenalis	red-crowned parrot
Aratinga mitrata	mitred parakeet
Nandyus nenday	black-hooded parakeet
TYRANNIDAE – TYRANT FLYCATCHERS	
Contopus cooperi	olive-sided flycatcher
Contopus sordidulus	western wood-pewee
Empidonax difficilis	Pacific-slope flycatcher
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Myiarchus cinerascens	ash-throated flycatcher
VIREONIDAE – VIREOS	
Vireo huttoni	Hutton's vireo
Vireo gilvus	warbling vireo
CORVIDAE – CROWS AND JAYS	
Cyanocitta stelleri	Steller's jay
Aphelocoma californica	western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	common raven
HIRUNDINIDAE – SWALLOWS	
Tachycineta thalassina	violet-green swallow
Stelgidopteryx serripennis	northern rough-winged swallow
Petrochelidon pyrrhonota	cliff swallow
Hirundo rustica	barn swallow
PARIDAE – TITMICE	
Baeolophus inornatus	oak titmouse
AEGITHALIDAE – BUSHTITS	
Psaltriparus minimus	bushtit

WILDLIFE SPECIES OBSERVED DURING 2012 FOCUSED SURVEYS (Continued)

Species	
SITTIDAE – NUTHATCHES	
Sitta carolinensis	white-breasted nuthatch
TROGLODYTIDAE – WRENS	
Catherpes mexicanus	canyon wren
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	house wren
TURDIDAE – THRUSHES AND ROBINS	
Catharus ustulatus	Swainson's thrush
Turdus migratorius	American robin
MIMIDAE – THRASHERS	
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
STURNIDAE – STARLINGS	
Sturnus vulgaris *	European starling
PTILOGONATIDAE – SILKY-FLYCATCHERS	
Phainopepla nitens	phainopepla
PARULIDAE – WARBLERS	
Oreothlypis [*Vermivora*] *celata*	orange-crowned warbler
Geothlypis trichas	common yellowthroat
Setophaga petechia [*Dendroica petechia*]	yellow warbler
Cardellina pusilla [*Wilsonia pusilla*]	Wilson's warbler
EMBERIZIDAE – SPARROWS AND JUNCOS	
Pipilo maculatus	spotted towhee
Melozone [*Pipilo*] *crissalis*	California towhee
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow
Melospiza melodia	song sparrow
Junco hyemalis	dark-eyed junco
CARDINALIDAE – CARDINALS AND ALLIES	
Piranga ludoviciana	western tanager
Pheucticus melanocephalus	black-headed grosbeak
ICTERIDAE – BLACKBIRDS	
Agelaius phoeniceus	red-winged blackbird
Molothrus ater	brown-headed cowbird
Icterus cucullatus	hooded oriole
Icterus bullockii	Bullock's oriole
FRINGILLIDAE – FINCHES	
Carpodacus mexicanus	house finch
Spinus [*Carduelis*] *psaltria*	lesser goldfinch
Spinus [*Carduelis*] *tristis*	American goldfinch
ESTRILDIDAE – MANNIKINS	
*Lonchura punctulata**	nutmeg mannikin

WILDLIFE SPECIES OBSERVED DURING 2012 FOCUSED SURVEYS (Continued)

Species	
MAMMALS	
LEPORIDAE – HARES AND RABBITS	
Sylvilagus audubonii	desert cottontail
SCIURIDAE – SQUIRRELS	
Neotamius [*Tamias*] *merriami*	Merriam's chipmunk
Spermophilus beecheyi	California ground squirrel
Sciurus griseus	western gray squirrel
CANIDAE – WOLVES AND FOXES	
Canis latrans	coyote
URSIDAE – BEARS	
Ursus americanus	American black bear
MEPHITIDAE – SKUNKS	
Mephitis mephitis	striped skunk
CERVIDAE – DEER	
Odocoileus hemionus	mule deer
* introduced species	

ATTACHMENT C

SPECIAL STATUS PLANT SURVEY REPORT

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October 15, 2012

Grace Yu
Water Resources Division
Department of Public Works
County of Los Angeles
900 South Fremont Avenue
Alhambra, California 91803

VIA EMAIL
gyu@dpw.lacounty.gov

Subject: Results of Special Status Plant Surveys for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California

Dear Ms. Yu:

This Letter Report presents the findings of special status plant surveys conducted for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project Site (hereinafter referred to as the "project site") located within the City of Arcadia and Angeles National Forest in Los Angeles County, California (Exhibits 1 and 2). The project will improve Los Angeles County Flood Control District facilities to better manage storm water runoff from the Santa Anita Canyon watershed and achieve the following goals: (1) reduce flood damage to the downstream communities; (2) increase recharge of the local groundwater basin; and (3) improve public safety by remediating seismic safety issues at the Dam and Debris Basin.

The project site is located immediately north of the Santa Anita Dam and continues south along Santa Anita Creek to the Santa Anita Debris Basin (Exhibit 3). The survey area for the project includes the area for the proposed improvements plus a 100-foot buffer. The survey area is bordered by open space in the Angeles National Forest and Arcadia Wilderness Park, and by residential development. The survey area is located on the U.S. Geological Survey's (USGS') Mt. Wilson 7.5-minute quadrangle, with an elevation of about 750 to 1,300 feet above mean sea level (msl).

METHODS

Prior to the field surveys, a literature review was conducted to identify special status plants known from the general survey area vicinity. This included a review of the USGS Mt. Wilson, Azusa, El Monte, Pasadena and Baldwin Park 7.5-minute quadrangles in the California Department of Fish and Game's (CDFG) California Natural Diversity Database (CNDDB; CDFG 2012) and the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2012). The literature review also included a review of the Angeles National Forest Threatened, Endangered, Proposed, Candidate, and Forest Service Sensitive Plants and Animals (U.S. Forest Service 2011). Table 1 lists all the special status plant species known to occur in the vicinity of the survey area. However, surveys were only conducted for those plant species shown in Table 1 to have potential suitable habitat in the survey area. The survey protocol follows the current CDFG protocol for surveying special status native plant populations (CDFG 2009).

Reference populations were visited for the highest status and priority special status plant species with potential to occur within the survey area to confirm that they were blooming and that it was an appropriate time to survey for them. A known reference population of San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) was visited and observed flowering immediately west of the San Fernando Valley on April 10, 2012, in Las Virgenes Canyon. A known reference population of slender-horned spineflower (*Dodecahema leptoceras*) was visited and observed flowering in the Elsinore area of Western Riverside on April 20, 2012. A known reference population of slender mariposa lily (*Calochortus clavatus* var. *gracilis*) was visited and observed flowering in the Santa Clarita area on May 18, 2012. A known reference population of Plummer's mariposa lily was visited and observed flowering in the Tujunga Dam area on June 8, 2012. A known reference population of southern tarplant (*Centromadia parryi* ssp. *australis*) was visited and observed flowering in the Riverside area on June 12, 2012. A known reference population of white rabbit-tobacco (*Pseudognaphalium leucocephalum*) was visited and observed flowering in San Juan Capistrano on August 13, 2012.

According to the National Weather Service, Burbank Valley Pump Plant (located about 20 miles south of the survey area) has received 10.37 inches of precipitation over the past year (since July 1, 2011), which is about 61 percent of the normal 16.29 inches based on 1939–2012 averages (Western Regional Climate Service 2012).

Consulting Botanist Sandra Leatherman conducted special status plant surveys on April 25; May 2, 16, and 30; June 4; August 8 and 24, 2012. Ms. Leatherman was assisted by Consulting Biologists Brian Leatherman, James Huelsman, and Adam DeLuna. Systematic surveys were conducted to search the survey area for any special status plants. All plant species observed were recorded in field notes. Plant species were identified in the field or collected for subsequent identification using keys in Baldwin, B.G., et al. (2012). Taxonomy follows Baldwin, B.G., et al. (2012) and current scientific data (e.g., scientific journals) for scientific and common names.

SITE DESCRIPTION

Vegetation types in the survey area include coastal sage scrub, chaparral, black willow riparian forest, sycamore woodland, mixed riparian forest, alder riparian forest, elderberry woodland, mule fat scrub, coast live oak woodland, mixed woodland, ornamental, and ruderal. Disturbed areas include dirt roads and other mechanically disturbed areas that generally lack vegetation. Photographs of representative habitat are included in Attachment A.

Soil types generally consist of the Trigo family soils, which have a granitic substratum on 60 to 90 percent slopes in the northern portion of the survey area, no data is available for the soils in the southern portion of the survey area (USDA NRCS 2012) (Exhibit 4).

SURVEY RESULTS

Two special status plant species were observed during the surveys: Engelmann oak (*Quercus engelmannii*) and Coulter's matilija poppy (*Romneya coulteri*) (Table 1; Exhibit 5). These species are further discussed below. A list of all plants observed within the survey area during focused botanical surveys can be found in Attachment B. CNDDB forms for the Engelmann oak and Coulter's matilija poppy occurrences are included in Attachment C.

TABLE 1
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR IN THE SURVEY AREA VICINITY

Species	Status				Habitat Suitability Within the Survey Area and Survey Results
	USFWS	CDFG	CRPR	FSS	
Acanthoscyphus parishii var. *parishii* Parish's oxytheca	None	None	4.2	None	No suitable habitat; out of elevation range.
Arctostaphylos glandulosa ssp. *gabrielensis* San Gabriel manzanita	None	None	1B.2	Yes	No suitable habitat; out of elevation range.
Astragalus brauntonii Braunton's milk-vetch	FE	None	1B.1	FE	Potentially suitable habitat present; not observed during focused surveys.
Berberis nevinii Nevin's barberry	FE	CE	1B.1	Yes	Potentially suitable habitat present; not observed during focused surveys.
Calochortus clavatus var. *gracilis* slender mariposa lily	None	None	1B.2	Yes	Potentially suitable habitat present; not observed during focused surveys.
Calochortus plummerae Plummer's mariposa lily	None	None	1B.2	FS	Potentially suitable habitat present; not observed during focused surveys.
Calochortus weedii var. *intermedius* intermediate mariposa lily	None	None	1B.2	None	Limited suitable habitat present; not observed during focused surveys.
Centromadia parryi ssp. *australis* southern tarplant	None	None	1B.1	None	Potentially suitable habitat present; not observed during focused surveys.
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	FC	SE	1B.1	FS	Limited suitable habitat present; not observed during focused surveys.
Chorizanthe parryi var. *parryi* Parry's spineflower	None	None	1B.1	FS	Limited suitable habitat present; not observed during focused surveys.
Cladium californicum California saw-grass	None	None	2.2	None	No suitable habitat present; not observed during focused surveys.
Clinopodium mimuloides monkey-flower savory	None	None	4.2	None	No suitable habitat; out of elevation range.
Cuscuta obtusiflora var. *glandulosa* Peruvian dodder	None	None	2.2	None	No suitable habitat; out of elevation range.
Dodecahema leptoceras slender-horned spineflower	FE	SE	1B.1	FE	Potentially suitable habitat present; not observed during focused surveys.
Dudleya cymosa ssp. *crebrifolia* San Gabriel River dudleya	None	None	1B.2	FS	Potentially suitable habitat present; not observed during focused surveys.
Dudleya densiflora San Gabriel Mountains dudleya	None	None	1B.1	FS	Potentially suitable habitat present; not observed during focused surveys.
*Galium angusti*folium ssp. *gabrielense* San Antonio Canyon bedstraw	None	None	4.3	None	No suitable habitat; out of elevation range.
Galium grande San Gabriel bedstraw	None	None	1B.2	FS	No suitable habitat; out of elevation range.
Galium johnstonii Johnston's bedstraw	None	None	4.3	None	No suitable habitat; out of elevation range.
Helianthus nuttallii ssp. *parishii* Los Angeles sunflower	None	None	1A	None	Not expected to occur, species presumed extinct; potentially suitable habitat present; not observed during focused surveys.
Hordeum intercedens vernal barley	None	None	3.2	None	Limited suitable habitat present; not observed during focused surveys.

TABLE 1 (Continued)
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR IN THE SURVEY AREA VICINITY

Species	Status				Habitat Suitability Within the Survey Area and Survey Results
	USFWS	CDFG	CRPR	FSS	
Horkelia cuneata ssp. *puberula* mesa horkelia	None	None	1B.1	FS	Limited suitable habitat present; not observed during focused surveys.
Imperata brevifolia California satintail	None	None	2.1	FS	Potentially suitable habitat present; not observed during focused surveys.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	None	None	1B.1	None	No suitable habitat present; not observed during focused surveys.
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	None	None	1B.2	None	Limited suitable habitat present; not observed during focused surveys.
Linanthus concinnus San Gabriel linanthus	None	None	1B.2	FS	No suitable habitat present; not observed during focused surveys.
Linanthus orcuttii Orcutt's linanthus	None	None	1B.3	None	No suitable habitat present; not observed during focused surveys.
Malacothamnus davidsonii Davidson's bush-mallow	None	None	1B.2	None	Potentially suitable habitat present; not observed during focused surveys.
Mimulus johnstonii Johnston's monkeyflower	None	None	4.3	None	No suitable habitat; out of elevation range.
Muhlenbergia californica California muhly	None	None	4.3	None	Potentially suitable habitat present; not observed during focused surveys.
Orobanche valida ssp. *valida* Rock Creek broomrape	None	None	1B.2	FS	No suitable habitat; out of elevation range.
Phacelia stellaris Brand's star phacelia	FC	None	1B.1	None	Limited suitable habitat present; not observed during focused surveys.
Pickeringia montana var. *tomentosa* woolly chaparral-pea	None	None	4.3	None	Limited suitable habitat present; not observed during focused surveys.
Pseudognaphalium leucocephalum white rabbit-tobacco	None	None	2.2	None	Potentially suitable habitat present; not observed during focused surveys.
Quercus engelmannii **Engelmann oak**	**None**	**None**	**4.2**	**None**	**Observed.**
Ribes divaricatum var. *parishii* Parish's gooseberry	None	None	1A	None	Species presumed extinct; potentially suitable habitat present; not observed during focused surveys.
Romneya coulteri **Coulter's matilija poppy**	**None**	**None**	**4.2**	**None**	**Observed.**
Rupertia rigida Parish's rupertia	None	None	4.3	None	No suitable habitat; out of elevation range.
Scutellaria bolanderi ssp. *austromontana* southern mountains skullcap	None	None	1B.2	FS	No suitable habitat; out of elevation range.
Senecio astephanus San Gabriel ragwort	None	None	4.3	None	Limited suitable habitat present; not observed during focused surveys.
Symphyotrichum defoliatum San Bernardino aster	None	None	1B.2	FS	Potentially suitable habitat present; not observed during focused surveys.
Symphyotrichum [*Aster*] *greatae* Greata's aster	None	None	1B.3	None	Potentially suitable habitat present; not observed during focused surveys.

TABLE 1 (Continued)
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR IN THE SURVEY AREA VICINITY

Species	Status				Habitat Suitability Within the Survey Area and Survey Results
	USFWS	CDFG	CRPR	FSS	
Thelypteris puberula var. *sonorensis* Sonoran maiden fern	None	None	2.2	FS	Potentially suitable habitat present; not observed during focused surveys.

LEGEND:

Federal (USFWS)
FE Endangered
FC Candidate

State (CDFG)
SE Endangered
SC Candidate

California Rare Plant Rank (CRPR) List Categories
List 1A Plants Presumed Extinct in California
List 1B Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2 Plants Rare, Threatened, or Endangered in California But More Common Elsewhere
List 3 Plants About Which We Need More Information - A Review List
List 4 Plants of Limited Distribution – A Watch List

CRPR Threat Rank Extensions
.1 Seriously threatened in California (high degree/immediacy of threat)
.2 Fairly threatened in California (moderate degree/immediacy of threat)
.3 Not very threatened in California (low degree/immediacy of threat or no current threats known)

Angeles National Forest Threatened, Endangered, Proposed, Candidate, and Forest Service Sensitive (FSS) Plants and Animals Which May Occur Within the Angeles National Forest, Los Angeles and San Bernardino Counties, California.
FE Federal Endangered
FS Forest Service Sensitive

Englemann Oak

Englemann oak is a CNPS List 4.2 species. This large tree grows in chaparral, cismontane woodland, riparian woodland and valley and foothill grasslands in Los Angeles, Orange and Riverside counties and in Baja California.

A total of six individuals of Englemann oak were observed in the survey area (Exhibit 5). These plants were observed west of the access road (above the Basin) in the southern portion of the survey area on gentle slopes on loamy soils. The associated species at the various populations included coast live oak (*Quercus agrifolia*), laurel sumac (*Malosma laurina*), mule fat (*Baccharis salicifolia*), valley oak (*Quercus lobata),* poison oak (*Toxicodendron diversilobum*), Coulter's matilija poppy, wild cucumber (*Marah macrocarpus*), shortpod mustard (*Hirschfeldia incana*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*) and sticktight (*Bidens frondosa*).

Coulter's Matilija Poppy

Coulter's matilija poppy is a CNPS List 4.2 species. This rhizomatous herb blooms between March and June in chaparral and coastal scrub. It is known to occur in Los Angeles, Orange, Riverside, and San Diego counties.

A total of 17 clumps of poppy were observed in the survey area in 1 general location (Exhibit 5). These plants were observed west of the access road above the Basin in the southern portion of the survey area on gentle slopes with loamy soils. The poppy spreads by rhizomes and it is

difficult to identify individual plants. The associated species include Englemann oak, wild cucumber, poison oak, coast live oak, and sand plantain (*Plantago arenaria*).

CONCLUSIONS

Although the CDFG protocol requests an assessment of potential project impacts to special status species, the project impact boundaries have not yet been identified. Because the Engelmann oak and Coulter's matilija poppy were observed outside the Basin, they are not expected to be directly impacted. However, future evaluations of project impacts and corresponding mitigation measures will be conducted as part of the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documentation. The Project should avoid the Engelmann oak and Coulter's matilija poppy to the extent practicable. Protective fencing should be placed around the oak and poppy locations to protect them from damage during construction activities.

Although reference populations and regional rainfall amounts were monitored to ensure the scientific adequacy of these focused surveys, there is always a minimal potential for false negative survey results as species could possibly be present on a site but may not be detectable at the time of the surveys.

If you have any comments or questions, please call Amber Oneal (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Amber S. Oneal
Senior Project Manager, Biological Services

Enclosures: Exhibit 1 – Regional Location
Exhibit 2 – Local Vicinity
Exhibit 3 – Survey Area
Exhibit 4 – Soil Types
Exhibit 5 – Special Status Plant Locations
Attachment A – Site Photographs
Attachment B – Plant Compendium
Attachment C – CNDDB Forms

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REFERENCES

Baldwin, B.G., D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (Eds.). 2012. *The Jepson Manual: Vascular Plants of California* (Second ed.). Berkeley, CA: University of California Press

California Department of Fish and Game (CDFG). 2012. California Natural Diversity Database. Records of Occurrence for the USGS Mt. Wilson, Azusa, El Monte, and Baldwin Park 7.5-minute quadrangle maps. Sacramento, CA: CDFG, Natural Heritage Division.

———. 2009 (November 24). *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Sacramento, CA: CDFG.

California Native Plant Society (CNPS). 2012. Electronic Inventory of Rare and Endangered Vascular Plants of California (v8-01a). Records of Occurrence for USGS Mt. Wilson, Azusa, El Monte, Pasadena and Baldwin Park 7.5-minute quadrangles. Sacramento, CA: CNPS. http://www.cnps.org/inventory.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2012 (September 5). Official Soil Series Descriptions. Fort Worth, TX: USDA, NRCS. http://soils.usda.gov/technical/classification/osd/index.html.

U.S. Forest Service. 2011. Angeles National Forest (Angeles) Threatened, Endangered, Proposed, Candidate, and Forest Service Sensitive Plants and Animals Which May Occur Within the Angeles National Forest, Los Angeles and San Bernardino Counties, California. Animals Revised March 2004; Plants October 1, 2006; Status of Species Updated September 21, 2007; Scientific Names Updated February 10, 2011

Western Regional Climate Center. 2012. Burbank Valley Pump, PLA California. Reno, NV: Western Regional Climate Center. http://www.wrcc.dri.edu/cgi-bin/cliMONtpre.pl?ca1194.

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Project Location

Exhibit 1

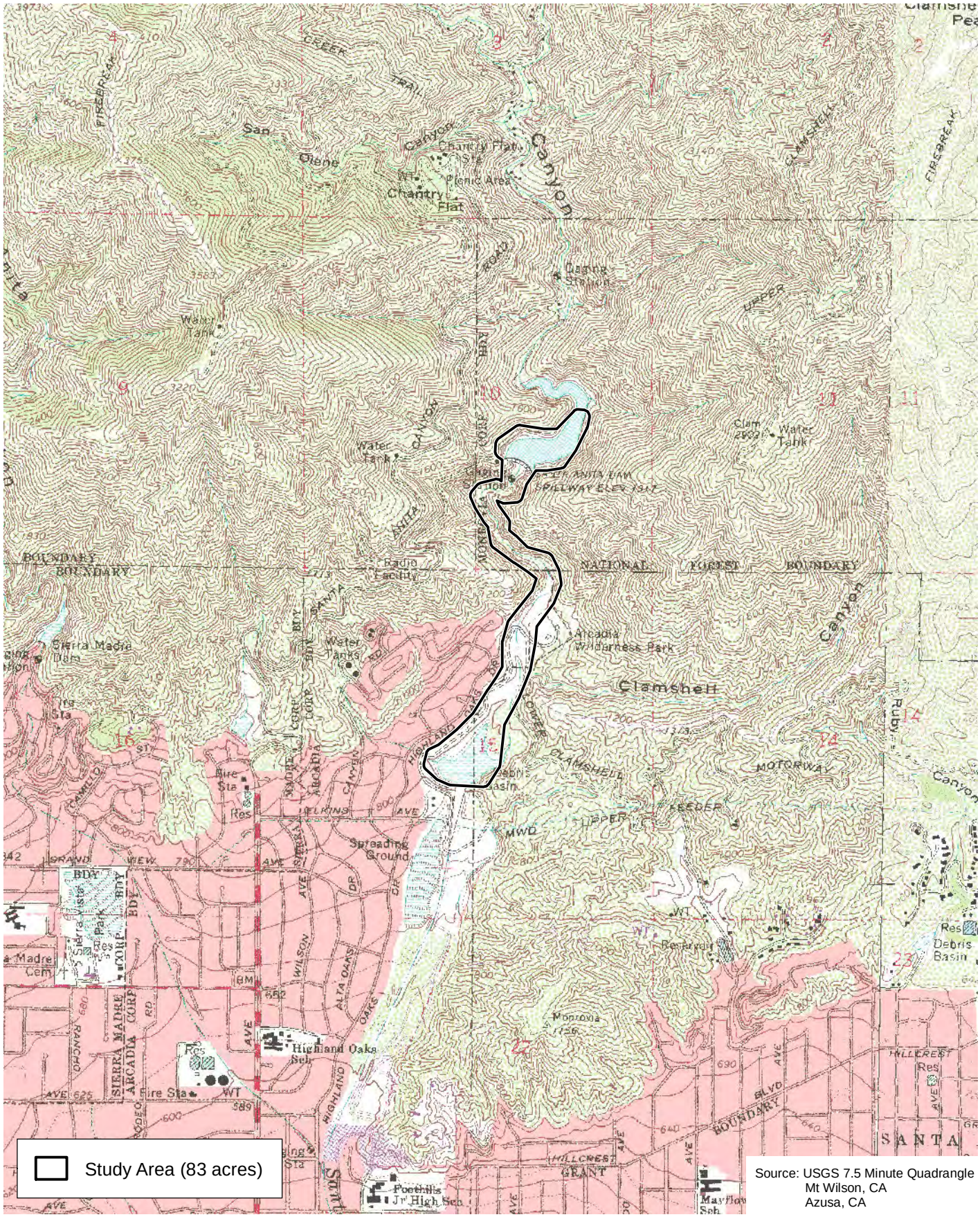
Santa Anita Prop 1E Project

N W E S

10 5 0 10 Miles

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex_RL.pdf



Source: USGS 7.5 Minute Quadrangle
Mt Wilson, CA
Azusa, CA

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Local Vicinity

Exhibit 2

Santa Anita Prop 1E Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex2_LV_usgs.pdf

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Survey Area

Exhibit 3

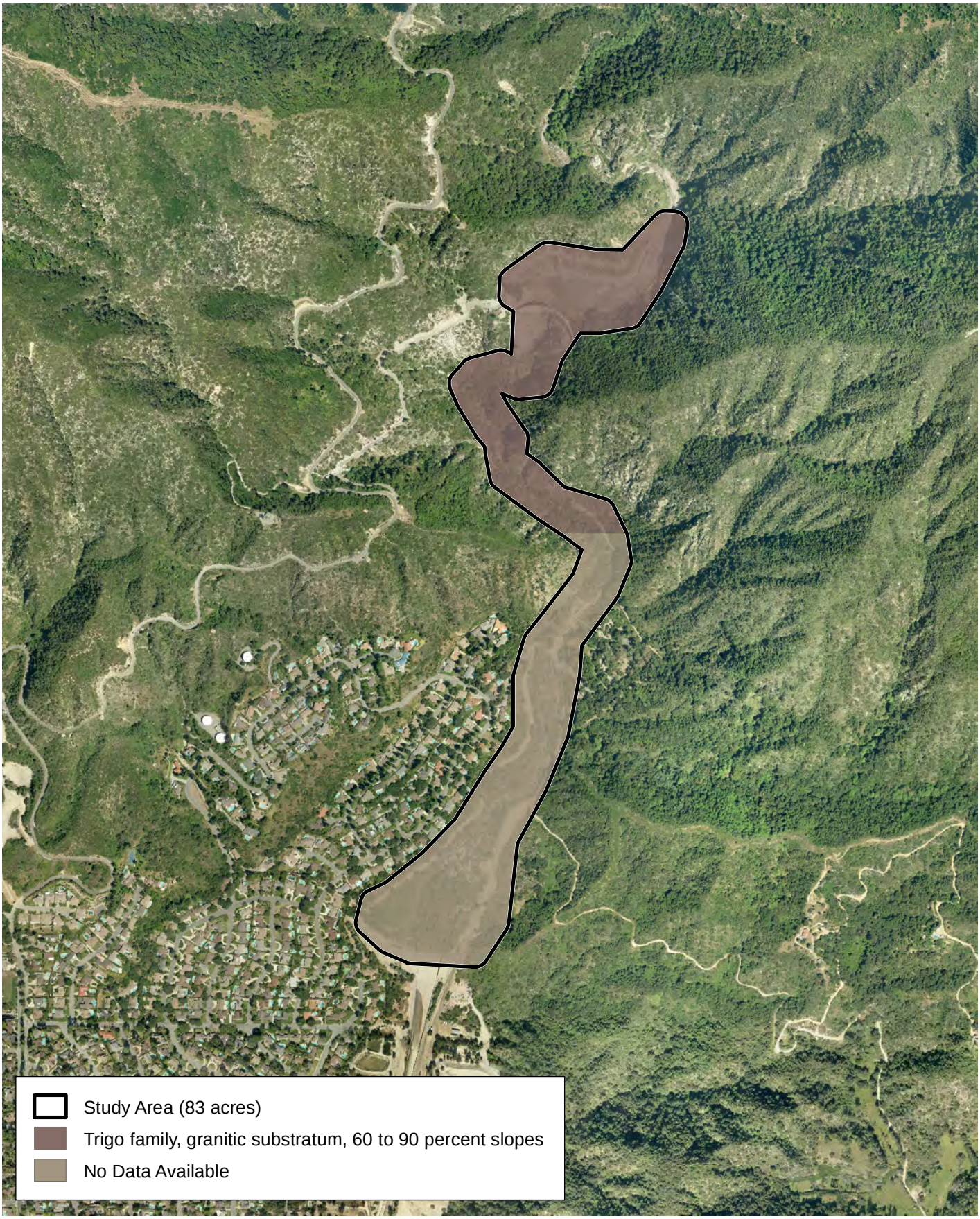
Santa Anita Prop 1E Project

N
W E
S

1,000 500 0 1,000
Feet

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex3_SurveyArea.pdf



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Soils

Exhibit 4

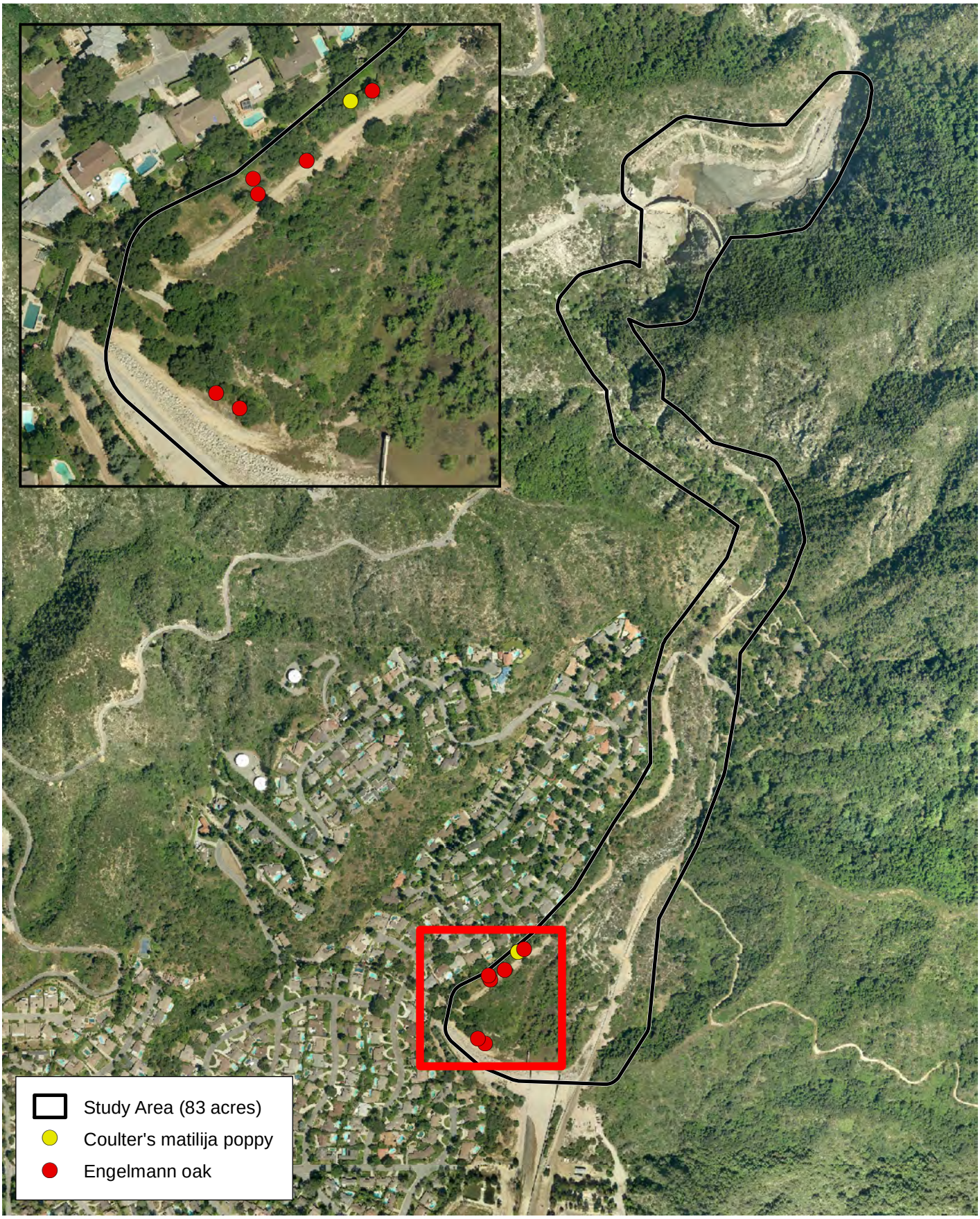
Santa Anita Prop 1E Project

N
W E
S

1,000 500 0 1,000
Feet

BonTerra CONSULTING

(Rev: 10-12-2012 MMD) Projects\CoLADPW\J166\Graphics\Plants\Ex4_Soils.pdf



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Special Status Plant Locations

Exhibit 5

Santa Anita Prop 1E Project

N
W E
S

750 375 0 750
Feet

BonTerra CONSULTING

(Rev: 10-12-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex5_SSPlants.pdf

ATTACHMENT A

SITE PHOTOGRAPHS

Photo 1. Facing east, view of willow riparian in the lower portion of Santa Anita Debris Basin.

Photo 2. Facing north, view of black willow riparian forest in the Santa Anita Debris Basin.

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Site Photographs

Attachment A-1

Santa Anita Proposition 1E Project

BonTerra CONSULTING

(10/04/2 KFD) PAS R: Projects\coladpw\J166\Graphics\Plant\ExAttA1_SP_Plant.pdf

Photo 3. Facing northwest, overview of coastal sage scrub and sycamore woodland in the upper portion of Santa Anita Debris Basin.

Photo 4. Facing north, overview of creek upstream of the headworks facility where the canyon begins to narrow.

PAS D:\Projects\coladpw\J166\Graphics\ex_SP2_Plant_20121004.ai

Site Photographs

Attachment A-2

Santa Anita Proposition 1E Project

BonTerra CONSULTING

(10/04/12 KFD) PAS R: Projects\coladpw\J166\Graphics\Plant\ExAttA2_SP2_Plant.pdf

Photo 5. Facing north, view of habitat along creek in the narrow portion of Santa Anita Canyon. Note the steep slope on the west side of the creek.

Photo 6. Facing west, view of alder riparian forest along creek in the narrow portion of Santa Anita Canyon. Note the steep slope on the opposite bank.

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Site Photographs

Attachment A-3

Santa Anita Proposition 1E Project

BonTerra CONSULTING

(10/04/12 KFD) PAS R: Projects\coladpw\J166\Graphics\Plant\ExAttA3_SP3_Plant.pdf

ATTACHMENT B

PLANT COMPENDIUM

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED BOTANICAL SURVEYS

Species	
***PTERIDOPHYTES* – FERNS AND ALLIES**	
POLYPODIACEAE – POLYPODY FAMILY	
Polypodium californicum	California polypody
PTERIDACEAE – BRAKE FAMILY	
Pellaea andromedifolia	coffee fern
Pellaea mucronata	bird's foot fern
SELAGINELLACEAE – SPIKE-MOSS FAMILY	
Selaginella bigelovii	Bigelow's or bushy spike-moss
GYMNOSPERMS	
CUPRESSACEAE – CYPRESS FAMILY	
Juniperus sp.	ornamental juniper
PINACEAE – PINE FAMILY	
Pinus canariensis	Canary Island pine
***ANGIOSPERMAE* – FLOWERING PLANTS**	
DICOTYLEDONES	
ADOXACEAE – MUSKROOT FAMILY	
Sambucus nigra ssp. *caerulea*	blue elderberry
AMARANTHACEAE – AMARANTH FAMILY	
*Amaranthus albus**	tumbleweed
ANACARDIACEAE – SUMAC FAMILY	
Malosma laurina	laurel sumac
Rhus ovata	sugar bush
Rhus aromatica [*Rhus trilobata*]	skunkbush
*Schinus molle**	pepper tree
Toxicodendron diversilobum	western poison oak
APIACEAE (UMBELLIFERAE) – CARROT FAMILY	
Apiastrum angustifolium	wild celery
APOCYNACEAE – DOGBANE FAMILY	
Asclepias fascicularis	narrow-leaved milkweed
*Nerium oleander**	common oleander
*Vinca major**	greater periwinkle
ARALIACEAE – GINSENG FAMILY	
*Hedera helix**	English ivy
ASTERACEAE (COMPOSITAE) – SUNFLOWER FAMILY	
Achillea millefolium	common yarrow
*Ageratina adenophora**	crofton weed
Ambrosia acanthicarpa	annual bur-sage
Artemisia californica	California sagebrush
Artemisia douglasiana	mugwort
Baccharis salicifolia ssp. salicifolia [*Baccharis salicifolia*]	mule fat
Bidens frondosa	sticktight
Brickellia californica	California brickellbush
Carduus pycnocephalus var. *pycnocephalus**	Italian thistle

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED BOTANICAL SURVEYS

Species	
*Centaurea melitensis**	tocalote/Maltese star thistle
Chaenactis glabriuscula	yellow pincushion
Corethrogyne filaginifolia [*Lessingia filaginifolia]*	California-aster
Delairea odorata [*Senecio mikanioides*]*	German ivy
Helianthus annuus	western sunflower
Heterotheca grandiflora	telegraph weed
*Hypochaeris glabra**	smooth cat's-ear
Isocoma menziesii	goldenbush
*Lactuca serriola**	prickly lettuce
Lepidospartum squamatum	scale-broom
Logfia gallica [*Filago gallica*] *	daggerleaf cottonrose
Malacothrix saxatilis	cliff malacothrix
Pseudognaphalium biolettii [*Gnaphalium bicolor*]	bicolored everlasting / Bioletti's cudweed
Pseudognaphalium californicum [*Gnaphalium californicum*]	California everlasting
Pseudognaphalium canescens [*Gnaphalium canescens*]	everlasting
Pseudognaphalium luteoalbum [*Gnaphalium luteoalbum*] *	weedy cudweed
*Senecio vulgaris**	common groundsel
*Silybum marianum**	milk thistle
*Sonchus oleraceus**	common sow thistle
Uropappus lindleyi	silver puffs
BETULACEAE – BIRCH FAMILY	
Alnus rhombifolia	white alder
BORAGINACEAE – BORAGE FAMILY	
Amsinckia intermedia	common fiddleneck
Cryptantha sp.	cryptantha
Cryptantha intermedia	common cryptantha
Eriodictyon trichocalyx	hairy yerba santa
Eucrypta chrysanthemifolia	common eucrypta
Phacelia cicutaria	caterpillar phacelia
Phacelia distans	common phacelia
Phacelia minor	wild canterbury-bell
Phacelia ramosissima	branching phacelia
BRASSICACEAE (CRUCIFERAE) – MUSTARD FAMILY	
*Hirschfeldia incana**	shortpod mustard
Lepidium nitidum	peppergrass / shining peppergrass
Nasturtium officinale [*Rorippa nasturtium-aquaticum*]*	water cress
*Sisymbrium irio**	London rocket
CACTACEAE – CACTUS FAMILY	
*Opuntia ficus-indica**	mission prickly-pear
Opuntia littoralis	coastal prickly pear

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED BOTANICAL SURVEYS

Species	
CAPRIFOLIACEAE – HONEYSUCKLE FAMILY	
Lonicera subspicata var. *denudata*	southern honeysuckle
*Silene gallica**	small-flower catchfly
CHENOPODIACEAE – GOOSEFOOT FAMILY	
*Chenopodium album**	lamb's quarters
*Salsola tragus**	Russian thistle
CISTACEAE – ROCK-ROSE FAMILY	
Helianthemum scoparium	peak rush-rose
CONVOLVULACEAE – MORNING-GLORY FAMILY	
Calystegia macrostegia	morning-glory
Cuscuta californica	chaparral dodder
CRASSULACEAE – STONECROP FAMILY	
Crassula connata	pygmy-weed
Dudleya caespitosa (?)	capitates dudleya
Dudleya cymosa ssp. *pumila*	canyon dudleya
Dudleya lanceolata	lance-leaved dudleya
CUCURBITACEAE – GOURD FAMILY	
Marah macrocarpus	wild cucumber/chilicothe
EUPHORBIACEAE – SPURGE FAMILY	
Croton setigerus [*Eremocarpus setigerus*]	doveweed / turkey mullein
*Ricinus communis**	castor bean
FABACEAE (LEGUMINOSAE) – LEGUME FAMILY	
Acmispon strigosus [*Lotus strigosus*]	strigose lotus
Acmispon glaber [*Lotus scoparius* var. *scoparius*]	deerweed
Lupinus bicolor	miniature lupine
Lupinus hirsutissimus	stinging lupine
Lupinus truncatus	truncate lupine / collar lupine
*Melilotus indica**	sourclover
*Spartium junceum**	Spanish broom
Trifolium willdenovii	tomcat clover
FAGACEAE – OAK / BEECH FAMILY	
Quercus agrifolia	coast live oak
Quercus berberidifolia	scrub oak / California scrub oak
Quercus chrysolepis	maul oak/canyon live oak
Quercus engelmannii	Engelmann oak
Quercus lobata	valley oak
GERANIACEAE – GERANIUM FAMILY	
*Erodium cicutarium**	red-stemmed filaree
Geranium sp. (molle?)*	Carolina geranium
GROSSULARIACEAE – GOOSEBERRY FAMILY	
Ribes aureum	golden currant
Ribes speciosum	fuchsia-flowered gooseberry

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED BOTANICAL SURVEYS

Species	
LAMIACEAE (LABIATAE) – MINT FAMILY	
*Marrubium vulgare**	common horehound
Salvia apiana	white sage
Salvia columbariae	chia
Salvia mellifera	black sage
LAURACEAE – LAUREL FAMILY	
Umbellularia californica	California bay
Claytonia perfoliata ssp. *perfoliata*	common miner's-lettuce
MORACEAE – FIG FAMILY	
*Ficus carica**	edible fig
MYRSINACEAE – MYRSINE FAMILY	
*Anagallis arvensis**	scarlet pimpernel
MYRTACEAE – MYRTLE FAMILY	
Eucalyptus sp.*	gum
OLEACEAE – OLIVE FAMILY	
Fraxinus sp.	ash
ONAGRACEAE – EVENING PRIMROSE FAMILY	
Camissonia bistorta	California sun cup
Clarkia purpurea	four-spot
Epilobium canum	California fuchsia
Epilobium ciliatum	willow-herb
Eulobus californicus [*Camissonia californica*]	mustard-like evening primrose
PAPAVERACEAE – POPPY FAMILY	
Romneya coulteri	Coulter's matilija poppy
PHRYMACEAE – LOPSEED FAMILY	
Mimulus aurantiacus	bush monkeyflower
Mimulus guttatus	seep monkeyflower
Mimulus pilosus	downy monkeyflower
PLANTAGINACEAE – PLANTAIN FAMILY	
Keckiella cordifolia	heart-leaved bush-penstemon
Plantago arenaria [*Plantago indica*]*	sand plantain
*Veronica anagallis-aquatica**	water speedwell
PLATANACEAE – SYCAMORE FAMILY	
Platanus racemosa	western sycamore
POLEMONIACEAE – PHLOX FAMILY	
POLYGONACEAE – BUCKWHEAT FAMILY	
Eriogonum elongatum var. *elongatum*	long-stemmed wild buckwheat
Eriogonum fasciculatum	California buckwheat
RHAMNACEAE – BUCKTHORN FAMILY	
Rhamnus ilicifolia	hollyleaf redberry
ROSACEAE – ROSE FAMILY	
Adenostoma fasciculatum	chamise
Cercocarpus betuloides var. betuloides	birch-leaf mountain-mahogany
Heteromeles arbutifolia	toyon / christmas berry

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED BOTANICAL SURVEYS

Species	
Prunus ilicifolia	holly-leaved cherry
Rosa californica	California rose
Rubus ursinus	California blackberry
RUBIACEAE – MADDER FAMILY	
Galium aparine	goose grass
SALICACEAE – WILLOW FAMILY	
Salix exigua	narrow-leaved willow
Salix gooddingii	Goodding's black willow
Salix laevigata	red willow
Salix lasiolepis	arroyo willow
SAPINDACEAE – SOAP BERRY FAMILY	
Acer macrophyllum	big-leaf maple
SCROPHULARIACEAE – FIGWORT FAMILY	
*Verbascum thapsus**	woolly mullein
SOLANACEAE – NIGHTSHADE FAMILY	
*Nicotiana glauca**	tree tobacco
Solanum douglasii	Douglas' nightshade
TAMARICACEAE – TAMARISK FAMILY	
*Tamarix ramosissima**	Mediterranean tamarix
URTICACEAE – NETTLE FAMILY	
Urtica dioica ssp. *holosericea*	hoary nettle
***MONOCOTYLEDONES* – MONOCOTS**	
AGAVACEAE – CENTURY PLANT FAMILY	
Hesperoyucca whipplei [Yucca whipplei]	Our Lord's candle
ARECACEAE (PALMAE) – PALM FAMILY	
*Washingtonia robusta**	Mexican fan palm
CYPERACEAE – SEDGE FAMILY	
Cyperus sp.	umbrella-sedge
LILIACEAE – LILY FAMILY	
POACEAE [GRAMINEAE] - GRASS FAMILY	
Stipa coronata [*Achnatherum coronatum*]	crested needlegrass
*Avena sp.**	cultivated oat
*Bromus diandrus**	ripgut grass
Bromus madritensis ssp. *rubens**	red brome
Festuca myuros [*Vulpia myuros*] *	foxtail fescue
*Lamarckia aurea**	goldentop
Melica imperfecta	little California melic grass
*Pennisetum setaceum**	crimson fountain grass
*Piptatherum miliaceum**	smilo grass / millett ricegrass
*Poa annua**	annual bluegrass

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED BOTANICAL SURVEYS

Species	
THEMIDACEAE – BRODIAEA FAMILY	
Bloomeria crocea	common goldenstar
TYPHACEAE– CATTAIL FAMILY	
Typha sp.	cattail
* Non-native species ? specimen sent to herbarium for confirmation since out of known elevational range, may be a hybrid (UCSC Herbarium); confirmed that it is not any of the listed *Dudleya* species.	

ATTACHMENT C

CNDDB FORMS

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/23/2012

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Quercus engelmannii*

Common Name: Engelmann oak

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 6 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Sandy Leatherman
Address: 4848 Lakeview Ave, Suite 100E
Yorba Linda, Ca 92886
E-mail Address: sandyleatherman@aol.com
Phone: (714) 701-0863

Plant Information

Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: Los Angeles County Department of Public Works
Quad Name: Mt. Wilson Elevation: 800-850
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon
DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐
Coordinates: 11 s 0405726 3781703, 11S 0405723 3781711, 11S 0405751 3781720, 11S 0405774 3781750, 11S 0405716 3781594, 11S 0405703 3781602

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

The associated species at the various populations included: coast live oak (Quercus agrifolia), laurel sumac (Malosma laurina), mule fat (Baccharis salicifolia), valley oak (Quercus lobata), poison oak (Toxicodendron diversilobum), Coulter's matilija poppy, wild cucumber (Marah macrocarpus), shortpod mustard (Hirschfeldia incana), ripgut brome (Bromus diandrus), red brome (Bromus madritensis ssp. rubens) and sticktight (Bidens frondosa). These plants were observed above the basin in the southern portion of the site on gentle slopes on loamy soils.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: residential and flood control

Visible disturbances: flood control activities

Threats:

Comments:

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☑ Other: known species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 08/23/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Romneya coulteri*

Common Name: Coulter's matilija poppy

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 17 clumps Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: - Number - Museum / Herbarium

Reporter: Sandy Leatherman
Address: 4848 Lakeview Ave, Suite 100E
Yorba Linda, Ca 92886
E-mail Address: sandyleatherman@aol.com
Phone: (714) 701-0863

Plant Information

Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: County of Los Angeles Department Public Works
Quad Name: Mt. Wilson Elevation: _____
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon
DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐
Coordinates: 11S 0405774 3781750

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Plants occur between residences and the maintenance road for the Santa Anita Debris Basin Area. The area is disturbed with clumps of Romneya. Associated species: Englemann oak (Quercus engelmannii) , wild cucumber (Marah macrocarpus), poison oak (Toxicodendron diversilobum), coast live oak (Quercus agrifolia) and sand plantain (Plantago arenaria).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Residential and Flood Control

Visible disturbances: Flood Control Activities including weed abatement

Threats:

Comments: Plants may have been planted by adjacent residences.

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☑ Other: Previous work with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

ATTACHMENT D

TREE SURVEY REPORT

Native Tree Survey

Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California

Prepared for

Los Angeles County Flood Control District
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October 15, 2014

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Appendix

A Summary of Native Tree Data
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Executive Summary

BonTerra Psomas Certified Arborists conducted a survey of native trees within and adjacent to proposed project construction areas associated with the Santa Anita Stormwater Flood Management and Seismic Strengthening Project. The project site is divided into six sub-areas: (1) the Santa Anita Dam Modification; (2) Santa Anita Dam Access Road; (3) Headworks Reconstruction; (4) Wilderness Park Culvert Crossing; (5) Debris Dam Remediation/Enlargement; and (6) Sediment Placement Site. Native trees that occur within and adjacent to construction impact areas at each of these sub-areas were identified, mapped, and given an identifying numbered tag. The trunk diameter, tree height, and canopy width were measured and the health and aesthetic quality of each tree were evaluated.

In addition to the project construction areas, the Debris Dam reservoir is proposed to be enlarged by raising the spillway of the Debris Dam. Trees that are currently in upland areas, but that would be within the new reservoir inundation boundary, were also inventoried.

The result of the tree survey indicates that a total of four trees are within the project construction boundary at the Wilderness Park Culvert Crossing site. These four trees consist of three western sycamores (*Platanus racemosa*) and one coast live oak (*Quercus agrifolia*).

In addition to the trees within the impacts area, 21 trees occur in future inundation areas that would result from raising the spillway of the Debris Dam. These 21 trees include 6 western sycamores, 12 coast live oaks, 1 Englemann oak (*Quercus englemannii*), and 2 Goodding's black willows (*Salix gooddingii*). Because the effect of the Debris Dam changes to these 21 trees is currently unknown, the LACFCD will implement a post-construction long-term monitoring program to identify any changes to the health of trees in the future inundation areas.

SECTION 1.0 INTRODUCTION

The purpose of this report is to (1) identify and quantify trees on the Santa Anita Stormwater Flood Management and Seismic Strengthening Project site (hereafter referred to as the project site) that are regulated by the Cities of Arcadia and Monrovia Tree Ordinances and/or the *California Fish and Game Code*; (2) determine the impacts that the project would have on these trees; (3) determine the expected number of replacement trees that would be required to mitigate these impacts; (4) describe methods to avoid impacts to trees that are located in the vicinity of proposed construction areas; and (5) describe long-term monitoring methods to determine the effect that increases in the extent, duration, and depth of inundation may have on various trees in the project area.

1.1 PROJECT LOCATION AND DESCRIPTION

The proposed Project is located in the cities of Arcadia and Monrovia, as well as unincorporated portions of Los Angeles County, California. The Project study area for the proposed Project extends from the inundation area of Santa Anita Dam downstream to the Santa Anita Debris Dam adjacent to Highland Oaks Drive (Exhibit 1). Open space in the City of Arcadia's Wilderness Park (Wilderness Park) and the Angeles National Forest occur north and east of the Project study area.

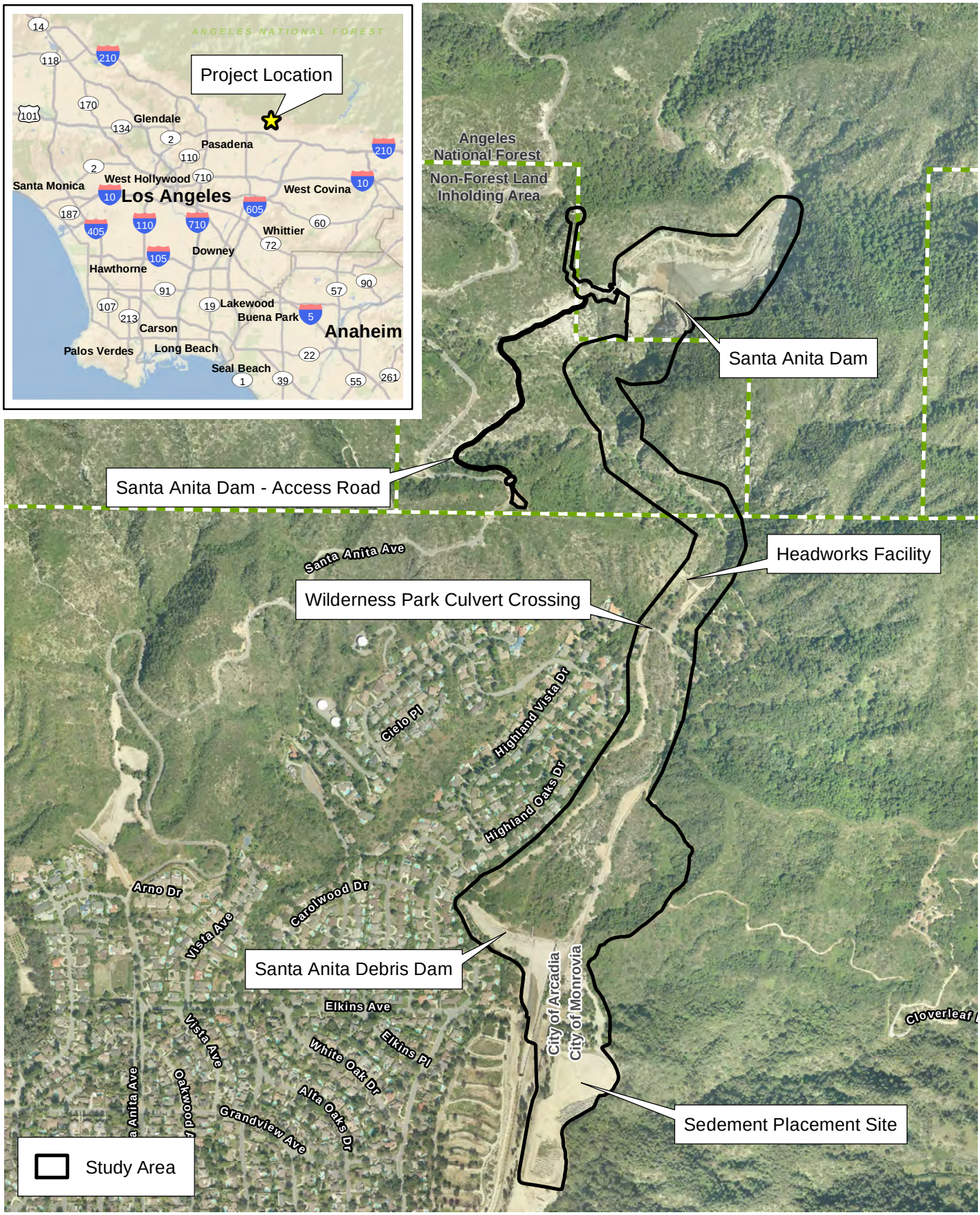
The Project has multiple components, including (1) the Santa Anita Dam Modification; (2) Santa Anita Dam Access Road; (3) Headworks Reconstruction; (4) Wilderness Park Culvert Crossing; (5) Debris Dam Remediation/Enlargement; and (6) Sediment Placement Site. A detailed project description can be found in the Project's Mitigated Negative Declaration (BonTerra Psomas 2014). The proposed Project would improve the Los Angeles County Flood Control District (LACFCD) facilities to better manage storm water runoff and improve public safety by addressing seismic safety and other structural issues, as well as by preventing flood damage to downstream communities.

1.2 REGULATORY BACKGROUND

The tree survey area for this project includes areas within the cities of Arcadia and Monrovia as well as unincorporated areas within Los Angeles County. As a result, proposed tree impacts are potentially subject to compliance with the Arcadia Oak Tree Ordinance (Article IX, Chapter 7 of the Arcadia Municipal Code), the Monrovia Oak Tree Ordinance (Chapter 17, Section 20.040 of the Monrovia Municipal Code), and the County of Los Angeles Oak Tree Ordinance (Section 22.56 of the Los Angeles County Code). Furthermore, many of the trees are associated with streambed areas that are subject to regulation under the *California Fish and Game Code* (§§1600–1616), regardless of city or county boundaries. A summary of each of these regulatory requirements is provided below.

Arcadia Oak Tree Ordinance

The City of Arcadia requires that an applicant acquire a permit prior to removing, relocating, damaging, or encroaching upon the protected zone of any oak tree (City of Arcadia 2014). The protected zone is defined as the outer canopy of any oak tree or 15 feet from the trunk, whichever is greater. Encroachment is defined as any soil disturbance or placement of fill that would potentially damage the root zone of trees.



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Project Location

Exhibit 1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

1,000 500 0 1,000 Feet

BonTerra PSOMAS

(Rev: 9-22-2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\TreeReport\ex1_ProjLocation.pdf

Oak trees that are covered by these regulations include any coast live oak (*Quercus agrifolia*) or Englemann oak (*Quercus englemannii*) that has a trunk diameter at breast height (dbh) of at least four inches. All other species of oak (i.e., trees within the genus *Quercus*) must have a dbh of at least 12 inches to qualify for protection under the ordinance. Tree replacement requirements are determined by the City and are based on the value or replacement cost of the trees that are impacted.

Monrovia Oak Tree Ordinance

The City of Monrovia requires that an applicant acquire a permit prior to removing an oak tree, pruning an oak tree, or grading (cutting or filling) within the outer canopy of an oak tree (City of Monrovia 2013). Oak trees (all species of the genus *Quercus*) must measure at least ten inches dbh to be regulated under this ordinance. Tree replacement requirements, if any, are determined by the City through the permit acquisition process.

Los Angeles County Oak Tree Ordinance

The County of Los Angeles Oak Tree Ordinance (County of Los Angeles 2014) requires that a permit is acquired prior to cutting, destroying, removing, relocating, inflicting damage, or encroaching into the protected zone of any oak tree species that measures at least eight inches dbh. Multi-trunk trees must have a combined size of at least 12 inches dbh for the largest two trunks to be included. For the County of Los Angeles, an oak tree protected zone extends 5 feet outside the outer canopy or 15 feet from the trunk, whichever is greater. Impacts to oak trees that are covered by this ordinance are to be replaced at a 2:1 ratio.

California Fish and Game Code

The California Department of Fish and Wildlife (CDFW) is charged with issuing Streambed Alteration Agreements that would allow for the removal of native tree species that occur within the bed, channel, or bank of any river, stream, or lake (State of California 2004). The minimum size requirement for regulation by the CDFW is two inches dbh. Mitigation/replacement ratios for trees within CDFW jurisdiction is based on the size of the tree dbh (i.e., mitigation ratios increase as the size of the impacted tree increases).

It should be noted that many trees in the survey area are subject to regulation by both a city/county ordinance as well as the *California Fish and Game Code*.

SECTION 2.0 METHODOLOGY

BonTerra Psomas Certified Arborists David Hughes (International Society of Arboriculture [ISA] Certificate Number WE-7752A) and Trevor Bristle (ISA Certificate Number WE-10233A) surveyed trees within the tree survey area on August 28, 2014, and by Mr. Hughes on September 2 and 15, 2014. All trees within the tree survey area boundaries that are subject to regulation by a city/county tree ordinance and/or the *California Fish and Game Code* were identified and mapped in the field. During the survey, each tree was tagged and the following data were collected: dbh, tree height, and canopy width, as well as qualitative ratings on aesthetics and overall health. Collected data are included in Appendix A.

2.1 MAPPING

Each tree that was surveyed was mapped on a 100-scale (1 inch = 100 feet) aerial photograph in the field and each location was recorded using a hand-held global positioning system (GPS) device.

2.2 TREE TAGS

Each tree that was assessed was individually tagged with an aluminum tag bearing the tree number. Trees that could not be tagged (e.g., trees on extremely steep slopes, surrounded by poison oak [*Toxicodendron diversilobum*], or infested with bees) were given identifying numbers. Tag numbers used during the surveys included tags 114 through 275.

2.3 DIAMETER

Using a diameter tape, measurements were taken at four and one-half feet above mean natural grade (two feet above grade for trees within the City of Monrovia boundaries); multiple trunks were measured separately. The diameter of the largest two trunks was combined to determine the total diameter of each tree. In addition, the total number of trunks was recorded. The diameter was estimated for trees that were not accessible (e.g., surrounded by poison oak or located on a steep slope).

2.4 HEIGHT AND CANOPY

The height of each tree was estimated from mean natural grade to the highest branch. Also, the diameter of each tree's canopy was estimated at its widest point.

2.5 AESTHETICS

Each tree assessed was inspected and compared to an archetype tree (considered excellent on all points mentioned below) of the same species. Tree aesthetics were evaluated with respect to overall form and symmetry, crown balance, branching pattern, and broken branches.

The trees were rated on a scale of 1 to 5, as follows:

1: Very Poor

2: Poor

3: Fair

4: Good

5: Excellent

2.6 HEALTH

The health of each tree was assessed based on visual evidence of vigor, such as the amount of foliage; leaf color and size; presence of branch or twig dieback; severity of insect infestation; the presence of disease; heart rot; fire damage; mechanical damage; amount of new growth; appearance of bark; and rate of callous development over wounds. The tree's structural integrity was also evaluated with respect to branch attachment, branch placement, root health, and stability. In addition, the health assessment considered such elements as the presence of decay, weak branch attachments, and the presence of exposed roots due to soil erosion.

Based on the brief health assessment, each tree was rated using a scale of one to five, based on the criteria that are summarized in Table 1.

TABLE 1
TREE HEALTH RATING CRITERIA

Rating	Criteria
5	Tree in excellent health with abundant foliage and new leaf growth and no signs of herbivory or decay on trunk or branches. Root zone unconfined and unaffected by soil disturbing activities. Excellent overall tree structure and branch attachment.
4	Tree in very good health with ample green foliage and new leaf growth; evidence of minor but compartmentalized trunk/branch decay. Minor soil disturbance evident within root zone. Excellent tree structure overall.
3	Tree in moderate health with thin canopy overall. Minor, uncompartmentalized or moderate, compartmentalized trunk/branch decay evident. Evidence of ongoing soil disturbing activities within root zone, compacted soil, or confined root zone overall. Poor branch attachments or included bark present.
2	Tree in poor health; existing leaves yellowing and/or new leaf growth appears unhealthy; extensive limb or trunk damage. Root zone severely confined. Evidence of internal decay (fungus, bleeding sap). Poor overall soil conditions for root development.
1	Tree in obvious decline; existing leaves yellowing and no new leaf growth. Tree sounds hollow. Extensive limb or trunk damage.

SECTION 3.0 RESULTS

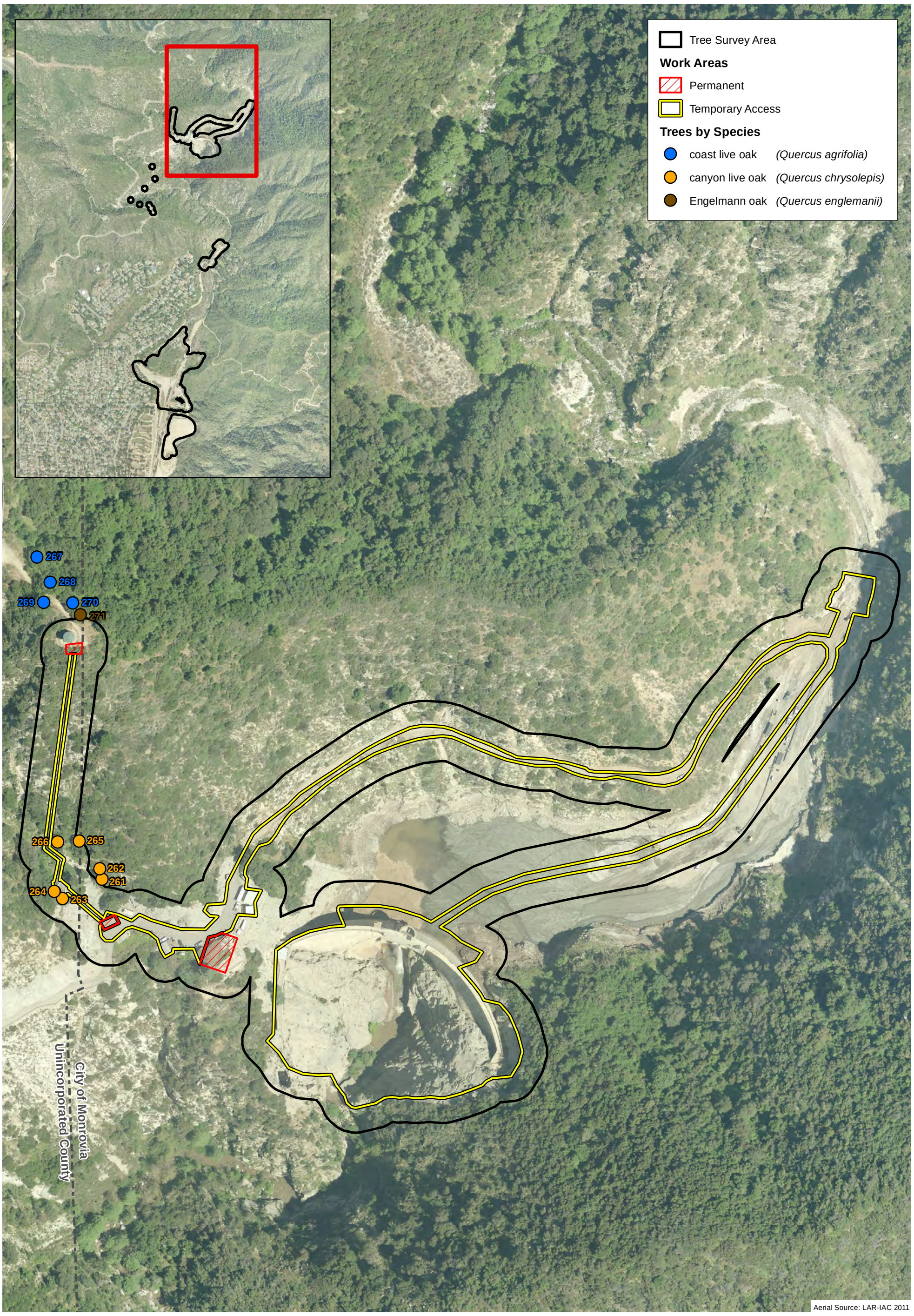
A total of 162 trees were documented within the tree survey area that met the minimum size requirement described in the various tree ordinances and/or the *California Fish and Game Code*. Tree locations are provided in Exhibits 2 through 6. At each location in the survey area, trees are either:

1. within the Project Work Areas and are presumed to be removed or protected and monitored;
2. adjacent to Project Work Areas so that protection measures should be taken to avoid impacts; or
3. in future inundation areas (i.e., current upland areas that will be periodically subject to flooding from an expanded Debris Dam inundation footprint) and will be monitored to identify any effects to their overall health from inundation.

In all, a total of four native trees are located within Project Work Areas. These include three western sycamores (*Platanus racemosa*) and one coast live oak. All four of these trees are located at the Wilderness Park Culvert Crossing. Two sycamore trees (Trees Numbers 220 and 221) located downstream of the culvert crossing would be removed in order to construct the Project. One sycamore tree (Tree Number 222) is located at the edge of the permanent impact area and would likely not need to be removed; however, to provide for a conservative analysis, this tree is considered impacted. The oak tree (Tree Number 219) is also located on the permanent impact boundary; however, this tree would not need to be removed. Grading for the culvert crossing would remain outside of the edge of the oak tree's canopy whenever possible. Construction activities occurring directly adjacent to the oak tree, and the sycamore tree if it is able to be preserved, could harm the trees' root systems and may affect the health of the trees. Therefore, during construction activities occurring directly adjacent to the canopy of this tree, a Certified Arborist should monitor the work to ensure that the tree is properly protected and to minimize the potential for harm to the health of the tree. A summary of trees that occur at each Project Work Area is provided in Tables 2 through 5 below (it should be noted that the coast live oak (Tree Number 219) adjacent to construction activities is subject to permitting by both the City of Arcadia and the CDFW, while the three western sycamores that would need to be removed are under the jurisdiction of the CDFW only). No trees protected by the Monrovia Municipal Code or the Los Angeles County Oak Tree Ordinance are proposed for removal.

As part of the improvements at the Debris Dam, six non-native deodar cedar trees (*Cedrus deodara*) located at the downstream toe of the embankment would also be removed. These trees are not subject to the jurisdiction of any tree ordinance nor are they regulated by the CDFW.

Several trees are located in the immediate vicinity of construction activities. No impacts to these trees are anticipated and recommendations to ensure that these trees are protected in place are provided in Section 4. Native trees in the construction buffer area that are subject to regulation by a city/county tree ordinance and/or the CDFW include 1 white alder (*Alnus rhombifolia*), 17 western sycamores, 74 coast live oaks, 9 canyon live oaks (*Quercus chrysolepis*), 3 Englemann oaks, and 18 Goodding's black willows (*Salix gooddingii*).



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Tree Locations – Dam

Exhibit 2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

180 90 0 180 Feet

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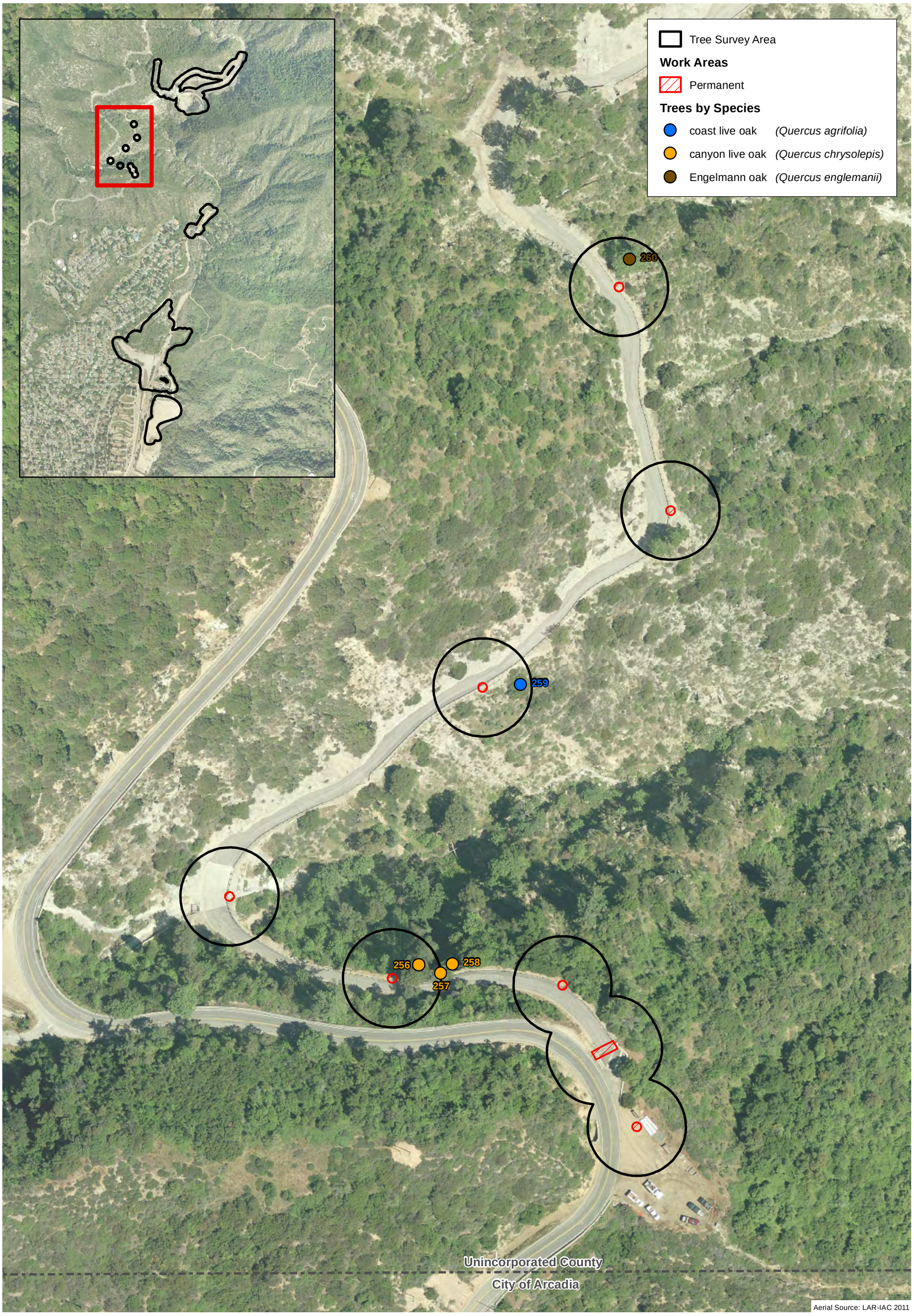

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Tree Locations – Dam (Access Road)

Exhibit 3

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

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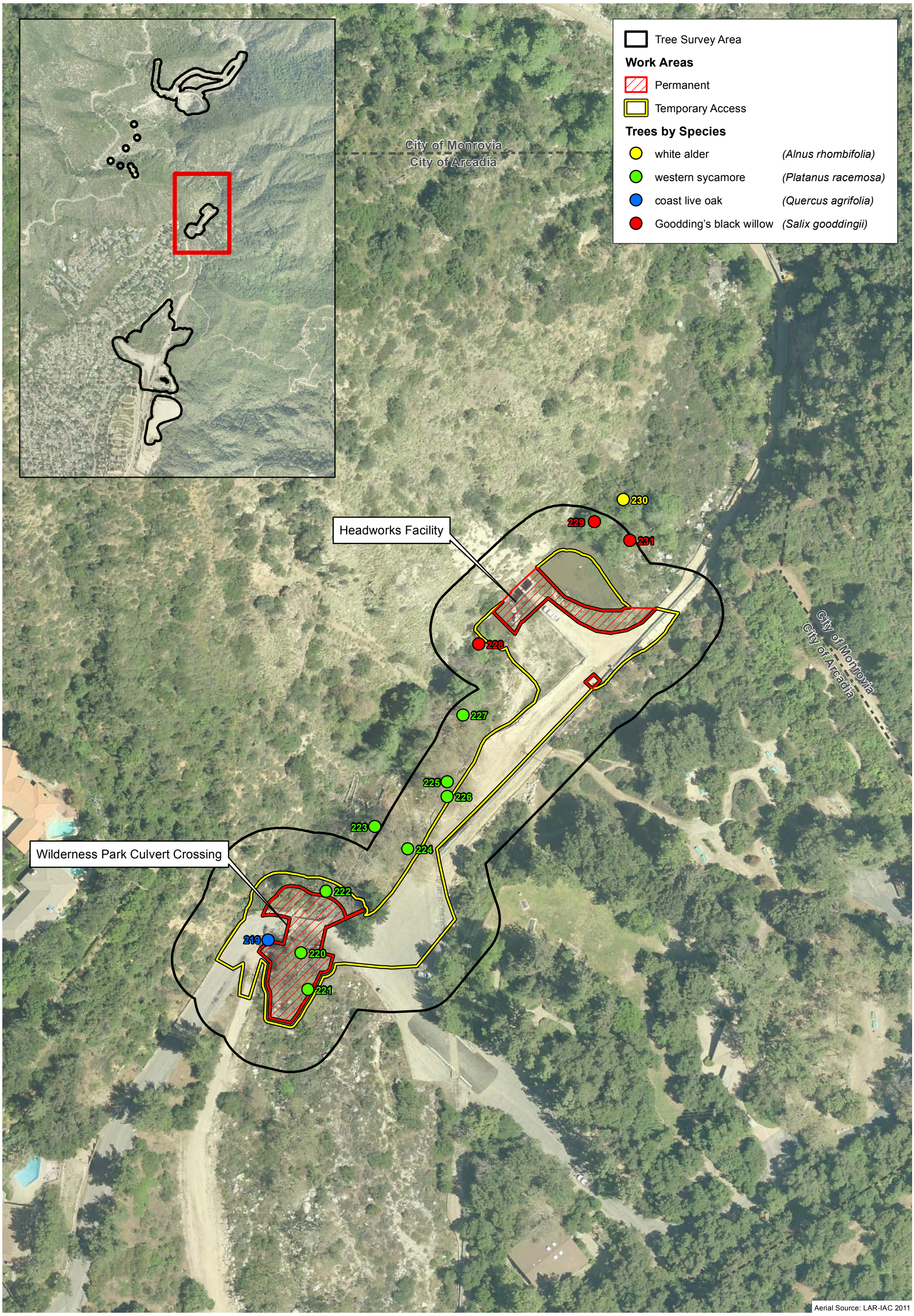

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Tree Locations – Headworks and Wilderness Park Culvert Crossing

Exhibit 4

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

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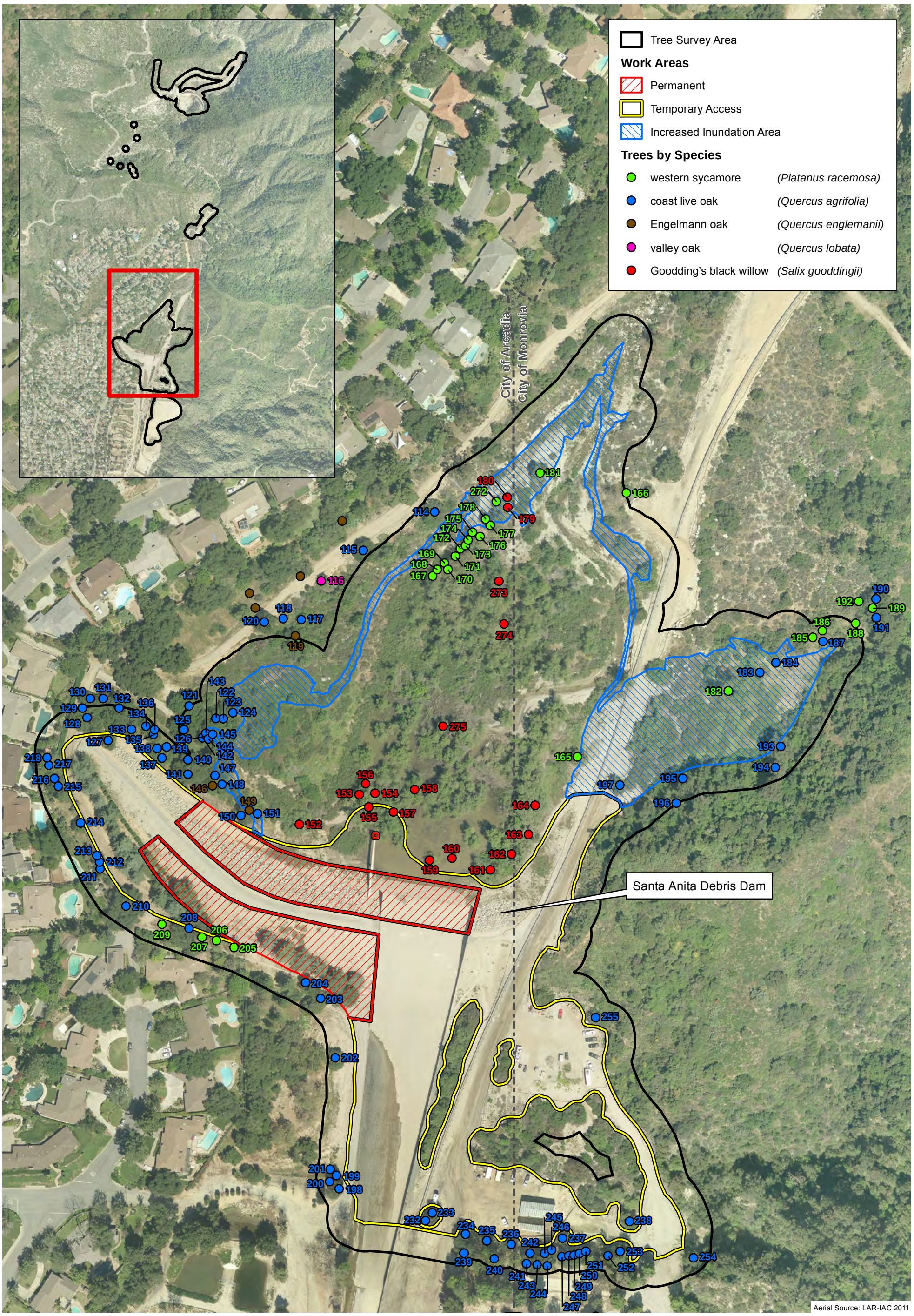

Tree Locations – Debris Dam

Exhibit 5

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

160 80 0 160 Feet

BonTerra PSOMAS

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Tree Locations – Debris Dam (Sediment Placement Site)

Exhibit 6

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

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TABLE 2
TREES WITHIN SURVEY AREA REGULATED BY CITY OF ARCADIA

Species	Existing Trees (Trees Within Project Work Areas)						
	Dam	Dam Access Road	Headworks Area	Wilderness Park Culvert Crossing	Debris Dam[a]	Sediment Placement Site	Total
Quercus agrifolia coast live oak	–	–	–	1 (1[b])	57 (0)	5 (0)	**63 (1[b])**
Quercus englemannii Englemann oak	–	–	–	–	2 (0)	–	**2 (0)**
Total	**0 (0)**	**0 (0)**	**0 (0)**	**1 (1)**	**59 (0)**	**5 (0)**	**65 (1[b])**

[a] 9 coast live oaks (numbers 126, 142-145, 147, 148, 150, and 151) and 1 Englemann oak (number 149) are located within future inundation areas.
[b] Although this oak tree (Tree Number 219) is located at the edge of the permanent impact boundary, construction plans show that this tree would not need to be removed to construct the Project.

TABLE 3
TREES WITHIN SURVEY AREA REGULATED BY CITY OF MONROVIA

Species	Existing Trees (Trees Within Project Work Areas)						
	Dam	Dam Access Road	Headworks Area	Wilderness Park Culvert Crossing	Debris Dam[a]	Sediment Placement Site	Total
Quercus agrifolia coast live oak	–	–	–	–	21 (0)	10 (0)	**31 (0)**
Quercus chrysolepis canyon live oak	2 (0)	–	–	–	–	–	**2 (0)**
Total	**2 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**21 (0)**	**10 (0)**	**33 (0)**

[a] One coast live oak (number 197) is located within future inundation areas.

TABLE 4
TREES WITHIN SURVEY AREA
REGULATED BY COUNTY OF LOS ANGELES

Species	Existing Trees (Trees Within Project Work Areas)						
	Dam	Dam Access Road	Headworks Area	Wilderness Park Culvert Crossing	Debris Dam	Sediment Placement Site	Total
Quercus agrifolia coast live oak	4 (0)	1 (0)	–	–	–	–	**5 (0)**
Quercus chrysolepis canyon live oak	4 (0)	3 (0)	–	–	–	–	**7 (0)**
Quercus englemannii Englemann oak	1 (0)	–	–	–	–	–	**1 (0)**
Total	**9 (0)**	**4 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**13 (0)**

TABLE 5
TREES WITHIN SURVEY AREA REGULATED BY CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Species	Existing Trees (Trees Within Project Work Areas)[a]						
	Dam	Dam Access Road	Headworks Area	Wilderness Park Culvert Crossing	Debris Dam[b]	Sediment Placement Site	Total
Alnus rhombifolia white alder	–	–	1 (0)	–	–	–	**1 (0)**
Platanus racemosa western sycamore	–	–	2 (0)	3 (3)	15 (0)	–	**20 (3)**
Quercus agrifolia coast live oak	–	–	–	1 (1[c])	49 (0)	–	**50 (1[c])**
Quercus chrysolepis canyon live oak	6 (0)	–	–	–	–	–	**6 (0)**
Quercus englemannii Englemann oak	–	–	–	–	3 (0)	–	**3 (0)**
Quercus lobata valley oak	–	–	–	–	1 (0)	–	**1 (0)**
Salix gooddingii black willow	–	–	3 (0)	–	15 (0)	–	**18 (0)**
Total	6 (0)	0 (0)	6 (0)	4 (4[c])	83 (0)	0 (0)	**99 (4[c])**

[a] Trees under CDFW jurisdiction are also subject to regulation by the ordinances summarized in Tables 2, 3, and 4. These trees are subject to overlapping jurisdictions.
[b] Five western sycamores (numbers 165, 177, 178, 181, and 272), nine coast live oaks (numbers 126, 142-145, 147, 148, 150, and 151), one Englemann oak (number 149), and two Goodding's black willows (numbers 179 and 180) are located within future inundation areas.
[c] Although this oak tree (number 219) is located at the edge of the permanent impact boundary, construction plans show that this tree would not need to be removed to construct the Project.

As part of the proposed project, the Debris Dam spillway will be raised four feet to increase the water retaining capacity of the Debris Dam reservoir. As a result, 21 trees that are currently outside the inundation area of the Debris Dam will be subject to periodic flooding. These 21 trees include 6 western sycamores, 12 coast live oaks, 1 Englemann oak, and 2 Goodding's black willows. Because the effect the Debris Dam changes would have on these 21 trees is currently unknown, the LACFCD will implement a post-construction long-term monitoring program to identify any changes to the health of trees in the future inundation areas. This monitoring program is discussed in more detail in Section 5.

Please note that of the 21 trees listed above that are within the future inundation areas, 1 western sycamore (tree number 182) and 3 coast live oaks (tree numbers 183, 184, and 197) are upland trees currently outside of the CDFW's jurisdiction. However, once the Debris Dam spillway is raised, these trees would presumably be considered under the CDFW's jurisdiction.

SECTION 4.0 TREE PRESERVATION RECOMMENDATIONS

Construction activities have the potential for unintended and/or indirect negative effects on trees. In order to avoid any unintended harm to trees adjacent to proposed construction areas, the following items are recommended:

1. Brightly-colored construction fencing shall be placed along or outside the root protection zone for all trees to be preserved (defined as the outer canopy edge, at least 15 feet from the trunk) that are located within 50 feet of proposed work areas. For trees that are subject to the Los Angeles County Oak Tree Ordinance, fencing shall be placed at least five feet outside the dripline (at least 15 feet from the trunk).

2. No stockpiling of materials or vehicle operation shall be allowed within the root protection zone.

3. Limbs can be pruned if necessary to allow construction equipment access. Small branches (less than three inches diameter) can be trimmed without the supervision of a Certified Arborist if less than ten percent of the total canopy will be removed. If larger branches need to be removed or if more than ten percent of the total canopy will be affected, these activities shall be supervised by a Certified Arborist.

4. Changes to the grade or drainage patterns in the areas surrounding a root protection zone shall be avoided so that excess water does not drain to these trees.

5. Any activities (e.g., vehicle operation) that need to occur within the root protection zone shall be coordinated with a Certified Arborist to mitigate the effects.

6. An on-site pre-construction field meeting shall be held to inform all construction personnel of these restrictions prior the initiation of work.

SECTION 5.0 LONG-TERM MONITORING GUIDELINES

As described in Section 3.0, 21 native trees are located within future inundation areas of the Debris Dam (areas currently outside the inundation zone of the Debris Dam that would be subject to inundation after the Debris Dam spillway is raised). In order to monitor the possible effects that inundation may have on these trees, 16 trees within or immediately adjacent to the future inundation area were selected and their health and structure were assessed. Trees were selected based on their location and the ability to reach and photograph them over time. These trees include 5 western sycamores, 9 coast live oaks, and 2 Englemann oaks. In addition, four Goodding's black willows were selected that are located within the current inundation area for the Debris Dam. The purpose of the monitoring is to detect negative health effects on trees that are (1) currently outside the inundation area of the Debris Dam to determine if periodic flooding will harm their health and (2) within the existing inundation area of the Debris Dam to determine if deeper and/or longer lasting inundation events harm willow trees that are found in the basin. A summary of the trees to be included in the long-term monitoring study is provided in Table 6.

After the Debris Dam construction is complete, 20 trees that comprise the monitoring study will be assessed each spring following the rainy season for five years. The health rating rubric shown in Table 1 was used to determine baseline health conditions and will be used future evaluations. A Certified Arborist will evaluate these trees for signs of negative health effects from flooding (yellowing leaves, lack of new growth, trunk decay, etc.). The dbh of these trees will be measured and tracked over time to ensure that trees continue to grow (other trees outside of the future inundation areas will also be measured to compare growth rates). Photographs of the 20 trees in this study were taken during the survey for this report to document baseline conditions and are provided in Appendix B. Future photographs will be taken during the long-term monitoring program to compare overall vigor of each tree's crown.

TABLE 6
TREES TO BE MONITORED IN FUTURE INUNDATION AREAS

Tree Number	Species	No. of Trunks	DBH (in)	Height (ft)	Canopy Width (ft)	Health Rating	Aesthetic Rating	Notes
122	*Quercus agrifolia* coast live oak	2	13.7, 7.3	30	20	4	4	
123	*Quercus agrifolia* coast live oak	1	8.2	25	15	4	3	No baseline photo taken
124	*Quercus agrifolia* coast live oak	1	6.1	25	25	4	3	
142	*Quercus agrifolia* coast live oak	1	18.0	50	25	4	4	
146	*Quercus englemannii* Englemann oak	3	13.0, 11.2, 7.5	50	35	5	4	
147	*Quercus agrifolia* coast live oak	1	7.9	20	20	4	3	
148	*Quercus agrifolia* coast live oak	1	10.2	20	15	5	3	
149	*Quercus englemannii* Englemann oak	1	22.0	50	40	5	5	
159	*Salix gooddingii* black willow	3	14.1, 12.2, 11.6	40	40	4	3	Within debris dam basin
165	*Platanus racemosa* western sycamore	1	19.4	25	30	4	4	

TABLE 6
TREES TO BE MONITORED IN FUTURE INUNDATION AREAS

Tree Number	Species	No. of Trunks	DBH (in)	Height (ft)	Canopy Width (ft)	Health Rating	Aesthetic Rating	Notes
177	*Platanus racemosa* western sycamore	2	13.0, 8.5	35	15	4	3	
181	*Platanus racemosa* western sycamore	7	8.5, 8.4, 6.0, 5.5, 5.5, 5.5, 4.0	35	35	4	4	
182	*Platanus racemosa* western sycamore	3	26.5, 22.2, 7.3	60	40	3	4	Large limb broken from poor branching structure
183	*Quercus agrifolia* coast live oak	1	6.0	20	15	5	4	
184	*Quercus agrifolia* coast live oak	1	5.8	15	12	4	3	
197	*Quercus agrifolia* coast live oak	1	19.5	30	25	5	5	Large tree adjacent to unpaved access road
272	*Platanus racemosa* western sycamore	1	5.5	25	20	4	4	
273	*Salix gooddingii* black willow	1	18.1	35	30	4	4	Within debris dam basin
274	*Salix gooddingii* black willow	1	12.0	35	30	4	4	Within debris dam basin
275	*Salix gooddingii* black willow	1	12.8	35	35	4	4	Within debris dam basin

dbh: diameter at breast height; in: inches; ft: feet

To determine what effect, if any, that inundation will have on the health of the trees in the future inundation areas, these trees will be visited annually for a period of five years to identify any deterioration in their health. During each annual visit, the dbh of each tree will be measured and the tree's health will be assessed based on the criteria shown in Table 1. Trees will be considered "affected" if a tree's health rating declines two or more rating levels after an inundation event. Affected trees will be monitored for a two year period to determine if their health condition subsequently improves after the inundation event. If an affected tree shows improvement in the health rating during this two year period, it shall be considered a "recovered" tree and would not need to be mitigated. However, if the health condition does not improve during this period, then such a tree would be considered "impacted" and would require mitigation as described below in Section 6.0.

SECTION 6.0 TREE REPLACEMENT REQUIREMENTS

A total of 4 trees are located within Project Work Areas and subject to the jurisdiction of a tree ordinance or regulated by CDFW; up to three of the trees would be removed. All of these trees are regulated by Section 1602 of the *California Fish and Game Code.* The one coast live oak that would not be removed, but is located adjacent to construction activities, is also subject to regulation by the Arcadia Municipal Code.

Impacts to trees that are regulated by the Arcadia Municipal Code typically deal with individual trees that a homeowner would propose for removal. Therefore, the City of Arcadia may not require tree replacement for this type of project. Tree replacement requirements are determined by the Arcadia Planning Director once a person or entity applies for a removal permit. Coordination with the City of Arcadia should be initiated to determine tree protection requirements.

No impacts to trees regulated by the City of Monrovia or County of Los Angeles are proposed, and no tree replacement would be required.

Tree replacement requirements for CDFW impacts are negotiated in the process of acquiring a Streambed Alteration Agreement. Typically, the CDFW requires escalating mitigation ratios based on each tree's trunk diameter (i.e., larger trees have a higher mitigation ratio). Though the tree replacement ratios are not codified in the *California Fish and Game Code*, the ratios shown in Table 7 are commonly used by the CDFW.

TABLE 7
ANTICIPATED MITIGATION FOR TREES UNDER CDFW JURISDICTION

Species		Tree Size (dbh)					Total
		< 5"	5-12"	12-24"	24-36"	>36"	
Platanus racemosa western sycamore	Impacts	–	–	–	–	3	**3**
	Replacement Ratio	2:1	5:1	10:1	15:1	20:1	
	Expected Replacement	–	–	–	–	60	**60**
Quercus agrifolia coast live oak	Impacts	–	–	–	–	–	–
	Replacement Ratio	2:1	5:1	10:1	15:1	20:1	
	Expected Replacement	–	–	–	–	–	–
Tree Impact Subtotal		–	–	–	–	3	**3**
Replacement Ratios		2:1	5:1	10:1	15:1	20:1	
Total Replacement Requirement		–	–	–	–	60	**60**
dbh: diameter at breast height; ": inches							

Additionally, within the future inundation areas, there are 10 trees that are protected by the Arcadia Municipal Code, 1 tree that is protected by the Monrovia Municipal Code, and 17 trees that will be under the jurisdiction of the CDFW following Debris Dam improvements. Because these trees are anticipated to be inundated infrequently in most years, this analysis assumes that these trees would not be affected. However, changing the site hydrology has the potential to negatively affect trees over the long-term; therefore, in accordance with a request from CDFW, these trees will be monitored for a period of five years following project implementation. If inundation affects the trees, as described in Section 5, affected trees would be mitigated at no less than a 1:1 ratio, in accordance with replacement ratios specified in the Project's Streambed Alteration Agreement. The Cities of Arcadia and Monrovia and CDFW should be consulted to ensure that they concur with the proposed approach.

SECTION 7.0 REFERENCES

Arcadia, City of. 2014 (May 21, codified through). Municipal Code, City of Arcadia (Article IX, Chapter 7, Oak Tree Preservation). Arcadia, CA: the City. https://library.municode.com/index.aspx?clientId=16197.

California, State of. 2004. (January, as amended). California Fish and Game Code. Section 1600-1603. Sacramento, CA: the State. http://www.leginfo.ca.gov/cgi-bin/displaycode?section=fgc&group=01001-02000&file=1600-1616

Los Angeles, County of. 2014 (August 20, updated through). Code of Ordinances, County of Los Angeles (Chapter 22.56, Oak Tree Permits). Los Angeles, CA: the County. https://library.municode.com/index.aspx?clientId=16274

Monrovia, City of. 2013 (June 4, codified through). Municipal Code, City of Monrovia (Chapter 8.52, City Trees and Tree Protection Ordinance). Monrovia, CA: the City. http://www.amlegal.com/nxt/gateway.dll/California/monrovia/monroviacaliforniacodeoforddinances?f=templates$fn=default.htm$3.0$vid=amlegal:monrovia_ca

APPENDIX A

RAW TREE DATA

NATIVE TREE DATA TABLE

Tree Tag #	Tree Species		# Main Trunks	DBH1 (in)	DBH2 (in)	DBH3 (in)	DBH4 (in)	DBH5 (in)	DBH6 (in)	DBH7 (in)	Sum of Largest Two Trunks (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	City of Arcadia Ordinance	City of Monrovia Ordinance	County of Los Angeles Ordinance	CDFW Tree	To be Removed
	Scientific Name	Common Name																		
114	*Quercus agrifolia*	coast live oak	2	21.0	19.3						40.3	35	50	3	4	X			X	
115	*Quercus agrifolia*	coast live oak	2	18.7	17.9						36.6	40	50	4	4	X			X	
116	*Quercus lobata*	valley oak	1	9.6							9.6	20	20	4	3				X	
117	*Quercus agrifolia*	coast live oak	2	5.8	5.6						11.4	15	20	4	3	X			X	
118	*Quercus agrifolia*	coast live oak	2	4.2	1.8						6.0	12	10	3	3	X			X	
119	*Quercus englemanii*	Engelmann oak	1	12.1							12.1	20	25	3	4				X	
120	*Quercus agrifolia*	coast live oak	2	15.3	14.5						29.8	25	30	4	4	X			X	
121	*Quercus agrifolia*	coast live oak	1	29.4							29.4	50	50	5	5	X			X	
122	*Quercus agrifolia*	coast live oak	2	13.7	7.3						21.0	30	40	4	4	X			X	
123	*Quercus agrifolia*	coast live oak	1	8.2							8.2	30	20	3	3	X			X	
124	*Quercus agrifolia*	coast live oak	1	6.1							6.1	25	15	4	3	X			X	
125	*Quercus agrifolia*	coast live oak	1	17.7							17.7	25	25	4	3	X			X	
126	*Quercus agrifolia*	coast live oak	1	28.0							28.0	40	35	3	4	X			X	
127	*Quercus agrifolia*	coast live oak	1	16.9							16.9	30	20	4	4	X			X	
128	*Quercus agrifolia*	coast live oak	2	6.0	5.4						11.4	20	15	3	2	X				
129	*Quercus agrifolia*	coast live oak	2	10.5	10.0						20.5	30	25	3	2	X				
130	*Quercus agrifolia*	coast live oak	1	9.6							9.6	25	15	3	2	X				
131	*Quercus agrifolia*	coast live oak	1	9.5							9.5	20	15	3	3	X				
132	*Quercus agrifolia*	coast live oak	1	51.0							51.0	70	60	5	5	X				
133	*Quercus agrifolia*	coast live oak	1	10.4							10.4	30	15	4	3	X			X	
134	*Quercus agrifolia*	coast live oak	3	10.0	4.7	4.0					14.7	25	15	2	2	X			X	
135	*Quercus agrifolia*	coast live oak	3	13.0	6.2	6.0					19.2	30	20	2	2	X			X	
136	*Quercus agrifolia*	coast live oak	2	7.3	4.8						12.1	15	12	3	2	X			X	
137	*Quercus agrifolia*	coast live oak	1	9.4							9.4	25	15	4	3	X			X	
138	*Quercus agrifolia*	coast live oak	1	18.7							18.7	25	25	4	4	X			X	
139	*Quercus agrifolia*	coast live oak	1	8.7							8.7	25	15	3	3	X			X	
140	*Quercus agrifolia*	coast live oak	1	6.5							6.5	25	15	3	3	X			X	
141	*Quercus agrifolia*	coast live oak	2	34.9	16.2						51.1	60	60	5	5	X			X	
142	*Quercus agrifolia*	coast live oak	1	18.0							18.0	50	25	4	4	X			X	
143	*Quercus agrifolia*	coast live oak	1	12.0							12.0	35	20	4	3	X			X	
144	*Quercus agrifolia*	coast live oak	1	8.5							8.5	25	15	4	3	X			X	
145	*Quercus agrifolia*	coast live oak	1	11.0							11.0	35	20	4	3	X			X	
146	*Quercus englemanii*	Engelmann oak	3	13.0	11.2	7.5					24.2	50	35	5	4	X			X	
147	*Quercus agrifolia*	coast live oak	1	7.9							7.9	20	20	4	3	X			X	
148	*Quercus agrifolia*	coast live oak	1	10.2							10.2	20	15	5	3	X			X	
149	*Quercus englemanii*	Engelmann oak	1	22.0							22.0	50	40	5	5	X			X	
150	*Quercus agrifolia*	coast live oak	2	7.7	4.0						11.7	20	20	4	3	X			X	
151	*Quercus agrifolia*	coast live oak	2	6.1	3.9						10.0	15	12	3	2	X			X	
152	*Salix gooddingii*	Goodding's black willow	2	20.0	18.0						38.0	40	50	5	2				X	
153	*Salix gooddingii*	Goodding's black willow	1	14.0							14.0	30	50	4	3				X	
154	*Salix gooddingii*	Goodding's black willow	2	12.0	10.0						22.0	30	50	4	3				X	
155	*Salix gooddingii*	Goodding's black willow	2	18.0	10.0						28.0	30	50	4	3				X	
156	*Salix gooddingii*	Goodding's black willow	2	10.0	8.0						18.0	30	50	4	3				X	
157	*Salix gooddingii*	Goodding's black willow	4	20.0	14.0	12.0	10.0				34.0	50	50	4	3				X	

Tree Tag #	Tree Species		# Main Trunks	DBH1 (in)	DBH2 (in)	DBH3 (in)	DBH4 (in)	DBH5 (in)	DBH6 (in)	DBH7 (in)	Sum of Largest Two Trunks (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	City of Arcadia Ordinance	City of Monrovia Ordinance	County of Los Angeles Ordinance	CDFW Tree	To be Removed
	Scientific Name	Common Name																		
158	*Salix gooddingii*	Goodding's black willow	1	16.0							16.0	20	20	4	3				X	
159	*Salix gooddingii*	Goodding's black willow	3	14.1	12.2	11.6					26.3	40	40	4	3				X	
160	*Salix gooddingii*	Goodding's black willow	3	9.0	8.0	6.0					17.0	35	25	4	3				X	
161	*Salix gooddingii*	Goodding's black willow	5	13.0	13.0	10.0	10.0	8.0			26.0	30	30	4	3				X	
162	*Salix gooddingii*	Goodding's black willow	4	13.0	12.0	12.0	9.0				25.0	30	30	4	3				X	
163	*Salix gooddingii*	Goodding's black willow	4	16.0	12.0	12.0	10.0				28.0	50	30	4	3				X	
164	*Salix gooddingii*	Goodding's black willow	1	28.0							28.0	45	30	4	3				X	
165	*Platanus racemosa*	western sycamore	1	19.4							19.4	25	30	4	4				X	
166	*Platanus racemosa*	western sycamore	1	28.0							28.0	35	25	3	3				X	
167	*Platanus racemosa*	western sycamore	2	10.7	7.1						17.8	40	20	4	3				X	
168	*Platanus racemosa*	western sycamore	2	9.8	8.0						17.8	35	15	4	3				X	
169	*Platanus racemosa*	western sycamore	2	8.8	5.9						14.7	35	15	4	3				X	
170	*Platanus racemosa*	western sycamore	1	7.9							7.9	35	15	4	3				X	
171	*Platanus racemosa*	western sycamore	2	11.6	4.7						16.3	35	15	4	3				X	
172	*Platanus racemosa*	western sycamore	1	12.0							12.0	35	15	2	3				X	
173	*Platanus racemosa*	western sycamore	1	11.2							11.2	35	15	4	3				X	
174	*Platanus racemosa*	western sycamore	1	10.1							10.1	35	15	4	3				X	
175	*Platanus racemosa*	western sycamore	1	14.0							14.0	20	10	1	3				X	
176	*Platanus racemosa*	western sycamore	3	10.1	9.0	7.0					19.1	35	15	2	3				X	
177	*Platanus racemosa*	western sycamore	2	13.0	8.5						21.5	35	15	4	3				X	
178	*Platanus racemosa*	western sycamore	2	10.7	5.7						16.4	35	15	4	3				X	
179	*Salix gooddingii*	Goodding's black willow	2	8.0	6.5						14.5	25	15	4	2				X	
180	*Salix gooddingii*	Goodding's black willow	3	5.5	5.5	5.0					11.0	15	25	4	3				X	
181	*Platanus racemosa*	western sycamore	7	8.5	8.4	6.0	5.5	5.5	5.5	4.0	16.9	35	35	4	4				X	
182	*Platanus racemosa*	western sycamore	3	26.5	22.2	7.3					48.7	60	40	3	4					
183	*Quercus agrifolia*	coast live oak	1	6.0							6.0	20	15	5	4					
184	*Quercus agrifolia*	coast live oak	1	5.8							5.8	15	12	4	3					
185	*Platanus racemosa*	western sycamore	4	22.0	18.0	10.0	7.0				40.0	50	40	4	4					
186	*Platanus racemosa*	western sycamore	2	9.9	7.4						17.3	30	25	3	3					
187	*Quercus agrifolia*	coast live oak	2	18.1	8.5						26.6	35	45	5	4		X			
188	*Platanus racemosa*	western sycamore	1	11.3							11.3	25	30	3	3					
189	*Platanus racemosa*	western sycamore	1	13.3							13.3	25	25	3	3					
190	*Quercus agrifolia*	coast live oak	4	36.0	25.7	19.4	11.5				61.7	60	80	5	4		X			
191	*Quercus agrifolia*	coast live oak	3	26.3	19.3	6.0					45.6	70	60	5	4		X			
192	*Platanus racemosa*	western sycamore	1	10.0							10.0	40	20	4	4					
193	*Quercus agrifolia*	coast live oak	1	28.0							28.0	60	40	5	4		X			
194	*Quercus agrifolia*	coast live oak	1	14.5							14.5	35	25	5	4		X			
195	*Quercus agrifolia*	coast live oak	2	18.0	14.0						32.0	40	30	5	4		X			
196	*Quercus agrifolia*	coast live oak	1	22.0							22.0	40	30	5	4		X			
197	*Quercus agrifolia*	coast live oak	1	19.5							19.5	30	25	5	5		X			
198	*Quercus agrifolia*	coast live oak	1	7.6							7.6	15	15	2	3	X				
199	*Quercus agrifolia*	coast live oak	1	9.3							9.3	20	15	3	4	X				
200	*Quercus agrifolia*	coast live oak	1	10.3							10.3	25	15	3	4	X				
201	*Quercus agrifolia*	coast live oak	1	19.3							19.3	25	25	4	4	X				
202	*Quercus agrifolia*	coast live oak	1	12.0							12.0	20	20	4	4	X				

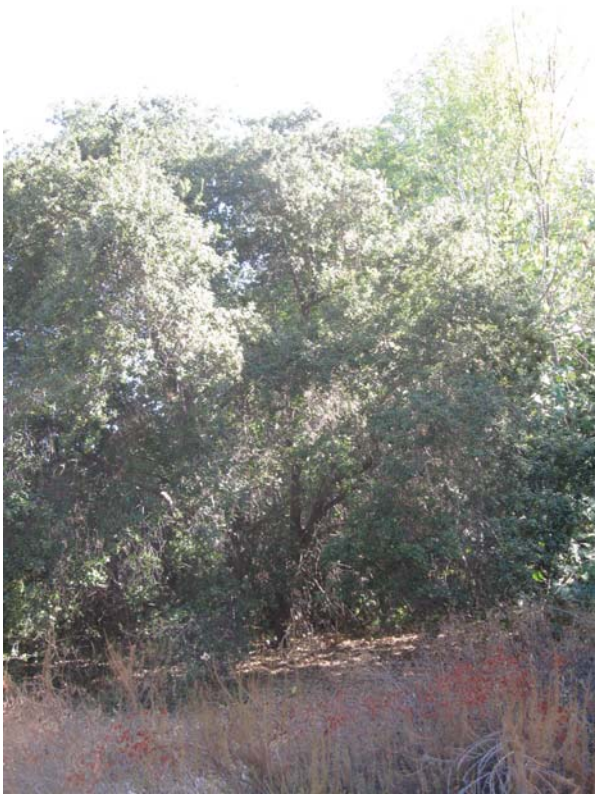
Tree Tag #	Tree Species		# Main Trunks	DBH1 (in)	DBH2 (in)	DBH3 (in)	DBH4 (in)	DBH5 (in)	DBH6 (in)	DBH7 (in)	Sum of Largest Two Trunks (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	City of Arcadia Ordinance	City of Monrovia Ordinance	County of Los Angeles Ordinance	CDFW Tree	To be Removed
	Scientific Name	Common Name																		
203	*Quercus agrifolia*	coast live oak	1	17.6							17.6	35	25	4	4	X				
204	*Quercus agrifolia*	coast live oak	1	18.3							18.3	40	30	4	4	X				
205	*Platanus racemosa*	western sycamore	1	19.7							19.7	40	20	4	4					
206	*Platanus racemosa*	western sycamore	1	22.3							22.3	45	25	4	4					
207	*Platanus racemosa*	western sycamore	1	25.0							25.0	50	25	4	4					
208	*Quercus agrifolia*	coast live oak	1	50.0							50.0	60	50	5	5	X				
209	*Platanus racemosa*	western sycamore	1	16.9							16.9	40	25	2	3					
210	*Quercus agrifolia*	coast live oak	1	64.0							64.0	50	60	5	5	X				
211	*Quercus agrifolia*	coast live oak	1	8.5							8.5	20	15	4	4	X				
212	*Quercus agrifolia*	coast live oak	1	3.6							3.6	15	10	4	3					
213	*Quercus agrifolia*	coast live oak	1	15.9							15.9	30	20	5	4	X				
214	*Quercus agrifolia*	coast live oak	2	10.6	9.3						19.9	25	20	4	4	X				
215	*Quercus agrifolia*	coast live oak	2	14.6	8.9						23.5	40	20	4	4	X				
216	*Quercus agrifolia*	coast live oak	1	17.0							17.0	40	20	4	4	X				
217	*Quercus agrifolia*	coast live oak	1	14.6							14.6	25	15	3	3	X				
218	*Quercus agrifolia*	coast live oak	1	10.3							10.3	15	15	2	2	X				
219	*Quercus agrifolia*	coast live oak	2	10.0	6.0						16.0	25	20	4	4	X			X	
220	*Platanus racemosa*	western sycamore	4	27.0	25.0	22.0	15.0				52.0	50	60	4	5				X	X
221	*Platanus racemosa*	western sycamore	5	30.0	27.0	27.0	24.0	5.0			57.0	50	40	4	4				X	X
222	*Platanus racemosa*	western sycamore	7	25.0	21.5	16.0	14.0	14.0	6.0	5.0	46.5	40	40	4	4				X	X
223	*Platanus racemosa*	western sycamore	1	28.5							28.5	40	40	4	4				X	
224	*Platanus racemosa*	western sycamore	4	16.6	16.0	13.2	9.0				32.6	40	50	4	4					
225	*Platanus racemosa*	western sycamore	2	23.3	19.2						42.5	50	25	5	5					
226	*Platanus racemosa*	western sycamore	2	15.4	5.5						20.9	50	40	4	4					
227	*Platanus racemosa*	western sycamore	2	27.0	18.6						45.6	50	40	4	4				X	
228	*Salix gooddingii*	Goodding's black willow	5	10.0	7.0	7.0	6.0	5.0			17.0	40	40	4	3				X	
229	*Salix gooddingii*	Goodding's black willow	2	12.0	10.0						22.0	30	20	4	3				X	
230	*Alnus rhombifolia*	white alder	2	10.0	8.0						18.0	25	20	4	3				X	
231	*Salix gooddingii*	Goodding's black willow	3	12.0	4.0	4.0					16.0	25	20	4	3				X	
232	*Quercus agrifolia*	coast live oak	1	9.4							9.4	25	15	3	4	X				
233	*Quercus agrifolia*	coast live oak	2	20.5	16.1						36.6	25	25	4	4	X				
234	*Quercus agrifolia*	coast live oak	1	25.5							25.5	25	30	5	4	X			X	
235	*Quercus agrifolia*	coast live oak	5	8.5	6.5	5.0	4.0	4.0			15.0	20	20	3	3	X			X	
236	*Quercus agrifolia*	coast live oak	1	10.5							10.5	25	20	2	3	X			X	
237	*Quercus agrifolia*	coast live oak	1	17.0							17.0	40	20	5	4		X		X	
238	*Quercus agrifolia*	coast live oak	1	14.0							14.0	30	20	4	3		X			
239	*Quercus agrifolia*	coast live oak	3	13.0	12.5	6.0					25.5	40	25	4	3	X			X	
240	*Quercus agrifolia*	coast live oak	1	7.5							7.5	10	10	3	3	X			X	
241	*Quercus agrifolia*	coast live oak	1	22.0							22.0	30	25	4	4		X		X	
242	*Quercus agrifolia*	coast live oak	2	7.5	7.0						14.5	20	15	3	3				X	
243	*Quercus agrifolia*	coast live oak	1	9.0							9.0	30	15	4	4				X	
244	*Quercus agrifolia*	coast live oak	1	11.0							11.0	35	20	4	4		X		X	
245	*Quercus agrifolia*	coast live oak	1	8.0							8.0	20	15	3	3				X	
246	*Quercus agrifolia*	coast live oak	1	14.5							14.5	25	20	4	4		X		X	
247	*Quercus agrifolia*	coast live oak	2	10.5	9.0						19.5	25	15	3	3		X		X	

Tree Tag #	Tree Species		# Main Trunks	DBH1 (in)	DBH2 (in)	DBH3 (in)	DBH4 (in)	DBH5 (in)	DBH6 (in)	DBH7 (in)	Sum of Largest Two Trunks (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	City of Arcadia Ordinance	City of Monrovia Ordinance	County of Los Angeles Ordinance	CDFW Tree	To be Removed
	Scientific Name	Common Name																		
248	*Quercus agrifolia*	coast live oak	1	5.0							5.0	20	15	4	4				X	
249	*Quercus agrifolia*	coast live oak	1	12.5							12.5	25	15	4	4		X		X	
250	*Quercus agrifolia*	coast live oak	1	12.0							12.0	25	15	4	4		X		X	
251	*Quercus agrifolia*	coast live oak	1	14.0							14.0	25	15	4	4		X		X	
252	*Quercus agrifolia*	coast live oak	1	11.0							11.0	30	20	4	4		X		X	
253	*Quercus agrifolia*	coast live oak	3	15.0	10.5	4.0					25.5	25	25	3	3		X		X	
254	*Quercus agrifolia*	coast live oak	1	25.0							25.0	40	25	4	4		X		X	
255	*Quercus agrifolia*	coast live oak	1	12.0							12.0	25	20	4	4		X			
256	*Quercus chrysolepis*	canyon live oak	3	14.0	3.0	2.0					17.0	40	25	4	4			X		
257	*Quercus chrysolepis*	canyon live oak	2	9.5	4.0						13.5	25	20	3	3			X		
258	*Quercus chrysolepis*	canyon live oak	2	8.5	4.5						13.0	25	15	4	3			X		
259	*Quercus agrifolia*	coast live oak	2	7.0	5.0						12.0	20	20	3	3			X		
260	*Quercus englemanii*	Engelmann oak	3	4.0	4.0	2.0					8.0	15	12	4	3					
261	*Quercus chrysolepis*	canyon live oak	2	10.0	8.0						18.0	20	15	2	2		X		X	
262	*Quercus chrysolepis*	canyon live oak	5	8.0	7.0	7.0	5.0	3.0			15.0	30	20	4	4		X		X	
263	*Quercus chrysolepis*	canyon live oak	2	11.0	5.0						16.0	30	20	4	3			X	X	
264	*Quercus chrysolepis*	canyon live oak	2	18.0	14.0						32.0	30	30	4	4			X	X	
265	*Quercus chrysolepis*	canyon live oak	1	10.0							10.0	25	25	4	3			X	X	
266	*Quercus chrysolepis*	canyon live oak	1	12.0							12.0	25	25	3	3			X	X	
267	*Quercus agrifolia*	coast live oak	1	35.0							35.0	30	30	4	4			X		
268	*Quercus agrifolia*	coast live oak	1	27.0							27.0	30	30	4	4			X		
269	*Quercus agrifolia*	coast live oak	3	22.0	17.0	16.0					39.0	30	25	4	4			X		
270	*Quercus agrifolia*	coast live oak	4	15.0	11.0	10.0	8.0				26.0	30	30	4	4			X		
271	*Quercus englemanii*	Engelmann oak	4	7.0	5.0	5.0	4.0				12.0	30	30	4	4			X		
272	*Platanus racemosa*	western sycamore	1	5.5							5.5	25	20	4	4				X	
273	*Salix gooddingii*	Goodding's black willow	1	18.1							18.1	35	30	4	4				X	
274	*Salix gooddingii*	Goodding's black willow	1	12.0							12.0	35	30	4	4				X	
275	*Salix gooddingii*	Goodding's black willow	1	12.8							12.8	35	35	4	4				X	
276	*Quercus agrifolia*	coast live oak	1	8.8							8.8	20	15	4	4	X				
277	*Quercus agrifolia*	coast live oak	1	12.5							12.5	25	20	4	4	X				
278	*Quercus agrifolia*	coast live oak	1	17.2							17.2	30	20	4	4		X			
279	*Quercus agrifolia*	coast live oak	1	6.5							6.5	15	10	3	3					
280	*Quercus agrifolia*	coast live oak	5	9.0	6.0	5.0	5.0	3.0			15.0	15	15	3	3		X			
281	*Quercus agrifolia*	coast live oak	1	13.0							13.0	25	20	4	3		X			
282	*Quercus agrifolia*	coast live oak	2	25.0	12.5						37.5	25	35	3	3		X			
283	*Quercus agrifolia*	coast live oak	1	19.5							19.5	20	20	3	3		X			
284	*Quercus agrifolia*	coast live oak	1	10.5							10.5	15	20	4	4		X			
285	*Quercus agrifolia*	coast live oak	1	11.5							11.5	20	20	4	3		X			
286	*Quercus agrifolia*	coast live oak	1	12.0							12.0	30	20	4	4	X				
287	*Quercus berberidifolia*	scrub oak	1	8.3							8.3	20	15	3	3					
288	*Quercus agrifolia*	coast live oak	1	8.3							8.3	25	15	4	3	X				
289	*Quercus agrifolia*	coast live oak	1	15.0							15.0	30	20	4	4	X				
290	*Quercus agrifolia*	coast live oak	2	8.0	7.0						15.0	15	15	3	3		X			
291	*Quercus agrifolia*	coast live oak	2	5.5	4.8						10.3	12	15	3	3		X			
292	*Quercus agrifolia*	coast live oak	4	4.0	4.0	3.2	3.0				8.0	10	10	3	3		X			

ATTACHMENT B

BASELINE PHOTOGRAPHIC DOCUMENTATION

September 5, 2014. Baseline photo of Tree 122.



September 5, 2014. Baseline photo of Tree 122.

September 5, 2014. Baseline photo of Tree 124.

September 5, 2014. Baseline photo of Tree 124.

D:\Projects\COLADPW\J166\Graphics\TreeReport\ex_SP1.ai

Baseline Photo Documentation

Exhibit B-1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(09/18/2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\TreeReport\exB1_SP.pdf

September 5, 2014. Baseline photo of Tree 142.

September 5, 2014. Baseline photo of Tree 142.

September 5, 2014. Baseline photo of Tree 146.

September 5, 2014. Baseline photo of Tree 146.

D:\Projects\COLADPW\J166\Graphics\TreeReport\ex_SP2.ai

Baseline Photo Documentation

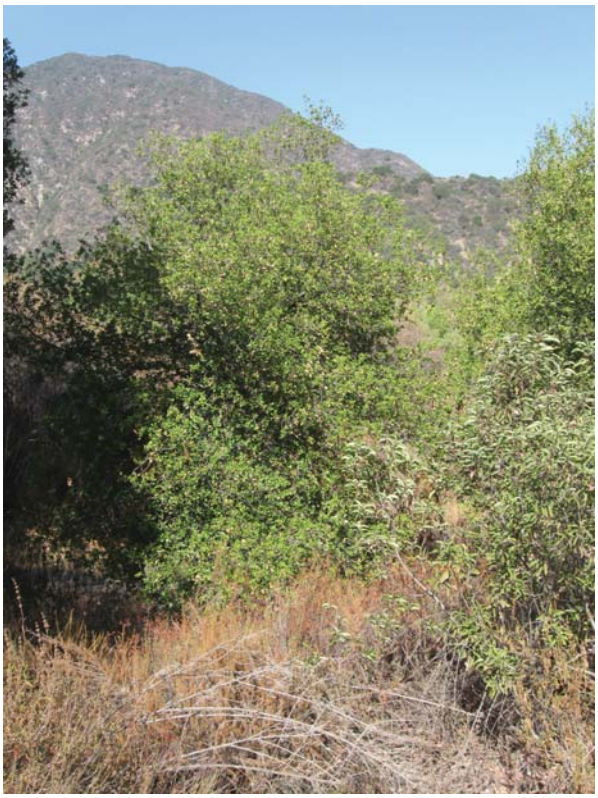
Exhibit B-2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(09/18/2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\TreeReport\exB2_SP.pdf

September 5, 2014. Baseline photo of Tree 147.



September 5, 2014. Baseline photo of Tree 147.

September 5, 2014. Baseline photo of Tree 148.

September 5, 2014. Baseline photo of Tree 148.

D:\Projects\COLADPW\J166\Graphics\TreeReport\ex_SP3.ai

Baseline Photo Documentation

Exhibit B-3

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(09/18/2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\TreeReport\exB3_SP.pdf

September 5, 2014. Baseline photo of Tree 149.

September 5, 2014. Baseline photo of Tree 149.

September 5, 2014. Baseline photo of Tree 165.

September 5, 2014. Baseline photo of Tree 165.

D:\Projects\COLADPW\J166\Graphics\TreeReport\ex_SP4.ai

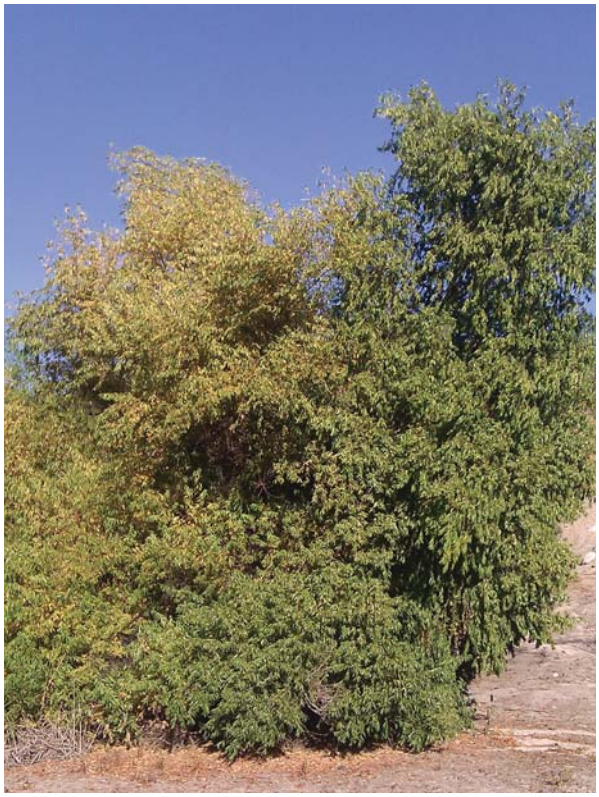
Baseline Photo Documentation

Exhibit B-4

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

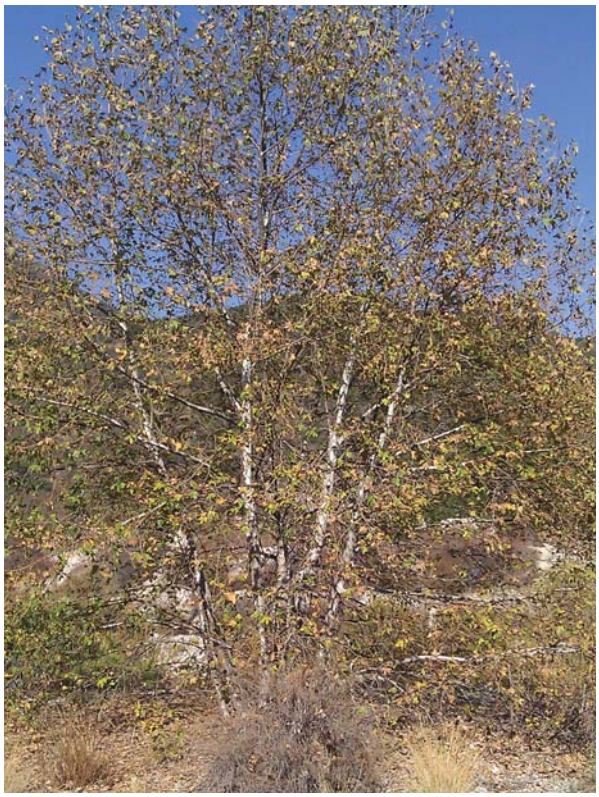
BonTerra PSOMAS

(09/18/2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\TreeReport\exB4_SP.pdf



September 5, 2014. Baseline photo of Tree 159.

September 5, 2014. Baseline photo of Tree 177.



September 5, 2014. Baseline photo of Tree 181.

September 5, 2014. Baseline photo of Tree 183.

D:\Projects\COLADPW\J166\Graphics\TreeReport\ex_SP5.ai

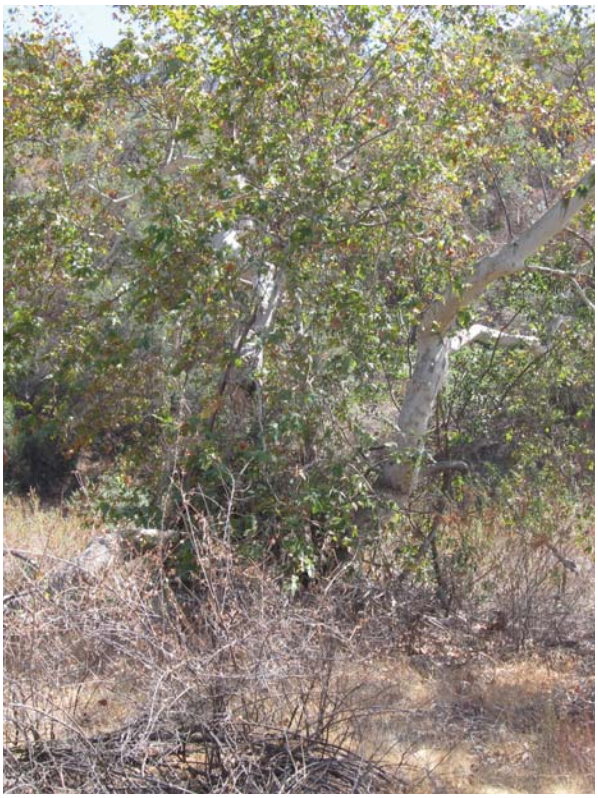
Baseline Photo Documentation

Exhibit B-5

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(09/18/2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\TreeReport\exB5_SP.pdf



September 5, 2014. Baseline photo of Tree 182.

September 5, 2014. Baseline photo of Tree 182.

September 5, 2014. Baseline photo of Tree 184.

September 5, 2014. Baseline photo of Tree 197.

D:\Projects\COLADPW\J166\Graphics\TreeReport\ex_SP6.ai

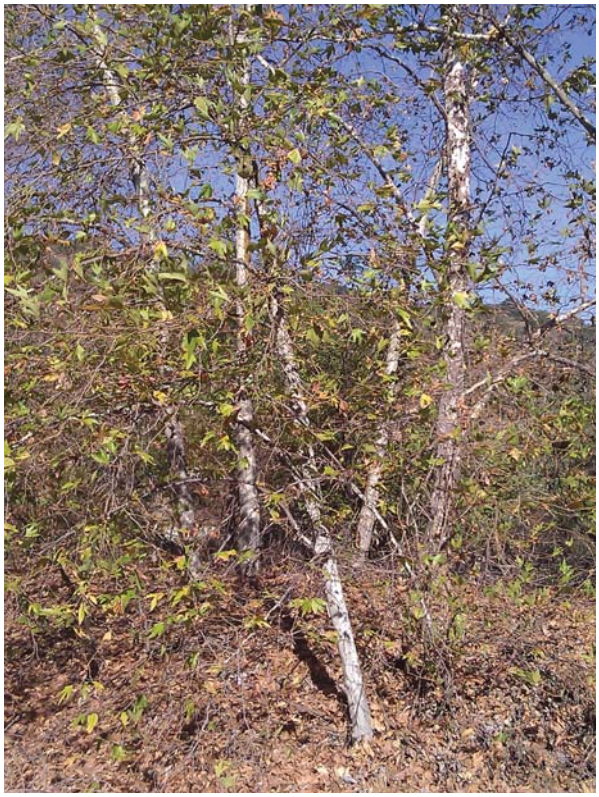
Baseline Photo Documentation

Exhibit B-6

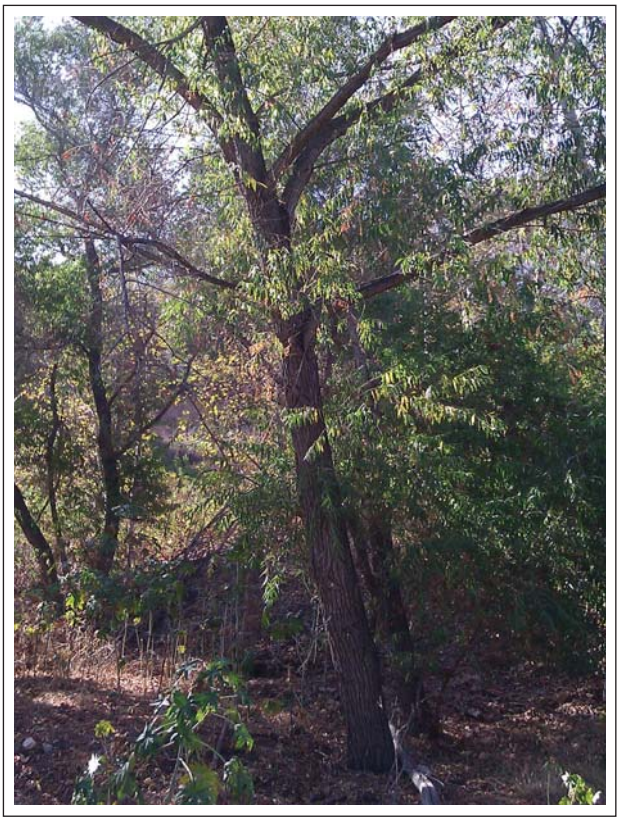
Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(09/18/2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\TreeReport\exB6_SP.pdf

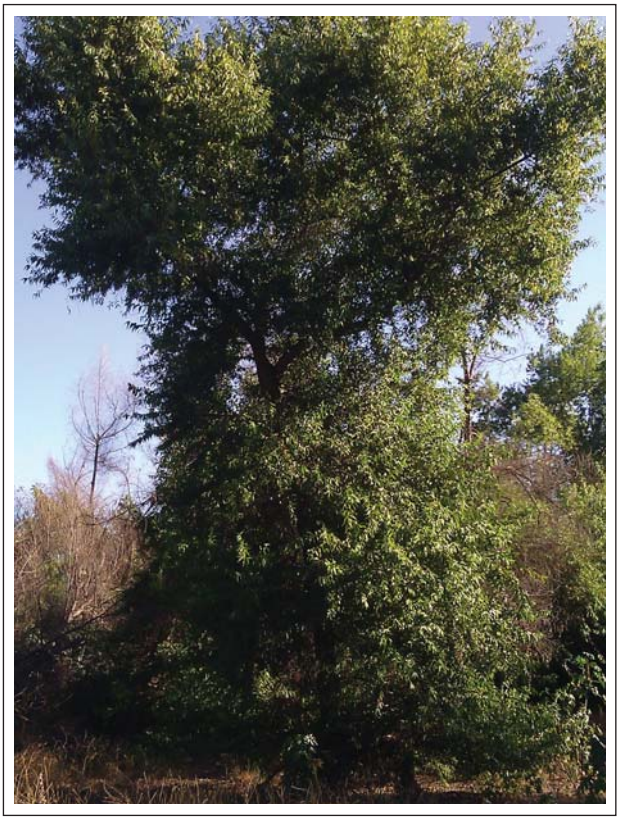


September 5, 2014. Baseline photo of Tree 272.



September 5, 2014. Baseline photo of Tree 273.

September 5, 2014. Baseline photo of Tree 274.



September 5, 2014. Baseline photo of Tree 275.

D:\Projects\COLADPW\J166\Graphics\TreeReport\ex_SP7.ai

Baseline Photo Documentation

Exhibit B-7

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(09/18/2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\TreeReport\exB7_SP.pdf

ATTACHMENT E

SPECIAL STATUS FISH SURVEY REPORT

BonTerra CONSULTING
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October 26, 2012

Ms. Susie Tharratt
Recovery Permit Coordinator
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

VIA EMAIL AND MAIL
Susie_Tharratt@fws.gov

Subject: Results of Focused Presence/Absence surveys for Special Status Fish Species for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California

Dear Ms. Tharratt:

This Letter Report presents the results of focused surveys to evaluate the presence or absence of special status fish species, including Santa Ana sucker (*Catostomus santaanae*), Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3), and arroyo chub (*Gila orcutti*) in the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project Site (hereinafter referred to as the "Project Site") in Los Angeles County, California. A Biologist with the necessary experience and the Federal Endangered Species Act 10(a) survey permit conducted the surveys according to U.S. Fish and Wildlife Service (USFWS) protocol.

The Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project would improve Los Angeles County Flood Control District facilities to better manage storm water runoff from the Santa Anita Canyon Watershed to achieve the following goals: (1) to reduce flood damage to the downstream communities; (2) to increase recharge of the local groundwater basin; and (3) to improve public safety by remediating seismic safety issues at the Dam and Debris Basin.

Survey Area

The Project Site is located in the City of Arcadia and the Angeles National Forest (Exhibit 1). It is located on the U.S. Geological Survey's (USGS') Mount Wilson 7.5-minute topographic quadrangle in Township 1 North, Range 11 West in portions of Sections 10 and 15 with elevations ranging from 750 to 1,300 feet above mean sea level (msl) (Exhibit 2). The survey area includes habitat from the Santa Anita Reservoir downstream along Santa Anita Creek to the Santa Anita Debris Basin (Exhibit 3). Private residences occur along the western boundary of the basin along Highland Oaks Boulevard. Open space in the Arcadia Wilderness Park and the Angeles National Forest occurs north and east of the survey area.

Santa Anita Canyon is very narrow and steep-sided along Santa Anita Creek as it flows approximately ½ mile below the Dam, opening into a broad alluvial wash in the Santa Anita Debris Basin. Vegetation types in the survey area include coastal sage scrub, chaparral, black willow riparian forest, sycamore woodland, mixed riparian forest, alder riparian forest,

elderberry woodland, mule fat scrub, coast live oak woodland, mixed woodland, ornamental, and ruderal. Representative photos are located in Attachment A.

Santa Anita Creek is perennial in the upper portion of the canyon and contains some slow moving pools. The lower portion of Santa Anita Creek and the Debris Basin are ephemeral and were dry at the time of the focused survey. Santa Anita Creek is characterized by very steep slopes, shallow soils, and watercourses contained within bedrock channels. Erosion has deposited alluvium (including boulders, cobbles, gravel, and coarse to fine sandy soils) within the stream course. Topography is irregular and stream grade, width, and flow velocity vary but are generally moderate to steep. The creek channel morphology in the survey area includes portions with narrow, incised, fast-moving water; portions with wider, slow-moving water; deep pools.

Background

Santa Ana Sucker

Santa Ana sucker is a federally listed Threatened species and a California Species of Special Concern. Its historic range consisted of the Los Angeles, San Gabriel, and Santa Ana River systems; only these populations within its historic range are federally protected. The California Natural Diversity Database (CNDDB) does not contain any records of Santa Ana sucker from the vicinity of the survey area. The nearest Santa Ana sucker occurrence reported in the CNDDB is from Fish Creek, a tributary of the San Gabriel River, roughly 5.5 miles east of the Project Site (CDFG 2012). The West Fork of the San Gabriel River, located roughly six miles northeast of the project area, also has a known extant population of Santa Ana sucker.

Santa Ana sucker is found in small, shallow streams with flows that run from slow to swift. It is most abundant where water is clear and unpolluted, although it can withstand seasonal turbidity. It is often associated with bottom materials of boulders, gravel, and cobble where there are growths of filamentous algae, though it is also occasionally found on sand or mud substrates. Although Santa Ana sucker has generalized stream habitat requirements, it is intolerant of polluted or highly modified streams (Moyle et al. 1995). The majority of its diet consists of algae and detritus that it scrapes from rock surfaces, as well as occasional aquatic insect larvae.

Adult Santa Ana suckers rarely exceed a standard length of eight inches (measured from snout tip to anterior of the caudal fin [tail fin]). It possesses a broad mouth with notches at the junction of the upper and lower lips, and the median notch on the lower lip is less well defined. Its body coloration is silver on the ventral (belly/underside) surface and darker with irregular blotches on the dorsal (back/top) surface. Its scale pattern has longitudinal lateral (along the length of their body) striping. The interradial membrane (membrane between the spines) of the caudal fin is pigmented, and the anal and pelvic fins normally lack pigment (Moyle et al. 1995).

Santa Ana suckers are relatively short-lived; they become reproductively mature by the first year and spawn during the first and second years. Most suckers do not survive past the second year, although a few live three to four years. There is no sexual dimorphism (appearances between males and females are distinguishable), although reproductive males develop breeding tubercles (small bumps) over most of the body (Moyle et al. 1995).

Santa Ana sucker spawning occurs from April until early July, but peaks in late May and early June. Santa Ana suckers spawn over gravel beds in flowing water where the female deposits the eggs in fine gravel substrate. The eggs hatch within 36 hours at 55.5 degrees Fahrenheit (°F), and the fry (fish hatchlings) congregate in shallow, slow-moving waters along the stream

margins in water depths ranging from 1 to 5.5 inches, often over very soft sand or mud substrates. Edgewater habitat is probably used by fry because (1) it typically contains fewer predatory fish and (2) shallow water is warmer and probably allows the suckers to grow more quickly (USFWS 2010).

The Santa Ana sucker is currently threatened by water diversions; alteration of stream channels; changes in the watershed that result in erosion and debris flows; pollution; and predation by non-native fishes. The primary cause for the extirpation of the Santa Ana sucker from lowland reaches of the Los Angeles, San Gabriel, and Santa Ana Rivers is most likely due to increased urbanization (USFWS 2000).

On January 4, 2005, the USFWS published a final rule designating 8,305 acres of critical habitat for the Santa Ana sucker (USFWS 2005). Two areas were designated in Los Angeles County, one along the San Gabriel River (Unit 2) and the other along Big Tujunga Creek (Unit 3). This designation did not include habitat for the species in Orange, Riverside, or San Bernardino Counties. Following lawsuits, the USFWS proposed a revised critical habitat on December 9, 2009, adding habitat along the Santa Ana River in Orange, Riverside, and San Bernardino Counties to critical habitat for the species (USFWS 2009). This increased the critical habitat designation to 9,331 acres. On December 14, 2010, the USFWS published the final rule formalizing the revised critical habitat (USFWS 2010). The survey area is not within the 2010 revised critical habitat for Santa Ana sucker.

Arroyo Chub

Arroyo chub is a California Species of Special Concern. Arroyo chub is a small freshwater fish native to the watersheds of the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita Rivers and those of the Malibu and San Juan Creeks. Arroyo chub has also been successfully introduced into the Santa Ynez, Santa Maria, Cuyama, and Mojave River systems and other smaller coastal streams (Moyle 2002). The arroyo chub is now common at only three of its native locations: Santa Margarita and De Luz Creeks in San Diego County; Trabuco and San Juan Creeks in Orange County; and Malibu Creek in Los Angeles County (Swift et al. 1993). The CNDDB does not contain any records of arroyo chub from the vicinity of the survey area.

The arroyo chub is a small fish that can reach standard lengths of 4.72 inches, although typical adult lengths are between 2.76 and 3.94 inches (Moyle 2002). Males are distinguished from females by their larger fins and, when breeding, by the prominent patch of tubercles on the upper surface of the pectoral fins (forelimbs). The arroyo chub has a chunky body, fairly large eyes, and a small mouth. Its body color is silver or grey to olive-green dorsally, white ventrally, and it usually has a dull grey lateral band (Moyle et al. 1995).

Arroyo chub is found in coastal freshwater streams and rivers with sustained flows and emergent vegetation. It prefers the slowest moving sections where the substrates consist primarily of sand or mud, but it can also be found in fairly fast-moving (31.5 inches/second or more) sections of stream over coarse substrates (Moyle 2002). The arroyo chub also prefers water with depths greater than 15.75 inches (Moyle 2002). This species is adapted to survive in widely fluctuating water temperatures (50°F to 75°F) and fluctuating dissolved oxygen levels common in coastal streams. The arroyo chub forms schools and feeds heavily on algae and other plants as well as small crustaceans and aquatic insect larvae (Moyle 2002).

Arroyo chubs rarely live beyond four years and begin to reproduce at one year of age (McGinnis 2006). Arroyo chubs breed more or less continuously from February through August, although

most spawning occurs in June and July. The majority of spawning occurs in pools or in quiet edge waters with temperatures between 57.2°F and 71.6°F (Moyle 2002). Eggs adhere to the substrate or plants and hatch in approximately four days. After hatching, the fry spend the next three to four months in quiet water in the water column and usually occur among vegetation or other flooded cover (Moyle 2002).

The arroyo chub is threatened by the introduction of non-native fish, and it shows a decline in the watershed when non-native species become abundant. The introduction of largemouth bass (*Micropterus salmoides*) and green sunfish (*Lepomis cyanellus*) pose a threat to arroyo chub and could be responsible for its extirpation from many areas (Moyle et al. 1995). The arroyo chub is also threatened by water diversions, urbanization of watersheds, and pollution.

Santa Ana Speckled Dace

Santa Ana speckled dace is a California Species of Special Concern. The Santa Ana speckled dace has not been formally described as a subspecies yet, which is the reason why it is not federally listed. Many believe that Santa Ana speckled dace deserves subspecies status because it has morphological differences that distinguish it from other California dace: it has finer scales; a better developed frenum (a flap of skin attaching the snout to upper lip); a longer head; and smaller eggs (Moyle et al. 1995). The species was historically distributed throughout the upland portions of the Santa Ana, San Gabriel, and Los Angeles River systems, but it currently has a limited distribution in the headwaters of the Santa Ana and San Gabriel Rivers (Moyle et al. 1995). The CNDDB does not contain any records of Santa Ana speckled dace from the vicinity of the survey area.

Santa Ana speckled dace is a small, freshwater fish that rarely exceeds three inches in length. Physical characteristics of the Santa Ana speckled dace include one barbel (whisker-like) at the end of each jaw and a frenum on the upper lip. The back and sides of the fish are dusky yellow or olive, and are covered with dark speckles and splotches. During breeding, the base of the fins in both sexes and the snouts and lips of males often turn red. Also, males usually develop tubercles on their pectoral fins and head (Moyle 2002).

Santa Ana speckled dace requires perennial streams with summer water temperatures between 62°F and 68°F (Moyle et al. 1995). It prefers riffle habitats in clean, rocky-bottomed streams and rivers, but is also found near the shores of lakes (Moyle et al. 1995). This species exhibits predatory avoidance behaviors such as nocturnal feeding and hiding among the bottom rocks during daylight hours. Except for the breeding season, this species does not form large groups, but instead forages in small groups that can easily blend into the bottom rocks to avoid predation. It forages on a large variety of small, ground-dwelling invertebrates, zooplankton, filamentous algae, and other plant material (McGinnis 2006).

Santa Ana speckled dace typically has a life span of three years, but it can live up to six years or more. It becomes sexually mature in their second year, and spawning occurs throughout the summer months. Speckled daces lay and fertilize their eggs on the stream bottom in rocks and gravel. The eggs hatch in six days and, similar to most other minnows, the young seek out calm inshore areas where zooplankton is available to feed upon (Moyle 2002; McGinnis 2006).

Santa Ana speckled dace is threatened by the introduction of non-native fish, and it shows a decline in the watershed when non-native species become abundant. The introduction of largemouth bass and green sunfish pose a threat to Santa Ana speckled dace and could be responsible for its extirpation from many areas (Moyle et al. 1995). Santa Ana speckled dace is also threatened by water diversions, urbanization of watersheds, and pollution.

Survey Methodology

Surveys were conducted by Consulting Fisheries Biologists Justin Wood (TE-37481A-0) and Cynthia Hitchcock from Aspen Environmental Group with BonTerra Consulting's Senior Fisheries Biologist, Dr. Carl Demetropoulos. Prior to the surveys, Mr. Wood consulted John O'Brien from the California Department of Fish and Game (CDFG) for approval to conduct the surveys for special status fish species in the survey area. Survey methods included underwater video recording, dip netting, seining, and snorkeling depending on the location/stream morphology within the survey area.

Surveys followed the current presence/absence protocol for the Santa Ana sucker and were conducted on August 23 and August 30, 2012, from Santa Anita Dam downstream to the upper end of Santa Anita Debris Basin. During the first survey, all accessible areas of the creek between the Santa Anita Dam and the headworks facility were surveyed using dip nets, seine nets, and underwater videography. During the second survey, dip nets were used along with snorkel surveys of two large pools: one below the headworks facility and one below the entrance road to Arcadia Wilderness Park. While using underwater video and seining, care was taken to avoid algal mats and dense vegetation in the creek to avoid impacts on refugia for potential young fish.

Netting

Dip netting and seining methods were used in shallow water down to depths of approximately three feet. Seining was conducted using a 20-foot by 4-foot deep nylon knotless delta weave bagged seine with ¼-inch mesh. Captured fishes were immediately transferred into a container of clean water taken from the creek and were visually identified. Native fishes were released unharmed at the point of capture. Non-native fish and invertebrates were not returned to Santa Anita Creek.

Underwater Videography

For the purpose of this study, deep creek habitat was defined as portions of the creek where depth was greater than what could effectively be surveyed using dip or seine nets (approximately three feet) and where underwater cameras would be more effective at determining presence/absence of fish species. Depending on the habitat type, the two following underwater cameras with high lumen light-emitting diode (LED) lighting systems and weighted platforms were used to observe pool and deep creek habitat: (1) high definition remote underwater color video camera (Aqua Vu, Inc AV760cz Color Underwater Video Camera) providing depth, temperature, and time on an underwater video monitor and (2) a high definition 360-degree view camera (Aqua Vu, Inc AV360 Black/White Underwater Video Camera) with a selectable 4-way split screen.

Surveyors viewed the creek in real time and could simultaneously record targets for later review on a Digital Video Recorder (DVR) output from the video camera. The location of the image (in Universal Transverse Mercator [UTM]) could be correlated to global positioning system (GPS) location by a time stamp. After the survey and in order to validate and map the location of fish that may not have been seen during the survey, video targets were analyzed on a computer at 0.25 real time speed.

Snorkel/Swim Surveys Transects

To establish in visual identification and assessment of fish species and description of habitat preferences in large pools (e.g., 15 feet wide by 30 feet long by approximately 6 feet deep), snorkel surveys were conducted by a single person (Permitted Biologist, Justin Wood) swimming zigzag transects and taking underwater photographs of any suspect fish targets.

All fish observed during the surveys were recorded in field notes.

Survey Results

The water temperature in Santa Anita Creek during both surveys was approximately 68°F. No native fish (Santa Ana sucker, arroyo chub, or Santa Ana speckled dace) were found during either of the surveys. During the August 23, 2012, survey, which covered the area from Santa Anita Dam downstream to the headworks facility, a total of 53 green sunfish (*Lepomis cyanellus*) were captured with an additional 35 observed in the creek.

During the August 30, 2012, survey in the large pool below the headworks, 2 green sunfish were captured with an additional 8 observed. For this species, a range of size classes were seen, indicating the species is actively reproducing. Four rainbow trout (*Oncorhynchus mykiss*) averaging approximately 6 inches in length were also observed in the large pool (15 feet wide by 30 feet long by 6 feet deep) below the headworks. These trout remained within the bottom 12 inches, indicating a thermocline1 was likely present in this pool. Rainbow trout were stocked in this stream system from 1930 to 1945 (CDFG 1945, 1952), and likely continue to reproduce when conditions are favorable.

Previous special-status fish surveys in Santa Anita Creek have also had absence findings for native fish (O'Brien 2012; Swift 2012).

OTHER OBSERVATIONS

One California Species of Special Concern[2] was observed in the survey area: two-striped garter snake (*Thamnophis hammondii*). A CNDDB form will be submitted to the CDFG for this species (Attachment B).

A single red swamp crayfish (*Procambarus clarkii*), an introduced species that can act as a predator on native aquatic species, was observed during the survey.

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[1] A thermocline is a thin layer in a body of water that changes more rapidly with depth than the water above it or below it; like a blanket that separates the upper mixed water layer from the calm deep water below

[2] California Species of Special Concern are considered special status due to declining population levels, limited ranges, and/or continuing threats, which have made them vulnerable to extinction. Not all Species of Special Concern have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing.

BonTerra Consulting appreciates the opportunity to assist on this project. If you have any comments or questions, please call Amber Oneal at (714) 444-9199) or Carl Demetropoulos at (626) 351-2000.

Sincerely,

BONTERRA CONSULTING

Amber S. Oneal
Senior Project Manager, Biological Services

Carl L. Demetropoulos, Ph.D.
Senior Fisheries Biologist

I certify that the information in this survey report and enclosed exhibits fully and accurately present my work.

Justin Wood
TE-37481A-0

Attachments: Exhibits 1, 2, and 3
A – Site Photographs
B – CNDDB Forms

cc: Grace Yu, Los Angeles County Department of Public Works

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REFERENCES

California Department of Fish and Game (CDFG). 2012 (August, 2012). California Natural Diversity Database. Records of Occurrence for the USGS Mount Wilson 7.5-minute quadrangles. Sacramento, CA: CDFG, Natural Heritage Division.

———. 1952. Field Notes, Big Santa Anita Canyon Creek (Report by P.A. Douglas, W.A. Evans, and R.R. Bell). Sacramento, CA: CDFG.

———. 1945. Fish Stocking Record. Sacramento, CA: CDFG.

McGinnis, S.M. 2006. *Field Guide to Freshwater Fishes of California* (Revised Ed.). Berkley and Los Angeles, CA: University of California Press.

Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake. 1995. *Fish Species of Special Concern in California*. Davis, CA: University of California Department of Wildlife and Fisheries Biology.

Moyle, P.B. 2002. *Inland Fishes of California*. Berkeley, CA: University of California Press.

O'Brien, J. 2012 (August 13). Personal communication. Phone call between J. Wood, Associate Biologist (Aspen Environmental Group) and J. O'Brien, Biologist (California Department of Fish and Game) regarding fish surveys in Santa Anita Canyon.

Swift, C.C., T.R. Haglund, M. Ruiz, and R.N. Fisher. 1993. The Status and Distribution of Freshwater Fishes of Southern California. *Bulletin of Southern California Academy of Sciences* 92(3): 101–167. Los Angeles, CA: The Academy.

Swift, C.C. 2012 (August 13). Personal communication. Email between J. Wood, Associate Biologist (Aspen Environmental Group) and C.C Swift, former ichthyology collection manager (Natural History Museum of Los Angeles County) regarding fish surveys in Santa Anita Canyon.

U.S. Fish and Wildlife Service (USFWS). 2010 (December 14). Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for Santa Ana Sucker; Final Rule. *Federal Register* 75(239): 77961–78027. Washington, D.C.: USFWS.

———. 2009 (December 8). Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Santa Ana Sucker (*Catostomus santaanae*); Proposed Rule. *Federal Register* 74(235): 65056–65087.

———. 2005 (January 4). Endangered and Threatened Wildlife and Plants; Final Rule to Designate Critical Habitat for the Santa Ana Sucker (*Catostomus santaanae*); Final Rule. *Federal Register* 70(2): 426–458. Washington, D.C.: USFWS.

———. 2000 (April 12). Endangered and Threatened Wildlife and Plants; Threatened Status for the Santa Ana Sucker (*Catostomus santaanae*); Final Rule. *Federal Register* 65(71): 19686–19698. Washington, D.C.: USFWS.

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Project Location

Exhibit 1

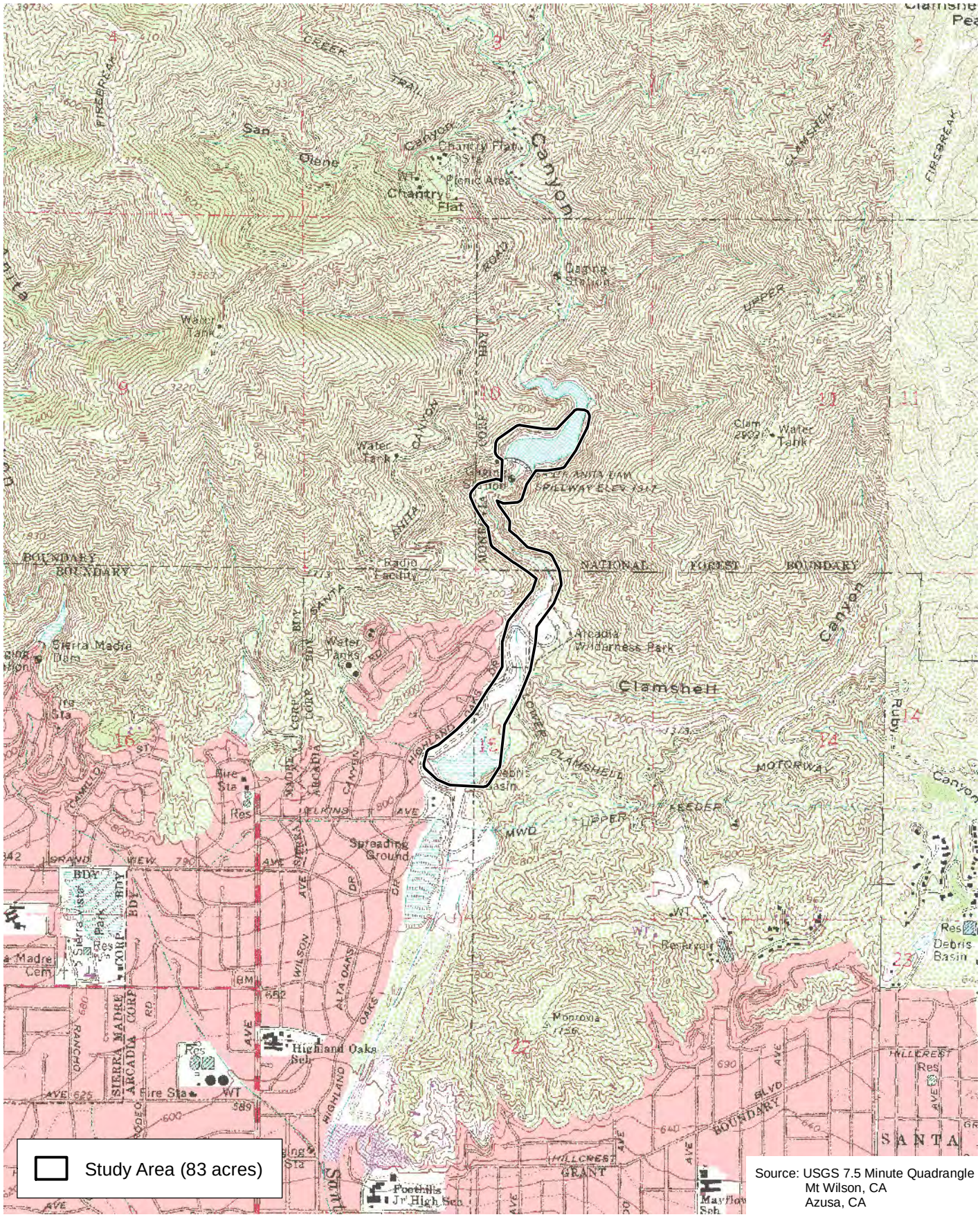
Santa Anita Prop 1E Project

N W E S

10 5 0 10 Miles

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex_RL.pdf



Source: USGS 7.5 Minute Quadrangle
Mt Wilson, CA
Azusa, CA

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Local Vicinity

Exhibit 2

Santa Anita Prop 1E Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex2_LV_usgs.pdf

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Survey Area

Exhibit 3

Santa Anita Prop 1E Project

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1,000 500 0 1,000
Feet

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex3_SurveyArea.pdf

ATTACHMENT A

SITE PHOTOS

Photo 1. Typical section in Santa Anita Creek.

Photo 2. Typical substrate in Santa Anita Creek.

Photo 3. Typical pool in Santa Anita Creek.

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Site Photos

Attachment A-1

Santa Anita Prop 1E Project

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Photo 4. Headworks pool in Santa Anita Creek (seasonally wet, sometimes dry)

Photo 5. Road pool in Santa Anita Creek (seasonally wet, sometimes dry)

Photo 6. Underwater videography survey method used in Santa Anita Creek.

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Site Photos

Attachment A-2

Santa Anita Prop 1E Project

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Photo 7. Adult green sunfish found in Santa Anita Creek.

Photo 8. Young of the year green sunfish found in Santa Anita Creek.

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Site Photos

Attachment A-3

Santa Anita Prop 1E Project

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BonTerra CONSULTING

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ATTACHMENT B

CNDDB FORMS

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/23/2012

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Thamnophis hammondii*

Common Name: Two-striped garter snake

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Justin M. Wood
Address: 201 North First Ave. No. 102
Upland, CA 91786
E-mail Address: Jwood@aspeneg.com
Phone: (909) 568-5235

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown
1				

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

San Gabriel Mountains, Santa Anita Canyon, 0.40 miles downstream of the Santa Anita Dam along Santa Anita Creek. Roughly 0.25 miles upstream of the entrance to Arcadia Wilderness Park

County: Los Angeles Landowner / Mgr.: USFS

Quad Name: Mount Wilson Elevation: 942'

T 1N R 11W Sec 10, SW ¼ of SE ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): Google

T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____

DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: 34 10' 47.6" N, 118 01' 07.56" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Single adult observed foraging along the margins of a deep pool in the canyon bottom. Foraging among boulders under mulefat canopy. Green sunfish abundant in pool, possible food source.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Dam upstream and city wilderness park downstream

Visible disturbances: None

Threats:

Comments: Relatively intact stretch of creek and riparian vegetation bounded by the dam upstream and concrete lined channel downstream.

Determination: *(check one or more, and fill in blanks)*

☑ Keyed (cite reference): Stebbins 2003
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

ATTACHMENT F

SPECIAL STATUS HERPETOFAUNA REPORT

BonTerra CONSULTING
2 Executive Circle, Suite 175 Irvine, CA 92614
T: (714) 444-9199 F: (714) 444-9599 | www.BonTerraConsulting.com

October 15, 2012

Grace Yu
Water Resources Division
Department of Public Works
County of Los Angeles
900 South Fremont Avenue
Alhambra, California 91803

VIA EMAIL
gyu@dpw.lacounty.gov

Subject: Results of Special Status Herpetofauna Surveys for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California

Dear Ms. Yu:

This Letter Report presents the findings of special status herpetofauna surveys conducted for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project Site (hereinafter referred to as the "project site") located in the City of Arcadia and in the Angeles National Forest in Los Angeles County, California (Exhibits 1 and 2). The Project will improve Los Angeles County Flood Control District facilities to better manage storm water runoff from the Santa Anita Canyon watershed and to achieve the following goals: (1) reduce flood damage to the downstream communities; (2) increase recharge of the local groundwater basin; and (3) improve public safety by remediating seismic safety issues at the Dam and Debris Basin.

This survey focused on the detection of Pacific [western] pond turtle (*Actinemys* [*Emys*] *marmorata*), Coast Range newt (*Taricha torosa torosa*), two-striped garter snake (*Thamnophis hammondii*), and silvery legless lizard (*Aniella pulchra*). The survey was conducted by qualified Biologists with the necessary experience and permits to handle special status herpetofauna.

SURVEY AREA

The project site is located immediately north of the Santa Anita Dam and continues south along Santa Anita Creek to the Santa Anita Debris Basin. The survey area for the project included the area for the proposed improvements plus a 100-foot buffer (Exhibit 3). The survey area is bordered by open space in the Angeles National Forest and Arcadia Wilderness Park, and residential development. The survey area is located on the Mt. Wilson U.S. Geological Survey's (USGS') 7.5-minute quadrangle at Township 1 North, Range 11 West, Section 12, with an elevation of about 750 to 1300 feet above mean sea level (msl).

Santa Anita Canyon is very narrow and steep-sided along Santa Anita Creek as it flows approximately ½-mile below the Dam, opening into a broad alluvial wash in the Santa Anita Debris Basin. Vegetation types in the survey area include coastal sage scrub, chaparral, black willow riparian forest, sycamore woodland, mixed riparian forest, alder riparian forest, elderberry woodland, mule fat scrub, coast live oak woodland, mixed woodland, ornamental, and ruderal. Santa Anita Creek is perennial in the upper portion of the canyon and contains

some slow moving pools. The lower portion of Santa Anita Creek and the Debris Basin were dry at the time of the focused survey. Representative photos are located in Attachment A.

BACKGROUND

Pacific Pond Turtle

The Pacific [western] pond turtle is a California Department of Fish and Game (CDFG) Species of Special Concern and a U.S. Forest Service Sensitive species in the Angeles National Forest. The Pacific pond turtle occurs primarily in freshwater rivers, streams, lakes, ponds, vernal pools, and seasonal wetlands with basking sites such as logs, banks, or other suitable areas above water level.

The Pacific pond turtle is found within the Coast Ranges and Central Valley south into northwestern Baja California, Mexico. Isolated, extant populations are found in the interior draining Mojave River of California as far into the Mojave Desert as Afton Canyon and in the Amargosa River in the vicinity of Lake Elizabeth in northern Los Angeles County (Holland 1994).The Pacific pond turtle has a low carapace (upper shell), 3.5 to 8.5 inches in length, and may be brown, olive, or blackish in color, usually with black or brown spots or lines that radiate out from the center of the carapace shields (Stebbins 2003). The limbs of this species have prominent scales that contain black lines or flecks, and the head may also contain black spots or markings (Stebbins 2003). Males tend to have a lighter throat without black markings with a shell that is flatter and more of a solid color than females (Stebbins 2003).

The Pacific pond turtle lays a clutch of 3 to 14 eggs from April to August (Stebbins 2003). Nest sites are usually found in upland habitat beyond the floodplain, typically on south-facing slopes of less than a 60-degree angle (Jennings and Hayes 1994). In Southern California, most hatchlings emerge in the early fall, while some may overwinter in the nest (Holland 1994). Adult pond turtles in Southern California may be active year round; however, during the coldest months (i.e., between October and April), this species will often seek upland refugia and enter a period of brumation (i.e., reptilian inactivity and decreased metabolic rate in response to seasonal temperature changes), particularly in more temperate, high elevation areas of the species' range (Holland and Goodman 1996). Winter refugia are often found in the same upland habitat as nesting sites.

Agricultural development, flood-control projects, water diversion, and urbanization have resulted in the elimination of over 90 percent of wetland habitat within the historic range of the Pacific pond turtle throughout California (USFWS 1992). These anthropogenic threats have also fragmented the remaining suitable habitat and isolated remaining populations, resulting in a lack of genetic variability.

Invasion of exotic pest species into habitat occupied by pond turtles is another threat to the continued survival of the species. Invasive, nonnative plant species such as tamarisk (*Tamarix ramosissima*) and giant reed (*Arundo donax*) have become established throughout Southern California, reducing plant diversity, altering stream morphology, and eliminating suitable basking sites (Lovich et al. 1994). The invasive bullfrog (*Rana catesbeiana*) is native to eastern North America, but is widely established in California. Bullfrogs are voracious predators that will eat any live animal they can swallow, and predation of hatchling and young pond turtles has been recorded (Holland 1994). The intensity of bullfrog predation is severe enough to eliminate recruitment in some pond turtle populations in Southern California (Overtree and Collings 1997). As a result of the threats listed above, the Pacific pond turtle population is believed to be in decline throughout 75 to 80 percent of its range (Stebbins 2003).

The closest records of the Pacific pond turtle relative to the survey area include occurrences in the west fork of the San Gabriel River, which is located approximately five miles northeast of the survey area (CDFG 2012). An unidentified turtle, likely a Pacific pond turtle, was visually observed in Santa Anita Reservoir during the 2011 trapping effort prior to dewatering for sediment removal (BonTerra Consulting 2011).

Coast Range Newt

The Coast Range newt is a CDFG Species of Special Concern. The Coast Range newt breeds in aquatic habitat such as slow-moving stream courses, pools, and ponds, and uses adjacent upland habitat extensively for foraging and aestivation (i.e., period of inactivity and decreased metabolic rate in response to arid conditions). Upland habitat typically consists of riparian, oak forests, chaparral, and rolling grasslands where it is often found in rodent burrows and beneath mesic (moist) microhabitats such as logs, boards, and rocks (Stebbins 2003). This species preys primarily upon small invertebrates, insects, and amphibian eggs and larvae (Hanson et al. 1994). It occurs between sea level and 4,200 feet above msl.

The Coast Range newt is the coastal subspecies of the California newt (*Taricha torosa*) that ranges from the Coast Ranges of California from Mendocino to San Diego County and from the western slopes of the southern Cascades south through the western slopes of the Sierra Nevada in Kern County. The Coast Range newt occurs from Monterey County south to San Diego County; it occurs throughout Southern California in isolated populations including the Santa Monica, San Gabriel, and Santa Ana Mountains.

The Coast Range newt is a stocky, medium-sized salamander with a snout to vent length between approximately 2.8 and 3.5 inches. It has rough, grainy skin in the terrestrial phase and no costal grooves (vertical grooves present on the sides of some salamanders). It is yellowish brown to dark brown above, and pale yellow to orange below. The eyelids and the area just below the eyes are lighter in color than the rest of the head, and the iris is light yellow to silver (Stebbins 2003).

From December to early May, depending on locality and weather conditions, the Coast Range newt enters streams, pools, and ponds to breed. Breeding at any given site will last from 3 to 12 weeks, and males will arrive before females to establish territories (Gamradt et al. 1997). Females deposit spherical egg masses with 7 to 47 eggs onto submerged vegetation or stones up to 1 foot deep (Mosher et al. 1964). Eggs will hatch within four to six weeks, and thereafter larvae will metamorphose within three months and move onto land in late summer or early fall (Kats et al. 1994; Kaplan 1985).

Coast Range newt populations have been impacted by degradation of breeding and aestivation sites, and the degradation and development of migration routes (Jennings and Hayes 1994). Migration occurs from non-breeding terrestrial locations to breeding ponds, reservoirs, and sluggish pools in streams. Migration can take several weeks, and distance travelled can span up to two miles. Furthermore, although adults and embryos of this species contain the potent neurotoxin tetradotoxin, which provides an effective defense against would-be predators, the introduced red-swamp crayfish (*Procambarus clarkia*), mosquitofish (*Gambusia affinis*), and American bullfrog have demonstrated a tolerance for the toxin and have caused serious declines and extermination of some populations (Gamradt and Kats 1996).

This species was observed during surveys for the Santa Anita Reservoir Sediment Removal Project approximately 0.25 mile upstream of the Santa Anita Reservoir within Santa Anita Creek (BonTerra Consulting 2009).

Two-Striped Garter Snake

Two-striped garter snake is a CDFG Species of Special Concern and a U.S. Forest Service Sensitive Species. The two-striped garter snake is highly aquatic and rarely found far from water, which it frequently enters to forage and escape predators (Stebbins 2003). Preferred habitat includes perennial and ephemeral streams with sandy to rocky beds bordered by willow thickets or other dense vegetation (Jennings and Hayes 1994). This species tends to occupy streamside sites during summer, switching to nearby upland habitats during winter (Rathbun et al. 1993). This species forages on fish, fish eggs, and tadpoles and metamorphs of frogs and toads (Rathbun et al. 1993; Cunningham 1959).

This species occurs throughout the South Coast and Peninsular Ranges west of the San Joaquin Valley, and deserts from the vicinity of Salinas and Cantua Creek in Monterey and Fresno counties, south along the coast to Southern California (Jennings and Hayes 1994). In Southern California, it ranges east through the Transverse Ranges and south through the Peninsular Ranges through Baja California, Mexico from near sea level to approximately 8,040 feet above msl (Jennings and Hayes 1994).

Breeding typically occurs in March, with females producing 4 to 36 live young in summer (Stebbins 2003). The young are born fully developed and receive no parental care.

The two-striped garter snake is medium-sized for the genus, growing to approximately 3.3 feet in total length. Body color varies from olive to brown or brownish gray with two lateral (along the length of the body) stripes on the second and third scale rows and four lateral rows of small dark spots between the stripes (Jennings and Hayes 1994). The lateral stripes and rows or dark spots may sometimes be absent, particularly in melanistic (dark coloration) individuals common in the northern portion of the species' range (Larson 1984). The ventral (bottom) surface is dull yellow to orange-red or salmon with a whitish throat (Stebbins 2003).

The historic range of two-striped garter snake has been reduced by an estimated 40 percent because of livestock grazing, urban development, and channelization of stream habitat for flood control (Stebbins 2003). Additionally, population declines have resulted from increased predation by introduced predatory fish and American bullfrog and a decline in prey species (Jennings and Hayes 1994).

The closest record of two-striped garter snake relative to the survey area is an occurrence in the west fork of the San Gabriel River, approximately 0.7 mile east of the Devore campground, which is located approximately 5 miles north of the survey area (CDFG 2012).

Silvery Legless Lizard

Silvery legless lizard is a California Species of Special Concern and a U.S. Forest Service Sensitive Species in the Angeles National Forest. It is a small, secretive lizard that spends most of its life in leaf litter; beneath the soil; and/or under stones, logs, and debris. The silvery legless lizard requires areas with loose, sandy soil; moisture; warmth; and plant cover. It occurs in chaparral, pine-oak woodland, beach, and riparian vegetation types at elevations ranging from sea level to about 5,100 feet above msl (Stebbins 2003). Silvery legless lizards are normally subterranean, and not often seen on the surface. They are active primarily in the morning and evening, when they forage in the leaf litter or soil. Their diet consists primarily of spiders, insects, and insect larvae (Jones and Lovich 2009).

Silvery legless lizard occurs from Contra Costa County south to Baja California, Mexico (Stebbins 2003). This species occurs in the Coast, Transverse, and Peninsular ranges, and also at the edge of the deserts. There are also scattered occurrences of this species on the San Joaquin Valley floor.

Silvery legless lizard is a small, slender lizard that reaches lengths of 4 to 7 inches from snout to vent. It lacks external ear openings, but has lower eyelids. It has small body scales that have a shiny or polished look. While body color varies geographically, throughout most of its range, the silvery legless lizard's body is silver, beige, or gray, with a dark mid-dorsal (along the back) stripe and several less defined lateral (along the sides) stripes (Jones and Lovich 2009).

Silvery legless lizards reach sexual maturity at two to three years of age, usually producing one to four live young between September and November (Jones and Lovich 2009). Young lizards are cream or silver colored above, and light gray or pale yellow below (Stebbins 2003).

This species is naturally rare since it specializes in substrates with a high sand content, but is also threatened by grazing; off-road vehicle activity; sand mining; beach erosion and excessive recreational use of coastal dunes; and the introduction of exotic plants (Jennings and Hayes 1994).

The closest record of silvery legless lizard relative to the survey area includes an observation from a residential lot in the city of Claremont, approximately 19 miles east of the survey area (CDFG 2012). Silvery legless lizard is also known from the Big Tujunga Wash, approximately 20 miles northwest of the survey area (CDFG 2012).

SURVEY METHODOLOGY

BonTerra Consulting Senior Herpetologist Samuel Stewart (CDFG Scientific Collecting Permit SC-004421) and Herpetologist Jason Mintzer conducted focused surveys on June 19–23, 2012. Mr. Stewart has experience with all four species and has the appropriate CDFG authorization for trapping and handling.

The Pacific pond turtle survey methodology was based on survey and census recommendations made by Holland (1991) and survey protocols developed by Reese and Welsh (1988) and Goodman (1999). Surveys incorporated both visual encounter and live-trapping. Live trapping consists of placing live-catch turtle traps (i.e., floating net mesh box traps) at 4 trapping stations in Santa Anita Creek (Exhibit 3) for a total of 4 trapping periods lasting up to 24 hours each. Net mesh box traps are 24-inch (in) by 18-in by 8-in framed, $^{5}/_{16}$-in mesh in square, mesh boxes with two 1-way funnel entrances. Floats were placed inside the traps to allow submergence of one trap entrance and flotation of approximately four inches of trap enclosure. All four net mesh box traps were firmly secured to banks or exposed vegetation within larger pools in the stream using nylon rope. The traps were baited with fresh mackerel. Turtles attracted by the scent of the bait would enter the submerged entrance and surface within the enclosure to breathe. All traps were fitted with tags listing the CDFG Scientific Collecting Permit number under which live trapping was being conducted. Trap station locations were recorded with a Garmin Etrex Vista H geographic positioning system (GPS) unit.

Mr. Stewart and Mr. Mintzer conducted five diurnal visual encounter surveys for Pacific pond turtle, two-striped garter snake, and Coast Range newt during setting and checking/removal of traps (Table 1). Additionally, two nocturnal visual encounter surveys for Coast Range newt and two-striped garter snake were conducted. Biologists conducted "visual encounter" surveys during atmospheric conditions most conducive to Pacific pond turtle, two-striped garter snake,

and Coast Range newt activity and avoided adverse conditions that may inhibit activity, including high winds (greater than 16 miles per hour), heavy precipitation, and temperature extremes less than 50 or greater than 90 degrees Fahrenheit. The visual encounter methodology involved walking along the creek banks checking the stream and pools for Pacific pond turtle, two-striped garter snake, and Coast Range newt, periodically scanning upstream and downstream using binoculars to detect two-striped garter snakes and Pacific pond turtles that may be basking or actively foraging, and inspecting crevices and under ledges for two-striped garter snakes at rest. Surveyors wore polarized sunglasses during diurnal surveys to reduce glare and improve visibility in the stream and pools.

The survey methodology for silvery legless lizard was based on an approach previously approved by CDFG in a Memorandum of Understanding for a silvery-legless lizard focused survey and translocation effort (BonTerra Consulting 2004). Methods included flipping rocks/debris, gently raking, and actively searching duff below oaks and sycamores in areas with sandy substrate. The survey effort focused on areas with deeper sandy deposits and leaf litter beneath oaks and sycamores in, and adjacent to, the Santa Anita Debris Basin.

SURVEY RESULTS

No Pacific pond turtles were captured during the trapping session or seen during visual surveys (Table 1). One introduced fish species, green sunfish (*Lepomis cyanellus*), was captured during live trapping. No Coast Range newts or two-striped garter snakes were observed during visual surveys. No silvery legless lizards were observed during active searches and/or raking.

A summary of survey results is provided in Table 1. A complete list of wildlife species observed during the surveys is included in Attachment B.

TABLE 1
SUMMARY OF TRAPPING RESULTS

Start				End				
Trap Set Date	**Time**	**Air Temp (°F)**	**Wind Speed (mph)**	**Trap Check Date**	**Time**	**Air Temp (°F)**	**Wind Speed (mph)**	**Trap Results**
6/19/2012	4:10PM–12:00 AM	78	1–3	6/20/2012	2:30–11:30 PM	77	1–3	Trap 1 – 8 sunfish
								Trap 2 – Empty
								Trap 3 – Empty
								Trap 4 – 1 sunfish
6/20/2012	2:30–11:30 PM	77	1–3	6/21/2012	3:30 PM–10:15 PM	80	1–4	Trap 1 – Empty
								Trap 2 – Empty
								Trap 3 – 1 sunfish
								Trap 4 – 2 sunfish
6/21/2012	3:30 PM–10:15 PM	80	1–4	6/22/2012	1:30 PM–9:15 PM	85	3–6	Trap 1 – 1 sunfish
								Trap 2 – Empty
								Trap 3 – 1 sunfish
								Trap 4 – 1 sunfish
6/22/2012	1:30 PM–9:15 PM	85	3–6	6/23/2012	12:30 PM–5:50 PM	86	4–7	Trap 1 – 1 sunfish
								Trap 2 – Empty
								Trap 3 – Empty
								Trap 4 – 1 sunfish

°F: degrees Fahrenheit; mph: miles per hour

Two CDFG Special Animals were observed during the survey: yellow warbler (*Setophaga petechia* [*Dendroica petechia*]), a CDFG Species of Special Concern, and Southern California rufous-crowned sparrow (*Aimophila ruficeps*), a CDFG Watch List Species. California Natural Diversity Database (CNDDB) forms for these species were submitted with focused survey reports for special status bird species for the project; therefore, none will be submitted with this report.

BonTerra Consulting appreciates the opportunity to assist with this project. Please contact Amber Oneal at (714) 444-9199 or Sam Stewart at (626) 351-2000 if you have questions or comments.

Sincerely,

BONTERRA CONSULTING

Amber S. Oneal
Senior Project Manager, Biological Resources

Samuel C. Stewart, IV
Senior Herpetologist

Enclosures: Exhibits 1–3
Attachment A – Site Photos
Attachment B – Wildlife Compendium

cc: M. Ching, mching@dpw.lacounty.gov

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REFERENCES

BonTerra Consulting. 2011. Results of Western Pond Turtle Trapping for the Santa Anita Dam Sediment Removal Project, Los Angeles County, California. Pasadena, CA: BonTerra Consulting.

———. 2009. *Coast Range Newt and Southwestern Pond Turtle Focused Survey Report for the Santa Anita Dam Project Site, Los Angeles County, California.* (Unpublished letter report to the County of Los Angeles Department of Public Works.

———. 2004. *Relocation of Silvery Legless Lizards from Plum Canyon , Los Angeles County, to Shapell Industries-Owned Property.* (Unpublished letter to Shapell industries).

Bury, R.B. and D.J. Germano. 2008 (May). Conservation Biology of Freshwater Turtles and Tortoises: *Actinemys marmorata* (Baird and Girard 1852) – Western Pond Turtle, Pacific Pond Turtle. *Chelonian Research Monographs, No. 5.* Lunenburg, MA: Chelonian Research Foundation.

California Department of Fish and Game (CDFG). 2012. California Natural Diversity Database. Records of Occurrence for U.S. Geological Survey San Fernando 7.5-minute quadrangle. Sacramento, CA: CDFG, Natural Heritage Division.

Cunningham, J.D. 1959. Reproduction and Food of Some California Snakes. *Herpetologica* 15(1):17–19. Salt Lake City, UT: Society for the Study of Amphibians and Reptiles.

Gamradt, S.C., L.B. Kats, and C.B Anzalone. 1997. Aggression by Non-native Crayfish Deters Breeding in California Newts. *Conservation Biology* 11:793–796. Boston, MA: Blackwell Scientific Publications.

Gamradt, S.C. and L.B. Kats. 1996. Effect of Introduced Crayfish and Mosquitofish on California Newts. *Conservation Biology* 10:1155–1162. Boston, MA: Blackwell Scientific Publications.

Goodman, R.H. 1999. *Relocation Project of the Southwestern Pond Turtle (Clemmys marmorata pallida) from the San Gabriel Dam to the Upper West Fork of the San Gabriel River*. Irvine, CA: Chambers Group, Inc.

Hanson, K., J. Snyder, and L. Kats. 1994. Natural History Notes: *Taricha torosa* (California newt), Diet. *Herpetological Review* 25:62. Salt Lake City, UT: Society for the Study of Amphibians and Reptiles.

Holland, D.C. and R.H. Goodman, Jr. 1996. *Clemmys marmorata* (western pond turtle) Terrestrial Habitat Use. *Herpetological Review* 27:198–199. Salt Lake City, UT: Society for the Study of Amphibians and Reptiles.

Holland, D.C. 1994. *The Western Pond Turtle: Habitat and History*. Portland, OR: U.S. Department of Energy, Bonneville Power Administration.

———. 1991. Status and Reproductive Dynamics of a Population of Western Pond Turtles (*Clemmys marmorata*) in 1991. (Unpublished Report for the U.S. Fish and Wildlife Service, National Ecology Research Center, San Simeon, California).

Jennings, M.R. and M.P. Hayes. 1994. *Amphibian and Reptile Species of Special Concern in California* (Contract No. 8023). Sacramento, CA: CDFG, Inland Fisheries Division.

Jones, L.L.C. and R.E. Lovich. 2009. *Lizards of the American Southwest: A Photographic Field Guide*. Tuscon, AZ: Rio Nuevo Publishers.

Kaplan, R.H. 1985. Maternal Influences on Offspring Development in the California Newt, *Taricha torosa. Copeia* 1985:1028–1035. Miami, FL: American Society of Ichthyologists and Herpetologists.

Kats, L.B., J.A. Breeding and K.M. Hanson. 1994. Ontogenetic Changes in California Newts (*Taricha* torosa) in Response to Chemical Cues from Conspecific Predators. *Journal of the North American Benthological Society* 13:321–325. Erie, PA: North American Benthological Society.

Larson, N. M. 1984. Geographic Variation in the Two-striped Garter Snake, *Thamnophis hammondii.* (Masters Thesis). Pomona, CA: California State Polytechnic University, Pomona.

Lovich, J.E., T.B. Egan, and R.C. de Gouvenain. 1994. Tamarisk Control on Public Lands in the Desert of Southern California: Two Case Studies. 46th Annual California Weed Conference, California Weed Science Society.

Mosher, H.S., F.A. Fuhrman, H.D. Buchwald, and H.G. Fisher. 1964. Tarichatoxin-tetrodotoxin. P. 333. In Ragelis, E.P. (Ed.), Seafood Toxins. American Chemical Society Symposium Series, Number 262, American Chemical Society, Washington D.C.

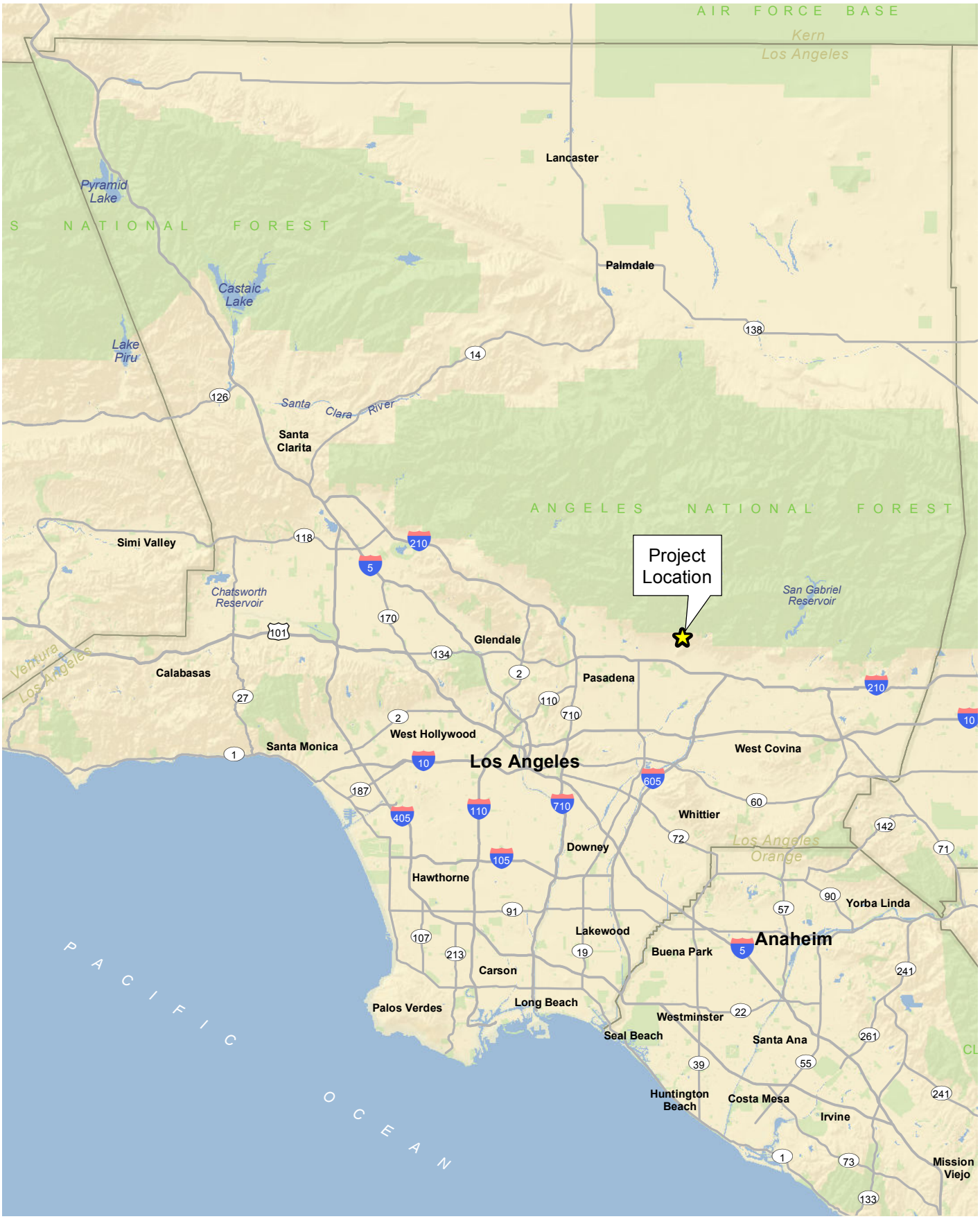
Overtree, L. and G. Collings. 1997. Western Pond Turtles in the Kern Valley Region. *The Tortuga Gazette* 33:1–2. Van Nuys, CA: California Turtle and Tortoise Club.

Rathbun, G. B., M. R. Jennings, T. G. Murphey, and N. R. Siepel. 1993. Status and Ecology of Sensitive Aquatic Vertebrates in Lower San Simeon and Pica Creeks, San Luis Obispo County, California. (Final Report under Cooperative Agreement 14-16-0009-91-1909; Publication Number PB93-230779). Springfield, VA: National Technical Information Service.

Reese, D.A. and H.H. Welsh, Jr. 1988. Habitat use by western pond turtles in the Trinity River, California. *Journal of Wildlife Management* 62:842–853. Bethesda, MD: The Wildlife Society.

Stebbins, R.C. 2003. *A Field Guide to Western Reptiles and Amphibians* (3rd ed.). Boston, MA: Houghton-Mifflin Company.

U.S. Fish and Wildlife Service (USFWS). 1992. Endangered and threatened wildlife and plants; 90-day finding and commencement of status reviews for a petition to list the western pond turtle and California red-legged frog. *Federal Register* 57:45761–45762. Washington, D.C.: USFWS.



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Project Location

Exhibit 1

Santa Anita Proposition 1E Project

N W E S

10 5 0 10 Miles

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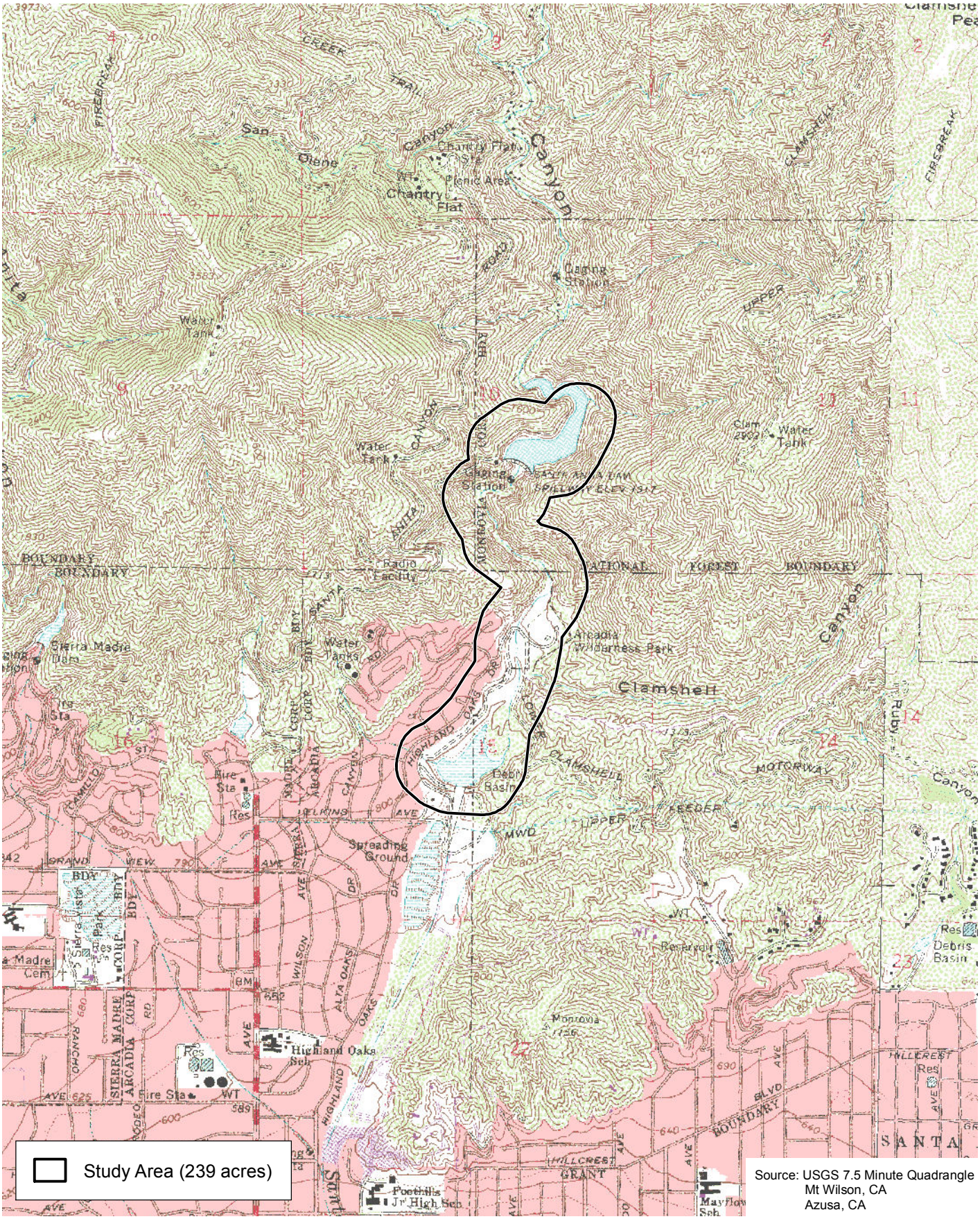

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Local Vicinity

Exhibit 2

Santa Anita Prop 1E Project

N W E S

2,000 1,000 0 2,000 Feet

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Survey Area

Exhibit 3

Santa Anita Proposition 1E Project

N
W E
S

1,000 500 0 1,000
Feet

BonTerra CONSULTING

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ATTACHMENT A

SITE PHOTOS

Photo 1. Trap Station 1: Large pool immediately downstream of the headworks facility. Photo taken facing west.

Photo 2. Trap Station 2: Large pool immediately upstream of the headworks facility. Photo taken facing north.

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Site Photographs

Attachment A-1

Santa Anita Proposition 1E Project

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Photo 3. Trap Station 3: Large pool with freshwater marsh habitat in the canyon between the dam and the headworks facility. Turtle trap is visible in the foreground (see red arrow). Photo taken facing north.

Photo 4. Trap Station 4: Large pool immediately downstream from Santa Anita Dam. Photo taken facing northwest.

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Site Photographs

Attachment A–2

Santa Anita Proposition 1E Project

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Photo 5. Collapsible nylon mesh box traps with two funnel entrances.

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Site Photographs

Attachment A-3

Santa Anita Proposition 1E Project

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ATTACHMENT B

WILDLIFE COMPENDIUM

WILDLIFE COMPENDIUM

Species
Fish
SALMONIDAE – SALMON, TROUT, CHARS, FRESHWATER WHITEFISHES, AND GRAYLINGS
Oncorhynchus mykiss rainbow trout
CENTRACHIDAE – SUNFISH
*Lepomis cyanellus** green sunfish
Amphibians
BUFONIDAE – TRUE TOADS
Anaxyrus boreas [*Bufo boreas*] *halophilus* California toad
HYLIDAE – TREEFROGS
Pseudacris [*Hyla*] *cadaverina* California treefrog
Pseudacris [*Hyla*] *hypochondriaca* [*regilla*] Baja California treefrog
Reptiles
PHRYNOSOMATIDAE – ZEBRA-TAILED, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS
Sceloporus occidentalis western fence lizard
Uta stansburiana side-blotched lizard
ANGUIDAE – ALLIGATOR LIZARDS
Elgaria multicarinata southern alligator lizard
COLUBRIDAE – COLUBRID SNAKES
Pituophis catenifer gopher snake
Birds
ODONTOPHORIDAE – QUAILS
Callipepla californica California quail
ARDEIDAE – HERONS, BITTERNS, AND ALLIES
Ardea Herodias great blue heron
CATHARTIDAE – NEW WORLD VULTURES
Cathartes aura turkey vulture
ACCIPITRIDAE – HAWKS, KITES, EAGLES, AND ALLIES
Buteo jamaicensis red-tailed hawk
COLUMBIDAE – PIGEONS AND DOVES
Zenaida macroura mourning dove
TYTONIDAE – BARN OWLS
Tyto alba barn owl
STRIGIDAE – TRUE OWLS
Bubo virginianus great horned owl

WILDLIFE COMPENDIUM (Continued)

Species
TROCHILIDAE – HUMMINGBIRDS
Archilochus alexandri black-chinned hummingbird
Calypte anna Anna's hummingbird
Calypte costae Costa's hummingbird
Selasphorus sasin Allen's hummingbird
PICIDAE – WOODPECKERS
Melanerpes formicivorus acorn woodpecker
Picoides nuttallii Nuttall's woodpecker
Colaptes auratus northern flicker
TYRANNIDAE – TYRANT FLYCATCHERS
Contopus cooperi olive-sided flycatcher
Contopus sordidulus western wood-pewee
Empidonax difficilis Pacific-slope flycatcher
Sayornis nigricans black phoebe
VIREONIDAE – VIREOS
Vireo gilvus warbling vireo
CORVIDAE – CROWS AND JAYS
Aphelocoma californica western scrub-jay
Cyanocitta stelleri Steller's jay
HIRUNDINIDAE – SWALLOWS
Tachycineta thalassina violet-green swallow
Petrochelidon pyrrhonota cliff swallow
Hirundo rustica barn swallow
PARIDAE – TITMICE
Baeolophus inornatus oak titmouse
AEGITHALIDAE – BUSHTITS
Psaltriparus minimus bushtit
TROGLODYTIDAE – WRENS
Catherpes mexicanus canyon wren
Thryomanes bewickii Bewick's wren
Troglodytes aedon house wren

WILDLIFE COMPENDIUM (Continued)

Species
TURDIDAE – THRUSHES AND ROBINS
Turdus migratorius American robin
MIMIDAE – THRASHERS
Mimus polyglottos northern mockingbird
PTILOGONATIDAE – SILKY-FLYCATCHERS
Phainopepla nitens phainopepla
PARULIDAE – WARBLERS
Setophaga petechia [*Dendroica petechia*] yellow warbler
Cardellina pusilla [*Wilsonia pusilla*] Wilson's warbler
EMBERIZIDAE – SPARROWS AND JUNCOS
Pipilo maculatus spotted towhee
Melozone [*Pipilo*] *crissalis* California towhee
Aimophila ruficeps rufous-crowned sparrow
Melospiza melodia song sparrow
CARDINALIDAE – CARDINALS AND ALLIES
Piranga ludoviciana western tanager
ICTERIDAE – BLACKBIRDS
Icterus cucullatus hooded oriole
FRINGILLIDAE – FINCHES
Carpodacus mexicanus house finch
Spinus [*Carduelis*] *psaltria* lesser goldfinch
ESTRILDIDAE – MANNIKINS
Lonchura punctulata * nutmeg mannikin
Mammals
SCIURIDAE – SQUIRRELS
Spermophilus beecheyi California ground squirrel
Neotamius [*Tamias*] *merriami* Merriam's chipmunk
Sciurus griseus western gray squirrel
MEPHITIDAE – SKUNKS
Mephitis mephitis striped skunk
* introduced species

ATTACHMENT G

COASTAL CALIFORNIA GNATCATCHER SURVEY REPORT

BonTerra CONSULTING
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October 3, 2012

Ms. Susie Tharratt
Recovery Permit Coordinator
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

VIA EMAIL AND MAIL
Susie_Tharratt@fws.gov

Subject: Results of Focused Presence/Absence Coastal California Gnatcatcher Survey for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California

Dear Ms. Tharratt:

This Letter Report presents the results of focused surveys to evaluate the presence or absence of the federally listed Threatened California gnatcatcher (*Polioptila californica californica*) on the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project Site (hereinafter referred to as the "Project Site") in Los Angeles County, California. A Biologist with the necessary experience and the Federal Endangered Species Act 10(a) survey permit conducted the surveys according to U.S. Fish and Wildlife Service (USFWS) protocol.

The Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project will improve Los Angeles County Flood Control District facilities to better manage storm water runoff from the Santa Anita Canyon Watershed to achieve the following goals: (1) reduce flood damage to the downstream communities; (2) increase recharge of the local groundwater basin; and (3) improve public safety by remediating seismic safety issues at the Dam and Debris Basin.

Survey Area

The Project Site is located in the City of Arcadia and the Angeles National Forest (Exhibit 1). It is located on the U.S. Geological Survey's (USGS's) Mount Wilson 7.5-minute topographic quadrangle in Township 1 North, Range 11 West in portions of Sections 10 and 15 with elevations ranging from 750 to 1,300 feet above mean sea level (msl) (Exhibit 2). The survey area includes habitat from the Santa Anita Reservoir downstream along Santa Anita Creek to the Santa Anita Debris Basin (Exhibit 3). Private residences occur along the western boundary of the basin along Highland Oaks Boulevard. Open spaces in the Arcadia Wilderness Park and the Angeles National Forest occur north and east of the survey area.

Most of the coastal sage scrub, representing potentially suitable habitat for the California gnatcatcher, occurs in the southern portion of the survey area within the Santa Anita Debris Basin. A mixture of alluvial fan sage scrub and riparian habitats occur along the banks and in the floodplain of the creek within the basin. The upper terraces transition from alluvial fan sage scrub, dominated by

scalebroom (*Lepidospartum squamatum*), to coastal sage scrub habitat, dominated by California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), and deerweed (*Lotus scoparius*).

Small patches of coastal sage scrub habitat also occur around the reservoir, upstream of the Dam. The understory in these areas consists of a variety of non-native herbs and grasses and some native annuals. These patches of habitat are interspersed with chaparral habitat and/or steep cliffs.

The area along Santa Anita Creek between the Dam and the Debris Basin consists of a canyon with vertical walls or very steep slopes that are either unvegetated or dominated by dense chaparral; these areas do not represent suitable habitat for California gnatcatchers.

Representative photos of coastal sage scrub habitat are included in Attachment A.

Background

The California gnatcatcher was listed by the USFWS as a Threatened species in 1993 (USFWS 1993). Historically, it occurred in California from the Santa Clara River Valley and northern San Fernando Valley south through the coastal foothills of San Diego County (Garrett and Dunn 1981). Habitat loss and fragmentation from expanding development and agriculture has been a major factor in the decline of this species in Southern California (Atwood 1993).

The California gnatcatcher inhabits moderately dense stands of coastal sage scrub occurring on arid hillsides, mesas, and washes. Coastal sage scrub communities dominated by California sagebrush, California buckwheat, and white sage (*Salvia apiana*) seem to be preferred by this species, but shrub composition in occupied areas across the species' range varies, as does shrub community structure (height, density, etc.). Chaparral, riparian, and ruderal habitats may be used occasionally for dispersal and foraging, especially when these habitats are adjacent to occupied stands of coastal sage scrub. California gnatcatcher populations in inland areas usually occur in lower densities than in coastal sites, and generally occur in more open scrub habitats; as such, inland populations tend to have larger home ranges than coastal populations. The California gnatcatcher's elevation limit is 2,640 feet above msl, but most occurrences are well below that, with populations generally between sea level and 1,800 feet above msl in inland areas and between sea level and 1,350 feet above msl in coastal habitats (Atwood and Bontrager 2001).

The California gnatcatcher is a resident (non-migratory) songbird that nests and forages in coastal sage scrub vegetation in Southern California year-round. Territory size varies with season and locale. Territory size may increase by as much as 80 percent during the non-breeding season as pairs and individuals tend to wander more widely, and inland populations tend to have larger home ranges than coastal populations, as noted above. The breeding season generally occurs from March through July. Juvenile dispersal distances average less than 1.2 miles from natal territories, but have been documented up to nearly 6 miles.

The USFWS published a Revised Final Rule designating critical habitat for the coastal California gnatcatcher in 2007 (USFWS 2007). This revised rule designates 197,303 acres of critical habitat in San Diego, Orange, Riverside, San Bernardino, Los Angeles, and Ventura Counties. The survey area is not within the Revised Critical Habitat for this species.

Survey Methodology

Prior to conducting the focused survey, a search was conducted in the California Department of Fish and Game's (CDFG's) California Natural Diversity Database (CNDDB) for the Mount Wilson USGS 7.5-minute quadrangle (CDFG 2012) to determine the extent of California gnatcatcher occurrences reported in the survey area and vicinity.

Focused surveys were conducted by James Huelsman (USFWS permit No. TE 827493-7). Survey methods followed guidelines developed by the USFWS for conducting California gnatcatcher surveys. Field surveys were aided by the use of topographic maps and aerial photographs depicting the survey limits. Locations of special status species observed incidentally were recorded as waypoints using Global Positioning System (GPS) technology (Garmin Oregon t450). The focus of the surveys was to detect and identify the California gnatcatcher, but all wildlife incidentally observed or detected in the survey area was recorded and is listed in Attachment B.

Surveys for the California gnatcatcher followed the current presence/absence protocol (USFWS 1997). Six surveys were conducted in suitable habitat at least seven days apart between March 15 and June 30. Surveys were conducted between dawn and noon under suitable weather conditions. The protocol allows coverage of 80 acres of suitable habitat per survey day; one field day was sufficient to survey all potentially suitable habitats in the survey area. Surveys were conducted by walking slowly within and along the perimeter of coastal sage scrub stands while watching and listening for California gnatcatcher activity. Recorded vocalizations were used conservatively to solicit a response from any gnatcatcher's potentially presence. The frequency of taped playback used varied with site conditions such as habitat patch size, topography, and ambient noise levels. Survey dates, times, and weather data for the focused California gnatcatcher surveys are shown in Table 1.

TABLE 1
DATES, TIMES AND WEATHER CONDITIONS
FOR CALIFORNIA GNATCATCHER SURVEYS

			Weather Conditions					
	Time		Temp. (ºF)		Ave. Wind (mph)		Cloud Cover	
Date	Start	Finish	Start	Finish	Start	Finish	Start	Finish
5/16/2012	6:30AM	11:50AM	65	75	0–1	2–3	0%	0%
5/25/2012	6:30AM	10:30AM	62	62	<1	2–4	100%	100%
6/1/2012	7:00AM	11:15AM	66	75	<1	1–3	100%	0%
6/11/2012	7:00AM	11:00AM	63	75	<1	2–3	20%	0%
6/18/2012	7:30AM	11:00AM	63	76	<1	2–3	100%	0%
6/25/2012	7:15AM	11:00AM	63	72	<1	1–2	0%	0%

ºF: degrees Fahrenheit; mph: miles per hour.

Survey Results

No California gnatcatchers were observed during any of the surveys. Therefore, the California gnatcatcher is determined to be absent from the survey area at this time. The only occurrence reported in the CNDDB was from 1928 in an area that is now completely developed in the City of Arcadia (CDFG 2012). Based on the following information, the California gnatcatcher is likely absent from the Project Site at this time and is unlikely to occur in the near future: (1) the negative survey results reported here; (2) the lack of recent sightings in the survey area;

California gnatcatchers within known dispersal distances; and (5) the professional judgment and experience of the surveying Biologist.

Other Observations

One California Species of Special Concern,[1] yellow warbler (*Dendroica petechia*), and one CDFG Watch List Species,[2] Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), were observed in the survey area. CNDDB forms will be submitted to the CDFG for these species (Attachment C).

Three brown-headed cowbirds (*Molothrus ater*) were observed on the June 11, 2012 survey visit; they were not observed on any of the other visits.

BonTerra Consulting appreciates the opportunity to assist on this project. If you have any comments or questions, please call Amber Oneal at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Thomas E. Smith
Principal, Environmental Services

Amber S. Oneal
Senior Project Manager, Biological Services

I certify that the information in this survey report and enclosed exhibits fully and accurately present my work.

James Huelsman
Biologist
Permit No. TE827493-7

Attachments: Exhibits 1, 2, and 3
A – Site Photographs
B – Wildlife Compendium
C – CNDDB Forms

cc: Grace Yu, Los Angeles County Department of Public Works

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1 California Species of Special Concern are considered special status due to declining population levels, limited ranges, and/or continuing threats, which have made them vulnerable to extinction. Not all Species of Special Concern have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing.

2 CDFG Watch List Species are not on the current Special Concern list but (1) were on previous lists and have not been State listed under California Endangered Species Act; (2) were previously State or federally listed and now are on neither list; or (3) are on the list of "Fully Protected" species.

REFERENCES

Atwood, J.L. and D.R. Bontrager. 2001. California Gnatcatcher (*Polioptila californica*). *The Birds of North America, No. 574* (A. Poole and F. Gill, Eds.). Philadelphia, PA: The Academy of Natural Sciences.

Atwood, J.L. 1993. California Gnatcatchers and Coastal Sage Scrub: The Biological Basis for Endangered Species Listing (pp. 149–169). *Interface Between Ecology and Land Development in California* (J.E. Keeley, Ed.). Los Angeles, CA: Southern California Academy of Sciences.

California Department of Fish and Game (CDFG). 2012. September. California Natural Diversity Database. Records of Occurrence for Mount Wilson USGS 7.5 minute quadrangle. Sacramento, CA: CDFG, Natural Heritage Division.

Garrett, K. and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Audubon Press.

U.S. Fish and Wildlife Service (USFWS). 2007 (December 19). Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule. *Federal Register* 72(243): 72009–72213. Washington, D.C.: USFWS.

———. 1997 (July 28). *Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Protocol.* Washington, D.C.: USFWS.

———. 1993 (March 30). Endangered and Threatened Wildlife and Plants: Determination of Threatened Status for the Coastal California Gnatcatcher. *Federal Register* 58(59): 16742–16757. Washington, D.C.: USFWS.

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Project Location

Exhibit 1

Santa Anita Prop 1E Project

N W E S

10 5 0 10 Miles

BonTerra CONSULTING

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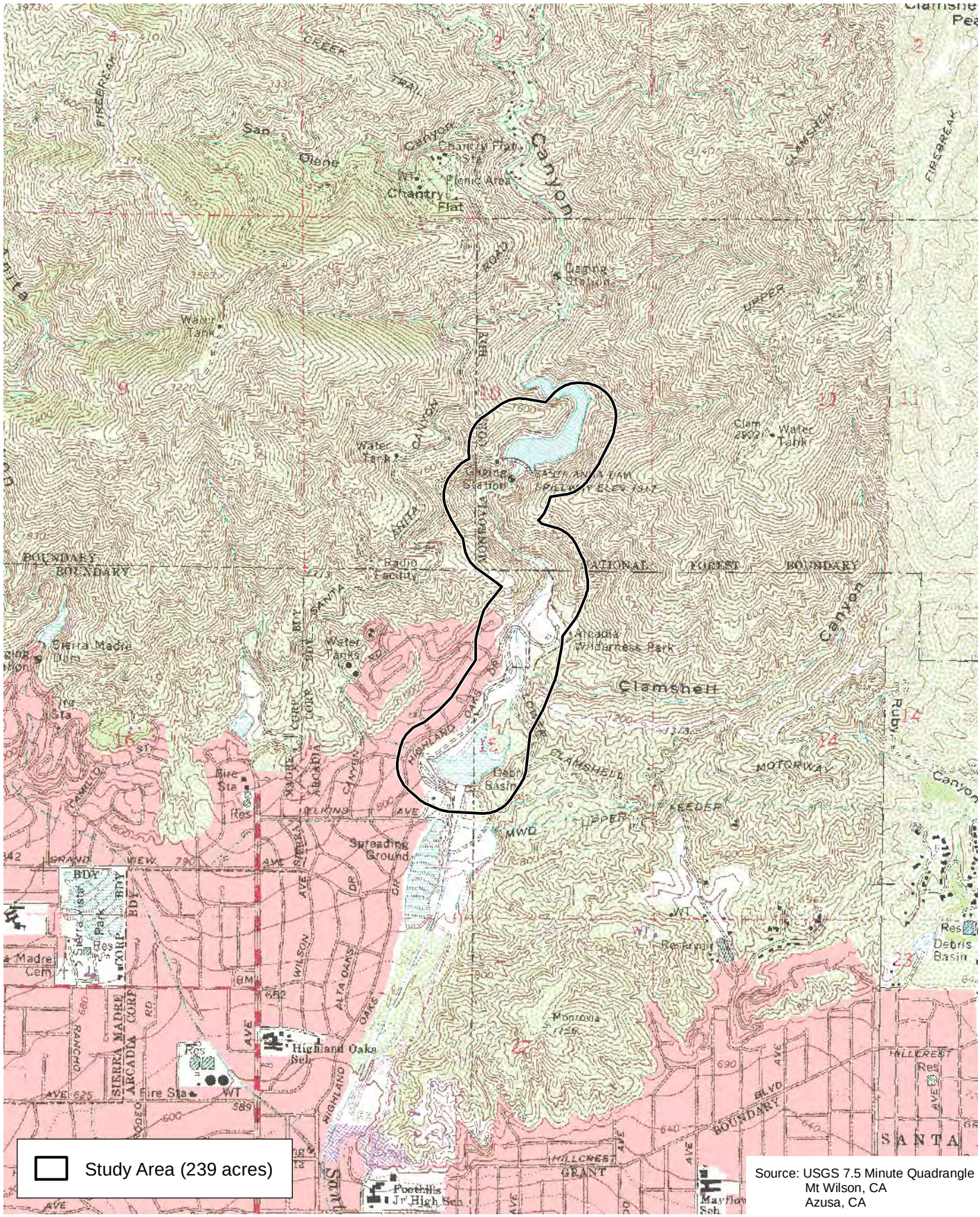

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Local Vicinity

Exhibit 2

Santa Anita Prop 1E Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\CAGN\Ex2_LV_usgs.pdf

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Survey Area

Exhibit 3

Santa Anita Prop 1E Project

N
W E
S

1,000 500 0 1,000
Feet

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\CAGN\Ex3_SurveyArea.pdf

ATTACHMENT A

SITE PHOTOS

View of alluvial sage scrub habitat at the upper end of the Santa Anita Debris Basin. Photo taken from the middle of the Debris Basin looking north.

View of coastal sage scrub habitat along the edges of the riparian habitat in the Santa Anita Debris Basin. Photo taken from the southwestern side of the Debris Basin looking east.

PAS D:\Projects\coladpw\J166\Graphics\ex_SP_092512.ai

Site Photographs

Attachment A

Santa Anita Proposition 1E Project

BonTerra CONSULTING

(09/25/12 KFD) PAS R: Projects\coladpw\J166\Graphics\CAGN\ExAttA1_SP.pdf

ATTACHMENT B

WILDLIFE COMPENDIUM

WILDLIFE SPECIES OBSERVED DURING COASTAL CALIFORNIA GNATCATCHER SURVEYS SPRING/SUMMER 2012

SCIENTIFIC NAME	COMMON NAME
REPTILIA	**Reptiles**
Phrynosomatidae	**Phrynosomatids**
Sceloporus occidentalis biseriatus	Western fence lizard
Uta stansburiana	Side-blotched lizard
Teiidae	**Whiptail lizards**
Cnemidophorus tigris	Western whiptail
Viperidae	**Rattlesnakes**
Crotalus viridis	Western rattlesnake
AVES	**Birds**
Ardeidae	**Herons and Egrets**
Ardea herodias	Great blue heron
Cathartidae	**Vultures**
Cathartes aura	Turkey vulture
Anatidae	**Geese and ducks**
Anas platyrhynchos	Mallard
Accipitridae	**Raptors**
Buteo lineatus	Red-shouldered hawk
Buteo jamaicensis	Red-tailed hawk
Odontophoridae	**Quail**
Callipepla californica	California quail
Columbidae	**Pidgeons and doves**
* *Columba livia*	Rock dove
* *Streptopelia decaocto*	Eurasian collared dove
Zenaida macroura	Mourning dove
Trochilidae	**Hummingbirds**
Calypte anna	Anna’s hummingbird
Calypte costae	Costa's hummingbird
Selasphorus sasin	Allen's hummingbird
Picidae	**Woodpeckers**
Melanerpes formicivorus	Acorn woodpecker
Picoides nuttallii	Nuttall’s woodpecker
Colaptes auratus	Northern flicker
Tyrannidae	**Tyrant flycatchers**
Empidonax difficilis	Pacific-slope flycatcher
Sayornis nigricans	Black phoebe
Sayornis saya	Say’s phoebe
Myiarchus cinerascens	Ash-throated flycatcher
Corvidae	**Jays and crows**
Cyanocitta stelleri	Steller’s jay
Aphelocoma californica	Western scrub-jay
Corvus corax	Common raven

WILDLIFE SPECIES OBSERVED DURING COASTAL CALIFORNIA GNATCATCHER SURVEYS SPRING/SUMMER 2012 (Continued)

SCIENTIFIC NAME	COMMON NAME
Hirundinidae	**Swallows**
Tachycineta thalassina	Violet-green swallow
Stelgidopteryx serripennis	Northern rough-winged swallow
Petrochelidon pyrrhonota	Cliff swallow
Paridae	**Titmice and chickadees**
Baeolophus inornatus	Oak (Plain) titmouse
Aegithalidae	**Bushtits**
Psaltriparus minimus	Bushtit
Troglodytidae	**Wrens**
Salpinctes obsoletus	Rock wren
Catherpes mexicanus	Canyon wren
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	House wren
Turdidae	**Bluebirds and thrushes**
Turdus migratorius	American robin
Timaliidae	**Wrentits**
Chamaea fasciata	Wrentit
Mimidae	**Mockingbirds and thrashers**
Mimus polyglottis	Northern mockingbird
Sturnidae	**Starlings**
* *Sturnus vulgaris*	European starling
Ptilogonatidae	**Silky flycatchers**
Phainopepla nitens	Phainopepla
Parulidae	**Wood warblers**
** *Dendroica petechia*	Yellow warbler
Emberizidae	**Towhees and sparrows**
Pipilo maculatus	Spotted towhee
Pipilo crissalis	California towhee
** *Aimophila ruficeps*	Rufous-crowned sparrow
Melospiza melodia	Song sparrow
Junco hyemalis	Dark-eyed junco
Cardinalidae	**Grosbeaks and buntings**
Pheucticus melanocephalus	Black-headed grosbeak
Icteridae	**Blackbirds and orioles**
* *Molothrus ater*	Brown-headed cowbird
Icterus cucullatus	Hooded oriole
Icterus bullockii	Bullock's oriole
Fringillidae	**Finches**
Carpodacus mexicanus	House finch
Carduelis tristis	American goldfinch
Estrildidae	**Estrildid finches**
Lonchura punctulata	Nutmeg mannikin

WILDLIFE SPECIES OBSERVED DURING COASTAL CALIFORNIA GNATCATCHER SURVEYS SPRING/SUMMER 2012 (Continued)

SCIENTIFIC NAME	COMMON NAME
MAMMALIA	**Mammals**
Leporidae	**Hares and rabbits**
Sylvilagus audubonii	Desert cottontail
Sciuridae	**Squirrels**
Spermophilus beecheyi	California ground squirrel
Sciurus griseus	Western gray squirrel
Canidae	**Dogs/wolves/foxes**
Canis latrans	Coyote (scat, tracks)
Ursidae	**Bears**
Ursus americanus	Black bear (scat, tracks)
Cervidae	**Deer**
Odocoileus hemionus	Mule deer

* non-native species
** CDFG's Special Animals

Note: Other species may have been overlooked or inactive/absent because of the season (amphibians are active during rains, reptiles during summer, some birds (and bats) migrate out of the area for summer or winter, some mammals hibernate etc.). Taxonomy and nomenclature generally follow NABA (2002) for butterflies, Stebbins (2003) for amphibians and reptiles, AOU (1998) for birds, and Jones et al. (1992) for mammals.

ATTACHMENT C

CNDDB FORMS

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/25/2012

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Dendroica petechia*

Common Name: Yellow warbler

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Brian Leatherman
Address: 5622 Amberdale Drive
Yorba Linda, CA 92886
E-mail Address: blelathermanwlb@aol.com
Phone: (714) 701-0863

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

1				
# adults	# juveniles	# larvae	# egg masses	# unknown
☐ wintering	☐ breeding	☐ nesting	☐ rookery	☐ burrow site	☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: LADPW
Quad Name: Mt. Wilson Elevation: _____
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon
DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐
Coordinates: 0406227mE, 3782454mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

A mixture of alluvial fan sage scrub and patches of riparian habitat dominated by mulefat (Baccharis salicifolia) and willows (Salix spp.) along the banks and within the floodplain of the creek within the basin. The upper terraces transition from alluvial fan sage scrub, dominated by scalebroom (Lepidospartum squamatum), to coastal sage scrub habitat, dominated by California sagebrush (Artemisia californica), California buckwheat (Eriogonum fasciculatum), and deerweed (Lotus scoparius). Adult male singing, presumably on territory.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: USFS to the north, urban sprawl to the south.

Visible disturbances:

Threats:

Comments: Along floodplain below Santa Anita Dam.

Determination: *(check one or more, and fill in blanks)*

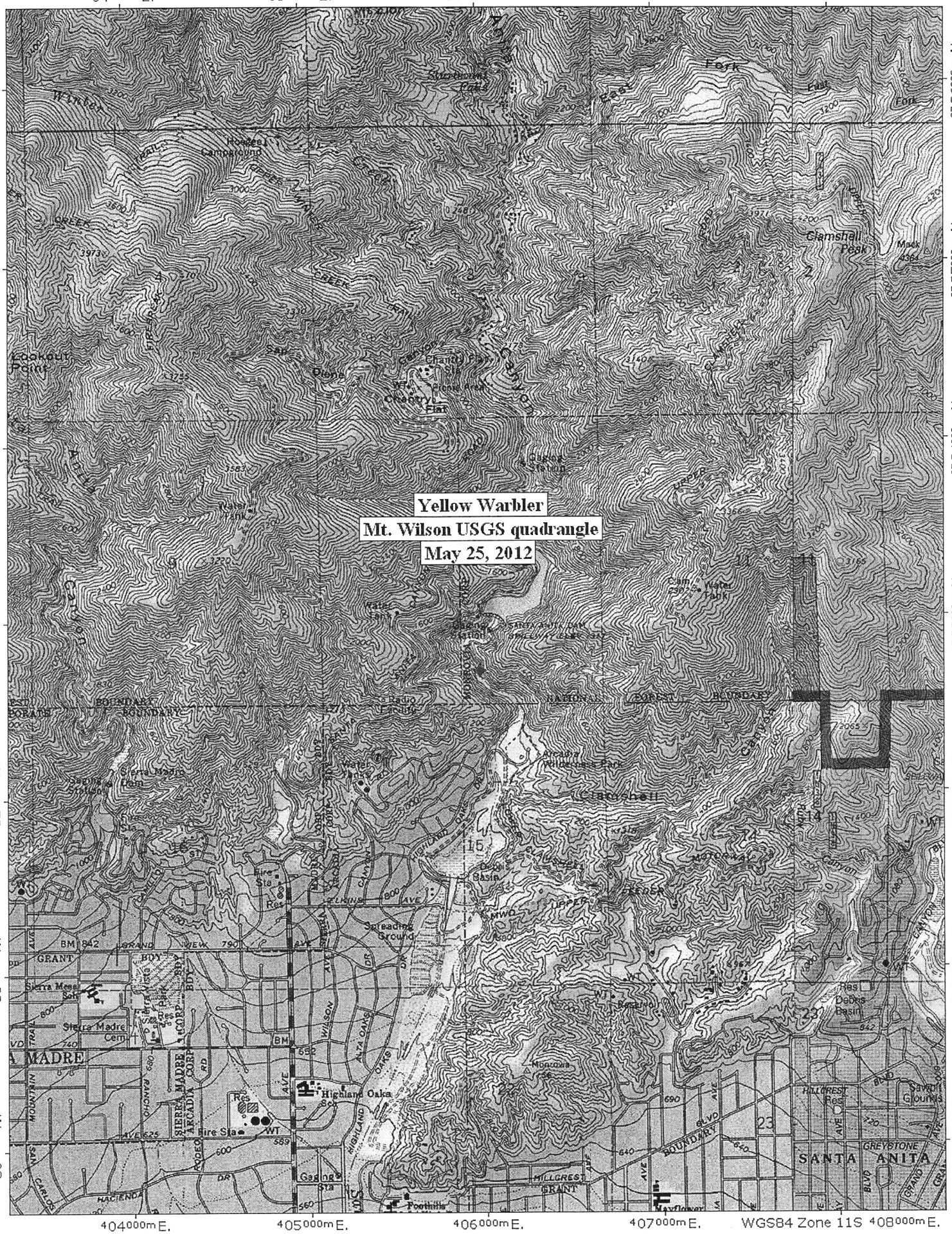
- ☐ Keyed (cite reference): _____
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

TOPO! map printed on 09/26/12 from "Untitled.tpo"



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 06/25/2012

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Aimophila ruficeps*

Common Name: Rufous-crowned sparrow

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Brian Leatherman
Address: 5622 Amberdale Drive
Yorba Linda, CA 92886
E-mail Address: bleathermanwlb@aol.com
Phone: (714) 701-0863

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown
1				

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: LADPW
Quad Name: Mt. Wilson Elevation: 1348 feet
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon
DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐
Coordinates: 0406179mE, 3783136mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Along access road above debris basin behind Santa Anita Dam with vertical walls or very steep slopes that are either unvegetated or dominated by a mixture of coastal sage scrub and chaparral elements.

Adult male singing, presumably on territory.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: USFS to the north, urban sprawl to the south.

Visible disturbances:

Threats: Maintenance of access road and debris basin/dam facility.

Comments:

Determination: *(check one or more, and fill in blanks)*

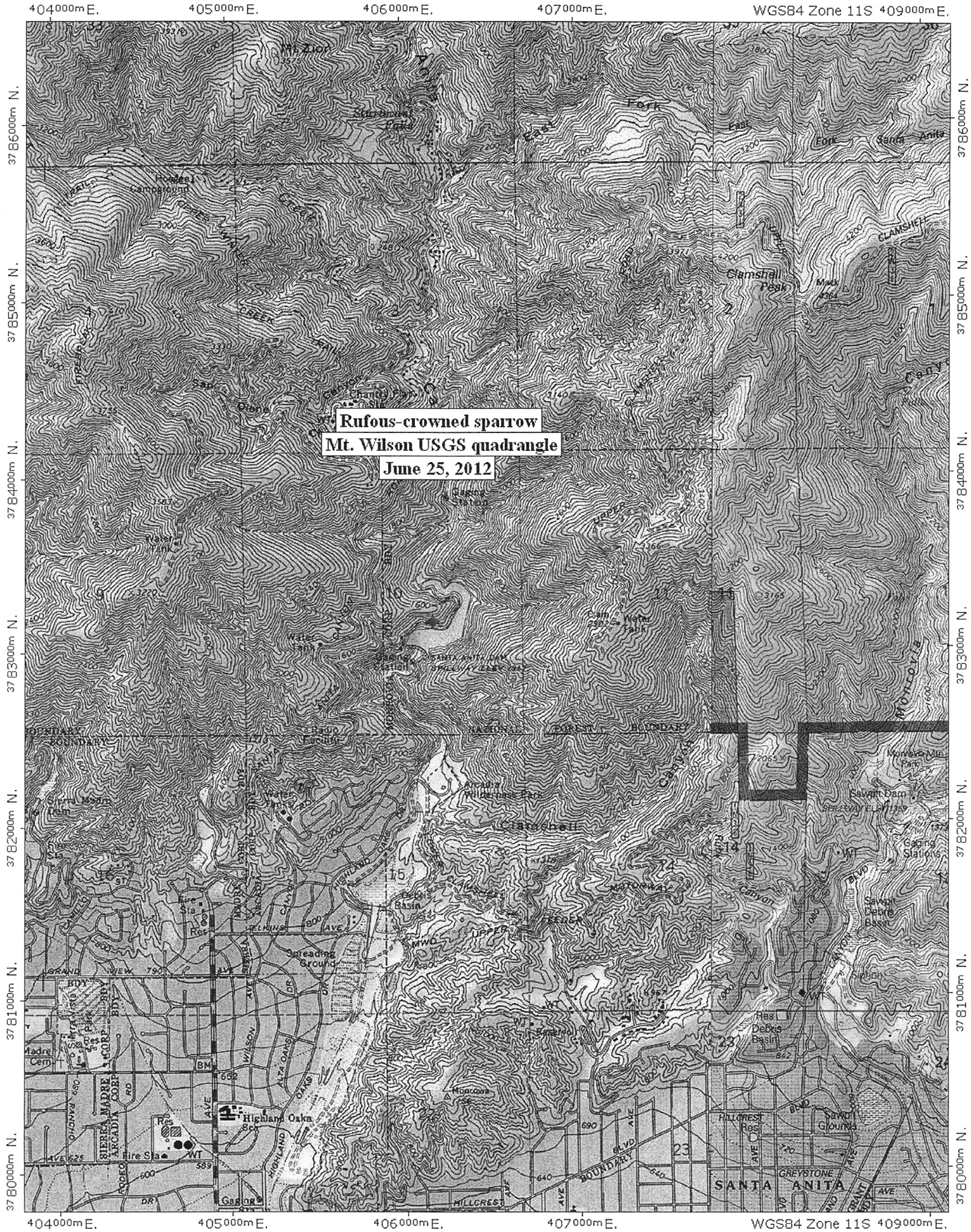
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☑ Other: Experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

TOPO! map printed on 09/26/12 from "Untitled.tpo"



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

ATTACHMENT H

LEAST BELL'S VIREO/SOUTHWESTERN WILLOW FLYCATCHER SURVEY REPORT

BonTerra CONSULTING
2 Executive Circle, Suite 175 Irvine, CA 92614
T: (714) 444-9199 F: (714) 444-9599 | www.BonTerraConsulting.com

October 10, 2012

Ms. Susie Tharratt
Recovery Permit Coordinator
U.S. Fish and Wildlife Service
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

VIA EMAIL AND MAIL
susie_tharratt@fws.gov

Subject: Results of the 2012 Least Bell's Vireo and Southwestern Willow Flycatcher Surveys for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California

Dear Ms. Tharratt:

This Letter Report presents the results of focused surveys to determine the presence or absence of the least Bell's vireo (*Vireo bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii extimus*) on the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project Site (hereinafter referred to as the "Project Site"). A Biologist with the necessary experience and the Federal Endangered Species Act 10(a) survey permit conducted the surveys according to U.S. Fish and Wildlife Service (USFWS) protocol for these species.

The Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project will improve Los Angeles County Flood Control District facilities to better manage storm water runoff from the Santa Anita Canyon watershed and to achieve the following goals: (1) to reduce flood damage to the downstream communities; (2) to increase recharge of the local groundwater basin; and (3) to improve public safety by remediating seismic safety issues at the Dam and Debris Basin. The Project Site is in the City of Arcadia and the Angeles National Forest and is located on the U.S. Geological Survey's (USGS') Mt. Wilson and Azusa 7.5-minute quadrangle maps (Exhibits 1 and 2).

Species Background

The southwestern willow flycatcher and least Bell's vireo were formerly more common and widespread, but have become rare and local summer residents of Southern California's lowland riparian woodlands (Grinnell and Miller 1986; Garrett and Dunn 1981). The substantial population declines of these two avian species over the latter half of the twentieth century is attributable to the loss and degradation of riparian habitats and to brood parasitism by the brown-headed cowbird (*Molothrus ater*). As a result, the least Bell's vireo was listed by the California Department of Fish and Game (CDFG) as Endangered on October 2, 1980, and by the USFWS as Endangered on May 2, 1986 (CDFG 2011). The CDFG listed all three subspecies of willow flycatcher that breed in California (*E. t. brewsteri*, *E. t. extimus*, and *E. t. adastus*) as Endangered on January 2, 1991 (CDFG 2011). The USFWS listed the southwestern willow flycatcher (*E. t. extimus*) as Endangered on February 7, 1995 (USFWS 1995), with an effective list date of March 29, 1995 (CDFG 2011).

Least Bell's Vireo

Bell's vireo is a Neotropical migrant that breeds in central and southwestern North America from northern Mexico to Southern California, Nevada, and Utah, east to Louisiana, and north to North Dakota, Wisconsin, and Indiana in the central U.S. (AOU 1998). Although not well known, the winter range of the Bell's vireo is believed to be the west coast of Central America from southern Sonora south to northwestern Nicaragua, including the cape region of Baja California, Mexico (Brown 1993). Of the four Bell's vireo subspecies, only two breed in California: the least Bell's vireo and the Arizona Bell's vireo (*V. b. arizonae*); the latter breeds in the Colorado River Valley (Garrett and Dunn 1981; Rosenberg et al. 1991). Though the least Bell's vireo was formerly considered a common breeder in riparian habitats throughout the Central Valley and other low-elevation riverine systems in California and Baja California, Mexico (Franzreb 1989), the least Bell's vireo had been eliminated from much of its historical range at the time of listing (Franzreb 1989; Brown 1993). The least Bell's vireo has increased tenfold since its listing to 2,968 territories, and it has begun to recolonize portions of its former range where it had been extirpated (USFWS 2006). The increase is credited to improvements in habitat abundance and quality and effective cowbird control. Continued cowbird control and exotic plant removal in riparian areas are considered necessary for the foreseeable future in order to continue this trend (USFWS 2006).

The breeding habitat of the least Bell's vireo is primarily riparian dominated by willows with dense understory vegetation, and shrubs such as mule fat and California rose are often a component of the understory (Goldwasser 1981). The least Bell's vireo is often found in areas that include trees such as willow (*Salix* spp.), western sycamore (*Platanus racemosa*), or cottonwood (*Populus* sp.), particularly where the canopy is within or immediately adjacent to an understory layer of vegetation (Salata 1983). The least Bell's vireo generally nests in early successional stages of riparian habitats, with nest sites frequently located in willows that are between four and ten years of age (RECON 1988; Franzreb 1989). The most critical factor in habitat structure is the presence of a dense understory shrub layer from approximately two to ten feet above ground (Goldwasser 1981; Salata 1983; Franzreb 1989).

On February 2, 1994, the USFWS issued their final determination of critical habitat for the least Bell's vireo (USFWS 1994), identifying approximately 37,560 acres as critical habitat in Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego Counties. The Project Site is not located within designated critical habitat for this species.

Southwestern Willow Flycatcher

The willow flycatcher is a Neotropical migrant that breeds in the west from northern Baja California, Mexico to central British Colombia, and generally east through the northern half of the U.S. to the Atlantic coast (AOU 1998). Depending on the authority, there are four or five recognized subspecies of willow flycatcher (Sedgwick 2000). The breeding range of southwestern willow flycatcher includes Southern California, Arizona, New Mexico, western Texas, and the extreme southern parts of Nevada and Utah (USFWS 1993). In California, the southwestern willow flycatcher breeds along the coast, north to the Santa Ynez River in Santa Barbara County, and north in the interior to about Independence in Inyo County (USFWS 2002; Unitt 1987). The largest breeding populations of southwestern willow flycatcher in California are located at the South Fork of the Kern River in Kern County and on the Santa Margarita River in Camp Pendleton in San Diego County (Unitt 1987). The range-wide population of southwestern willow flycatcher is estimated at 1,299 territories at 288 sites (Durst et. al. 2008). The population of southwestern willow flycatcher in California is estimated to be about 172 territories at 96 sites (Durst et al. 2008). Within the Coastal California Recovery Unit,

the population is estimated at 120 territories at 73 sites (Durst et al. 2008). The southwestern willow flycatcher population has not shown the same recovery that the least Bell's vireo has shown in response to riparian habitat restoration and cowbird control (Kus 2011).

The southwestern willow flycatcher breeds in willow-dominated riparian habitats that are similar to least Bell's vireo nesting habitats. The southwestern willow flycatcher differs from least Bell's vireo in that it shows a stronger dependency on willow thickets for all its habitat requirements (Grinnell and Miller 1986). In addition, the southwestern willow flycatcher appears to have a preference for sites with surface water in the vicinity, such as along streams; on the margins of a pond or lake; and at wet mountain meadows (Grinnell and Miller 1986; Flett and Sanders 1987; Harris et al. 1987). In Arizona, the southwestern willow flycatcher invariably nests near surface water (Phillips et al. 1964). Recently, the southwestern willow flycatcher has adapted to introduced highly invasive vegetation present in riparian communities, such as tamarisk (*Tamarix* sp.) and Russian olive (*Elaeagnus angustifolia*) (USFWS 1993).

The willow flycatcher is a common migrant in the interior of California and a rare-to-uncommon migrant along the coastal slope, with most birds moving through Southern California between May 15 and June 20 (Garrett and Dunn 1981; Unitt 1987). The spring migration of southwestern willow flycatcher is earlier than the northern subspecies (Unitt 1984; USFWS 1993). As a result, there is a presence of more abundant subspecies migrating through the range of the southwestern willow flycatcher during its breeding season. The migratory pattern of the willow flycatcher subspecies complicates the surveying process.

On October 19, 2005, the USFWS published a Final Rule designating critical habitat for the southwestern willow flycatcher (USFWS 2005). This final rule designates 120,824 acres in Arizona, California, Nevada, New Mexico, and Utah as critical habitat. Of that, 17,212 acres were designated in Kern, Santa Barbara, San Bernardino, and San Diego Counties, California. USFWS recently proposed a revised critical habitat designation on August 15, 2011. This revised critical habitat covers 2,090 stream miles in California, Nevada, Utah, Colorado, Arizona, and New Mexico (USFWS 2011). The Proposed Rule uses a slightly different methodology to designate critical habitat; it includes areas that USFWS consider essential for the recovery of the species even if they were not occupied at the time of the species' listing. The Project Site is not located within the previous final critical habitat designation, or the 2011 proposed revised critical habitat designation.

Survey Methodology

The USFWS protocol for the least Bell's vireo requires that at least eight surveys be conducted from April 10 to July 31 with a ten-day interval between each site visit. The USFWS protocol for the southwestern willow flycatcher requires a total of five surveys, with the first survey conducted between May 15 and May 31; the second and third surveys between June 1 and June 24; and the fourth and fifth surveys between June 25 and July 17. Due to similar ecological requirements, surveys for these two species can be conducted concurrently. A total of eight surveys were conducted to satisfy the survey requirements of both species. BonTerra Consulting Senior Biologist Brian Daniels (Permit No. TE 821401-4) conducted the five southwestern willow flycatcher surveys on May 24; June 4, 14, and 25; and July 6, 2012. BonTerra Consulting Senior Biologist Amber Oneal (Permit No. TE 148554-2) conducted the first two least Bell's vireo surveys on May 2 and 14, 2012, and Mr. Daniels conducted the remaining surveys on May 24; June 4, 14, and 25; and July 6 and 16, 2012.

The survey area for the Project Site includes all riparian habitats from the Santa Anita Debris Basin upstream to the outlet of the sediment transport tunnel (Exhibit 3). The approximate 4,000 feet length of riparian habitats were systematically surveyed by walking slowly and methodically along the margins of riparian habitat or by using meandering transects through riparian habitat at the debris basin. Following the willow flycatcher protocol, recorded vocalizations were used to elicit a response from any potentially territorial southwestern willow flycatchers. If no southwestern willow flycatchers were detected after the initial playing of the recorded vocalization, the recording will be replayed at least once, but often multiple times. The least Bell's vireo survey protocol does not require the playback of least Bell's vireo vocalizations, therefore, recorded least Bell's vireo vocalizations were not used during the surveys.

All surveys were conducted under optimal weather conditions (i.e., between 55 and 95 degrees Fahrenheit [°F] with wind speeds between 0 and 15 miles per hour) and during the early morning hours when bird activity is at a peak.

Survey Results

No breeding least Bell's vireo or southwestern willow flycatcher were detected during the surveys. No migrant willow flycatchers were observed during the surveys. Daily tallies indicating relative abundance for all bird species detected during the surveys are presented in Attachment A. Representative site photos are presented in Attachment B.

Riparian habitats in the Santa Anita Debris Basin at the south end of the survey area are dominated by willows. Willows are scarce elsewhere in the survey area, but there are some upstream of the small retention basin located about 300 feet downstream of the sediment transport tunnel outlet (see Attachment B- Project Photographs). The riparian habitats upstream from this retention basin are dominated by white alder (*Alnus rhombifollia*) and, as the canyon narrows significantly, the riparian habitats become unsuitable for occupation by both the least Bell's vireo and southwestern willow flycatcher. The middle of the survey area is dominated by alluvial sage scrub vegetation with scattered individuals or clumps of western sycamore and is generally not suitable for the least Bell's vireo or southwestern willow flycatcher.

The list of 69 species of birds identified during these surveys includes one species, the yellow warbler (*Setophaga petechia*), that is listed by the CDFG as Species of Special Concern (Shuford and Gardali 2008). Four to five breeding territories were established in the mature willow woodland at the south end of the survey area behind the dam of the Santa Anita Debris Basin. At least one family group of yellow warblers was observed during the surveys. As required by BonTerra Consulting's Letter of Agreement with the CDFG, a California Natural Diversity Database (CNDDB) form has been completed and submitted to the CDFG documenting this occurrence (Attachment C).

Please contact Amber Oneal (714) 444-9199 or Brian Daniels at (626) 351-2000 if you have questions or comments.

Sincerely,

BONTERRA CONSULTING

Amber S. Oneal
Associate, Senior Project Manager

Brian E. Daniels
Senior Biologist/Ornithologist

I certify that the information in this survey report and enclosed exhibits fully and accurately present my work.

Brian E. Daniels
Senior Biologist/Ornithologist
(TE-821401-4)

Attachments: Exhibits 1–3
A – Avian List: Daily Tallies – 2012
B – Project Photographs
C – CNDDB Form
D – Willow Flycatcher Survey and Detection Form

R:\Projects\CoLADPW-S\J166\LBV_WIFL\LBV_WIFL Report-101012.docx

References

American Ornithologists' Union (AOU). 1998. *Check-list of North American Birds* (7th ed). Shipman, VA: Buteo Books.

Brown, B.T. 1993. Bell's Vireo (*Vireo bellii*). *The Birds of North America, No. 35* (A. Poole, P. Stettenheim, and F. Gill, Eds.). Philadelphia, PA and Washington, D.C.: The Academy of Natural Sciences and AOU (respectively).

California Department of Fish and Game (CDFG). 2011 (January). *State and Federally Listed Endangered and Threatened Animals of California*. Sacramento, CA: CDFG, Natural Heritage Division.

Durst, S.L., Sogge, M.K., Stump, S.D., Walker, H.A., Kus, B.E., and Sferra, S.J., 2008. *Southwestern Willow Flycatcher Breeding Sites and Territory Summary – 2007.* (Open–File Report 2008–1303). Reston, VA: U.S. Geological Survey.

Flett, M.A. and S.D. Sanders. 1987. Ecology of a Sierra Nevada Population of Willow Flycatchers. *Western Birds* 18(1): 37–42. San Diego, CA: Western Field Ornithologists.

Franzreb, K.E. 1989. *Ecology and Conservation of the Endangered Least Bell's Vireo* (Biological Report 89[1]). Sacramento, CA: USFWS, Endangered Species Office.

Garrett, K. and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society.

Goldwasser, S. 1981. *Habitat Requirements of the Least Bell's Vireo* (Final Report, Job IV-38.1). Sacramento, CA: CDFG.

Grinnell, J. and A.H. Miller. 1986 (April). *The Distribution of the Birds of California* (reprint from Cooper Ornithological Club's December 30, 1944, Pacific Coast Avifauna No. 27). Lee Vining, CA: Artemesia Press.

Harris, J.H., S.D. Sanders, and M.A. Flett. 1987. Willow Flycatcher Surveys in the Sierra Nevada. *Western Birds* 18(1): 27–36. San Diego, CA: Western Field Ornithologists.

Kus, B.E. 2011 (April 1). Annual Meeting of the California Least Bell's Vireo, Southwestern Willow Flycatcher and Yellow-billed Cuckoo Working Group. Workshop for U.S. Fish and Wildlife Service and California Department of Fish and Game, Carlsbad, California.

Phillips, A.R., J. Marshall, and G. Monson. 1964. *The Birds of Arizona*. Tucson, AZ: University of Arizona Press.

RECON Regional Environmental Consultants (RECON). 1988. *Draft Comprehensive Species Management Plan for the Least Bell's Vireo* (Prepared for the San Diego Association of Governments). San Diego, CA: RECON.

Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. *Birds of the Lower Colorado River Valley*. Tucson, AZ: University of Arizona Press.

Salata, L.R. 1983. *Status of the Least Bell's Vireo on Camp Pendleton, California: Report on Research Done in 1983*. Laguna Niguel, CA: USFWS.

Sedgwick, J.A. 2000. Willow Flycatcher (*Empidonax traillii*). *The Birds of North America, No. 533* (A. Poole and F. Gill, Eds.). Philadelphia, PA: The Academy of Natural Sciences.

Shuford, W.D. and T. Gardali (Ed.). 2008. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and District Populations of Birds of Immediate Conservation Concern in California. *Studies of Western Birds 1*. Camarillo, CA and Sacramento, CA: Western Field Ornithologists and CDFG (respectively.

Unitt, P. 1987. *Empidonax traillii extimus:* An Endangered Subspecies. *Western Birds*. 18(3): 137–162. San Diego, CA: Western Field Ornithologists.

———. 1984. *The Birds of San Diego County* (Memoir 13). San Diego, CA: San Diego Society of Natural History.

U.S. Fish and Wildlife Service (USFWS). 2011 (August 15). Endangered and Threatened Wildlife and Plants; Designation of Revised Critical Habitat for Southwestern Willow Flycatcher; Proposed Rule. *Federal Register* 76(157): 50542–50629. Washington, D.C.: USFWS.

———. 2006 (September). *Least Bell's Vireo (Vireo belii pusillus) 5-Year Review Summary and Evaluation.* Carlsbad, CA: USFWS, Carlsbad Field Office.

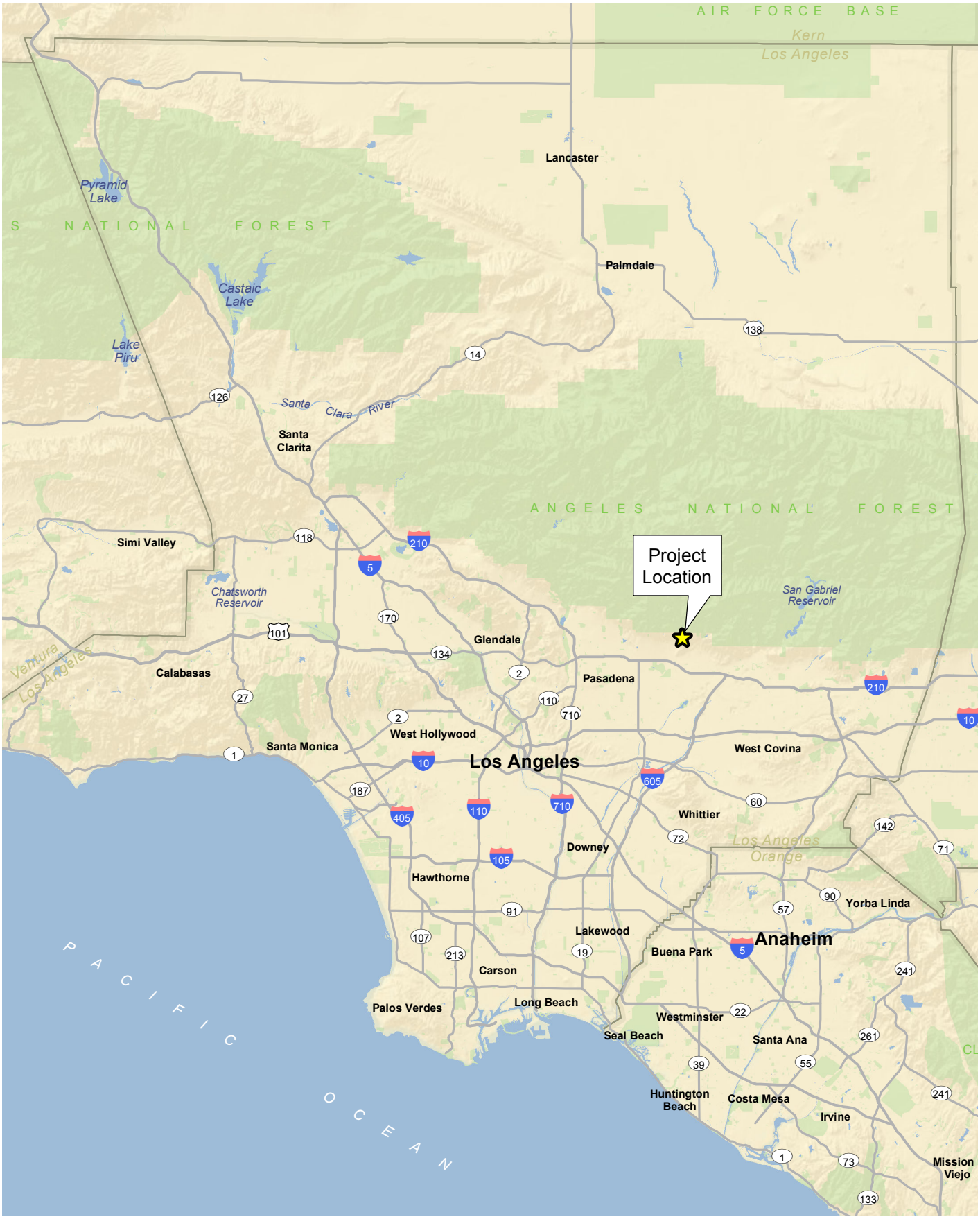
———. 2005 (October 19). Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*). *Federal Register* 70(201): 60885–61009. Washington, D.C.: USFWS.

———. 2002 (August). *Final Recovery Plan for Southwestern Willow Flycatcher (Empidonax traillii extimus).* Albuquerque, NM: USFWS, Southwestern Willow Flycatcher Recovery Team Technical Subgroup for Region 2.

———. 1995 (February 27). Endangered and Threatened Wildlife and Plants: Final Rule, Determining Endangered Status for the Southwestern Willow Flycatcher. *Federal Register.* 60(38): 10693–10715. Washington, D.C.: USFWS.

———. 1994 (February 2). Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Least Bell's Vireo. *Federal Register* 59(22): 4845–4867. Washington, D.C.: USFWS.

———. 1993 (July 23). Endangered and Threatened Wildlife and Plants; Proposed Rule to List the Southwestern Willow Flycatcher as Endangered With Critical Habitat. *Federal Register* 58(140): 39495–39522. Washington, D.C.: USFWS.



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Project Location

Exhibit 1

Santa Anita Proposition 1E Project

N W E S

10 5 0 10 Miles

BonTerra CONSULTING

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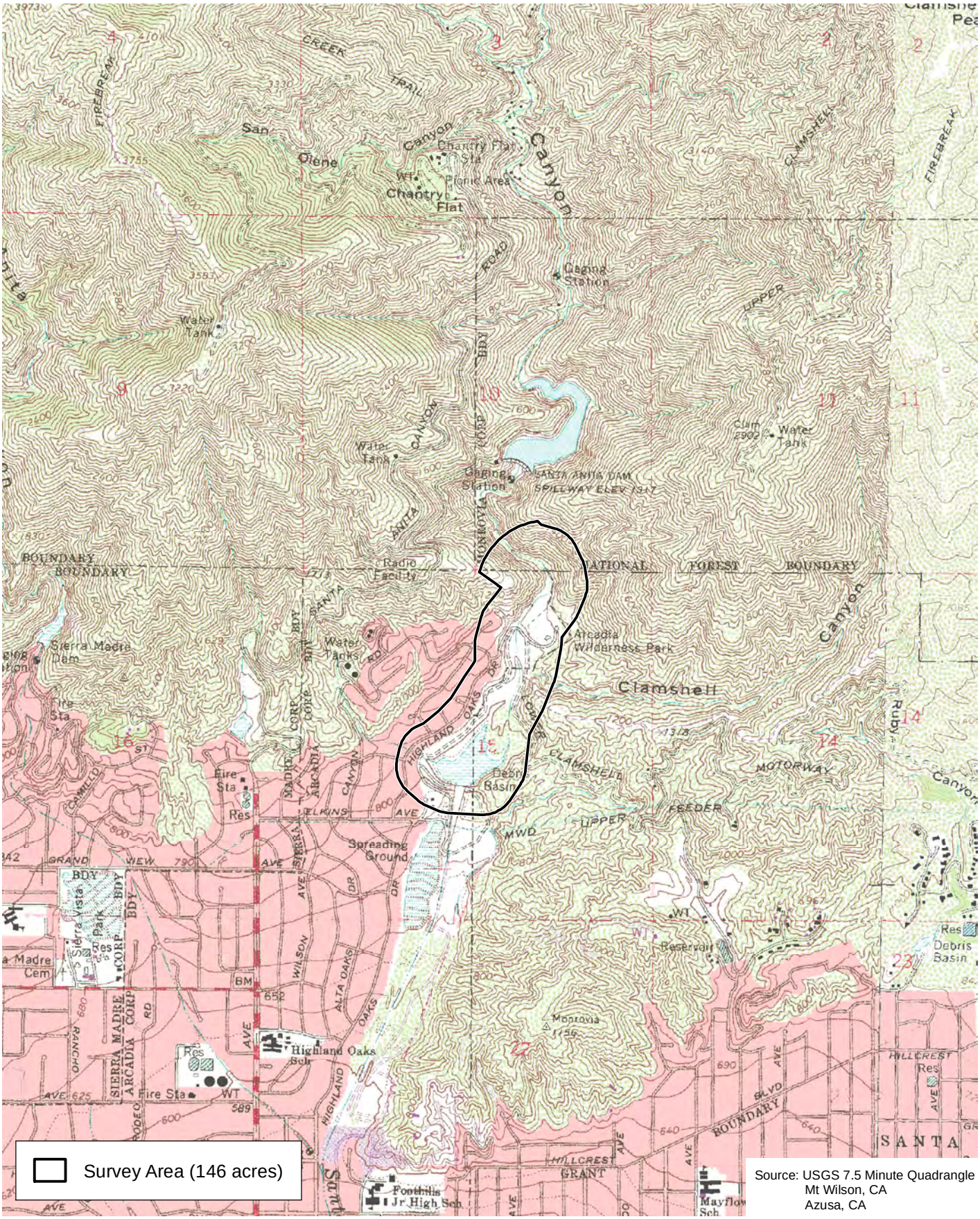

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Local Vicinity

Exhibit 2

Santa Anita Proposition 1E Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

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Survey Area

Exhibit 3

Santa Anita Proposition 1E Project

N
W E
S

1,000 500 0 1,000
Feet

BonTerra CONSULTING

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ATTACHMENT A

AVIAN LIST: DAILY TALLIES – 2012

TABLE 1
AVIAN LIST
DAILY TALLIES – 2012

Common Name	May 2	May 14	May 24	June 4	June 14	June 25	July 6	July 16
Canada Goose *Branta canadensis*			2					
Mallard *Amas platyrhynchos*		2	2					
California Quail *Callipepla californica*	2	4	10	10	20		40	15
Great Blue Heron *Ardea Herodias*		1			1			
Great Egret *Ardea alba*		1						
Turkey Vulture *Cathartes aura*		2						
Cooper's Hawk *Accipiter cooperii*					1	1		1
Red-shouldered Hawk *Buteo lineatus*	1		1	1	1	1		1
Red-tailed Hawk *Buteo jamaicensis*		1		1	1	1	5	1
Killdeer *Charadrius vociferus*		2						
Band-tailed Pigeon *Patagioenas fasciata*			4	6		1	4	2
Mourning Dove *Zenaida macroura*	8	6	7	6		6	12	8
White-throated Swift *Aeronautes saxatalis*				2		2	1	
Black-chinned Hummingbird *Archilochus alexandri*		1		1	1	1	2	5
Anna's Hummingbird *Calypte anna*	8	7	2	2	1	1	1	11
Costa's Hummingbird *Calypte costae*						3		
Allen's Hummingbird (males) *Selasphorus sasin*				3		1		
Allen'/Rufous Hummingbird *Selasphorus* sp.	1	4	1	4	4	6	11	5
Belted Kingfisher *Ceryle alcyon*		1						
Acorn Woodpecker *Melanerpes formicivorus*	7	6	4	7	5	3	6	5
Nuttall's Woodpecker *Picoides nuttallii*	2	1	2	5	2	5	3	3
Northern Flicker *Colaptes auratus*		4				1		
Red-crowned Parrot *Amazona viridigenalis* – **I**	6	9	15	12	8	12	12	15
Mitred Parakeet *Aratinga mitrata* – **Ex**					3			
Black-hooded Parakeet *Nandayus nenday* – **Ex**				1				

TABLE 1 (Continued)
AVIAN LIST
DAILY TALLIES – 2012

Common Name	May 2	May 14	May 24	June 4	June 14	June 25	July 6	July 16
Western Wood-Pewee *Contopus sordidulus*	2	1	3	1	2		2	3
Pacific-slope Flycatcher *Empidonax difficilis*	6	3	1			1	2	
Black Phoebe *Sayornis nigricans*	4	1	5	4	6	6	5	2
Ash-throated Flycatcher *Myiarchus cinerascens*		4	2		2	2	4	5
Hutton's Vireo *Vireo huttoni*			1					
Steller's Jay *Cyanocitta stelleri*					1		2	1
Western Scrub-Jay *Aphelocoma californica*	9	9	11	7	8	6	10	9
American Crow *Corvus brachyrhynchos*			1					
Common Raven *Corvus corax*			2	1			1	2
Violet-green Swallow *Tachycineta thalassina*		6	2	4	2	2	2	4
Northern Rough-winged Swallow *Stelgidopteryx serripennis*	6		8	2	4	2	8	1
Cliff Swallow *Petrochelidon pyrrhonota*		6	2					
Barn Swallow *Hirundo rustica*		1	1					1
Oak Titmouse *Baeolophus inornatus*	1	1	4	2	6	2		5
Bushtit *Psaltriparus minimus*	13	4	30	30	15	15	10	
White-breasted Nuthatch *Sitta carolinensis*						1		
Canyon Wren *Catherpes mexicanus*	3	1	4	1	3	3	4	4
House Wren *Troglodytes aedon*	6	7	12	6	4	3	4	4
Bewick's Wren *Thryomanes bewickii*	15	3	3	7	3	3	5	3
Wrentit *Chamaea fasciata*	4	3	14	8	12	12	23	10
Swainson's Thrush *Catharus ustulatus*		2						
American Robin *Turdus migratorius*			3	3	1	3	2	2
Northern Mockingbird *Mimus polyglottos*	2	7	4	3	5	8	10	8
California Thrasher *Toxostoma redivivum*	2	2			2	1		

TABLE 1 (Continued)
AVIAN LIST
DAILY TALLIES – 2012

Common Name	May 2	May 14	May 24	June 4	June 14	June 25	July 6	July 16
Red-whiskered Bulbul *Pycnonotus jocosus* – **Ex**			1	1	1		1	3
European Starling *Sturnus vulgaris* – **I**			5	2	5	1	4	2
Phainopepla *Phainopepla nitens*	2	7	8	15	18	15	9	9
Orange-crowned Warbler *Oreothlypis celata*	1		1	1				
Common Yellowthroat *Geothlypis trichas*	3	3	3	2	4	1	6	1
Yellow Warbler *Setophaga petechia*	6	4	10	5	5	7	8	4
Wilson's Warbler *Cardellina pusilla*	2	4						
Spotted Towhee *Pipilo maculates*	22	9	18	10	16	17	17	12
Rufous-crowned Sparrow *Aimophila ruficeps*						1	1	
California Towhee *Melozone crissalis*	18	1	12	5	9	6	12	8
Song Sparrow *Melospiza melodia*	16	12	15	10	9	3	6	
Western Tanager *Piranga ludoviciana*			2	1	1	2	4	4
Black-headed Grosbeak *Pheucticus melanocephalus*	6	6	7	5	3	1	7	13
Red-winged Blackbird *Agelaius phoeniceus*		4						
Brown-headed Cowbird *Molothrus ater*	4	4	2			1	1	
Hooded Oriole *Icterus cucullatus*			2	1	2	10	6	7
Bullock's Oriole *Icterus bullockii*	8	6	6	6	3	5	2	2
House Finch *Carpodacus mexicanus*	16	8	15	9	9	19	20	23
Lesser Goldfinch *Spinus psaltria*	32	8	8	8	20	7	12	11
American Goldfinch *Spinus tristis*							4	
Nutmeg Mannikin *Lonchura punctulata* – **Ex**						2		7

I Introduced non-native species with established breeding population in California
Ex Exotic or escaped non-native species that may or may not be breeding in California

ATTACHMENT B

PROJECT PHOTOGRAPHS

Photo 1. Representative habitat in the Santa Anita Debris Basin. Photo taken looking northeast.

Photo 2. Representative habitat in the Santa Anita Debris Basin. Photo taken looking north.

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Site Photographs

Attachment B-1

Santa Anita Proposition 1E Project

BonTerra CONSULTING

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Photo 3. Representative habitat along Santa Anita Creek near the headworks facility, just upstream of Arcadia Wilderness Park. Photo taken looking north.

Photo 4. Representative habitat along Santa Anita Creek, just north of the headworks facility near the tunnel used for sediment removal (project in progress). Upstream of this point, the canyon becomes narrow and habitat changes to alder riparian forest with little understory. Photo taken looking north.

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Site Photographs

Attachment B-2

Santa Anita Proposition 1E Project

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(rev 10/10/12 KFD) PAS R: Projects\coladpw\J166\Graphics\LBV_SFW\ExAttB2_SP2_lbv.pdf

ATTACHMENT C

CNDDB FORM

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/06/2012

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Setophaga petechia*

Common Name: Yellow Warbler

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 8 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Brian E. Daniels
Address: 225 South Lake Ave, Suite 1000
Pasadena, CA 91101
E-mail Address: bdaniels@bonterraconsulting.com
Phone: (626) 351-2000

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

6	2			
# adults	# juveniles	# larvae	# egg masses	# unknown

☐ wintering ☑ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: Los Angeles County
Quad Name: Azusa Elevation: 232 m
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GoogleEarth
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐
Coordinates: 11S 405802 3781599

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Mature willow woodland behind Santa Anita Debris Basin supporting 4 to 5 breeding territories of Yellow Warblers

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Residential areas and open spaces of the Arcadia Wilderness Park

Visible disturbances: Active transfer of sediment from Santa Anita Dam downstream via conveyor belt to soil disposal site

Threats:

Comments: This is an active flood control debris basin.

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

ATTACHMENT D

WILLOW FLYCATCHER SURVEY AND DETECTION FORM

Appendix 1. Willow Flycatcher Survey and Detection Form

Always check the U.S. Fish and Wildlife Service Arizona Ecological Services Field Office web site (http://www.fws.gov/southwest/es/arizona/) for the most up-to-date version.

Willow Flycatcher (WIFL) Survey and Detection Form (revised April 2010)

Site Name Santa Anita Dam State CA County Los Angeles
USGS Quad Name Mt. Wilson and Azusa Elevation 234 - 295 (meters)
Creek, River, Wetland, or Lake Name Santa Anita Creek
Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? ***Yes*** ✓ ***No*** ___

Survey Coordinates: Start: E 405767 N 3781583 UTM Datum NAD83 (See instructions)
Stop: E 406142 N 3782582 UTM Zone 11S
If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.
***** Fill in additional site information on back of this page *****

Survey # / Observer(s) (Full Name)	Date (m/d/y) Survey time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N / If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding; potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s) BED	Date 5/24 Start 0615 Stop 0900 Total hrs 2.75	0	0	0	N		0			
Survey # 2 Observer(s) BED	Date 6/4 Start 0615 Stop 0830 Total hrs 2.25	0	0	0	N		0			
Survey # 3 Observer(s) BED	Date 6/14 Start 0600 Stop 0900 Total hrs 3	0	0	0	N		0			
Survey # 4 Observer(s) BED	Date 6/25 Start 0600 Stop 0900 Total hrs 3	0	0	0	N		0			
Survey # 5 Observer(s) BED	Date 7/6 Start 0615 Stop 0845 Total hrs 2.5	0	0	0	N		0			

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total Survey Hrs ___	0	0	0	0

Were any Willow Flycatchers color-banded? Yes___ No ___

If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual Brian E. Daniels Date Report Completed September 25, 2012
US Fish and Wildlife Service Permit # TE821401-4 State Wildlife Agency Permit # ___

***Submit** form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.*

ATTACHMENT I

ROOSTING BAT SURVEY REPORT

BonTerra PSOMAS

Balancing the Natural and Built Environment

September 11, 2014

Matt Frary
Water Resources Division
Department of Public Works
County of Los Angeles
900 South Fremont Avenue
Alhambra, California 91803

VIA EMAIL
mfrary@dpw.lacounty.gov

Subject: Roosting Bat Survey Report for the Santa Anita Stormwater Management and Seismic Strengthening Project, Los Angeles County, California

Dear Mr. Frary:

At the request of the Los Angeles County Department of Public Works (LACDPW), BonTerra Psomas conducted a focused roost survey and habitat assessment for bat species (Order: *Chiroptera*) in the area that would be impacted by the Santa Anita Stormwater Management and Seismic Strengthening Project (hereinafter referred to as the "proposed project"). This Letter Report details the findings of the roost survey and focused habitat assessment.

PROJECT DESCRIPTION AND LOCATION

The proposed project is located in Los Angeles County at the northeast edge of the City of Arcadia; at the northwest edge of the City of Monrovia; and in the Angeles National Forest (Exhibit 1). The project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, specifically in three areas: the Santa Anita Dam (Dam); the Santa Anita Headworks (Headworks) with the adjacent Wilderness Park Culvert Crossing; and the Santa Anita Debris Dam (Debris Dam). It aims to improve the facilities to better manage storm water runoff from the Santa Anita Canyon Watershed and to improve public safety by addressing seismic safety and other structural issues. The effort associated with this Letter Report focused on the portions of the project site with potential to support roosting bats, as generally identified in the Biological Technical Report (BonTerra Psomas 2014).

The project survey area is located on the U.S. Geological Survey's (USGS') Mount Wilson 7.5-minute topographic quadrangle in Township 1 North, Range 11 West in portions of Sections 10 and 15 with elevations ranging from 750 to 1,300 feet above mean sea level (msl). The project study area includes habitat from the Santa Anita Reservoir downstream along Santa Anita Creek to the Santa Anita Debris Basin. Private residences occur along the western boundary of the Debris Dam along Highland Oaks Boulevard. Open space in the Arcadia Wilderness Park and the Angeles National Forest occurs north and east of the project survey area.

2 Executive Circle
Suite 175
Irvine, CA 92614

Tel 714.444.9199
Fax 714.444.9599
www.Psomas.com

Santa Anita Canyon is very narrow and steep-sided along Santa Anita Creek as it flows approximately ½ mile below the Dam, opening into a broad alluvial wash in the Santa Anita Debris Basin. Vegetation types in the survey area include coastal sage scrub, chaparral, black willow riparian forest, sycamore woodland, mixed riparian forest, alder riparian forest, elderberry woodland, mule fat scrub, coast live oak woodland, mixed woodland, ornamental, and ruderal.

Santa Anita Creek is perennial in the upper portion of the canyon and contains some slow moving pools. The lower portion of Santa Anita Creek and the Debris Dam are ephemeral and were dry at the time of the survey. Santa Anita Creek is characterized by very steep slopes, shallow soils, and watercourses contained within bedrock channels.

SURVEY AREA

The survey area for the focused roost survey and habitat assessment for bat species focused on areas within the permanent and temporary impact footprints for the project (Exhibit 2a—2c). At the Dam, the survey focused on the Dam structure, gunite slopes adjacent to the Dam, and facility structures associated with the Dam. At the Headworks, the survey focused on the facility structure. At the Wilderness Park Culvert Crossing, the survey focused on the culverts and wing walls associated with the bridge. At the Debris Dam, the survey focused on the inlet structure and ornamental vegetation adjacent to the Debris Dam. Native vegetation, predominately mixed chaparral or riparian woodlands, occurs adjacent to all proposed impact areas.

No enclosed, subterranean mines (abandoned or active) are recorded in the greater vicinity (approximately 20 miles) of the proposed impact area (DOC 2014); however, the Angeles National Forest expands across a large, undeveloped area and likely contains various unreported or unlisted mine locations.

This survey was conducted during a poor precipitation year and only limited areas in Santa Anita Canyon supported aboveground water. The portions or adjacent portions of the survey area that contain open, standing water during the survey effort were limited to (1) the stored water on the upstream-side of Santa Anita Dam; (2) a small pool located immediately downstream of the Santa Anita Dam facilities (beyond all the slopes covered in gunite); and (3) a small pool located on the downstream side of the Headworks facility. No other areas currently support any aboveground water, including the Debris Dam, the area upstream of the Headworks facility, and the stream beneath the Wilderness Park Culvert Crossing.

METHODS

The focused daytime survey involved inspecting all proposed impact areas for sign of bat roosting. Signs of roosting include audible social calls; observation of individuals roosting; and presence of guano, urine staining, or *Lepidopteron* (moth) wings. The absence of sign does not preclude potential roosting features from additional survey efforts, but rather aids in final determinations. The focused daytime survey is also used to identify suitable roosting features in the survey area, including natural and artificial crevices in rocks and buildings. Various factors contribute to suitable day-roost sites, including structural opportunities (e.g., crevices), microclimate, thermal conductivity (the roost's ability to passively regulate temperature), protection from predators, and proximity to resources such as open water for drinking. The daytime survey was conducted by BonTerra Psomas biologist Steve Norton on July 31, 2014 from 8:30 AM to 5:00 PM.

The emergence survey (also known as the exit or evening survey) involved visually monitoring all potential roost sites for evening emergence. The evening emergence surveys were conducted on July 31 and August 6, 7, and 12, 2014, by BonTerra Psomas Biologists Steve Norton, Dani Henning, Jonathan Aguayo, and Jason Mintzer. Just before dusk, Biologists were staged at different locations near each proposed impact area with suitable roost features (Exhibit 2). Many of the suitable features along the

canyon walls at Santa Anita Dam were inaccessible and visibility was limited; monitoring of these features was conducted at remote distances and the findings were accompanied by monitoring bat activity entering and leaving the downstream Dam area. This effort was achieved by stationing two biologists at the top of the Dam and two biologists at the bottom of the Dam.

Visual monitoring and any bat exit counts extended from 30 minutes before sunset to approximately 1 hour after sunset, for a duration of approximately 90 minutes, depending on the amount of ambient light available. When environmental conditions (such as previously existing artificial light or moonlight) allowed for additional visual survey times, the visual survey window was extended. Alternatively, when environmental conditions were not favorable due to significant shading from dense canopy cover or canyon walls, the visual survey time was reduced. Surveys were scheduled to accommodate favorable emergence conditions, which include wind speeds less than 10 miles per hour, moderate day and evening temperatures, no rain, and avoiding the full moon (Table 1).

TABLE 1
SURVEY DATES AND CONDITIONS

Survey Location	Date	Surveying Biologists	Sunset	Moon Phase	Acoustic survey hours	Visual Survey hours	Cloud cover/ wind speed	daytime high/ evening low (°F)
Dam	7/31/2014	Steve Norton, Dani Henning, Jonathan Aguayo, Jason Mintzer	7:54 PM	20% visible, waxing	7:28 PM–11:06 PM	7:25 PM–8:55 PM	0%/1–3 mph	93/71
	8/12/2014	Steve Norton	7:42 PM	94% visible, waning*	7:13 PM–10:44 PM	7:13 PM–8:43 PM	0%/1–2 mph	89/68
Headworks	8/6/2014	Steve Norton, Jason Mintzer	7:48 PM	78% visible, waxing	7:20 PM–10:57 PM	7:20 PM–8:58 PM	0%/0–1 mph	82/70
Debris Dam	8/7/2014	Steve Norton, Jonathan Aguayo	7:47 PM	87% visible, waxing	7:20 PM–10:51 PM	7:20 PM–8:50 PM	0%/1–3 mph	82/69

mph: miles per hour; waxing: increasing the illumination of the moon; waning: decreasing the illumination of the moon.

* Survey was conducted within one day of a full moon; however, the survey location was in a deep, steep-walled canyon which prevented any ambient moon light from increasing visibility until after 11:00 PM.

The emergence survey also included stationing an ultrasonic acoustic recording device at locations likely to aid in determining roost occupancy. An acoustic recording device adds further useful data by (1) recording individuals that may have not been visually observed; (2) allowing passive species identification to associate roosting preferences with habitat present in the survey area; and (3) documenting the time of arrival of a species in the survey area. The purpose of conducting ultrasonic acoustic recording in this effort is not to provide a comprehensive inventory of all bat species utilizing the survey area, but rather to identify the potential for bats to utilize the survey area (i.e., project impact areas) for day-roosting. The acoustic recording occurred during each evening survey and extended for approximately 3.5 hours (30 minutes before sunset to 3 hours after sunset).

A Wildlife Acoustics EchoMeter 3+ unit was used to collect acoustic data. The acoustic data collected was recorded in full spectrum .wav files and segregated into regular files and noise files by the acoustic recording unit. The files not disqualified as “noise” were analyzed using SonoBat 3.2.1 software using the “United States West Region” classifier. These files were analyzed using the SonoBatch process, then

visually verified using Echolocation Call Characteristics of Western US Bats (Humboldt State University 2011). Any recordings potentially classified as a sensitive species—specifically Townsend's big-eared bat (*Corynorhinus townsendii*) or fringed myotis (*Myotis thysanodes*)—received additional analysis by Senior Biologist Ed West, an expert bat biologist with a specialty in acoustic monitoring.

RESULTS

The results are separated into the three survey areas (Dam, Headworks, and Debris Dam), summarized in Table 2 and discussed in detail below. A complete list of all the wildlife observed during the surveys is located in Attachment A. California Natural Diversity Database forms for special status species are included in Attachment B.

TABLE 2
BAT SPECIES RECORDED DURING SURVEY

Survey Location	Species	Common Name	Protected Status	Time first recorded on site	Suitable Roosting Habitat in Impact Area*	Potential to Roost in Impact Area*
Dam	*Corynorhinus townsendii*	Townsend's big-eared bat	SC, SSC, FSS	9:23 PM	No, cave roosting	Not likely
	Tadarida brasiliensis	Brazilian free-tailed bat	–	8:54 PM	Yes, crevice roosting	Low
	Parastrellus Hesperus	canyon bat	–	7:32 PM	Yes, crevice roosting	High
	Lasiurus cinereus	hoary bat	–	9:32 PM	No, tree roosting	Not likely
	Myotis yumanensis	yuma myotis	–	8:25 PM	Yes, crevice roosting	High
	Myotis lucifigus	little brown bat	–	7:57 PM	Yes, crevice and structure roosting	High
	Myotis californicus	California myotis	–	8:30 PM	Yes, crevice roosting	High
	Myotis thysanodes	fringed myotis	SSC, FSS	9:23 PM	Yes, crevice roosting	Low
	Eumops perotis	mastiff bat	SSC	9:10 PM	Yes, structure and crevice roosting	Low
Headworks	*Tadarida brasiliensis*	Brazilian free-tailed bat	–	9:59 PM	Yes, crevice and structure roosting	Moderate
	Parastrellus hesperus	canyon bat	–	7:42 PM	Yes, crevice roosting	Moderate
	Myotis yumanensis	yuma myotis	–	8:14 PM	Yes, crevice and structure roosting	High

TABLE 2
BAT SPECIES RECORDED DURING SURVEY

Survey Location	Species	Common Name	Protected Status	Time first recorded on site	Suitable Roosting Habitat in Impact Area*	Potential to Roost in Impact Area*
Debris Dam	*Eptesicus fuscus*	big brown bat	–	8:21 PM	Yes, structure roosting	Moderate
	Tadarida brasiliensis	Brazilian free-tailed bat	–	8:35 PM	Yes, crevice and structure roosting	Moderate
	Parastrellus hesperus	canyon bat	–	8:19 PM	No, crevice roosting	Not likely

SC: State Candidate for listing; SSC: California Species of Special Concern; FSS: United States Forest Service Sensitive
* Roosting is defined here as a necessary day-roosting feature. Features ambiguously used for temporary night-roosting or uncommon day-roost features are not assessed in this report.

Dam

The Dam impact area included three types of features with potential to support roosting bats: the openings in the gunite on the canyon walls proposed for repair; the small operations shack on the top-center of the Dam proposed for removal; and the concrete-lined spillway, which will remain unchanged. Photographs of these features are located in Exhibits 3a, 3b, and 3c.

The openings in the gunite are intermittent but provide large gaps in the otherwise sealed walls of the canyon adjacent to the Dam. Most of these areas were only visible by binoculars and a thorough physical inspection was not feasible; regardless, sufficient information was available to make an assessment of the roosting potential. The gunite is superficial and is separated from the natural sediment and rock of the canyon walls by several inches. This space in between the gunite and the natural canyon walls provides suitable day-roosting habitat for crevice-roosting bat species.

The small operations shack located on the Dam is a thin-walled, wooden shack with a composite shingled roof. Both the interior and exterior of the shack were inspected for sign of bat roosting. Various crevices were available for roosting, but all were unoccupied and no sign of bat roosting was present. The shack is regularly accessed by humans.

The concrete-lined spillway **[Matt-please verify that this would be called a spillway or correct this term for us]** runs beneath the top of the Dam on the west side. It is a smooth-walled, box culvert that is open on both sides with a gap in the top for ventilation. There are no cracks or crevices in the structure, but the ceiling on the upstream side of the spillway has several cement-lined crossbeams and two small steel pipes that span its width. The roosting opportunities in the spillway are very exposed and do not provide any suitable day-roosting habitat for bats. Additionally, significant amounts of owl pellets and whitewash were observed beneath the steel pipes, suggesting the spillway is frequently used for roosting by great-horned owl (*Bubo virginianus*), a likely predator of bats.[1] Regardless, sign of bat roosting along the corners of the spillway were present. Specifically, urine staining and guano characteristic of small insectivorous bats (such as myotis [*Myotis* spp.]) were present. No insect remains, such as *Lepidopteron* wings, were present. One bat was observed night-roosting in the spillway at the end of the survey.

[1] A great-horned owl was calling in the immediate vicinity the Santa Anita Dam during the evening emergence survey.

Bat activity at the Dam was significant; however, the activity was predominantly located on the upstream side of the Dam. Bats were observed foraging at the onset of the survey and activity continued throughout the survey. According to analysis of the acoustic recordings, nine bat species were confirmed during the surveys. Of the species that were recorded, four were first recorded within one hour of sunset. All four species are known to be crevice-roosting species and all have a high potential of roosting at the Dam.

Headworks

The Headworks area contains three features with potential to support roosting bats that would be impacted: the overhang structure at the Headworks building; the small, stone wall on the southwest abutment of the Wilderness Park Culvert Crossing; and the sycamore (*Platanus racemosa*) trees adjacent to the Wilderness Park Culvert Crossing. Photographs of the Headworks building and the stone wall are located in Exhibits 3c and 3d.

The majority of the Headworks building and its associated facilities are comprised of steel beams or exposed concrete walls with no crevices or other thermic insulation. These areas contain no suitable day-roosting habitat. The overhanging structure on the upstream side of the Headworks facility, however, contains large crevices between the wooden beams on the exposed underside of the structure. This area contains suitable bat roosting habitat, and one bat was observed day-roosting in this structure during the survey.

The culverts of the existing Wilderness Park Culvert Crossing do not provide suitable roosting habitat because they do not provide sufficient protection from predators. However, the small stone wall adjacent to the southwest abutment of the Wilderness Park Culvert Crossing provides potential roosting habitat. The wall is comprised of cobble-sized rocks that are cemented in place with shallow cracks. These cracks are likely not deep enough to support significant roost populations; however, day-roosting habitat for solitary individuals is present. No bats or sign was observed in this area during the survey.

The sycamore trees adjacent to the Wilderness Park Culvert Crossing contain suitable habitat for tree-roosting bats. No roosting bats or sign of roosting were observed during the survey; however, tree-roosting bats are far less likely to be observed roosting or provide easily observable sign. The trees proposed for removal are not isolated and comprise only a small portion of the larger riparian woodland. Removal of these trees would not be considered a significant loss of tree-roosting habitat, and there are no observable reasons that the trees proposed for removal are more likely to support bats than the remaining trees in the woodland.

Bat activity at the Headworks facility was minimal with the majority of the activity occurring at high elevations. According to analysis of the acoustic recordings, three bat species were confirmed as occurring during the surveys. Of the species present, two were first recorded within one hour of sunset. All of the species recorded, however, are known to be crevice- or structure-roosting species and all have potential to roost in the overhang structure at the Headworks building. No bat activity was observed at the sycamore trees or at the Wilderness Park Culvert Crossing, and no bats are likely roosting in these features at this time. During wet seasons or other periods when the drainage feature beneath the Wilderness Park Culvert Crossing supports standing water, both of the features have potential to support day-roosting bats.

Debris Dam

The Debris Dam area includes two features with potential to support roosting bats that would be impacted: the intake structure upstream of the Debris Dam and the deodar cedar trees (*Cedrus deodara*) downstream of the Debris Dam. Photographs of these features are located in Exhibit 3e.

The intake structure upstream of the Debris Dam is a well-ventilated, cement structure that has potential for structure-roosting bats. The structure was locked during the survey and a detailed visual assessment could not be completed. The structure is located at the boundary of a tall-growing, riparian woodland and an open sandy area leading to the Debris Dam. The deodar cedar trees located downstream of the Debris Dam are adjacent to the residences and contain marginally suitable habitat for tree-roosting bats.

Bat activity adjacent to the intake structure was significant; however, no bats were observed emerging from the structure. According to analysis of the acoustic recordings, three bat species were confirmed as occurring during the surveys. All of the species present were first recorded within one hour of sunset; however, the one species known to emerge prior to sunset did not occur until 30 minutes after sunset and is subsequently, not likely to be roosting in the immediate vicinity. The remaining two species are known to roost in structures and have potential to roost in the intake structure; however, neither are likely to roost in the survey area currently. Bat activity at the deodar cedar trees proposed for removal was limited and, although the visual monitoring could not confirm the absence of roosting activity, no tree-roosting bat species were recorded in the vicinity. The trees are not likely to currently support roosting bats. The trees, however, still contain marginally suitable habitat that may be used in the future.

DISCUSSION

All suitable habitat identified in the survey area has potential to support day-roosting bats. However, despite this suitability, the adjacent natural habitat, including the naturally occurring fissures in the cliff rocks, provides higher-quality habitat that is likely the preferred habitat of the crevice-roosting bat species identified during the survey. The naturally occurring features likely provide better thermic regulation and better protection from predators because the cliff fissures have the ability to go far deeper below the substrate surface. Also, the higher elevation cliffs in the canyon have more sun exposure and thereby better thermic regulation than the low-elevation features in the survey area. The relative abundance of the natural features in the immediate vicinity further support this conclusion. Finally, the overwhelming amount of bat activity observed during the emergence surveys involved bats originating and occurring at very high elevations through the night.

The findings in this report assume bat species (1will be emerge from their respective roosts within one hour of sunset and (2) will be acoustically recorded upon roost emergence if the roost is in the vicinity. Factors reinforcing these assumptions include locating the acoustic recording devices near local water sources and conducting the surveys during typical weather conditions for the region. It is possible the emerged individuals occurred in the survey area prior to the first recording and that they did not pass within the range of the acoustic recording device; however, it is more likely that the species is utilizing a day-roost located off site and that the late recording is a result of travel time from the roost to the survey area where the bat is foraging.

Several incidental observations were made during this survey effort. First, foraging periods for both bat species and swallow (*Petrochelidon pyrrhonota*) species overlapped on the upstream end of the Dam at dusk. Swallows were observed to be physically harassing foraging bat species during the dusk overlap period. Secondly, significant numbers of foraging bats were observed at both the Dam and Debris Dam locations, suggesting water is not the only factor in bats' preferred foraging locations. The Dam structures likely create a barrier in the flight column of night-flying invertebrates, causing greater invertebrate concentrations than other areas. The abundance of bat activity in these areas is not likely a function of high quality roosting habitat, but more likely a function of prey abundance. Finally, three special status bat species were recorded foraging at the Dam: Townsend's big-eared bat, fringed myotis, and mastiff bat (*Eumops perotis*) (Attachment B). None of these species are anticipated to be roosting in the features proposed to be impacted by the project. California Natural Diversity Database forms will be submitted to report these occurrences (Attachment C). One additional, poor-quality recording was collected at 11:04 PM at the Dam which has potential to be from a pallid bat (*Antrozous pallidus*). The

quality of the recording did not allow for sufficient analysis to confirm presence of the species and the species was, subsequently, not included in the results or wildlife compendium.

RECOMMENDATIONS

BonTerra Psomas recommends implementing the measures listed in Table 3 for each project feature listed. Each of these exclusion measures is discussed further below.

TABLE 3
EXCLUSIONARY MEASURE RECOMMENDATIONS

Action Area	Potential Roost Feature	Method*	Reference Photograph in Exhibits 3a–3e
Dam	Gunite to be repaired	Reentry exclusion	Various locations such as Photo 3
	Operations shack	Pre-construction survey and exclusion	Photo 4
Headworks	Underside of overhang at the Headworks Facility	Reentry exclusion	All the underside crevices visible in Photo 8.
	Stone wall on the southwest abutment	Pre-construction survey and exclusion	The two-foot tall stone wall at the top of Photo 6
	Sycamore trees	Two stage liming	No Photograph
Debris Dam	Intake structure	Reentry exclusion	Photo 9
	Deodar cedar trees	Two stage liming	Photo 10

* All the methods suggested must occur between August 1 and November 30 to avoid the bat maternity and bat hibernation seasons.

Reentry Exclusion

Under the supervision of a qualified Biologist, a barrier using light-weight, pliable materials (e.g., Visquine or a fine-mesh) must be installed around the relevant feature between August 1 and November 30. The material should be sealed on all sides except in one area where bat emergence can occur. On the unsealed side, the material must extend approximately 18 to 24 inches beyond the roost feature, leaving a pliable flap that will allow for bat emergence, but not allow for reentry (Attachment D). Construction activities at that location may be conducted two days following the successful installation of the exclusion material.

Pre-Construction Survey and Exclusion

Certain features in the survey area have potential to support day-roosting bats, but they lack the depth to support large populations and have a low likelihood of supporting day-roosting bats on a consistent basis. Furthermore, the occupancy status of these roosts can be determined through direct observation. These features do not likely require reentry exclusion, but would be better served by a daytime pre-construction survey immediately followed by installation of permanent exclusion materials (e.g., calking or wiremesh). In the unlikely scenario of day-roosting bat occupation as determined by the pre-construction survey, reentry exclusion may be necessary. Therefore, it is recommended that all the above activities occur between August 1 and November 30.

Two-Stage Liming

Tree-roosting bats have potential to occur in all the trees proposed for removal as part of the proposed project. To facilitate bat abandonment of the trees, a two-stage liming process must be implemented

between August 1 and November 30. On the first day of tree removal, trimming of branches with a general diameter of less than three inches shall be conducted. The following day, the remainder of tree can be removed.

If you have any questions or concerns regarding the content of this Letter Report, please contact Steve Norton or Amber Heredia.

Sincerely,
BonTerra Psomas

Amber O. Heredia
Senior Project Manager

Steve Norton
Senior Project Manager

cc: Eugenia Lin

Enclosures: Exhibit 1: Regional Vicinity Map
Exhibit 2: Survey Locations and Impact Boundary Map
Exhibit 3: Site Photos
Attachment A: Wildlife Compendium
Attachment B: Santa Anita Bat Call Identifications Memorandum
Attachment C: California Natural Diversity Database Form
Attachment D: Sample Exclusion Designs

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References

BonTerra Psomas. 2014 (September). Biological Technical Report Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California. Pasadena, CA: BonTerra Psomas.

California Department of Conservation (DOC), Office of Mine Reclamation. 2014. Mines On Line. Data for the project area. Sacramento, CA: DOC. http://maps.conservation.ca.gov/mol/ mol-app.html.

United States Forest Service, Angeles National Forest (ANF). 2014 (March). Angeles National Forest Threatened, Endangered, Proposed, Candidate, and Forest Service Sensitive Plants and Animals Which May Occur Within the Angeles National Forest, Los Angeles and San Bernardino Counties, California. Arcadia, CA: ANF.

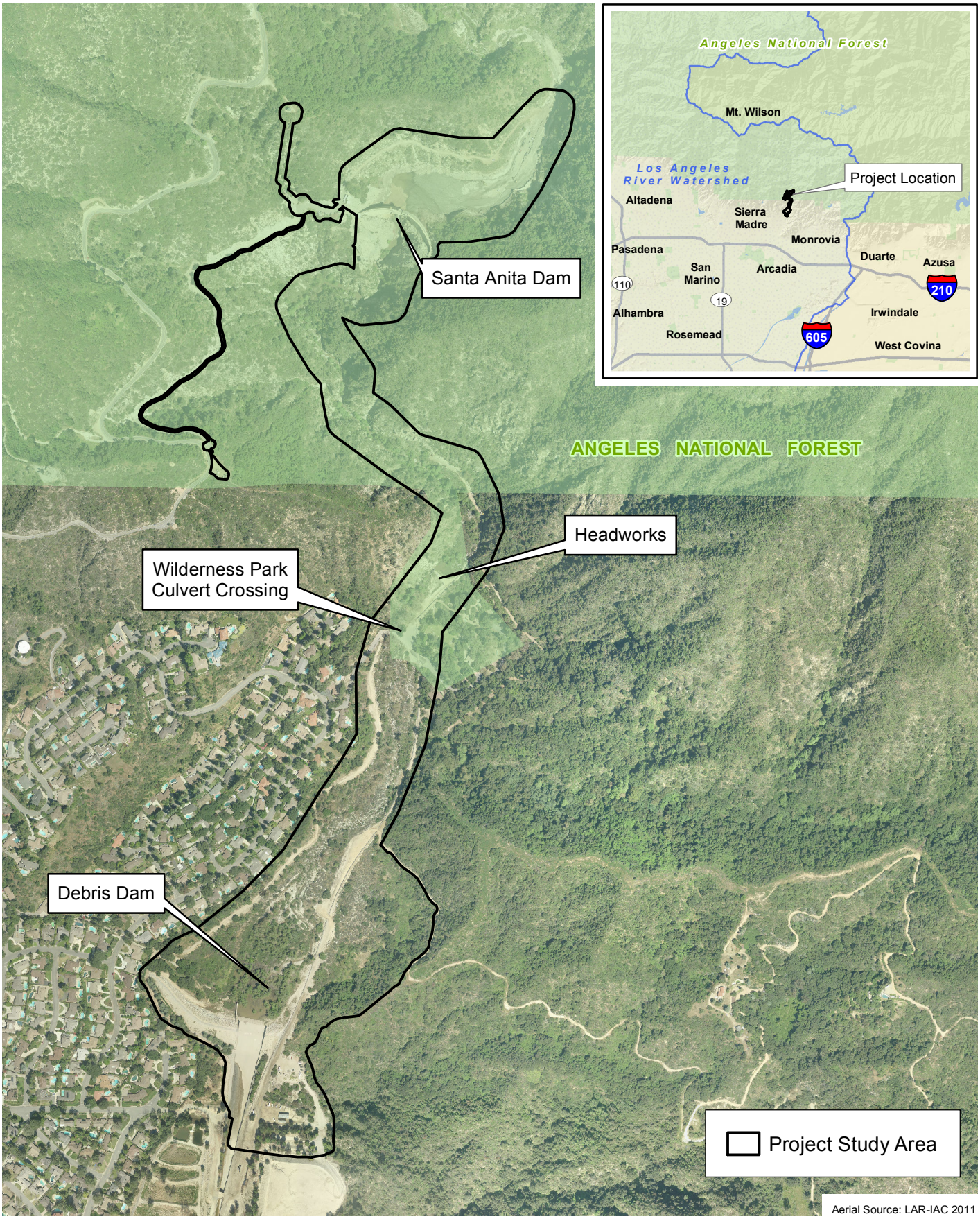
Humboldt State University. 2011 (March). *Echolocation Call Characteristics of Western US Bats*. Arcada, CA: Humboldt State University.

SonoBat. 2013. SonoBat Software (United States West Region Classifier, version 3.2.1).

U.S. Naval Observatory, Astronomical Applications Department (USNO). 2014 (September). Complete Sun and Moon Data for One Day. Records for July 31, August 6, 7, and 12, 2014, California, Monrovia. Washington, D.C.: USNO. http://aa.usno.navy.mil/data/docs/ RS_OneDay.php

Western Bat Working Group. 2005. Species accounts for *Corynorhinus townsendii, Parastrellus Hesperus, Lasiurus cinereus, Myotis lucifigus, Myotis californicus, Myotis thysanodes, Eumops perotis, Tadarida brasiliensis, Parastrellus Hesperus, Myotis yumanensis,* and *Eptesicus fuscus*. Rapid City, SD: Western Bat Working Group. http://www.wbwg.org/speciesinfo/species_accounts/species_accounts.html.

Weather Underground. 2014. Daytime high temperatures for Monrovia, California on August 6th, 7th, and 12th. Atlanta, GA: the Weather Channe, LLC. http://www.wunderground.com/history/airport/KEMT/2014/8/7/MonthlyHistory.html?.



Aerial Source: LAR-IAC 2011

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Project Location Map

Exhibit 1

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

N W E S

800 400 0 800 Feet

BonTerra PSOMAS

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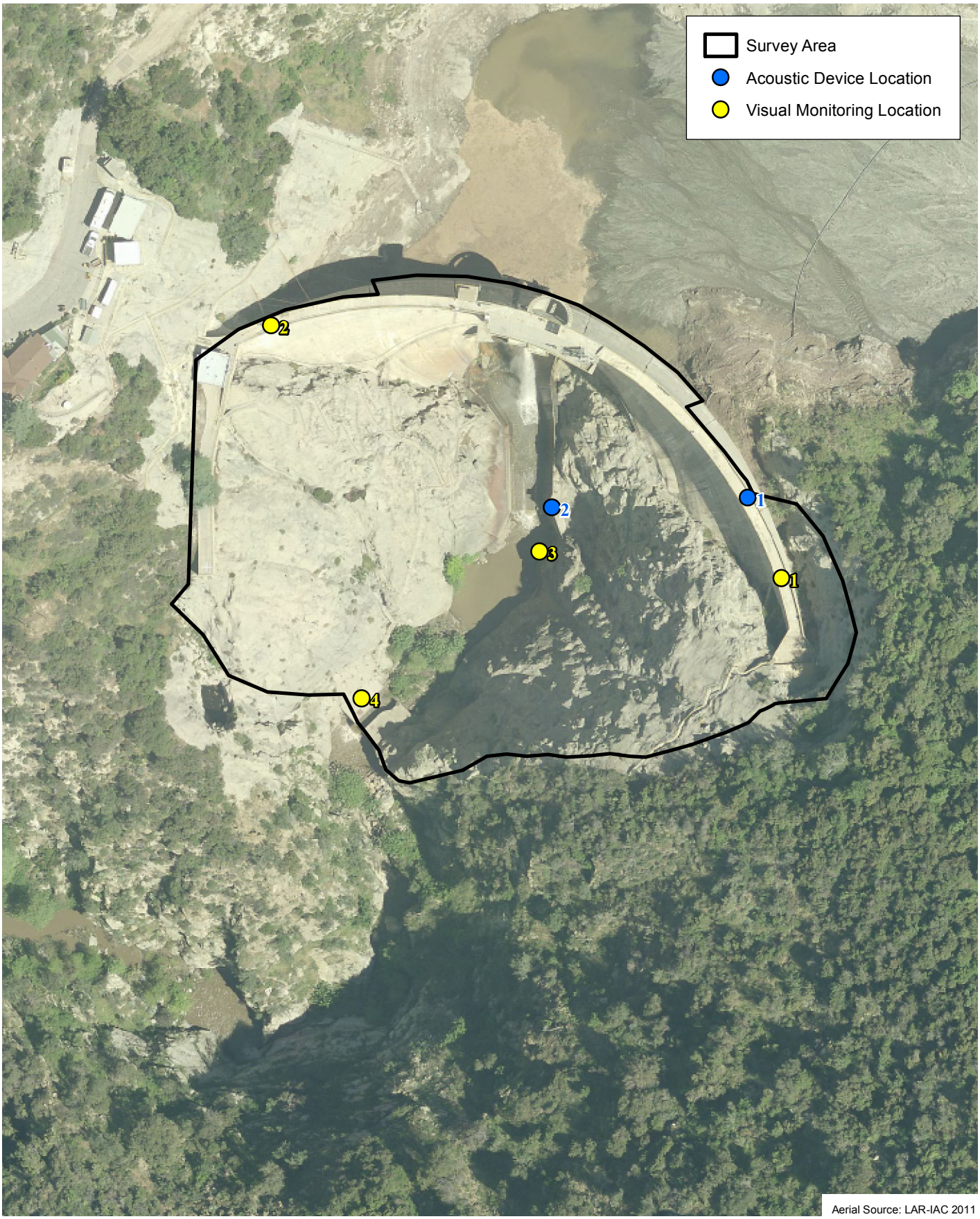

Aerial Source: LAR-IAC 2011

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Bat Survey Locations – Santa Anita Dam

Exhibit 2a

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

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Aerial Source: LAR-IAC 2011

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Bat Survey Locations – Headworks and Wilderness Park Culvert Crossing Exhibit 2b

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

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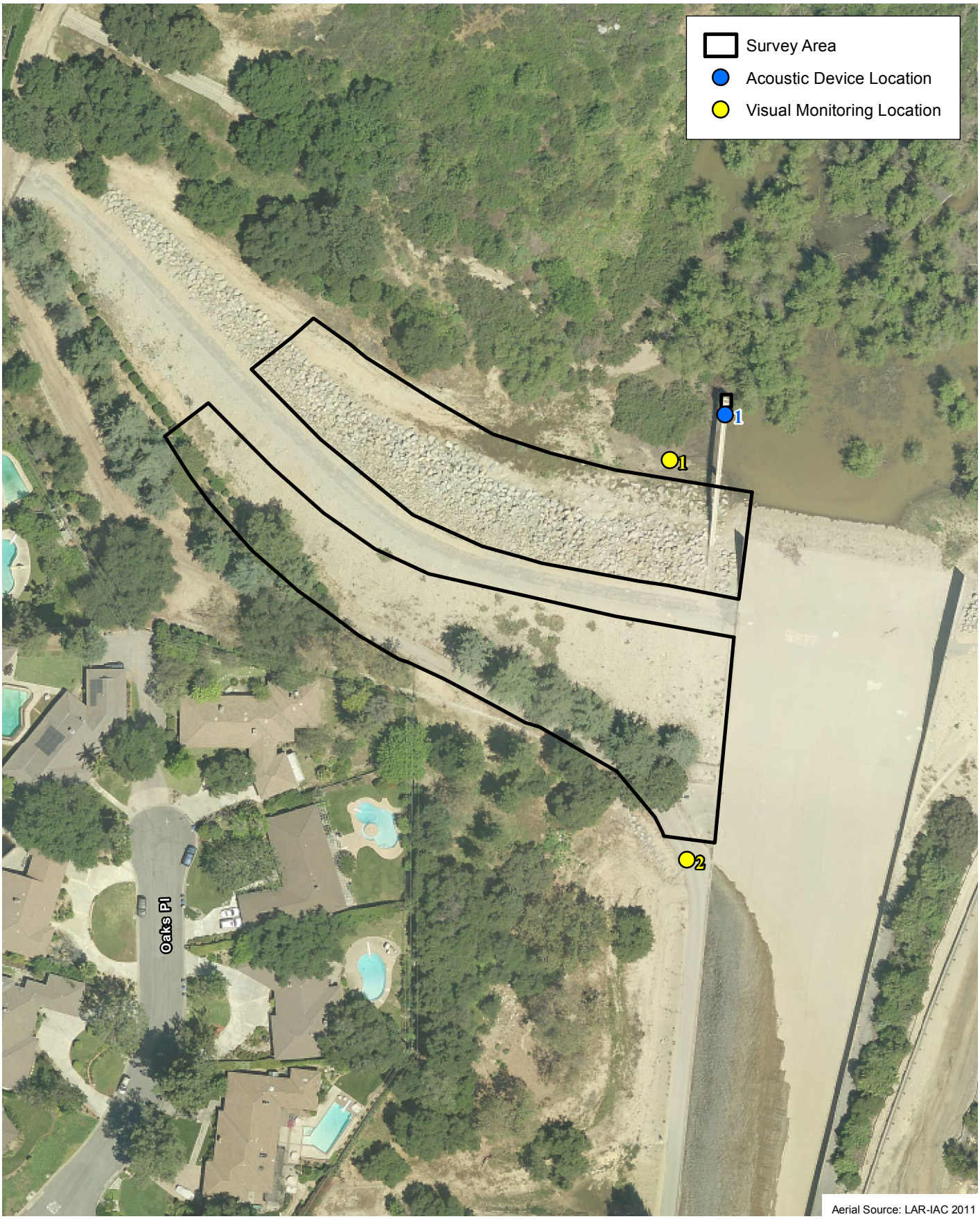

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Bat Survey Locations – Debris Dam

Exhibit 2c

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

N W E S

100 50 0 100 Feet

BonTerra PSOMAS

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Photo 1: Photo taken facing northeast toward the downstream side of Santa Anita Dam. The west-facing slope on the right of the photo is covered by gunite, an artificial slope stabilization material. The red circle highlights one of the intermittent gunite areas that requires repair. The acoustic recording device was located at the top of the dam beneath the circle for one of the survey nights.

Photo 2: Photo taken facing northeast toward the downstream side of Santa Anita Dam. The acoustic recording device was located at the bottom of the dam near the water feature at the bottom of the photo for one of the survey nights.

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Site Photographs

Exhibit 3a

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

BonTerra PSOMAS

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Photo 3: The cracked and missing gunite in the center of the photo is one of the locations that will require repair. The broken feature provides marginally suitable habitat for crevice roosting bats.

Photo 4: Photo taken on the western side of the dam facing northeast, upstream of the dam. The building in the center of the photograph provided no evidence of roosting bats. Separately, the naturally-occurring cliff walls, crevices, and vegetation provides higher-quality roosting habitat for bats.

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Site Photographs — Exhibit 3b

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

BonTerra PSOMAS

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Photo 5: Photo taken within the entrance of the dam spillway facing downstream. Night roosting was observed on the exposed walls of the spillway. Additionally, significant evidence of great horned owl roosting was present.

Photo 6: Photo taken of facing north west toward the west end of the Wilderness Park Culvert Crossing. The small rock wall at the top of the photo contains limited, suitable roosting habitat for bats.

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Site Photographs

Exhibit 3c

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

BonTerra PSOMAS

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Photo 7: Photo taken facing west toward the Headworks facility and the adjacent gunite wall. The acoustic recording device was located at this facility for one of the recording nights.

Photo 8: Photo taken in the Headworks facility facing south. The red arrow points to crevice features that provides suitable roosting habitat for bats.

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Site Photographs

Exhibit 3d

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

BonTerra PSOMAS

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Photo 9: Photo of the Debris Dam and intake tower facility taken facing east. The intake tower is immediately adjacent to extensive riparian vegetation. The acoustic recording device was located at the top of the intake tower for one of the recording nights.

Photo 10: Photo of the trees proposed for removal taken from the top of the Debris Dam facing south.

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Site Photographs

Exhibit 3e

Roosting Bat Survey Report - Santa Anita Stormwater Management and Seismic Strengthening Project

BonTerra PSOMAS

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ATTACHMENT A

WILDLIFE COMPENDIUM

WILDLIFE OBSERVED DURING THE SURVEYS

Species	
REPTILES	
PHRYNOSOMATIDAE – ZEBRA-TAILED, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS	
Sceloporus occidentalis	western fence lizard
BIRDS	
STRIGIDAE – TRUE OWLS	
Bubo virginianus	great horned owl
CAPRIMULGIDAE – GOATSUCKERS	
Phalaenoptilus nuttallii	common poorwill
APODIDAE – SWIFTS	
Aeronautes saxatalis	white-throated swift
PICIDAE – WOODPECKERS	
Melanerpes formicivorus	acorn woodpecker
TYRANNIDAE – TYRANT FLYCATCHERS	
Sayornis nigricans	black phoebe
CORVIDAE – CROWS AND JAYS	
Aphelocoma californica	western scrub-jay
HIRUNDINIDAE – SWALLOWS	
Stelgidopteryx serripennis	northern rough-winged swallow
Petrochelidon pyrrhonota	cliff swallow
TROGLODYTIDAE – WRENS	
Catherpes mexicanus	canyon wren
Thryomanes bewickii	Bewick's wren
SYLVIIDAE – SYLVIID WARBLERS	
Chamaea fasciata	wrentit
MIMIDAE – THRASHERS	
Mimus polyglottos	northern mockingbird
PARULIDAE – WARBLERS	
Setophaga [*Dendroica*] *petechia*	yellow warbler
EMBERIZIDAE – SPARROWS AND JUNCOS	
Melozone [*Pipilo*] *crissalis*	California towhee
Melospiza melodia	song sparrow
FRINGILLIDAE – FINCHES	
Spinus [*Carduelis*] *psaltria*	lesser goldfinch
MAMMALS	
DIDELPHIDAE – NEW WORLD OPOSSUMS	
*Didelphis virginiana**	Virginia opossum
BATS	
VESPERTILIONIDAE – VESPER BATS	
Myotis californicus	California bat
Myotis lucifugus	little brown bat
Myotis thysanodes	fringed myotis
Myotis yumanensis	Yuma bat
Lasiurus cinereus	hoary bat
Parastrellus [*Pipistrellus*] *hesperus*	canyon bat

WILDLIFE OBSERVED DURING THE SURVEYS

Species	
Corynorhinus townsendii	Townsend's big-eared bat
MOLOSSIDAE – FREE-TAILED BATS	
Tadarida brasiliensis	Brazilian free-tailed bat
Eumops perotis	Western mastiff bat
CANIDAE – WOLVES AND FOXES	
Urocyon cinereoargenteus	common gray fox
URSIDAE – BEARS	
Ursus americanus	American black bear
* introduced species	

ATTACHMENT B

SANTA ANITA BAT CALL IDENTIFICATIONS MEMORANDUM

MEMO

To: Steve Norton,
Senior Project Manager, BonTerra Psomas

From: Edward W. West, Ph.D.,
President, West Ecosystems Analysis, Inc.

Date: August 25, 2014

Re: Santa Anita Dam bat call identifications

Introduction

Bat calls were recorded by BonTerraPsomas biologists (BTP) at Santa Anita Dam, Los Angeles County, California (34°11'1.50"N, 118° 1'7.46"W) on July 31, 2014. Six of the call sequences recorded were sent to West Ecosystems Analysis (WEA) for analysis and species identification. This report provides the results of that analysis.

Methods

All calls were recorded with an EM3+ ultrasonic detector (Wildlife Acoustics) using the internal SMX-UT microphone. The EM3+ settings were: sampling frequency 256 kHz; max duration 10 sec; trigger 8 kHz, 18 dB; RTE triggered; Format WAV. All files were provided to WEA as direct download wav files without any processing.

Each call file was processed and analyzed by WEA using Sonobat 3.1 (Sonobat). If call files exceeded the analysis capacity of the program representative subsections were selected for analysis. Each call within each call sequence was analyzed separately using the Standard View option to obtain species classification and discrimination probability values. The decision threshold for the analysis was set at 0.90 and the acceptable call quality level was 0.70. General characterizing call parameters were also obtained including the characteristic frequency (**fc**), highest frequency (**hi*f***), lowest frequency (**lo*f***), frequency at maximum amplitude (***f*maxE**), call duration (**dur**), upper slope (highest frequency to knee, **HiFtoKnSlope**), lower slope (knee to Fc; **KneetoFcSlope**), slope at Fc (**Slp@Fc**), total slope (**TotalSlope**) and call quality (**Quality**). Each subsection file was then analyzed using the Classify option at three different filter settings (unfiltered, 5 k Hz, and 10 kHz) to obtain species classifications and discrimination probability values for the call sequence. All full files (subsections + remaining recording) were then analyzed using the Sonobatch option to obtain species classifications and discrimination probability values for the complete files.

Final species determinations were made for each call sequence after reviewing the classifications of each call within each sequence, the quality of each call, the status of analysis checks (e.g. ambiguity, trend, and post classification checks), and how well the call characteristics matched those of California bats detailed in *Echolocation Call Characteristics of Western US Bats* (Humboldt State University Bat Lab,

2011) and the reference calls provided in Sonobat. All calls with classifications different from those obtain for their full call sequence were examined for characteristics that could explain the differences. For example, differences were due to the calls being of poor quality, they failed post classification tests, or were from sections of the non-search phase sections of the call sequence (e.g. feeding phase). Also out of range calls may exhibit features that mimic the call characteristics similar species (e.g. Tabr, Epfu, Lano and Laci). Finally the temporal patterns of the calls were examined to determine if more than one species were represented in any of the call sequences.

Results

Figures 1 – 6 show the sonograms, call characteristics and species identification determinations for the six call sequences analyzed. The call quality values are color coded from lowest (blue) to highest (red). The species classifications are color coded by species. The following summarizes the pertinent results of the analysis and provides species classifications for each call sequence.

Call Sequence #212301

- 24 calls in the call sequence (Figure 1),
- All calls except one had quality levels above call quality threshold (0.70),
- 12 calls (50%) were cleanly identified,
- One call (4.2%) had an ambiguous classification,
- 11 calls (45.8%) failed post classification checks,
- Both by vote and mean classification Sonobat call analysis algorithms for both the subsection view (Figure 1) and the full file analysis identified the call sequence as that from a **Brazilian free-tailed bat** (*Tadarida brasiliensis*, **Tabr**). The silver-haired bat (*Lasiurus noctivagans*; **Lano**) classifications are likely out of range Tabr calls.

Call Sequence #212316

- 28 calls in the call sequence (Figure 2),
- All calls except two (93%) had quality levels above threshold (0.70);
- Two calls (7.1%) had unacceptable trends,
- 12 calls (50%) failed post classification checks,
- Both by vote and mean classification Sonobat call analysis algorithms for both the subsection view (Figure 2) and the full file analysis identified the call sequence as that from a **Brazilian free-tailed bat**. Variable Tabr calls commonly mimic big-brown bat (*Eptesicus fuscus*, Epfu) calls.

Call Sequence #212339

- 31 calls in the call sequence (Figure 3),
- 24 calls (77.4%) had quality levels above threshold (0.70),
- Five calls (7.1%) had unacceptable quality,
- 18 calls (58%) failed post classification checks,
- Both by vote and mean classification Sonobat call analysis algorithms for both the subsection view (Figure 3) and the full file analysis identified the call sequence as that from a **Townsend's big-eared bat** (*Corynorhinus townsendii*, **Coto**). The simple linear FM sweep with the upsweep at the onset in numerous search phase calls is characteristic of the species.
- The temporal pattern of apparent **Tabr/Epfu** calls at the beginning of the full sequence suggests that it may include the two species – Coto and Tabr.

Call Sequence #213423

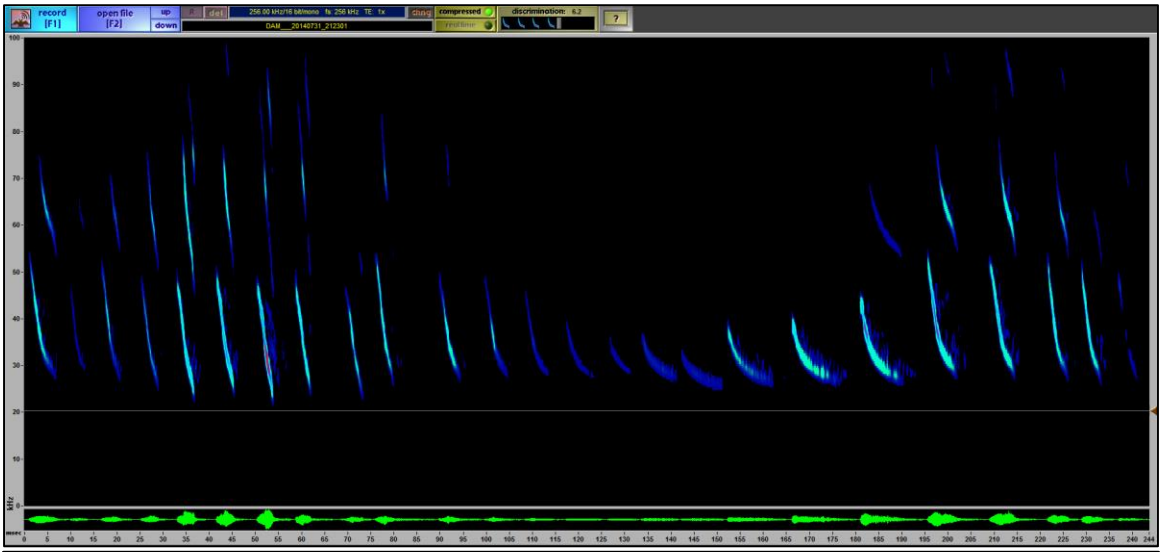
- 30 calls in the call sequence,
- 11 calls (37%) had quality levels above threshold (0.70),
  One call (3.3%) had unacceptable quality,
- Four calls (13.3%) had unacceptable trends,
- 15 calls (50%) failed post classification checks,
- The by vote and mean classification Sonobat call analysis algorithms for the subsection view (Figure 4) analysis identified the call sequence as that from a **fringed myotis** (Myotis thysanodes, **Myth**). The full file analysis, which included approximately 6 seconds of recording before the subsection view, and numerous Tabr calls, was only able to weakly classify the entire call sequence, by vote analysis only, as **Tabr**. The full call sequence therefore probably consists of Tabr calls upfront with Myth calls predominating in the subsection view section at the end of the sequence.

Call Sequence #224726

- 17 calls in the call sequence (Figure 5),
- Only seven calls (41%) had quality levels above threshold (0.70),
- Nine calls (53%) had an ambiguous classification,
- Nine calls (53%) had unacceptable trends,
- One call (5.9%) failed post classification checks,
- Both by vote and mean classification algorithms for both the subsection view (Figure 5) and the full file analysis were unable to give species specific classifications, defaulting to the **LoF** classification. However, the prevalence of Tabr call classifications (Figure 5), despite the numerous call quality limitations, suggest that this sequence was given by **Tabr**.

Call Sequence #224720

- 32 calls in the call sequence (Figure 6),
- Only three calls (9.4%) had quality levels above threshold (0.70),
- One call (3.3%) had an ambiguous classification (noise),
- Eight calls (25%) had unacceptable quality,
- One call (3.3%) had an unacceptable trend,
- 25 calls (78%) failed post classification checks,
- Filtering the subsection view file (Figure 6) at 10 kHz) resulted in a weak Coto/Myth classification. This classification is likely incorrect due to the high level of failed post classification checks and calls with unacceptable quality. The mean classification algorithm identified the principal calls as those from **Tabr**, a more reasonable result given the number of Tabr calls identified in the sequence (Figure 6). Because the reference view file included most of the entire file, the results for the full file analysis were identical to those for the reference view analysis.



Call No.	Time In File (msec)	Fc (kHz)	Hi Freq (kHz)	Low Freq (kHz)	Freq @ MaxPwr (kHz)	Cal Duration (msec)	HiF to Knee Slope	Knee To Fc Slope	Slope @ Fc	Total Slope	Quality	Ambiguous Classification	Unacceptable Quality	Unacceptable Trend	Failed Post Classification Checks	Spp 1	Discriminate Probability	Spp 2	Discriminate Probability	Spp 3	Discriminate Probability
1	216	31.15	54.35	30.57	40.82	4.43	7.59	3.83	0.26	6.36	0.84					Anpa	0.4025	Tabr	0.3383	Lano	0.1253
2	343	50.26	50.26	25.56	48.67	2.33	10.94	4.87	0.25	8.24	0.82				x	Anpa	0.6362	Epfu	0.2098	Lano	0.1321
3	414	30.90	53.60	28.87	41.11	3.75	9.08	4.43	0.85	8.09	0.85				x	Epfu	0.9496				
4	543	52.06	79.62	49.14	59.17	2.62	15.35	8.38	12.71	10.72	0.84					Coto	1.0000				
5	702	52.26	79.19	45.83	68.49	2.62	16.24	8.33	12.02	11.79	0.83					Lano	0.9755				
6	810	27.84	50.29	24.17	32.90	3.96	7.89	3.76	4.58	6.94	0.88					Lano	0.9792				
7	930	28.87	47.67	23.18	31.13	3.46	6.70	8.04	5.50	7.65	0.89				x	Lano	0.6255	Coto	0.3093		
8	1,017	28.95	49.53	24.30	37.04	3.40	17.13	7.44	5.63	7.60	0.91				x	Lano	0.7257	Coto	0.2623		
9	1,083	23.24	47.49	22.95	36.56	4.10	6.84	5.03	2.84	6.42	0.87				x	Coto	0.9987				
10	1,114	29.34	54.01	25.73	35.32	4.15	9.08	4.33	4.45	7.86	0.87				x	Epfu	0.9961				
11	1,212	28.53	50.13	26.07	35.66	4.97	6.66	2.63	2.97	5.18	0.91					Anpa	0.6318	Tabr	0.1977	Lano	0.1352
12	1,317	29.03	49.48	27.11	35.89	5.40	6.87	1.99	0.02	4.85	0.91					Lano	0.6340	Tabr	0.3201		
13	1,547	28.80	48.23	26.10	34.60	6.34	6.39	1.91	0.12	3.99	0.83					Anpa	0.6435	Tabr	0.2064	Lano	0.1294
14	1,808	27.98	39.96	26.87	35.22	6.89	3.76	1.07	0.08	2.08	0.83					Tabr	0.9958				
15	2,048	29.17	36.48	28.19	33.71	5.73	3.15	1.31	0.12	1.95	0.67					Tabr	1.0000				
16	2,383	28.92	37.21	27.65	34.05	7.47	2.96	1.06	0.09	1.71	0.88			x		Tabr	1.0000				
17	2,635	26.22	33.17	25.74	27.92	9.63	2.16	0.67	0.00	0.93	0.85					Tabr	0.9999				
18	2,881	27.83	38.10	27.26	36.41	8.01	2.94	0.89	0.30	1.59	0.90				x	Tabr	1.0000				
19	3,134	30.79	39.45	29.62	37.63	4.26	3.65	1.54	0.05	2.82	0.92				x	Epfu	0.9996				
20	3,365	29.59	45.03	27.08	37.20	8.44	5.59	1.58	0.02	2.86	0.92				x	Tabr	0.9996				
21	3,683	30.81	53.91	28.48	37.30	6.19	7.63	2.31	0.02	5.02	0.89					Anpa	0.7225	Lano	0.1371	Epfu	0.0821
22	3,867	28.20	52.86	28.20	40.98	5.55	6.56	1.97	1.85	4.59	0.88				x	Tabr	1.0000				
23	4,005	30.26	53.93	29.72	38.65	3.86	9.06	3.19	0.04	6.95	0.84					Epfu	0.9992				
24	4,089	28.96	52.58	25.72	36.73	4.37	8.59	3.06	3.15	6.24	0.88				x	Epfu	0.9979				

Filename	Filter	Reference View (Classify Option)					Full File (Sonobatch Option)				
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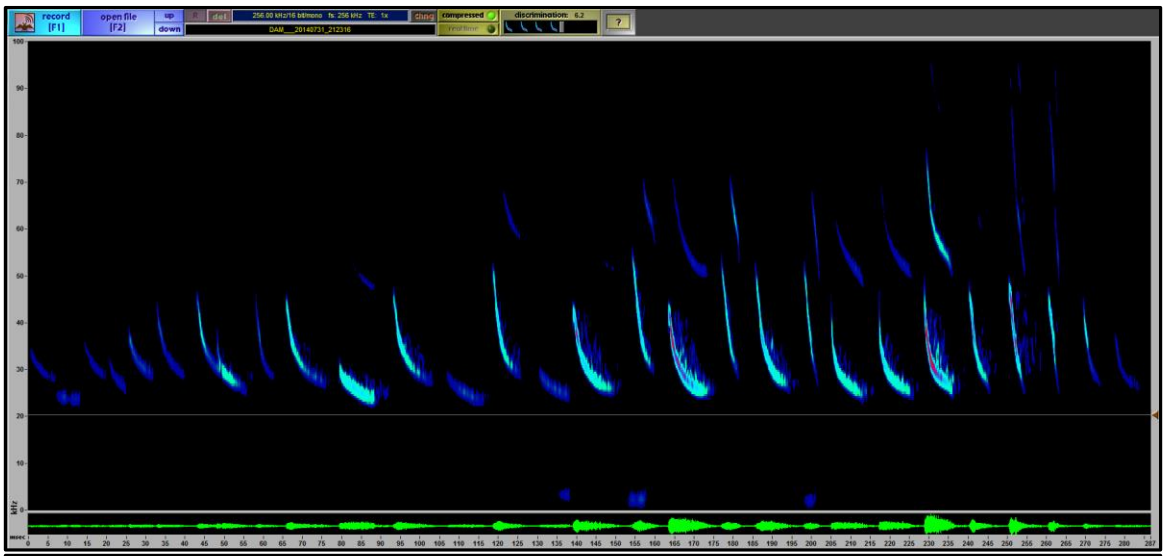
DAM___20140731_212301	unfiltered	Tabr	6	10	Tabr	0.9978	Tabr	6	10	Tabr	0.9983
DAM___20140731_212301	5 kHz	Tabr/Lano	3	6	Tabr	0.9974	Tabr	6	9	Tabr	0.9975
DAM___20140731_212301	10 kHz	Tabr/Lano	5	9	Tabr	0.9999	Tabr	4	6	Tabr	0.9903

Figure 1. Sonogram, call characteristics and species classifications of call sequence #212301.



Call No.	Time In File (msec)	Fc (kHz)	Hi Freq (kHz)	Low Freq (kHz)	Freq @ MaxPwr (kHz)	Cal Duration (msec)	HiF to Knee Slope	Knee To Fc Slope	Slope @ Fc	Total Slope	Quality	Ambiguous Classification	Unacceptable Quality	Unacceptable Trend	Failed Post Classification Checks	Spp 1	Discriminate Probability	Spp 2	Discriminate Probability	Spp 3	Discriminate Probability
1	2,807	28.59	34.95	28.13	28.57	6.01	1.86	0.88	0.01	1.27	0.61					Tabr	0.9995				
2	2,866	23.69	25.64	23.38	23.87	7.71	0.02	0.60	0.01	0.05	0.83			x	x	Tabr	1.0000				
3	3,182	29.04	37.35	27.22	29.15	7.80	2.62	0.92	0.06	1.57	0.63				x	Tabr	0.9142				
4	3,427	26.00	33.29	24.44	26.30	7.31	3.21	0.82	0.03	1.40	0.79			x	x	Tabr	0.9928				
5	3,449	29.82	40.27	28.30	35.76	7.38	3.19	1.06	0.08	1.86	0.90					Tabr	0.9959				
6	3,689	29.26	45.79	27.74	39.20	8.46	4.43	1.12	0.09	2.16	0.85					Tabr	0.9593				
7	3,814	26.73	45.47	25.43	29.03	12.97	5.05	0.79	0.08	1.37	0.90				x	Epfu	0.7911	Anpa	0.2081		
8	3,865	28.69	47.88	25.05	37.05	6.14	8.34	1.65	0.00	3.90	0.86					Lano	0.9205				
9	3,940	28.30	45.81	25.63	36.78	10.77	5.83	1.15	0.07	1.97	0.92					Tabr	0.5998	Laci	0.4002		
10	4,008	24.22	29.82	23.36	24.70	9.30	1.57	0.63	0.06	0.77	0.91				x	Tabr	0.9949				
11	4,120	31.07	46.56	29.24	36.03	6.55	6.61	1.88	0.02	3.38	0.91					Epfu	0.9902				
12	4,200	24.46	29.03	23.15	24.93	8.89	1.07	0.55	0.03	0.79	0.85				x	Tabr	0.9697				
13	4,357	30.71	52.33	29.38	39.67	6.54	8.41	2.44	0.20	4.57	0.91					Anpa	0.7129	Epfu	0.1376		
14	4,374	25.19	29.04	24.53	25.74	7.27	1.28	0.55	0.02	0.77	0.87					Tabr	0.8962	Lano	0.0569		
15	4,554	30.54	43.94	28.46	37.18	4.76	5.63	2.21	0.00	4.16	0.93				x	Epfu	0.9988				
16	4,593	31.63	55.70	29.95	37.03	5.51	8.34	2.97	0.09	5.85	0.88				x	Anpa	0.7618	Tabr	0.2139		
17	4,706	27.42	42.92	26.08	35.53	6.84	6.09	1.84	0.08	3.04	0.89					Tabr	0.9987				
18	4,760	31.68	55.09	28.50	36.75	4.25	8.45	4.72	0.04	7.33	0.87				x	Epfu	0.9703				
19	4,849	27.41	52.66	26.65	36.95	8.62	8.44	1.68	0.05	3.48	0.91					Tabr	0.8469	Lano	0.1467		
20	4,897	26.55	54.41	25.31	36.78	3.86	9.83	4.61	6.02	7.32	0.89					Lano	0.9009				
21	5,038	25.74	44.97	24.50	31.03	8.44	7.38	0.95	0.10	2.09	0.89					Tabr	0.7727	Lano	0.2151		
22	5,221	26.31	43.80	24.42	30.51	8.55	5.49	0.86	0.04	1.97	0.89					Lano	0.6716	Laci	0.2129		
23	5,525	27.05	46.33	25.57	31.88	7.45	6.86	0.92	0.08	2.40	0.88					Lano	0.8090	Anpa	0.0552	Tabr	0.0511
24	5,781	29.08	48.28	27.28	38.37	4.88	8.48	2.91	0.29	5.63	0.91					Epfu	0.8131	Anpa	0.1670		
25	5,874	28.82	48.94	26.28	44.82	3.67	8.08	4.22	4.05	6.66	0.91				x	Lano	0.5254	Laci	0.2937	Epfu	0.1796
26	5,925	26.32	47.31	25.55	41.85	2.70	7.25	8.78	7.86	8.02	0.89					Coto	1.0000				
27	6,111	27.98	46.18	26.84	38.19	4.65	7.59	2.08	0.10	4.57	0.90				x	Epfu	0.9921				
28	6,359	28.63	39.49	27.00	33.55	4.42	6.80	2.43	0.06	3.72	0.75				x	Epfu	0.9992				

Filename	Filter	Reference View (Classify Option)					Full File (Sonobatch Option)				
		ByVote	#Maj	#Accpt	MeanClssn	DiscrProb	ByVote	#Maj	#Accpt	MeanClssn	DiscrProb
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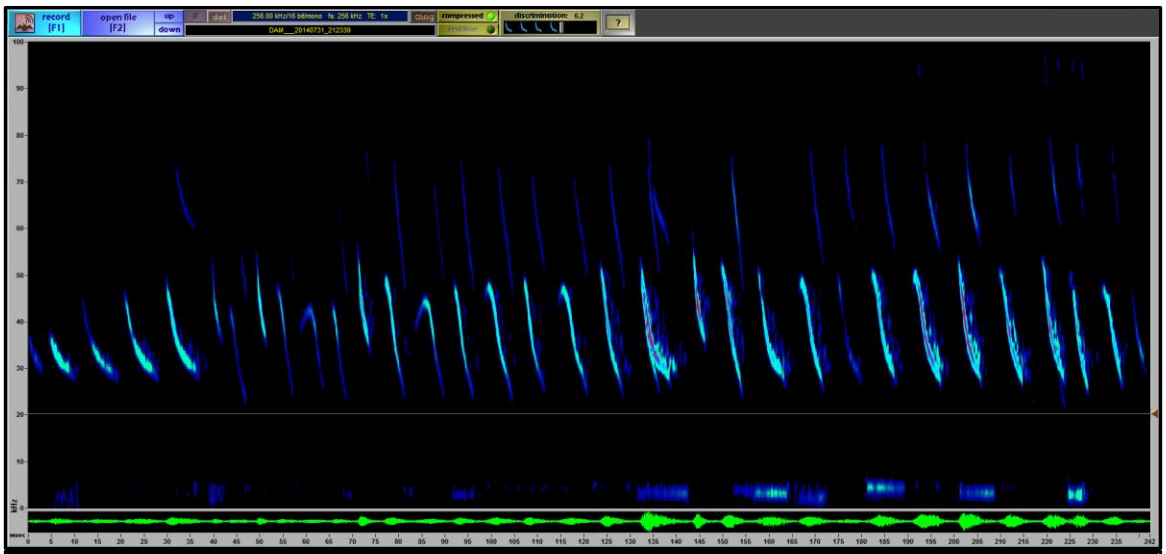
DAM___20140731_212316	5 kHz	Tabr	7	9	Tabr	0.9723	Tabr	3	4	Tabr	0.9987
DAM___20140731_212316	10 kHz	Tabr/Epfu	5	9	Tabr	0.9436	Tabr	3	4	Tabr	0.9985

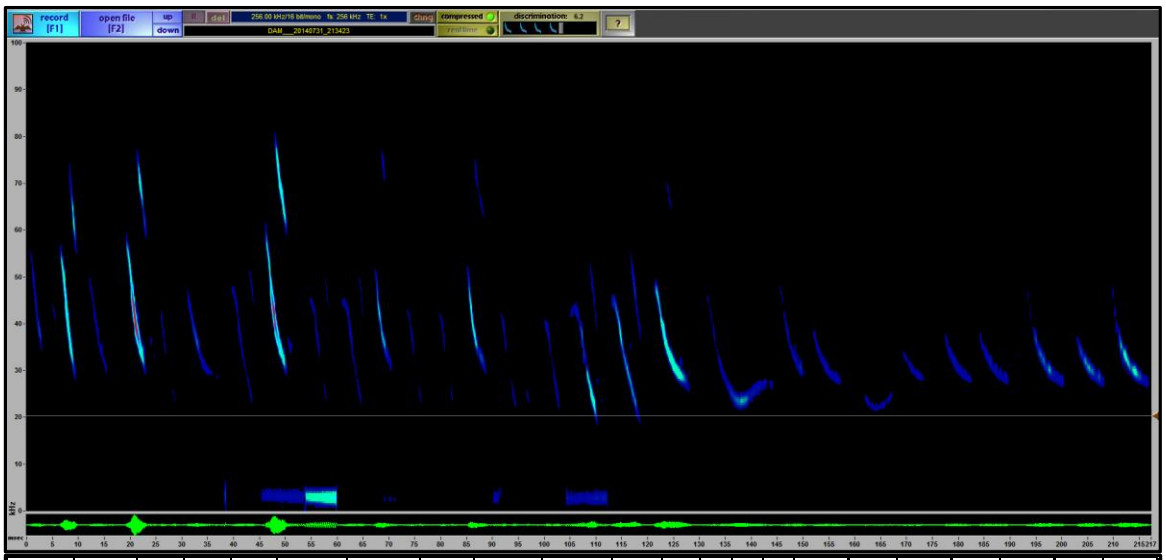
Figure 2. Sonogram, call characteristics and species classifications of call sequence #212316.



Call No.	Time In File (msec)	Fc (kHz)	Hi Freq (kHz)	Low Freq (kHz)	Freq @ MaxPwr (kHz)	Cal Duration (msec)	HiF to Knee Slope	Knee To Fc Slope	Slope @ Fc	Total Slope	Quality	Ambiguous Classification	Unacceptable Quality	Unacceptable Trend	Failed Post Classification Checks	Spp 1	Discriminate Probability	Spp 2	Discriminate Probability	Spp 3	Discriminate Probability
1	1,986.9	30.30	45.49	27.90	33.46	7.03	5.70	1.89	0.13	3.17	0.84					Tabr	0.9987				
2	2,234.2	29.82	44.55	27.14	32.68	7.88	4.65	1.53	0.04	2.45	0.68					Tabr	0.9995				
3	2,601.1	30.42	46.02	30.39	32.51	5.51	5.03	1.69	0.23	3.08	0.74					Tabr	1.0000				
4	2,948.4	31.38	49.18	29.13	38.30	6.78	5.70	1.92	0.11	3.85	0.88				x	Tabr	0.9983				
5	2,990.6	36.46	56.34	32.61	42.85	2.51	14.69	5.08	6.44	8.45	0.68				x	Mylu	0.8691	Myev	0.0939		
6	3,033.7	22.13	43.44	21.56	40.95	3.74	6.75	4.40	6.35	6.01	0.47		x		x	Coto	1.0000				
7	3,093.0	34.65	55.59	34.54	43.56	2.53	13.91	5.68	4.01	8.15	0.88				x	Tabr	0.9998				
8	3,115.6	29.83	48.52	24.09	42.95	3.67	4.69	8.30	6.05	7.32	0.60		x			Epfu	0.4705	Coto	0.4285		
9	3,170.2	31.63	42.15	24.51	42.14	5.30	2.88	8.23	7.01	5.56	0.55		x		x	Coto	1.0000				
10	3,189.7	23.43	44.27	23.35	39.14	3.15	7.27	5.49	5.34	7.10	0.61				x	Tabr	1.0000				
11	3,260.9	34.44	57.30	32.75	43.91	3.11	14.01	5.14	4.87	7.87	0.92				x	Epfu	0.8305	Anpa	0.0948		
12	3,283.8	30.48	49.17	24.45	44.88	4.30	2.15	7.56	5.12	6.77	0.82					Coto	1.0000				
13	3,345.5	29.92	43.95	24.06	43.66	6.26	1.36	6.95	5.07	5.43	0.68					Coto	1.0000				
14	3,367.9	25.32	48.42	23.64	44.01	4.34	6.99	3.86	4.19	6.32	0.79					Coto	0.9991				
15	3,446.9	29.98	47.14	23.69	44.33	5.92	1.23	5.86	3.22	5.64	0.83					Coto	0.9993				
16	3,469.7	26.82	50.14	25.48	40.59	4.60	7.58	3.14	3.32	5.79	0.81					Coto	0.9999				
17	3,543.2	29.49	46.63	25.16	44.25	6.38	5.24	1.57	2.74	5.05	0.81				x	Tabr	1.0000				
18	3,566.7	28.63	52.18	25.52	42.92	4.81	8.02	3.20	3.40	6.45	0.88				x	Epfu	0.9756				
19	3,642.9	35.93	59.71	34.77	43.74	2.93	14.33	5.21	4.87	8.20	0.95				x	Lano	0.9065				
20	3,668.8	29.43	52.71	24.94	43.71	4.62	7.08	4.51	4.64	6.85	0.89					Coto	1.0000				
21	3,712.7	30.43	51.08	28.76	31.84	5.50	7.51	2.25	0.03	5.24	0.86				x	Tabr	0.8565	Lano	0.1431		
22	3,761.6	30.29	48.15	25.71	44.39	5.29	5.94	2.11	3.46	5.74	0.85				x	Coto	1.0000				
23	3,821.0	30.50	50.63	26.24	47.34	5.30	7.38	3.40	0.26	6.34	0.52		x			Coto	0.5131	Myth	0.4869		
24	3,856.2	30.71	49.82	30.66	44.79	4.52	6.26	2.46	0.78	5.47	0.86					Epfu	0.9998				
25	3,954.5	29.56	49.45	29.56	44.64	5.18	6.23	2.52	0.10	4.96	0.90				x	Tabr	1.0000				
26	3,974.8	29.48	53.43	29.48	43.49	4.63	8.70	2.74	0.43	5.46	0.89					Epfu	0.9989				
27	4,037.6	30.21	50.19	26.42	37.65	5.25	6.61	3.12	3.08	5.73	0.89				x	Tabr	1.0000				
28	4,059.4	31.82	53.47	28.19	38.97	4.86	8.46	3.38	2.57	6.57	0.87				x	Tabr	1.0000				
29	4,100.2	27.53	49.31	25.11	38.93	4.09	7.36	5.58	4.52	6.94	0.88				x	Epfu	0.8854				
30	4,184.5	26.62	46.89	26.62	35.26	4.66	0.70	5.54	0.45	5.12	0.88				x	Epfu	0.8982				
31	4,910.1	31.35	49.50	28.26	33.31	3.65	8.22	3.90	5.65	6.27	0.56		x		x	Epfu	0.8679				

Filename	Filter	Reference View (Classify Option)					Full File (Sonobatch Option)				
		ByVote	#Maj	#Accpt	MeanClssn	DiscrProb	ByVote	#Maj	#Accpt	MeanClssn	DiscrProb
DAM___20140731_212339	unfiltered	Coto/Epfu	7	11	Coto	0.9999	Coto	7	9	Coto	0.9999
DAM___20140731_212339	5 kHz	Coto/Tabr	4	7	Coto	0.9999	Coto	6	8	Coto	0.9999
DAM___20140731_212339	10 kHz	Coto/Epfu	7	9	Coto	0.9995	Coto	7	9	Coto	0.9999

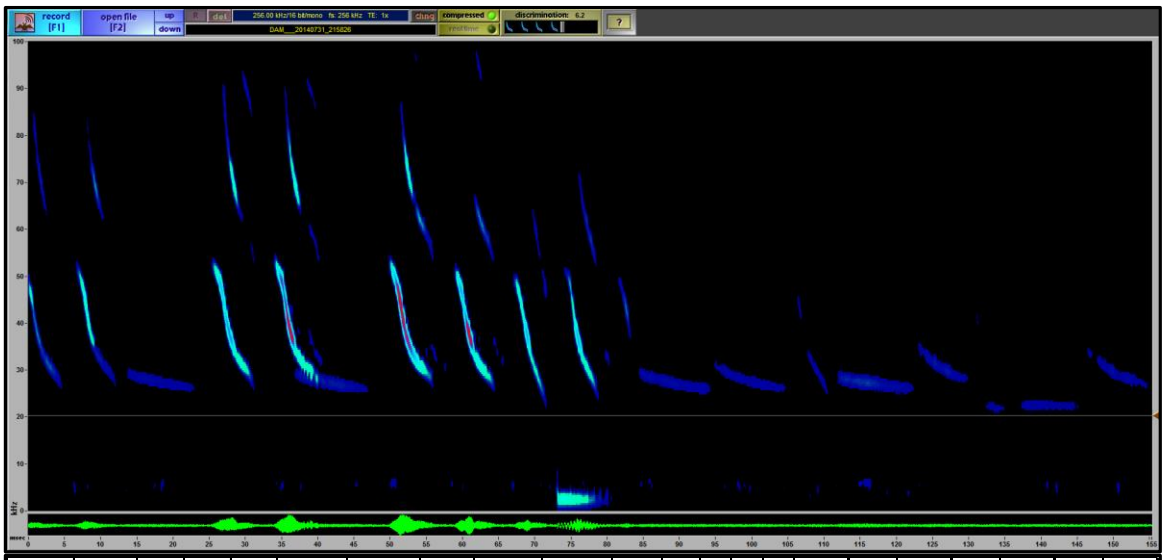
Figure 3. Sonogram, call characteristics and species classifications of call sequence #212339.



Call No.	Time In File (msec)	Fc (kHz)	Hi Freq (kHz)	Low Freq (kHz)	Freq @ MaxPwr (kHz)	Cal Duration (msec)	HiF to Knee Slope	Knee To Fc Slope	Slope @ Fc	Total Slope	Quality	Ambiguous Classification	Unacceptable Quality	Unacceptable Trend	Failed Post Classification Checks	Spp 1	Discriminate Probability	Spp 2	Discriminate Probability	Spp 3	Discriminate Probability
1	7,448	31.54	58.25	30.01	38.73	3.16	11.07	6.57	5.99	9.16	0.89				x	Epfu	0.8813				
2	7,644	28.71	57.49	28.27	45.35	3.06	11.32	6.67	6.26	10.00	0.93				x	Lano	0.8865				
3	7,764	29.91	51.39	21.50	37.14	5.62	6.55	3.92	0.10	6.00	0.74				x	Coto	0.9858				
4	7,842	31.06	58.84	29.79	41.01	3.80	10.30	4.82	5.02	8.07	0.94				x	Epfu	0.9741				
5	7,988	22.51	47.51	19.81	36.58	5.36	0.04	6.80	6.40	5.94	0.63				x	Myth	0.9999				
6	8,022	28.80	47.70	27.30	36.00	6.68	5.29	1.17	0.00	3.46	0.91				x	Tabr	0.8407	Lano	0.1151		
7	8,101	21.89	48.00	20.90	46.25	5.04	1.10	6.36	6.94	6.07	0.76					Myth	0.9999				
8	8,161	31.93	61.22	29.57	42.28	4.14	11.27	4.41	3.93	8.08	0.93				x	Epfu	0.9758				
9	8,198	19.85	45.34	19.46	44.17	4.60	0.44	7.50	5.66	6.42	0.69					Myth	1.0000				
10	8,325	20.40	44.63	19.46	38.27	5.00	0.16	7.17	6.16	5.64	0.80					Myth	0.9997				
11	8,408	33.18	57.61	29.45	42.57	4.03	12.17	5.14	3.24	8.81	0.90				x	Epfu	0.9975				
12	8,452	20.83	43.24	19.57	37.32	4.73	0.71	7.47	6.26	7.07	0.66					Myth	1.0000				
13	8,549	19.73	42.93	18.71	38.38	5.29	0.74	7.29	5.87	6.88	0.72					Myth	1.0000				
14	8,561	22.10	40.80	19.80	37.00	3.10	6.77	5.93	7.42	6.69	0.80				x	Coto	0.9999				
15	8,623	29.30	53.90	28.10	41.80	4.09	12.20	3.20	2.98	5.54	0.91				x	Epfu	0.9994				
16	8,670	21.90	42.83	19.47	39.07	4.80	0.67	7.03	7.10	6.57	0.77					Myth	0.9997				
17	8,771	21.02	40.26	20.27	38.91	4.62	1.08	7.21	5.66	6.49	0.78				x	Myth	0.9672				
18	8,863	22.38	42.94	18.42	22.94	5.55	0.43	6.43	4.08	6.28	0.89					Myth	1.0000				
19	8,935	22.47	44.76	17.77	38.05	5.75	5.44	4.71	4.66	5.25	0.84					Myth	0.9985				
20	9,007	28.79	47.70	26.21	37.77	6.67	5.91	2.12	1.12	4.00	0.92				x	Tabr	0.9032				
21	9,069	27.59	45.96	23.54	23.64	15.02	4.64	0.59	0.01	1.44	0.89		x			Laci	0.6799	Tabr	0.1713	Epfu	0.1487
22	9,122	30.33	48.42	29.19	30.53	5.31	6.07	2.54	0.07	4.81	0.82				x	Tabr	0.9032				
23	9,230	32.90	47.50	29.80	30.50	4.36	6.69	4.25	1.99	5.20	0.86			x	x	Epfu	0.6803	Anpa	0.3197		
24	9,312	28.20	43.10	22.10	23.30	14.62	3.70	0.92	0.03	1.08	0.72			x		Epfu	1.0000				
25	9,452	27.76	43.34	26.03	29.03	8.50	4.70	1.33	0.01	2.17	0.62			x		Tabr	0.9997				
26	9,556	28.92	50.59	25.84	31.52	8.33	7.42	2.15	0.05	3.66	0.79					Tabr	0.9966				
27	9,668	28.91	46.59	26.32	31.74	8.07	5.37	1.83	0.03	3.00	0.83			x		Tabr	1.0000				
28	9,786	26.44	50.08	26.16	29.90	8.52	6.18	1.28	0.32	2.63	0.90				x	Tabr	0.9314				
29	9,877	29.68	49.88	25.71	30.24	7.41	8.39	2.52	0.07	4.25	0.91					Tabr	0.9712				
30	9,973	28.58	50.33	25.73	32.84	8.05	7.50	1.79	0.07	3.45	0.92					Epfu	0.3096	Laci	0.3092	Tabr	0.1770

		Reference View (Classify Option)					Full File (Sonobatch Option)				
Filename	Filter	ByVote	#Maj	#Accpt	MeanClssn	DiscrProb	ByVote	#Maj	#Accpt	MeanClssn	DiscrProb
DAM___20140731_213423	unfiltered	MythEpfu	7	11	Myth	0.9999	Tabr	1	1		
DAM___20140731_213423	5 kHz	Myth	9	9	Myth	1.0000					
DAM___20140731_213423	10 kHz	Myth	9	10	Myth	1.0000					

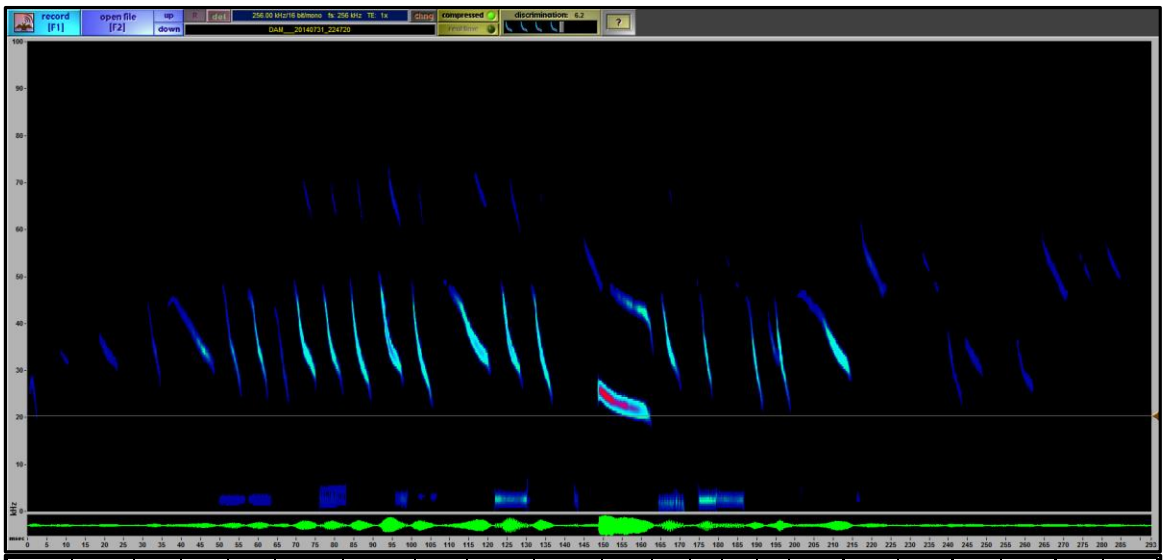
Figure 4. Sonogram, call characteristics and species classifications of call sequence #213423.



Call No.	Time In File (msec)	Fc (kHz)	Hi Freq (kHz)	Low Freq (kHz)	Freq @ MaxPwr (kHz)	Cal Duration (msec)	HiF to Knee Slope	Knee To Fc Slope	Slope @ Fc	Total Slope	Quality	Ambiguous Classification	Unacceptable Quality	Unacceptable Trend	Failed Post Classification Checks	Spp 1	Discriminate Probability	Spp 2	Discriminate Probability	Spp 3	Discriminate Probability
1	8	30.27	50.61	25.82	46.15	4.87	8.98	3.46	2.25	6.11	0.66	x			x	Epfu	0.9974				
2	132	30.72	52.69	26.96	45.02	5.50	7.43	2.73	0.10	6.23	0.78	x				Tabr	1.0000				
3	206	26.59	28.98	25.95	27.95	9.79	0.61	0.33	0.05	0.36	0.18			x		Tabr	0.9983				
4	306	34.13	52.79	34.10	36.73	3.13	3.03	7.67	3.14	6.68	0.85	x				Tabr	1.0000				
5	465	30.06	53.72	29.35	37.76	5.39	7.15	2.13	0.54	5.72	0.93	x				Tabr	1.0000				
6	582	28.68	53.29	27.94	44.46	5.84	6.99	1.97	1.25	4.73	0.91	x				Tabr	1.0000				
7	691	28.36	51.51	26.53	37.50	5.38	7.33	2.26	1.75	5.18	0.92	x				Tabr	0.9906				
8	747	24.28	49.42	22.50	37.43	4.60	7.12	4.43	5.71	6.43	0.89					Myth	0.9932				
9	793	26.02	51.52	24.26	36.70	4.74	8.28	3.40	5.12	6.37	0.86					Epfu	0.6845	Coto	0.2280		
10	911	34.38	49.69	34.32	43.42	2.27	5.31	8.95	1.61	7.66	0.49	x		x		Tabr	0.9989				
11	1,085	26.25	29.41	25.33	27.11	11.18	0.82	0.36	0.01	0.41	0.19			x		Tabr	0.9998				
12	1,388	26.42	32.42	26.00	29.46	10.90	0.89	0.39	0.01	0.64	0.18			x		Tabr	0.9997				
13	1,416	30.13	50.08	24.41	43.29	4.83	9.56	3.13	2.57	7.14	0.17	x		x		Epfu	0.9782				
14	1,659	26.55	28.14	25.83	27.04	10.60	0.32	0.19	0.04	0.24	0.34			x		Tabr	1.0000				
15	1,918	29.52	35.25	27.90	31.31	7.40	1.77	0.99	0.03	1.35	0.31			x		Tabr	0.9999				
16	2,039	22.11	22.54	21.39	22.35	7.52	0.05	0.61	0.11	0.05	0.12	x		x		Anpa	1.0000				
17	2,274	27.56	34.84	26.00	29.50	8.83	1.35	0.48	0.01	0.96	0.22			x		Tabr	0.9999				

Filename	Filter	Reference View (Classify Option)					Full File (Sonobatch Option)				
		ByVote	#Maj	#Accpt	MeanClssn	DiscrProb	ByVote	#Maj	#Accpt	MeanClssn	DiscrProb
DAM___20140731_215826	unfiltered	LoF	0	0	None	0.0000	LoF	0	0	None	0.0000
DAM___20140731_215826	5 kHz	LoF	1	1	None	0.0000	LoF	1	1	None	0.0000
DAM___20140731_215826	10 kHz	LoF	1	1	None	0.0000	LoF	1	1	None	0.0000

Figure 5. Sonogram, call characteristics and species classifications of call sequence #215826.



Call No.	Time In File (msec)	Fc (kHz)	Hi Freq (kHz)	Low Freq (kHz)	Freq @ MaxPwr (kHz)	Cal Duration (msec)	HiF to Knee Slope	Knee To Fc Slope	Slope @ Fc	Total Slope	Quality	Ambiguous Classification	Unacceptable Quality	Unacceptable Trend	Failed Post Classification Checks	Spp 1	Discriminate Probability	Spp 2	Discriminate Probability	Spp 3	Discriminate Probability
1	540	11.71	27.11	11.65	27.10	3.53	0.56	6.60	1.67	6.45	0.60	x	x		x	Noise	1.0000				
2	648	31.01	43.13	29.08	32.44	8.58	2.13	1.01	0.88	1.79	0.40		x			Tabr	1.0000				
3	1,189	32.51	40.35	29.03	34.71	7.06	1.89	1.12	0.00	1.74	0.68		x	x		Tabr	1.0000				
4	1,353	27.03	49.05	25.37	33.46	4.36	6.00	4.54	9.72	5.23	0.76					Epfu	0.7843	Lano	0.1988		
5	1,506	33.37	44.88	28.69	33.97	13.37	1.37	1.32	0.72	1.42	0.88				x	Anpa	1.0000				
6	1,534	26.72	50.10	24.05	33.95	5.44	5.58	3.71	6.52	4.72	0.80				x	Tabr	1.0000				
7	1,556	31.90	46.01	23.46	33.78	5.47	0.77	5.03	3.45	4.84	0.86				x	Tabr	1.0000				
8	1,684	26.86	43.99	22.78	33.21	4.32	1.58	6.29	5.07	5.38	0.74				x	Coto	0.7661	Myth	0.2339		
9	1,733	24.35	45.70	21.75	33.04	4.04	6.60	5.19	5.53	6.30	0.81				x	Myth	0.9020				
10	1,789	29.11	49.93	26.17	35.84	6.20	5.56	1.89	3.58	3.68	0.90				x	Tabr	1.0000				
11	1,818	30.39	48.70	24.66	33.80	5.68	6.14	2.30	2.14	4.68	0.86				x	Tabr	1.0000				
12	1,881	28.76	52.02	23.27	33.93	6.21	7.58	2.83	2.30	5.13	0.92					Anpa	0.4482	Tabr	0.2875	Epfu	0.1797
13	1,904	32.38	50.46	27.21	35.60	6.59	5.93	1.87	1.41	4.31	0.90				x	Tabr	1.0000				
14	1,930	29.81	50.43	22.41	32.76	5.70	8.90	3.89	2.43	5.97	0.89					Anpa	0.6556	Lano	0.2143		
15	1,987	32.91	48.80	29.20	35.38	13.57	0.88	1.77	0.94	1.65	0.94				x	Anpa	1.0000				
16	2,021	32.00	48.63	26.98	34.57	5.70	6.07	2.03	1.42	4.56	0.88				x	Tabr	1.0000				
17	2,070	29.51	48.01	22.88	34.32	6.07	5.61	2.64	2.53	5.32	0.92				x	Tabr	1.0000				
18	2,218	21.91	26.02	19.04	24.48	13.91	0.68	0.27	0.02	0.48	0.94					Tabr	0.5574	Laci	0.4420		
19	2,240	31.55	46.78	25.93	34.58	5.47	5.74	2.20	2.77	4.67	0.89				x	Tabr	0.9966				
20	2,346	26.79	47.71	23.51	34.31	3.45	9.10	5.11	6.04	6.91	0.89				x	Lano	0.8622				
21	2,364	23.44	47.51	21.03	34.05	4.62	9.72	4.23	4.39	5.60	0.92				x	Coto	0.9770				
22	2,458	22.57	45.59	22.11	32.96	4.81	0.71	5.75	4.22	5.61	0.93				x	Coto	0.6830	Myth	0.3170		
23	2,475	27.79	44.88	20.69	33.63	6.49	1.33	4.89	4.32	2.70	0.90				x	Coto	1.0000				
24	2,539	31.98	46.03	28.17	33.54	14.85	0.95	1.65	0.66	1.38	0.94				x	Anpa	1.0000				
25	2,580	46.86	67.05	46.60	52.60	7.34	8.90	1.85	0.02	2.46	0.84				x	Myca	0.0658	Myyu	0.3415		
26	2,775	46.70	62.39	46.61	53.29	6.55	6.08	1.88	0.05	2.35	0.48		x		x	Myca	0.9999				
27	2,812	25.64	42.01	20.51	34.69	4.72	6.16	2.97	2.84	4.59	0.75				x	Myth	0.9923				
28	2,872	28.79	39.55	28.28	32.97	6.98	1.83	1.45	1.31	1.55	0.68		x		x	Tabr	1.0000				
29	3,017	24.20	44.12	23.08	27.26	6.66	5.33	1.58	2.15	3.02	0.61		x			Lano	0.6558	Tabr	0.2191		
30	3,063	46.03	66.30	46.01	53.68	7.92	8.22	1.80	0.18	2.29	0.72				x	Myca	0.9637				
31	3,353	46.71	64.91	46.66	51.53	6.61	7.58	1.89	0.01	2.49	0.49		x		x	Labl	1.0000				
32	3,794	47.15	68.45	47.15	53.03	6.47	9.89	1.78	0.05	2.65	0.55		x		x	Myca	0.9999				

Filename	Filter	Reference View (Classify Option)					Full File (Sonobatch Option)				
		ByVote	#Maj	#Accpt	MeanClssn	DiscrProb	ByVote	#Maj	#Accpt	MeanClssn	DiscrProb
DAM___20140731_224720	unfiltered	LoF	1	1	None	0.0000	LoF	1	1	None	0.0000
DAM___20140731_224720	5 kHz	LoF	0	0	Tabr	0.9989	LoF	0	0	Tabr	0.9989
DAM___20140731_224720	10 kHz	CotoMyth	2	4	Tabr	0.9998	CotoMyth	2	4	Tabr	0.9998

Figure 6. Sonogram, call characteristics and species classifications of call sequence #224720.

ATTACHMENT C

CALIFORNIA NATURAL DIVERSITY DATABASE FORM

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____

Elm Code: _____ Occ No.: _____

EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 07/31/2014

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Myotis thysanodes*

Common Name: fringed myotis

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: 1 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # [X] No [ ] Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Steve Norton

Address: BonTerra Psomas, 2 Executive Circle, Suite 175, Irvine, CA 92614

E-mail Address: Steve.Norton@psomas.com

Phone: 714-444-9199

Plant Information

Phenology:

_____ % vegetative _____ % flowering _____ % fruiting

Animal Information

1 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

[ ] wintering [ ] breeding [ ] nesting [ ] rookery [ ] burrow site [ ] lek [ ] other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Los Angeles Landowner / Mgr: USFS (Angeles National Forest), LA County

Quad Name: Mt. Wilson Elevation: 1,280

T____ R____ Sec____, ____1/4 of ____ 1/4, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): Google Earth

T____ R____ Sec____, ____1/4 of ____ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____

DATUM: NAD27 ( ) NAD83 ( ) WGS84 ( ) Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)

Coordinates: 34° 11' 1.50" N, 118° 1' 7.46" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

The acoustic recording device was located on top of Santa Anita Dam to the east. A large, open body of water located on the upstream side of the Dam in a steep-walled canyon. The cliffs above the top of the Dam supported southern mixed chaparral.
The species was recorded acoustically recorded as foraging onsite at 9:23 PM.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent (●) Good ( ) Fair ( ) Poor

Immediate AND surrounding land use: Water storage and flood protection; open space.

Visible disturbances: _____

Threats: _____

Comments:

Determination: *(check one or more, and fill in blanks)*

- [ ] Keyed (cite reference): _____
- [ ] Compared with specimen housed at: _____
- [ ] Compared with photo / drawing in: _____
- [X] By another person (name): Edward W. West, Ph.D.
- [ ] Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	[ ]	[ ]	[ ]
Habitat	[ ]	[ ]	[ ]
Diagnostic feature	[ ]	[ ]	[ ]

May we obtain duplicates at our expense? ( ) yes ( ) no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____

Elm Code: _____ Occ No.: _____

EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 07/31/2014

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Corynorhinus townsendii*

Common Name: Townsend's big-eared bat

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: 1 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # [X] No [ ] Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Steve Norton

Address: BonTerra Psomas, 2 Executive Circle, Suite 175, Irvine, CA 92614

E-mail Address: Steve.Norton@psomas.com

Phone: 714-444-9199

Plant Information

Phenology:

_____ % vegetative _____ % flowering _____ % fruiting

Animal Information

1 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

[ ] wintering [ ] breeding [ ] nesting [ ] rookery [ ] burrow site [ ] lek [ ] other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Los Angeles Landowner / Mgr: USFS (Angeles National Forest), LA County

Quad Name: Mt. Wilson Elevation: 1,280

T____ R____ Sec____, ____1/4 of ____ 1/4, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): Google Earth

T____ R____ Sec____, ____1/4 of ____ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____

DATUM: **NAD27** ( ) **NAD83** ( ) **WGS84** ( ) Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)

Coordinates: 34° 11' 1.50" N, 118° 1' 7.46" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

The acoustic recording device was located on top of Santa Anita Dam to the east. A large, open body of water located on the upstream side of the Dam in a steep-walled canyon. The cliffs above the top of the Dam supported southern mixed chaparral.
The species was recorded acoustically recorded as foraging onsite at 9:23 PM.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent (●) Good ( ) Fair ( ) Poor

Immediate AND surrounding land use: Water storage and flood protection; open space.

Visible disturbances: _____

Threats: _____

Comments:

Determination: *(check one or more, and fill in blanks)*

- [ ] Keyed (cite reference): _____
- [ ] Compared with specimen housed at: _____
- [ ] Compared with photo / drawing in: _____
- [X] By another person (name): Edward W. West, Ph.D.
- [ ] Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	[ ]	[ ]	[ ]
Habitat	[ ]	[ ]	[ ]
Diagnostic feature	[ ]	[ ]	[ ]

May we obtain duplicates at our expense? ( ) yes ( ) no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____

Elm Code: _____ Occ No.: _____

EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 07/31/2014

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Eumops perotis*

Common Name: Western mastiff bat

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: 1 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # [X] No [ ] Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Steve Norton

Address: BonTerra Psomas, 2 Executive Circle, Suite 175, Irvine, CA 92614

E-mail Address: Steve.Norton@psomas.com

Phone: 714-444-9199

Plant Information

Phenology:

_____ % vegetative _____ % flowering _____ % fruiting

Animal Information

1 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

[ ] wintering [ ] breeding [ ] nesting [ ] rookery [ ] burrow site [ ] lek [ ] other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Los Angeles Landowner / Mgr: USFS (Angeles National Forest), LA County

Quad Name: Mt. Wilson Elevation: 1,280

T____ R____ Sec____, ____1/4 of ____ 1/4, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): Google Earth

T____ R____ Sec____, ____1/4 of ____ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____

DATUM: NAD27 ( ) NAD83 ( ) WGS84 ( ) Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)

Coordinates: 34° 11' 1.50" N, 118° 1' 7.46" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

The acoustic recording device was located on top of Santa Anita Dam to the east. A large, open body of water located on the upstream side of the Dam in a steep-walled canyon. The cliffs above the top of the Dam supported southern mixed chaparral.
The species was recorded acoustically recorded as foraging onsite at 9:10 PM.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent (●) Good ( ) Fair ( ) Poor

Immediate AND surrounding land use: Water storage and flood protection; open space.

Visible disturbances: _____

Threats: _____

Comments:

Determination: *(check one or more, and fill in blanks)*

[ ] Keyed (cite reference): _____
[ ] Compared with specimen housed at: _____
[ ] Compared with photo / drawing in: _____
[ ] By another person (name): _____
[ ] Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	[ ]	[ ]	[ ]
Habitat	[ ]	[ ]	[ ]
Diagnostic feature	[ ]	[ ]	[ ]

May we obtain duplicates at our expense? ( ) yes ( ) no

ATTACHMENT D

SAMPLE EXCLUSION DESIGNS

For detailed information on bats in buildings and a list of professional bat excluders, visit Bat Conservation International at: www.batcon.org

Guidelines excerpted from Bat Conservation International (www.batcon.org):

Bats in Buildings: An Information and Exclusion Guide

by
Barbara French, Laura Finn and Mark Kiser
http://www.austinbathospital.com/gotbats.html

Introduction

As primary predators of night-flying insects, bats play a vital role in maintaining the balance of nature. A single little brown bat can catch 1,200 mosquito-sized insects in an hour, and big brown bats are important predators of some of America's most costly crop pests. Cucumber beetles, June beetles, bark beetles, stink bugs, leafhoppers, cutworm moths, corn earworm moths, armyworm moths, termites, assassin bugs, ants, roaches, crickets, and grasshoppers are just some of the many pests known to be consumed by America's bats. Yet, bat populations are in alarming decline due to decades of unwarranted human fear and persecution.

As traditional roosts in trees and caves have been destroyed, many of North America's bats have been forced to seek shelter in man-made structures. An understanding of the habits of these beneficial animals can help solve problems that sometimes develop when bats roost in buildings. The following pages provide details about safe, effective methods for permanently evicting bats from buildings when necessary. These methods help ensure the safety of both humans and bats.

Accidental Intruders

What if you find a bat in your home?

On occasion, a solitary bat may accidentally fly into a home, garage or other building through an open door or window. Such incidents often involve lost youngsters whose primary goal is a safe escape. As long as no direct contact with the bat has occurred, it can be released outside. These bats will usually leave on their own if a window or door to the outside is opened while others leading to the rest of the building are closed. Bats are rarely aggressive, even if chased, but may bite if handled. As with any wild animal, bats should not be touched with bare hands, and anyone bitten should immediately seek medical consultation.

If a bat does not leave your home on its own, its exit can be hastened by waiting until it lands, and then covering it with a small box or other container. Slip a piece of cardboard between the wall and box, slide the bat into the box, then release the bat outside. You may also catch it by hand, using leather work gloves to avoid being bitten. Keep doors and windows to buildings closed, and window screens in good repair, to prevent bats from reentering.

Where do bats roost?

Bats may roost in attics, soffits, louvers, chimneys, under siding, eaves, roof tiles or shingles and behind shutters (see diagram). In sports stadiums and parking garages, bats sometimes roost in expansion joints between concrete beams. They can enter through openings as small as one-half inch in diameter (1.3 cm). Common points of entry include open windows or doors, broken or poorly-fitted screens, loose missing shingles or tiles, places where flashing or boards have come loose and locations where pipes or wiring enter buildings. Openings often occur where walls meet the eaves at the gable ends of an attic, where porches attach to the main part of a house, or where dormers meet the roof. Other points of entry are associated with siding. For example, cracks and crevices are often created where siding forms corners, at places where it meets windows, doors or chimneys (see diagram). Bats can sometimes be detected by the presence of black or brown stains from body oils droppings around cracks or crevices formed by ill-fitting building materials. Bat droppings may also appear on walls, under porches or decks, or on floors beneath dilapidated ceilings. Bat droppings are dark and do not contain any white material. Although they may resemble small hard rodent pellets, bat droppings are soft and easily crushed, revealing shiny insect parts.

or

or

or

Common entry points on homes and buildings include corners, eaves and louvers.

Providing a safe exit for bats

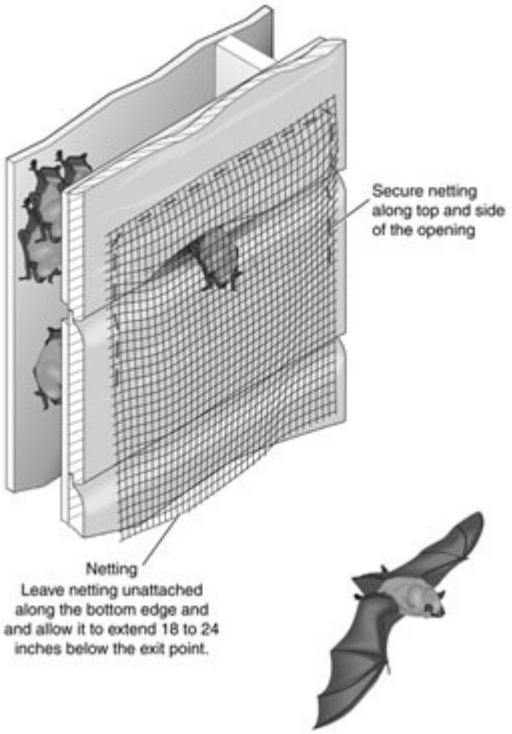
There is little reason to evict bats from buildings where they are not causing a nuisance. However, bats should be prevented from entering human living quarters. This can be accomplished by inspecting the inside of a building for small openings through which bats could enter. All openings connecting the attic or other roosting areas to inside living quarters should be sealed, although entry points on the outside of the building should be left open, allowing bats to exit. Draft-guards should be placed beneath doors to attics; electrical and plumbing holes should be filled with steel wool, caulking or weather-stripping. Bats have small teeth for eating insects; they do not gnaw through wood or other building materials like rodents. Caulking, flashing, screening or insulation can be used to seal most openings on the inside. Expanding urethane foam products should not be used to seal cracks where bats are active, because they can become caught in it. Caulk should also be applied early in the day so that it has time to dry before bats emerge in the evening.

In some instances, noise or odors from large colonies of bats can become a nuisance. When bats must be evicted from a building, netting or tubes that function as one-way valves must be placed over the openings bats use to enter and exit. These one-way valves allow bats to leave, but not reenter the building. Valves may be constructed from lightweight plastic netting (1/6 inch-0.4 cm-or smaller mesh), or plastic pipes or tubes. These exclusion devices should be left in place for five to seven days to ensure all bats have exited. It is not appropriate simply to wait for bats to fly out at night and then seal openings. Not all of the bats leave at the same time, and some bats may remain inside all night. Take weather conditions into consideration when deciding how long to leave the netting or tubes in place; there may be evenings (such as during storms), when no bats exit.

Bats often roost in buildings seasonally, including during maternity periods, and exclusions should not take place until young bats are able to fly. After the young are old enough to fly, all bats can be excluded. The maternity season begins as early as mid-April in the southernmost U.S., mid-June in the northern U.S. and Canada. Young bats are flying and exclusions can resume by late August. In late fall most house-dwellings bats either migrate to warmer climates or enter caves or abandoned mines to hibernate. However, a few species can hibernate in buildings, and in the mildest climates, they may even remain active year-round. If bats are present in cold regions during the winter, exclusions should be postponed until spring when they emerge to feed.

Exclusion is the **ONLY** effective solution for permanently removing bats from buildings. Trapping and relocating is ineffective since bats have excellent homing instincts and simply return, even when released at great distances. The use of pesticides against bats is illegal and counterproductive. Poisoning greatly increases the likelihood of bats coming into contact with people and pets.

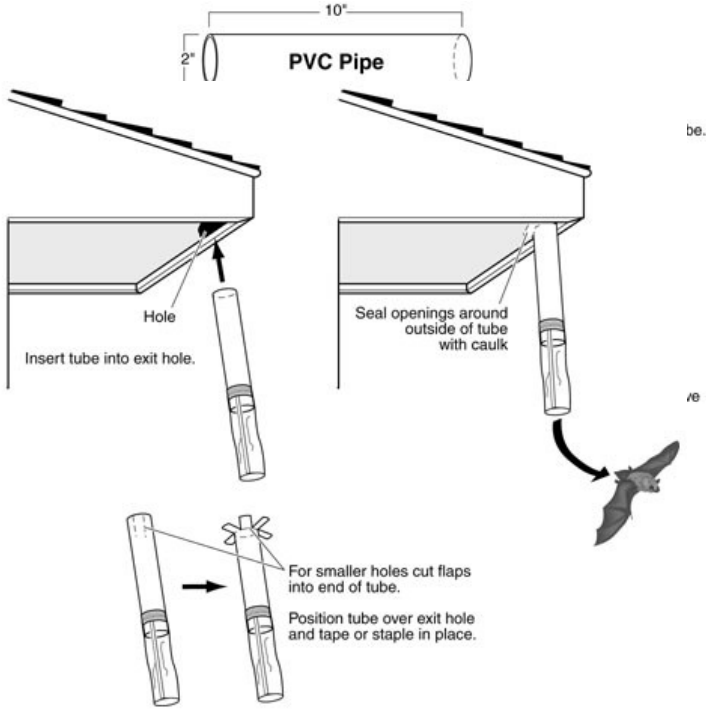
Naphthalene, the active ingredient in moth balls, and ultrasonic devices are often promoted as bat repellents. However, ultrasonic devices are ineffective against bats, and to be effective, naphthalene must be used in such large quantities that it poses a significant health hazard to humans.



Using Netting to Exclude Bats

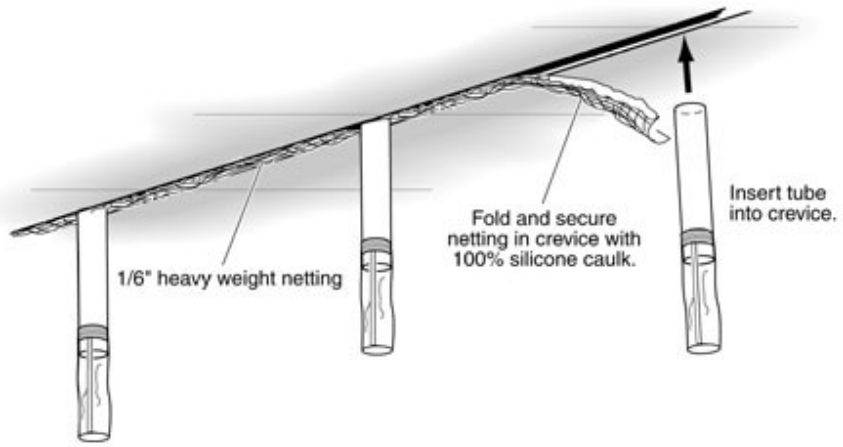
Bats sometimes enter buildings through openings on smooth surfaces of exterior walls or through louvers. In such cases, plastic or lightweight, flexible netting with 1/6 inch (0.4 cm) mesh or smaller, should be secured to the building along the top and sides of the opening as shown in the diagram. It should extend 18 to 24 inches (46 to 61 cm) below the bottom edge of the opening and should remain in place for a minimum of five to seven days to ensure all bats have exited. Then, openings should be permanently sealed with silicone caulking, caulk backing rod, hardware cloth, or heavy-duty netting. In some cases, sealing may require repair or replacement of old, deteriorated wood. When bats are using multiple openings to exit and enter, exclusion material should be placed on each opening unless it can be determined with certainty that all areas used by the bats are connected. If so, some openings can be sealed as described above, and netting can be placed over the openings used by the most bats. Even when all roosting areas are connected, bats will sometimes refuse to use alternative exits. In this case, exclusion material must be installed over all exits. After this has been done, watch to make sure the bats are able to exit safely. If they do not appear to be exiting, or appear to be having trouble doing so, make adjustments or add new valves as needed.

Using PVC pipe or Empty Caulking Tubes to Exclude Bats



There are a number of situations in which tubes work best as bat exclusion devices. Examples include openings used by bats on buildings constructed from materials that do not create smooth exterior walls, such as those found on brick or stone houses, and log cabins. Tubes also work best for holes located at corners where walls meet and on horizontal surfaces such as soffits. Exclusion tubes should have a 2-inch (5 cm) diameter and be approximately 10 inches (25.4 cm) in length. Exclusion devices can be made from PVC pipe or flexible plastic tubing. According to Laura Finn of Fly by Night, Inc., empty caulking tubes work well for this purpose. When using caulking tubes, both ends must be cut out. Use of a flexible plastic tube makes it easy to either squeeze one end of the tube so that it fits into a crevice, or cut one end of the tube into flaps that can be fit over an opening and stapled, nailed, or taped to the building (see diagram). Bats are unable to cling to the smooth surface of these tubes. Do not let the tube project more than 1/4-inch (6 mm) into the opening, ensuring that bats can easily enter the tube to exit. Caulking tubes must be thoroughly cleaned before use to prevent bats from sticking to wet caulk and because dried caulk creates a roughened surface, making it possible for bats to re-enter. Once the tube has been inserted over the hole, a piece of light weight, clear plastic can be taped around the end of the tube that projects to the outside (see diagram) to further reduce the likelihood of bats reentering, though this is typically not necessary.

Plastic sleeves collapse on themselves, preventing bats from reentering once they have crawled out through the tube. After the tube has been inserted into or over the opening used by bats, any spaces between the outer rim of the tube and the building must be sealed shut. Be sure also to seal shut any other openings in the building that bats could use to reenter. Leave the tube in place for a minimum of five to seven days to ensure all bats have exited. After the bats have been excluded, the tube should be removed and the opening permanently sealed.



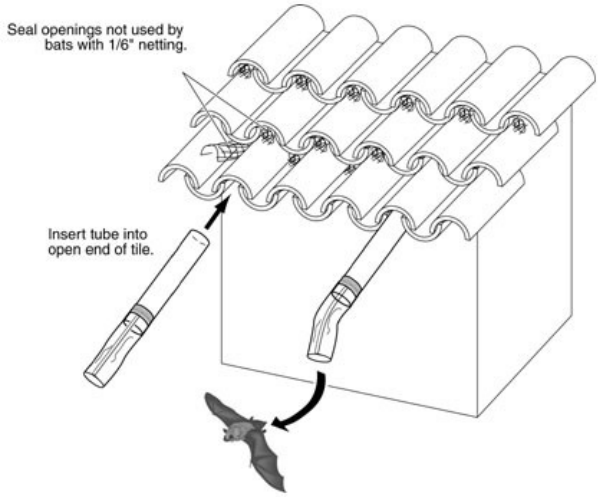
Some concrete parking garages have lengthy crevices used by bats. Multiple exclusion tubes will need to be placed every few feet along the length of each crevice; spaces between the tubes should be closed with heavy-weight (1/6 inch mesh) netting (see diagram). Fold the netting so that it fits into the crevice, and caulk it in place as shown in the diagram. The same procedure can be used in lengthy crevices created where flashing has pulled away from a wall.

Plastic tubes also work best for excluding bats from under Spanish (clay) or concrete roofing tile. Bats typically enter through open ends of the tiles on the lowest row, or through openings created where tiles overlap one another. Observe the building when bats fly out in the evening to determine which openings they use. Exclusion tubes should be placed in these openings (see diagram). Multiple exclusion tubes are often needed to exclude bats from problem roofs. Collapsible plastic sleeves should also be attached to the ends of the tubes. Heavy weight netting can be folded and inserted into openings where tiles overlap *(see diagram)*.

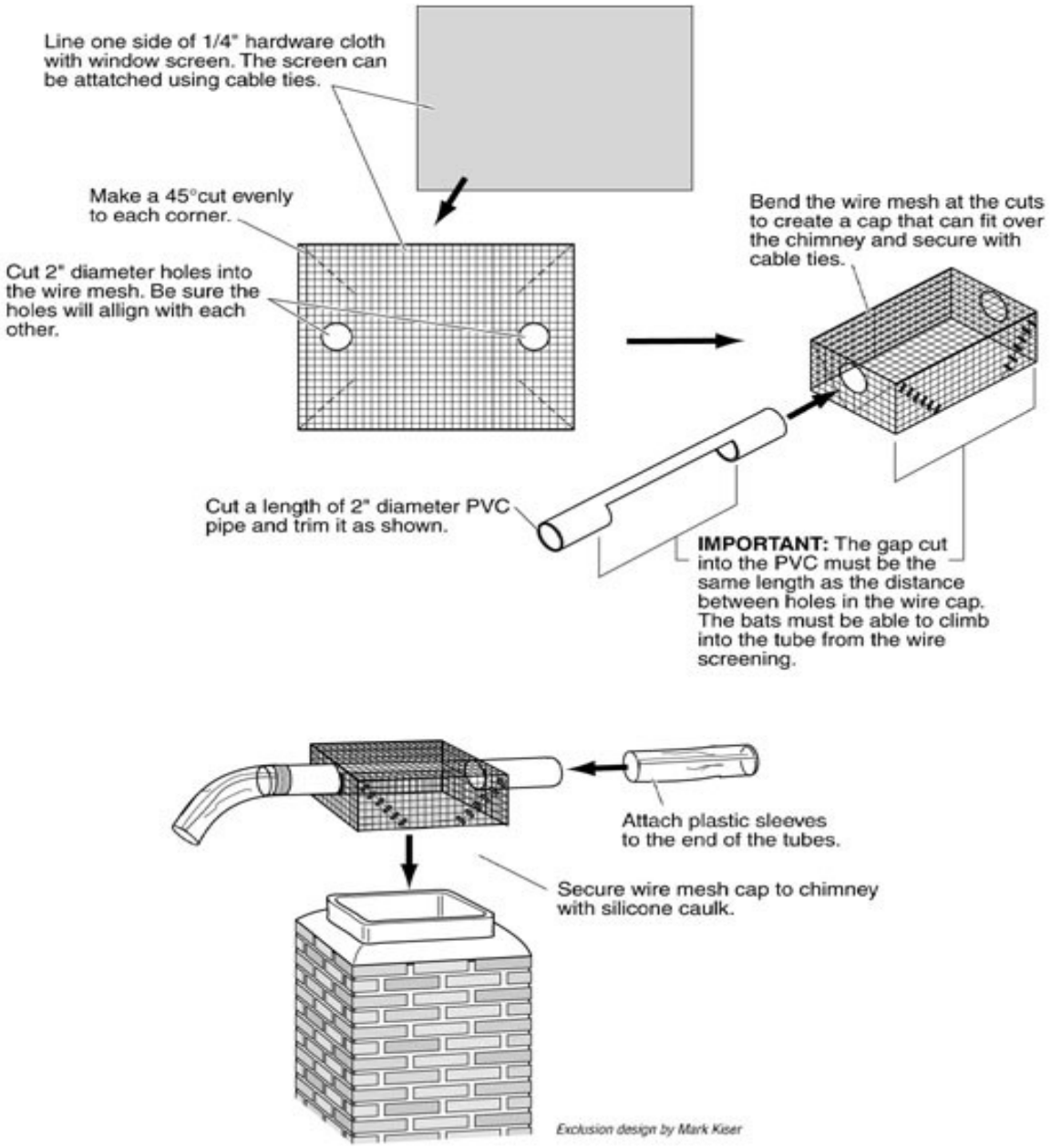
Tiles are sometimes temporarily removed to replace a layer of tar paper. When this is done, a layer of coarse fiberglass batting can be put over the tar paper and under the tiles. Constantine (1979) found that the fiberglass layer repelled bats, although he recommended against use of batting within 6 inches (15 cm) of open tile ends to prevent birds from pulling it out for nesting material.

Bats may also enter a building through spaces beneath corrugated or galvanized roofing sheets. These roofs can be sealed with a variety of materials such as caulk backing rod during months when bats are not present, or after they have been excluded from a building by use of exclusion tubes.

Special modifications may be needed when bats roost in chimneys or in separations between chimneys and roofs. If bats are roosting inside the chimney, construct a wire cage from 1/4-inch hardware cloth lined with window screen. A section of PVC pipe can be cut and then inserted through holes cut into the sides of the wire cage *(see diagram)*. Although bats are able to simply drop down and out of a vertically placed tube that extends below the roost, they are not able to grip the slick surface to crawl out if the tube extends upward above the roost. Therefore, the tubes should project



horizontally or down. A collapsible plastic sleeve should be placed over the ends of all exclusion tubes used on chimneys. Once the bats have been excluded, a chimney cap should be installed.



Bats Roosting on Porches at Night

Bats sometimes roost on porches or under overhangs briefly during the night while they digest the insects they have eaten. Non-toxic aerosol dog or cat repellents may be used to discourage bats from roosting in these areas. The spray should be applied by day when bats are not present (Aerosol repellents are not an adequate substitute for exclusion in the case of day roosts and should never be applied when bats are in a roost.) Mylar balloons or strips of aluminum foil hung from the porch ceiling and allowed to move in the breeze may also discourage bats from roosting in that area.

Bat Houses

It's always a good idea to provide bats with a new place to roost. For information on building or purchasing bat houses visit the North American Bat House Project Web site at www.batcon.org/bhra. You can also purchase *The Bat House Builder's Handbook* or the *Building Homes for Bats* video through the BCI catalog.

NOTE: For those residing in the United Kingdom, please note that bat exclusion without prior notification to the proper authorities is a punishable offense. The proper authorities to seek guidance from include: English Nature, Scottish Natural Heritage, The Countryside Council for Wales, or the Countryside and Wildlife Branch of the Department of the Environment in Northern Ireland.

ATTACHMENT J

JURISDICTIONAL DELINEATION REPORT

Jurisdictional Delineation Report

Santa Anita Stormwater Flood Management and Seismic Strengthening Project, County of Los Angeles, California

Prepared for
Los Angeles County Flood Control District
900 South Fremont Avenue
Alhambra, California 91803-1331

Prepared by
BonTerra Psomas
225 South Lake Avenue, Suite 1000
Pasadena, California 91101
Contact: Amber Heredia
T: (626) 351-2000 F: (626) 351-2030

October 15, 2014

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EXECUTIVE SUMMARY

The purpose of this report is to provide baseline data concerning the type and extent of jurisdictional resources for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project (hereinafter referred to as the "proposed Project"). Jurisdictional resources considered for this report include wetlands and non-wetland "waters of the U.S." regulated by the U.S. Army Corps of Engineers (USACE); waters regulated by the Los Angeles Regional Water Quality Control Board (RWQCB); as well as the bed, bank, and channel of all lakes, rivers, and/or streams (and associated riparian vegetation), as regulated by the California Department of Fish and Wildlife (CDFW).[1]

The jurisdictional delineation work was performed by BonTerra Regulatory Specialist Gary Medeiros and Regulatory Technicians David Hughes and Allison Rudalevige on April 23 and 25, 2013. The proposed Project is located in the cities of Arcadia and Monrovia, Los Angeles County, California on the U.S. Geological Survey's (USGS') Mount Wilson 7.5-minute quadrangle map.

Wetland features were analyzed based on the USACE's three-parameter approach in which wetlands are defined by the presence of hydrophytic vegetation, hydric soils, and the presence of wetland hydrology indicators. The limits of non-wetland "waters of the U.S." were identified by the presence of an ordinary high water mark (OHWM). The limits of CDFW jurisdictional waters were identified as the top of bank or the outer drip line of riparian vegetation.

Based on the results of the jurisdictional delineation field work, it was determined that the total jurisdictional resources in the Study Area are as follows:

- **USACE Jurisdiction.** 19.421 acres of non-wetland "waters of the U.S.".
- **RWQCB Jurisdiction.** 19.421 acres.
- **CDFW Jurisdiction.** 26.985 acres.

Based on the current limits of project disturbance, the following jurisdictional resources will be within the proposed Project Work Areas:

- **USACE Jurisdiction.** 3.392 acres.
- **RWQCB Jurisdiction.** 3.392 acres.
- **CDFW Jurisdiction.** 3.708 acres.

[1] The California Department of Fish and Game (CDFG) changed its name to the California Department of Fish and Wildlife (CDFW) effective January 1, 2013.

The following permits, agreements, and certifications, which involve work within areas under the jurisdiction of the USACE, the RWQCB, and the CDFW, are expected to be required before Project activities are initiated:

- USACE Section 404 Permit;
- RWQCB Section 401 Water Quality Certification; and
- CDFW Section 1602 Lake or Streambed Alteration Agreement (LSAA).

Please note that if the project involves any proposed modifications to an existing Corps project (either federally or locally maintained) that goes beyond those modifications required for normal operation and maintenance requires approval under 33 USC 408 hereafter referred to as Section 408.

1.0 INTRODUCTION

This Jurisdictional Delineation Report (report) was prepared for the Los Angeles County Flood Control District (LACFCD) to provide baseline data concerning the type and extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW),[2] and the Regional Water Quality Control Board (RWQCB) for the Santa Anita Stormwater Flood Management and Seismic Strengthening Project (hereinafter referred to as the "proposed Project"). This report is based on the jurisdictional delineation surveys performed on April 23 and 25, 2013.

1.1 PROJECT LOCATION AND DESCRIPTION

The Project is located in the cities of Arcadia and Monrovia, Los Angeles County, California. The Study Area for the proposed Project extends along Santa Anita Wash from just upstream of Santa Anita Dam (Dam) to the Santa Anita Debris Dam (Debris Dam) adjacent to Highland Oaks Drive (Exhibit 1). The Study Area is approximately 1.5 miles long and 115 acres total. The Study Area is located on the U.S. Geological Survey's (USGS') Mount Wilson 7.5-minute topographic quadrangle of the San Bernardino Meridian at Township 1 North, Range 11 West, Sections 10 and 15 (Exhibit 2). It is within the 831-square-mile Los Angeles Watershed (Hydrologic Unit Code 18070105). Open space in the City of Arcadia's Wilderness Park (Wilderness Park) and the Angeles National Forest occur north and east of the Study Area.

The Project has multiple components, including the Dam, Headworks and Wilderness Park Culvert Crossing, and Debris Dam.

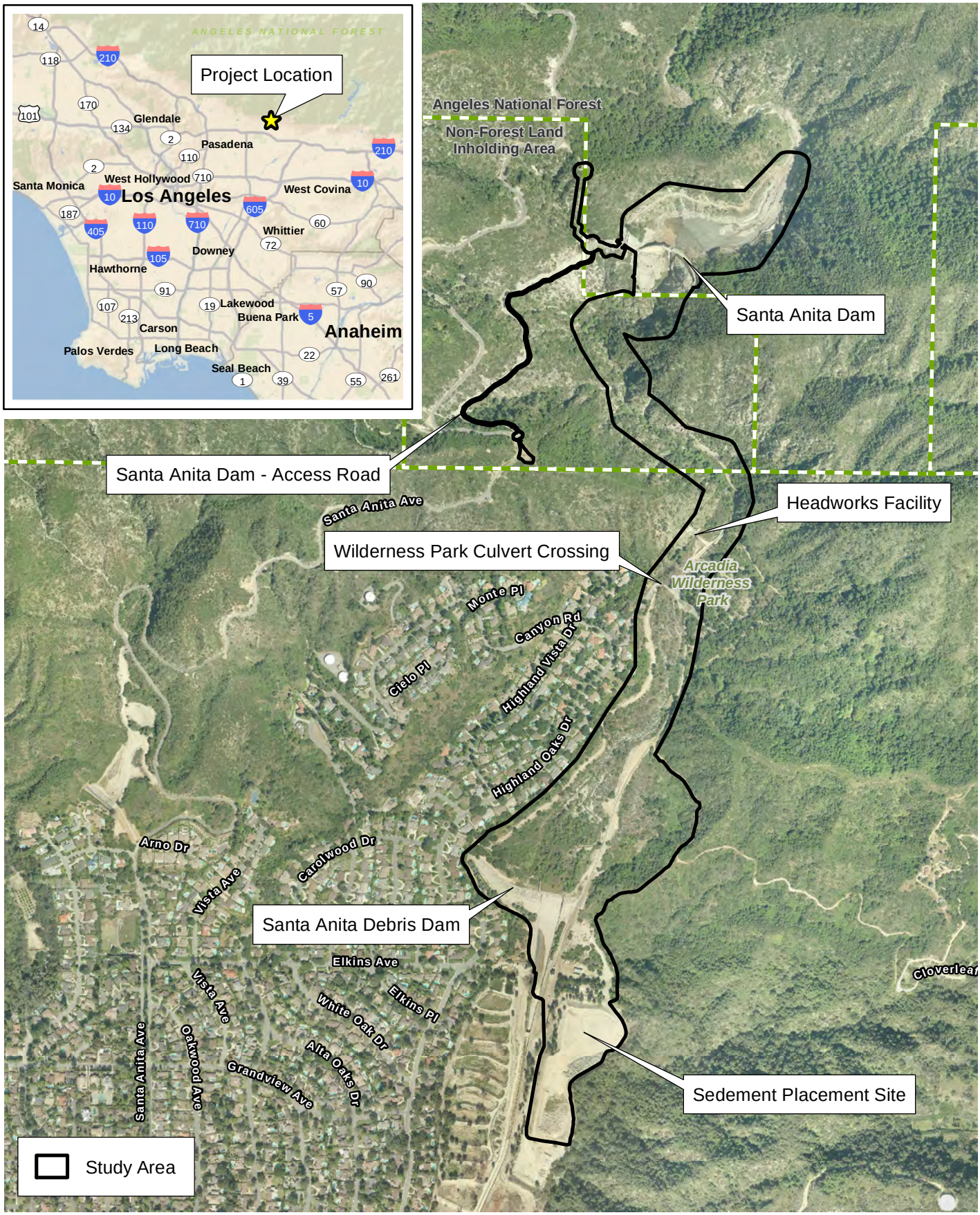
The Project would improve the LACFCD facilities to better reduce flood risk to downstream communities by modifying the Dam spillway to safely pass the Probable Maximum Flood (PMF) and remediate seismic safety issues at the Dam and Debris Dam. It would also enhance the sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre feet per year (afy) by restoring storage capacity at the Debris Dam, rehabilitate the Headworks for more reliable diversion of stormwater runoff to the spreading grounds, and modernize facilities and implement new monitoring and control systems. The Project would also improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing. The following describes each of the Project's components.

Dam

The Dam would be structurally altered to accommodate a new spillway with sufficient capacity to pass the probable maximum flood (PMF) of 26,100 cubic feet per second (cfs) in order to reduce the risk of Dam failure from uncontrolled overtopping during major storm events. The proposed improvements to the Dam would not result in changes to the existing maximum water surface elevation restrictions; therefore, the reservoir's capacity to retain water would not be altered by Project implementation.

The spillway modification would consist of cutting a "notch" in the Dam crest to allow the PMF to overtop in a controlled manner. The existing auxiliary spillway bowl and trash rack and existing emergency crest spillway would be removed. The proposed notch would be centered on the crest of the Dam, similar to the existing emergency crest spillway, and would require concrete removal from the Dam. An existing spillway on the far western edge of the Dam would remain and be

[2] The California Department of Fish and Game (CDFG) changed its name to the California Department of Fish and Wildlife (CDFW) effective January 1, 2013.



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Study Area

Exhibit 1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

1,000 500 0 1,000 Feet

BonTerra PSOMAS

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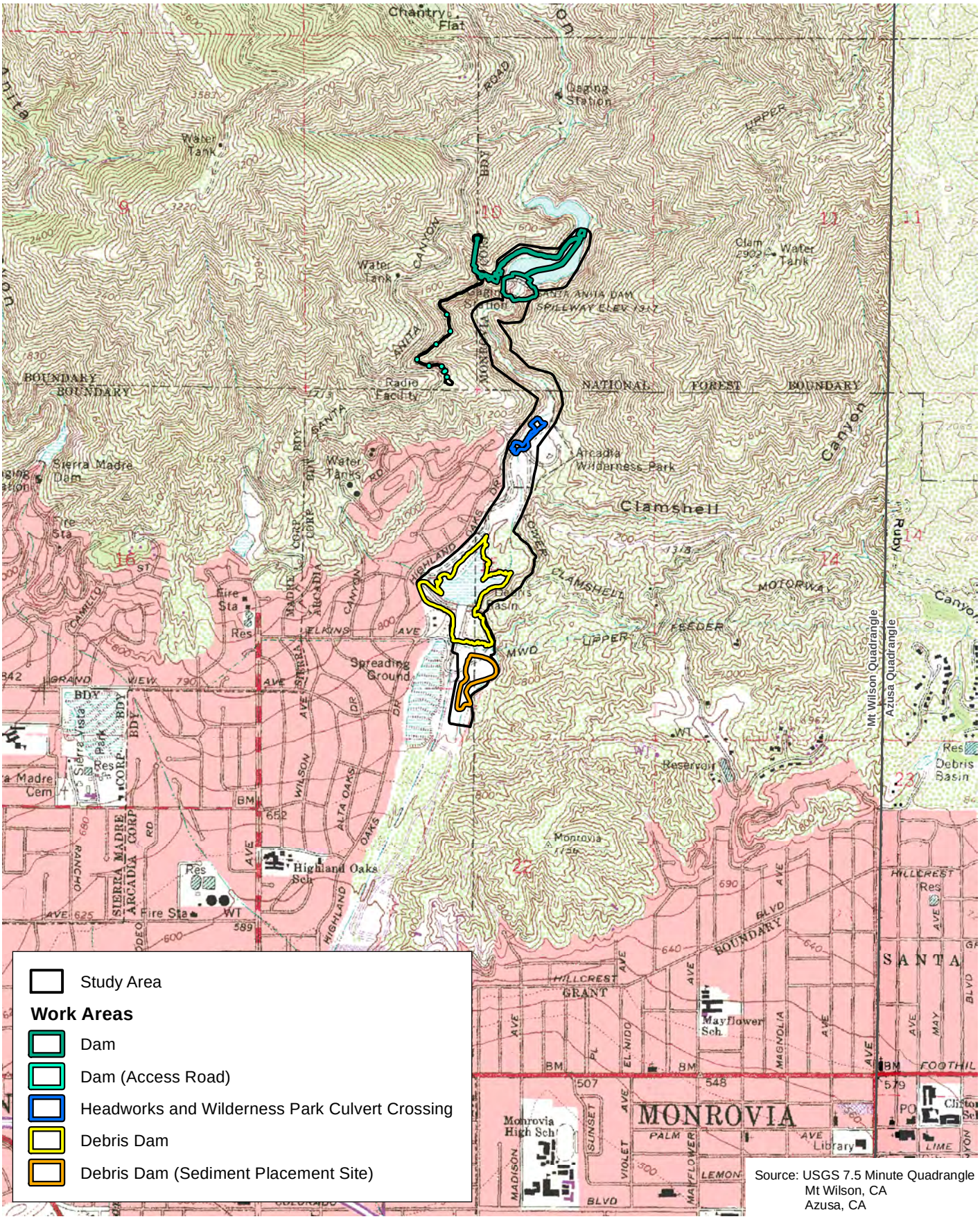

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Local Vicinity

Exhibit 2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

2,000 1,000 0 2,000 Feet

Bonterra PSOMAS

(Rev: 9-22-2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\JD\Ex2_LV_usgs.pdf

unaltered by the Project; however, the existing auxiliary orifice spillway beneath the proposed new spillway would be removed.

A new pedestrian bridge would be constructed over the notch, and the existing hoist system would be upgraded to have a higher load capacity and re-aligned to accommodate the new spillway, including relocation of the lower hoist tower along the Dam crest (and potentially cantilevered of the back side, if necessary. The proposed improvements would not change the height of the Dam; the crest of the Dam will remain at an elevation of 1,325 feet above mean sea level (msl) and the parapet wall would remain at an elevation of 1,328 feet above msl.

To better manage stormwater runoff and to ensure reliability and efficiency of operations, six of the existing valves will be replaced (three control valves and three backup valves, along with new electrical and control systems. The Dam's structural concrete would be repaired to ensure that it meets acceptable standards consistent with the required seismic performance of the Dam.

The downstream canyon walls and the toe of the Dam would be re-armored with additional reinforced gunite or equivalent concrete erosion protection to dissipate the energy from the overtopping water as the flow cascades through the spillway notch and the orifice spillway or sluiceway. The flow would be directed onto the downstream armoring before flowing into the channel downstream of the Dam. The new re-amoring would reinforce the existing armoring that extends approximately 100 feet downstream from the toe of the Dam. The re-armoring would be held in position with tie-back anchors to be drilled and grouted into the bedrock. The tie-ins for the re-armoring may include superficial rock excavation, grading, and subsurface pressure grouting. The color of the material used for re-armoring would be the same as the existing concrete.

The Project would also include improvements to ancillary facilities of the Dam. The existing garage/storage shed would be demolished and replaced with a new three-bay garage (the third bay would house a new back-up generator). Additionally, the existing Dam Operator's house would be removed and replaced with a helipad to provide aerial access to the Dam in the event of an emergency. It is anticipated that the helipad would only be used one or two times per year. The addition of a helipad would allow for improved emergency access to the Dam, as well as the other facilities downstream, especially if access roads get obstructed. The existing relief quarters and control house would remain to serve as an office. Although the Dam Operator would no longer reside at the Dam, he/she would still be on-site daily and available on-call after hours. The Project would include remote control capabilities that provide redundant control options from multiple off-site locations. The Dam also has a built-in safety mechanism to automatically pass water through the Dam once the reservoir surface level reaches the DSOD restriction.

The existing potable water system that serves the Dam site would be replaced. The water system currently consists of a 60,000 gallon upper tank located off Chantry Flats Road that connects to two 5,000 gallon lower tanks located near the Dam access road via a pipeline that runs down the mountainside. The slope adjacent to the upper tank has erosion damage and would be repaired as part of the Project. To repair the slope, an approximately 216 square foot eroded gully located near the tank's foundation would be grubbed and stabilized with engineered fill and geotextile fabric, or the installation of support piles. The exposed portions of the existing water pipeline would be removed while any underground portions would be capped and abandoned in place. The replacement pipeline would run along the same general alignment as the existing pipeline. The two lower tanks would be removed and would not require replacement.

The existing manual swing gate at Chantry Flats Road that provides secured entry to the Dam access road would be replaced with a new electric slide gate. In order to provide electricity to the

gate and new lighting/intercom systems, a power line would be strung on up to seven new power poles to be installed along the outer edge of the Dam's access road, or where possible, in conduit along the inner slope of the access road.

Headworks and Wilderness Park Culvert Crossing

Headworks

The Headworks structure would be replaced and the associated earthen levee would be partially reconstructed to better manage the diversion of flows to the downstream spreading grounds and the downstream Debris Dam. A rehabilitation of the Headworks is needed to protect facilities from stormwater damage and to direct stormwater runoff to the spreading grounds for groundwater recharge.

Redevelopment of the Headworks would include reconstruction of the levee to ensure it can withstand flows produced by a 25-year storm event and replacement of the existing tainter gate (used to divert flows) with a new rubber diversion structure. The new rubber diversion structure would be a pneumatically operated (through the use of compressed air or compressed gas), bottom hinged, spillway gate system.

The majority of the existing Headworks structure would be demolished and removed, including the tainter gate, supporting walls, catwalk, and keys. The new facility would increase the width of the structure by approximately 20 feet in order to house the 34-foot rubber diversion structure. Operation of the rubber diversion structure would result in the retention of waters behind the levee to allow for the diversion of flows through the intake gates and into the existing 30-inch reinforced concrete pipe (RCP) leading to the Santa Anita Spreading Grounds and/or Sierra Madre Spreading Grounds. The pool created by the new rubber diversion structure would remain the same as under existing conditions. Construction of the new diversion structure would require work in the creekbed extending approximately 25 feet downstream of the Headworks, including the placement of new riprap on the downstream side.

The rehabilitation of the Headworks would also include a new control system, including remote operation capabilities, to increase efficiency of water conservation operations. Currently, the response time required for County personnel to drive to the Headworks and manually operate the tainter gate, along with the limited flow rates that can be bypassed, results in the loss of a water conservation opportunity. A new control system integrated with the control system of the other Project components would optimize water conservation. A control house for the rubber diversion structure would be constructed on the other side of the channel next to the access road.

The earthen levee would be reinforced and raised approximately five feet higher to match the height of the Headworks structure by removing and under-excavating the existing levee and rebuilding the new levee using a combination of imported fill and suitable material from the existing levee. It would then be recompacted to the proposed height. The access road leading to the facility would be modified to match the height of the reinforced earthen levee. The existing riprap on the upstream side of the levee would be reinforced. A subsurface conduit would be installed along the length of the levee to connect the rubber diversion structure to the control house on the other side.

Wilderness Park Culvert Crossing

In addition to the improvements at the Headworks, armoring of the roadway and construction of a replacement culvert crossing to the Wilderness Park is needed to ensure that the structure can

withstand flows produced by a larger storm event. The existing culvert crossing located approximately 450 feet downstream of the Headworks, including the concrete slab and corrugated metal culverts, would be removed and replaced with a new crossing structure.

The new culvert crossing may be wider than the existing structure by up to approximately ten feet. The new culvert crossing would be built on top of a new abutment and would be designed with a permanent guard rail and flexible pavement driving surface adequate for emergency vehicles. The new roadway elevation of the culvert crossing would be raised above the existing roadway elevation by approximately 4.5 feet to accommodate higher flows. Approximately 1,800 square feet of the roadways leading to and from the Culvert Crossing would be repaved and sloped to join the existing grade.

Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing would be grubbed and graded to accommodate the new Culvert Crossing. It is anticipated that adequate vehicular and pedestrian access could be provided to the Arcadia Wilderness Park for the majority of the construction period for the Culvert Crossing, with only occasional closures required for periods of about a week or less at any give time during construction. Notification of any temporary closures would be posted at the entrance to the Wilderness Park. Those brief closures would avoid important events at the Wilderness Park, such as the overnight Boy Scout campouts every Friday and Saturday and youth day camps every weekday between mid-June to late-August. However, in order to provide a conservative analysis for impacts to Biological Resources (see Section 4.4 of this MND), the assembly of a temporary bypass crossing located north of the existing Culvert Crossing, which would require removal of a sycamore tree, has been assumed and assessed, to account for the event that the temporary crossing is used. Therefore, access to the Wilderness Park would be maintained throughout construction with minimal interruption to access.

Two existing sycamore tree located and within this area, a temporary crossing would be implemented to maintain vehicular access until construction is complete. Therefore, access to the Wilderness Park would be maintained throughout construction of the culvert crossing through the use of the temporary bridge. Two existing sycamore trees located adjacent to the crossing on the eastern shore of the Wash, south of the culvert crossing, would need to be removed. One sycamore located on the eastern shore of the Wash, north of the culvert crossing, may need to be removed, depending on whether or not the temporary bypass crossing is installed. In order to provide a conservative analysis, this technical report assumes that all three of the upstream and downstream sycamore trees would be removed.

The LACFCD may transplant the root ball(s) of the sycamores to a suitable riparian location, and/or utilize the woody debris from the sycamore to enhance habitat value at another nearby location, if determined to be feasible and if approved by the County and other appropriate parties. In addition, new sycamore trees would be planted within a 100-foot radius of the original location of any removed existing trees.

New riprap would be installed upstream and downstream of the culvert crossing. The roadways leading to and from the culvert crossing would be armored, 36 feet on the upstream side and 84 feet on the downstream side, to withstand flows and sloped to join the existing grade. The existing water and sewer lines that run through the current culvert crossing would need to be relocated to the new height of the structure. The sewer force main is on the downstream surface of the Culvert Crossing and the water line is on the upstream surface of the Culvert Crossing. Additionally, the fire hydrant, vault, water valve and standpipe would be demolished and relocated approximately 15 feet to the north in the case that the temporary bypass crossing is utilized. All utility trenching and relocations would remain within the area anticipated for impacts by the culvert

crossing construction activities, and there would be no changes in water/sewer quantities or demands as a result of the Project.

Debris Dam

Remediation of the seismic deficiencies at the Debris Dam would involve minor improvements to the existing structures, including the intake tower and embankment. As a result of the loss of water conservation capacity from the California Department of Water Resources, Division of Safety of Dams (DSOD) restrictions on the Dam, there is an increased need to capture as much stormwater runoff as possible in facilities below the Dam. As a result, the Debris Dam would also be enlarged by raising the existing spillway by 4 feet. Remediating the seismic deficiencies at the Debris Dam would result in the DSOD removing the operational restrictions on the facility, thereby restoring 119 acre-feet of water conservation capacity. Enlarging the Debris Dam would create an additional 40 acre-feet of additional storage capacity, for a total of 159 acre-feet. When captured stormwater is released from the Dam to the spreading grounds for groundwater recharge, the Debris Dam can then capture more runoff, which would allow for water storage capacity multiple times in a single season depending on the frequency, duration, and intensity of storm events.

The intake tower located in the Debris Dam is unable to resist seismic loading and would be strengthened or replaced. The improved intake tower would be connected to the existing 48-inch outlet pipe (being lined as part of this project). The outlet pipe has an existing junction box which is used to deliver water either into the spillway channel or into the spreading grounds. The upstream and downstream portions of the Debris Dam embankment and alluvial foundation material that are subject to potential liquefaction would be reinforced with structural buttressing. Currently, a cross-section of the Debris Dam resembles a triangle (e.g. sloped sides on the upstream and downstream sides of the dam) with a flat top (e.g. flattened to accommodate vehicular access).The top of the embankment ranges from an elevation of 796 feet above msl at its center to an elevation of 811 feet above msl at the western edge. The construction activities would involve the removal of the existing rip-rap exterior surface on portions of both the upstream (approximately 0.69 acre) and downstream (approximately 0.89 acre) slopes. Engineered fill materials beneath the riprap would be excavated and removed, and an engineered buttress would be constructed. Upon completion of construction activities, the sloped upstream and downstream surfaces of the Debris Dam would be reconfigured into a single stair-stepped terrace. The surface of the Debris Dam would be completed with a rip-rap similar to the existing condition.

As part of the improvements, six non-native deodar cedar trees (*Cedrus deodara*) located at the downstream toe of the embankment would be removed as mandated by DSOD to ensure the structural integrity of the Debris Dam.

A new automated outlet gate and control system would be constructed to modernize operations and to ensure compatibility with other Project components. Upon completion of these improvements, DSOD would issue a new certificate for the facility and remove the current operating restriction on the Debris Dam, which would increase the Debris Dam's available and allowable water conservation storage capacity from 0 acre-feet to 119 acre-feet.

In addition to the DSOD design approval requirements, the modification of the Debris Dam requires approval under 33 USC 408 (hereafter referred to as Section 408), which requires obtaining a permit from the U.S. Army Corps of Engineers (USACE). Under the terms of Section 408, any proposed modification to a USACE facility requires a determination that the proposed alterations is not injurious to the public interest and will not impair the usefulness of the facility.

Consultation with the USACE will be required to determine whether the modifications would be considered a "Minor" (Minor 408) or "Major" (Major 408) Modification.

An existing disturbed area south of the Debris Dam would be used as a Sediment Placement Site.

1.2 REGULATORY AUTHORITY

1.2.1 Summary of Regulations

U.S. Army Corps of Engineers

The USACE Regulatory Branch regulates activities that discharge, dredged or fill materials into "waters of the U.S." under Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. This permitting authority applies to all "waters of the U.S." where the material (1) replaces any portion of a "waters of the U.S." with dry land or (2) changes the bottom elevation of any portion of any "waters of the U.S.". These fill materials would include sand, rock, clay, construction debris, wood chips, and materials used to create any structure or infrastructure in these Waters. The selection of disposal sites for dredged or fill material is done in accordance with Section 404(b)(1) guidelines, which were developed by the U.S. Environmental Protection Agency (USEPA).

Waters of the United States

"Waters of the U.S." can be divided into 3 categories: territorial seas, tidal waters, or non-tidal waters. The term "waters of the U.S." is defined by the *Code of Federal Regulations* (CFR, Title 33, Navigation and Navigable Waters; Part 328, Definition of waters of the United States; §328.3, Definitions) and includes:

1. All waters that have, are, or may be used in interstate or foreign commerce (including sightseeing or hunting), including all waters subject to the ebb and flow of the tide.
2. All interstate waters including interstate wetlands.
3. All other waters such as intrastate lakes, rivers, or streams (including intermittent streams); mudflats; sand flats; wetlands; sloughs; prairie potholes; wet meadows; playa lakes; or natural ponds where the use, degradation, or destruction of which could affect interstate or foreign commerce.
4. All impoundments of waters otherwise defined as "waters of the U.S." under the definition.
5. All tributaries of waters identified above.
6. The territorial seas.
7. All wetlands adjacent to waters (other than waters that are themselves wetlands) identified above.

Ordinary High Water Mark

The landward limit of tidal "waters of the U.S." is the high-tide line. In non-tidal waters where adjacent wetlands are absent, jurisdiction extends to the ordinary high water mark (OHWM). In the absence of wetlands in non-tidal waters, the extent of jurisdictional limits is determined by the OHWM. The OHWM is defined as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence

of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR §328.3[e]). The OHWM limits will be further refined to define the "low flow channel" and extent of the "Active Floodplain" in accordance with the provisions of *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, A Delineation Manual* (Lichvar and McColley 2008); *Ordinary High Flows and the Stage-Discharge Relationship in the Arid West Region* (Curtiset al. 2011); and the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar 2010).

Wetlands

A wetland is a subset of jurisdictional waters and is defined by the USACE and the USEPA as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR §328.3[b]). Wetlands generally include swamps, marshes, bogs, and areas containing similar features. The definition and methodology for identifying wetland resources can be found in the USACE's *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008c), a supplement to the USACE's *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The methodology contained in this supplement was used to identify the type and extent of wetland resources associated with the proposed Project.

On June 19, 2006, a majority of the U.S. Supreme Court overturned 2 Sixth Circuit Court of Appeals decisions, finding that certain wetlands constituted "waters of the U.S." under the CWA. Justice Scalia argued that "waters of the U.S." should not include channels through which water flows intermittently or ephemerally, or channels that periodically provide drainage for rainfall. He also stated that a wetland may not be considered "adjacent to" remote "waters of the U.S." based on a mere hydrologic connection. On June 5, 2007, the USACE published a memorandum that provides guidance to both the USEPA regions and the USACE districts that implement the Supreme Court's decision in the Rapanos cases (which address the jurisdiction over "waters of the U.S." under the CWA) (USACE 2007a).[3] The memorandum includes a chart that summarizes its key points, which is intended to be used as a reference tool along with a complete discussion of issues and guidance furnished throughout the memorandum.

In summary, the USACE and the USEPA will assert jurisdiction over the following waters: (1) traditional navigable waters (TNW); (2) wetlands adjacent to a TNW; (3) relatively permanent, non-navigable tributaries of a TNW that typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and (4) wetlands that directly abut such tributaries.

The USACE and the USEPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a TNW: (1) non-navigable tributaries that are not relatively permanent; (2) wetlands adjacent to non-navigable tributaries that are not relatively permanent; and (3) wetlands adjacent to but that do not directly abut a relatively permanent, non-navigable tributary.

The USACE and the USEPA generally will not assert jurisdiction over the following features: (1) swales or erosional features (e.g., gullies or small washes characterized by low volume, infrequent, or short duration flow) and (2) ditches (including roadside ditches) excavated wholly within and draining only uplands and that do not carry a relatively permanent flow of water.

[3] Consolidated cases: *Rapanos v. United States* and *Carabell v. United States* refer to the U.S. Supreme Court's decision concerning USACE jurisdiction over "waters of the U.S." under the CWA.

The USACE and the USEPA will apply the significant nexus standard defined as follows:

1. A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream TNWs.
2. A significant nexus includes consideration of hydrologic and ecological factors.

Regional Water Quality Control Board

The RWQCB is the primary agency responsible for protecting water quality in California through the regulation of discharges to surface waters under the CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The RWQCB's jurisdiction extends to all "waters of the State" and to all "waters of the U.S.", including wetlands (isolated and non-isolated).

Section 401 of the CWA provides the RWQCB with the authority to regulate, through a Water Quality Certification, any proposed, federally permitted activity that may affect water quality. Among such activities are discharges of dredged or fill material permitted by the USACE pursuant to Section 404 of the CWA. Section 401 requires the RWQCB to provide "certification that there is reasonable assurance that an activity which may result in the discharge to 'waters of the U.S.' will not violate water quality standards". Water Quality Certification must be based on a finding that the proposed discharge will comply with water quality standards, which contain numeric and narrative objectives that can be found in each of the 9 RWQCBs' Basin Plans.

The Porter-Cologne Act provides the State with very broad authority to regulate "waters of the State" (which are defined as any surface water or groundwater, including saline waters). The Porter-Cologne Act has become an important tool in the post-SWANCC (Solid Waste Agency of Northern Cook Counties vs. Unites States Corps of Engineers) and Rapanos era with respect to the State's authority over isolated waters. Generally, any person proposing to discharge waste into a water body that could affect its water quality must file a "Report of Waste Discharge" (ROWD) when there is no federal nexus, such as under Section 404(b)(1) of the CWA. Although "waste" is partially defined as any waste substance associated with human habitation, the RWQCB interprets this to include fill discharge into water bodies.

<u>Regional Water Quality Control Plans</u>

There are 9 RWQCBs in California. The Study Area is located within RWQCB Region 4, the Los Angeles Region. The State Water Resources Control Board (SWRCB) and the RWQCB have adopted a Water Quality Control Plan (or "Basin Plan") for this region. The Basin Plan contains goals and policies, descriptions of conditions, and proposed solutions to surface and groundwater issues. The Basin Plan also establishes water quality standards for surface and groundwater resources and includes beneficial uses and levels of water quality that must be met and maintained to protect these uses. These water quality standards are implemented through various regulatory permits pursuant to CWA Section 401 for Water Quality Certifications and Section 402 for Report of Waste Discharge permits.

The Los Angeles Basin Plan indicates that the Study Area is located within the Los Angeles-San Gabriel Hydrologic Unit, Raymond Hydrologic Area, and Santa Anita Hydrologic Subarea (HSA). The Basin Plan provides Water Quality Objectives for Santa Anita Wash above the Santa Anita spreading grounds (Table 1).

TABLE 1
WATER QUALITY OBJECTIVES FOR SANTA ANITA WASH

Water Quality Objectives (mg/L)					
Total Dissolved Solids	**Sulfate**	**Chloride**	**Boron**	**Nitrogen**	**Sodium Adsorption Ratio**
250	30	10	–[a]	–[b]	–[a]

mg/L: milligrams per liter

[a] Agricultural supply is not a beneficial use of the surface water in the specified reach.
[b] site-specific objectives have not been determined.

Source: RWQCB 1994 (Table 3-8).

The Basin Plan identifies a number of beneficial uses, some or all of which may apply to a specific HSA, including: Municipal and Domestic Water Supply (MUN) waters; Agricultural Supply (AGR) waters; Industrial Process Supply (PROC) waters; Industrial Service Supply (IND) waters; Groundwater Recharge (GWR) waters; Freshwater Replenishment (FRSH) waters; Navigation (NAV) waters; Hydropower Generation (POW) waters; Water Contact Recreation (REC1) waters; Non-Contact Water Recreation (REC2) waters; Commercial and Sport Fishing (COMM) waters; Aquaculture (AQUA) waters; Warm Fresh Water Habitat (WARM) waters; Cold Fresh Water Habitat (COLD) waters; Inland Saline Water Habitat (SAL) waters; Estuarine Habitat (EST) waters; Wetland Habitat (WET) waters; Marine Habitat (MAR) waters; Wildlife Habitat (WILD) waters; Preservation of Biological Habitats (BIOL) waters; Rare, Threatened or Endangered Species (RARE) waters; Migration of Aquatic Organisms (MIGR) waters; Spawning, Reproduction and Development (SPWN) waters; and Shellfish Harvesting (SHEL) waters. Beneficial uses are defined in the Porter-Cologne Act as those uses of water that are necessary for tangible and intangible economic, social, and environmental benefits.

Beneficial or potential beneficial uses associated with the HSA encompassing the Study Area are described in detail below (RWQCB 1994); beneficial uses not described below do not apply to the HSA covering the Study Area.

- **MUN** waters support community, military, or individual water supply systems including, but not limited to, drinking water supply. Water from Santa Anita Wash is diverted at the mouth of Santa Anita Canyon for irrigation (LACDPW 2013).
- **GWR** waters are used for natural or artificial recharge of groundwater for purposes of future extraction; maintenance of water quality; or for halting saltwater intrusion into freshwater aquifers. Water from Santa Anita Wash is diverted at the Santa Anita Headworks by the City of Sierra Madre and LACDPW for spreading in the Sierra Madre Spreading Grounds and at the mouth of Santa Anita Canyon (LACDPW 2013).
- **REC1** waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, whitewater activities, fishing, and use of natural hot springs. Please note that while this beneficial use designation is assigned to surface water bodies in this Region, it should not be construed as encouraging recreational activities. Fishing may occur in the reservoir above the Dam.
- **REC2** waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking; sunbathing; hiking;

beachcombing; camping; boating; tidepool and marine life study; hunting; sightseeing; and aesthetic enjoyment in conjunction with the above activities. Please note that, while this beneficial use designation is assigned to surface water bodies in this region, it should not be construed as encouraging recreational activities. Public use adjacent to waters in the Study Area is present in Wilderness Park.

- **WARM** waters support warm water ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, or wildlife (including invertebrates). The Study Area provides suitable habitat for a variety of aquatic species.
- **COLD** waters support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife (including invertebrates). Deeper waters in the reservoir provide cold water habitat for a variety of aquatic species.
- **WILD** waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife. A variety of wildlife species have been observed utilizing habitat in the Study Area. One California Species of Special Concern, two-striped garter snake (*Thamnophis hammondii*), was observed in the Study Area (BonTerra 2012).
- **RARE** waters support the habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species designated under State or federal law as Rare, Threatened, or Endangered. The Study Area provides suitable or marginally suitable habitat for federally and/or State-listed species; however, no listed species have been observed during focused surveys of the Study Area.
- **SPWN** waters support high quality aquatic habitats necessary for reproduction and early development of fish and wildlife. Green sunfish (*Lepomis cyanellus*) and rainbow trout (*Oncorhynchus mykiss*) were observed during focused fish surveys of the Study Area (BonTerra 2012).
- **WET** waters support wetland ecosystems including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions that enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants. The Dam and the spreading grounds provide flood control for downstream ecosystems and communities.

California Department of Fish and Wildlife

The CDFW has jurisdictional authority over wetland resources associated with rivers, streams, and lakes pursuant to *California Fish and Game Code* (§§1600–1616). Activities of State and local agencies as well as public utilities that are project proponents are regulated by the CDFW under Section 1602 of the *California Fish and Game Code;* this section regulates any work that will (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

Because the CDFW includes streamside habitats under its jurisdiction that, under the federal definition, may not qualify as wetlands on a particular project site, its jurisdiction may be broader than that of the USACE. Riparian forests in California often lie outside the plain of ordinary high water regulated under Section 404 of the CWA, and often do not have all 3 parameters (wetland hydrology, hydrophytic vegetation, and hydric soils) sufficiently present to be regulated as a

wetland. However, riparian forests are frequently within CDFW regulatory jurisdiction under Section 1602 of the *California Fish and Game Code.*

The CDFW enters into a Lake or Streambed Alteration Agreement (LSAA) with a project proponent and can impose conditions on the agreement. The notification process involves the completion of the applications which will serve as the basis for the CDFW's issuance of a Section 1602 LSAA. Section 1602 of the *California Fish and Game Code* applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State.

The CDFW jurisdictional limits are not as clearly defined by regulation as those of the USACE. While they closely resemble the limits described by USACE regulations, they include riparian habitat supported by a river, stream, or lake regardless of the presence or absence of hydric and saturated soils conditions. In general, the CDFW takes jurisdiction from the top of a stream bank or to the outer limits of the adjacent riparian vegetation (outer drip line), whichever is greater. Notification is generally required for any project that will take place within or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish and other aquatic plant and/or wildlife species, and watercourses that have a surface or subsurface flow that support or have supported riparian vegetation.

2.0 METHODOLOGY

The 3-parameter approach used to identify USACE wetlands is summarized in Sections 2.1 through 2.3; literature reviewed for the preparation of the delineation is outlined in Section 2.4; and the field delineation is outlined in Section 2.5.

2.1 VEGETATION

Hydrophytic vegetation (or hydrophytes) is defined as any macrophytic plant that "grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats" (Environmental Laboratory 1987). Specifically, these plant species have specialized morphological, physiological, or other adaptations for surviving in permanently saturated to periodically saturated soils where oxygen levels are very low or the soils are anaerobic. The USACE—as part of an interagency effort with the USEPA, the U.S. Fish and Wildlife Service (USFWS), and the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS)—has approved a new National Wetland Plant List (NWPL) (Lichvar and Kartesz 2009) to replace the *National List of Plant Species that Occur in Wetlands* (Reed 1988). The NWPL went into effect on June 1, 2012, and is to be used to determine whether the hydrophytic vegetation parameter is met when conducting wetland determinations under the Clean Water Act and the Wetland Conservation Provisions of the Food Security Act. The NWPL is also intended to be used for wetland restoration, establishment, and enhancement projects. This report utilized the indicator statuses for the Arid West Supplement portion of the NWPL.

The following revisions were made to the Reed (1988) pursuant to the NWPL:

1. The USACE eliminated the "probability-of-occurrence" categories (e.g., <1 percent, 1–33 percent, 34–66 percent, 67–99 percent, and >99 percent) due to the lack of numerical data to support these ratings.
2. The USACE determined that, because the wetland plant indicator statuses have shifted from a series of numerical categories to qualitative definitions, the use of +/– suffixes is difficult to apply accurately. Adding finer-scale +/– ratings implies there are data to support their assignments, which is generally not the case. Therefore, to improve the accuracy of the overall list, the USACE decided to drop the +/– suffixes.

Lichvar and Gillrich (2011) provide updated technical definitions of wetland plant indicator status categories as part of the procedures used in updating the NWPL:

- **Obligate Wetland (OBL):** These wetland-dependent plants (herbaceous or woody) require standing water or seasonally saturated soils (14 or more consecutive days) near the surface to assure adequate growth, development, and reproduction and to maintain healthy populations. These plants are of 4 types:
    - *submerged:* plants that conduct virtually all of their growth and reproductive activity under water.
    - *floating:* plants that grow with leaves and, most often, their vegetative and reproductive organs floating on the water surface.
    - *floating-leaved:* plants that are rooted in sediment but also have leaves that float on the water surface.

- *emergent:* herbaceous and woody plants that grow with their bases submerged and rooted in inundated sediment or seasonally saturated soil and their upper portions, including most of the vegetative and reproductive organs, growing above the water level.

- **Facultative Wetlands (FACW):** These plants depend on and predominantly occur with hydric soils, standing water, or seasonally high water tables in wet habitats for assuring optimal growth, development, and reproduction and for maintaining healthy populations. These plants often grow in geomorphic locations where water saturates soils or floods the soil surface at least seasonally.
- **Facultative (FAC):** These plants can occur in wetlands or non-wetlands. They can grow in hydric, mesic, or xeric habitats. The occurrence of these plants in different habitats represents responses to a variety of environmental variables other than just hydrology, such as shade tolerance, soil hydrogen potential (pH), and elevation, and they have a wide tolerance of soil moisture conditions.
- **Facultative Upland (FACU):** These plants are not wetland dependent. They can grow on hydric and seasonally saturated soils, but they develop optimal growth and healthy populations on predominantly drier or more mesic sites. Unlike FAC plants, these plants are non-wetland plants by habitat preference.
- **Obligate Upland (UPL):** These plants occupy mesic to xeric non-wetland habitats. They almost never occur in standing water or saturated soils. Typical growth forms include herbaceous, shrubs, woody vines, and trees.

The following are 3 procedures for determining hydrophytic vegetation: Indicator 1, “Dominance Test”, using the “50/20 Rule”; Indicator 2, “Prevalence Index”; or Indicator 3, “Morphological Adaptation”, as identified in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008c). Hydrophytic vegetation is present if any indicator is satisfied. If none of the indicators are satisfied, then hydrophytic vegetation is absent unless (1) indicators of hydric soil and wetland hydrology are present and (2) the site meets the requirements for a problematic wetland situation.

- ***Dominance Test:*** Vegetative cover is estimated and is ranked according to its dominance. Dominant species are the most abundant species for each stratum of the community (i.e., tree, sapling/shrub, herb, or woody vine) that individually or collectively amount to 50 percent of the total coverage of vegetation plus any other species that, by itself, accounts for 20 percent of the total vegetation cover (also known as the “50/20 Rule”). These species are recorded on the “Wetland Determination Data Form – Arid West Region”. The wetlands indicator status of each species is also recorded on the data forms based on the NWPL (Lichvar and Kartesz 2009). If greater than 50 percent of the dominant species across all strata are OBL, FACW or FAC species, the criterion for wetland vegetation is considered to be met.
- ***Prevalence Index:*** The prevalence index considers all plant species in a community, not just the dominant ones. The prevalence index is the average of the wetland indicator status of all plant species in a sampling plot. Each indicator status category is given a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and is weighted by the species’ abundance (percent cover). Hydrophytic vegetation is present if the prevalence index is 3.0 or less.

- ***Morphological Adaptation:*** Morphological adaptations, such as adventitious roots (i.e., roots that take advantage of the wet conditions) and shallow root systems, must be observed on more than 50 percent of the individuals of a FACU species for the hydrophytic vegetation wetland criterion to be met.

2.2 SOILS

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that is formed under conditions of saturation, flooding, or ponding that occurs long enough during the growing season to develop anaerobic conditions (or conditions of limited oxygen) at or near the soil surface and that favor the establishment of hydrophytic vegetation (USDA NRCS 2008). It should be noted that hydric soils created under artificial conditions of flooding and inundation sufficient for the establishment of hydrophytic vegetation would also meet this hydric soils indicator.

The soil conditions are verified by digging test pits along each transect to a depth of at least 20 inches (except where a restrictive layer occurs in areas containing hard pan, cobble, or solid rock). It should be noted that at some sites, it may be necessary to make exploratory soil test pits up to 40 inches deep to more accurately document and understand the variability in soil properties and hydrologic relationships on the site. Soil test pit locations are usually dug within the drainage invert or at the edge of a drainage course within vegetated areas. Soil extracted from each soil test pit is then examined for texture and color using the standard plates within the Munsell Soil Color Chart (1994) and recorded on the Data Form. The Munsell Soil Color Chart aids in designating soils by color labels based on gradations of 3 simple variables: hue, value, and chroma. Any indicators of hydric soils such as the following are also recorded on the Data Form: redoximorphic features (i.e., areas where iron is reduced under anaerobic conditions and oxidized following a return to aerobic conditions); buried organic matter; organic streaking; reduced soil conditions; gleyed (i.e., soils having a characteristic bluish-gray or greenish-gray in color) or low-chroma soils; or sulfuric odor. If hydric soils are found, progressive pits are dug along the transect moving laterally away from the active channel area until hydric soil features are no longer present within the top 20 inches of the soil.

2.3 HYDROLOGY

Wetlands hydrology is represented by either (1) all of the hydrological elements or characteristics of areas permanently or periodically inundated or (2) areas containing soils that are saturated for a sufficient duration of time to create hydric soils suitable for the establishment of plant species that are typically adapted to anaerobic soil conditions. The presence of wetland hydrology is evaluated at each intersect by recording the extent of observed surface flows, the depth of inundation, the depth to saturated soils, and the depth to free water in soil test pits. In instances where stream flow is divided into multiple channels with intervening sandbars, the entire area between the channels is considered within the OHWM. Therefore, an area containing these features would meet the indicator requirements for wetland hydrology.

2.4 LITERATURE

Prior to conducting the delineation and during the course of preparing this report, BonTerra Psomas reviewed the following documents to identify areas that may fall under agency jurisdiction: the USGS' Mount Wilson 7.5-minute quadrangle map; color aerial photography provided by Google Earth (various dates); the Report and General Soil Maps for the Angeles National Forest Area, California (USDA NRCS 2006); the National Hydric Soils List (USDA NRCS

2012); and the National Wetlands Inventory's Wetland Mapper (USFWS 2013). A description of this literature is provided below.

USGS Topographic Quadrangle. USGS quadrangle maps show geological formations and their characteristics; they describe the physical settings of an area through topographic contour lines and other major surface features. These features include lakes, streams, rivers, buildings, roadways, landmarks, and other features that may fall under the jurisdiction of one or more regulatory agencies. In addition, the USGS maps provide topographic information that is useful in determining elevations, latitude and longitude, and Universal Transverse Mercator Grid coordinates for a project site.

Santa Anita Wash, the Dam, and an unnamed debris basin (i.e., Debris Dam Reservoir) are the main features shown on the USGS Mount Wilson 7.5-minute quadrangle. In addition, Clamshell Canyon drainage enters Santa Anita Wash at the debris basin. Topography in the Study Area consists of a narrow canyon that opens up into the debris basin. Elevations range from approximately 1,300 feet above msl above the Dam to approximately 730 feet above msl at the southern end of the Study Area.

Color Aerial Photography. BonTerra reviewed an existing color aerial photograph prior to conducting the field delineation to identify the extent of any drainages and riparian vegetation occurring in the Study Area.

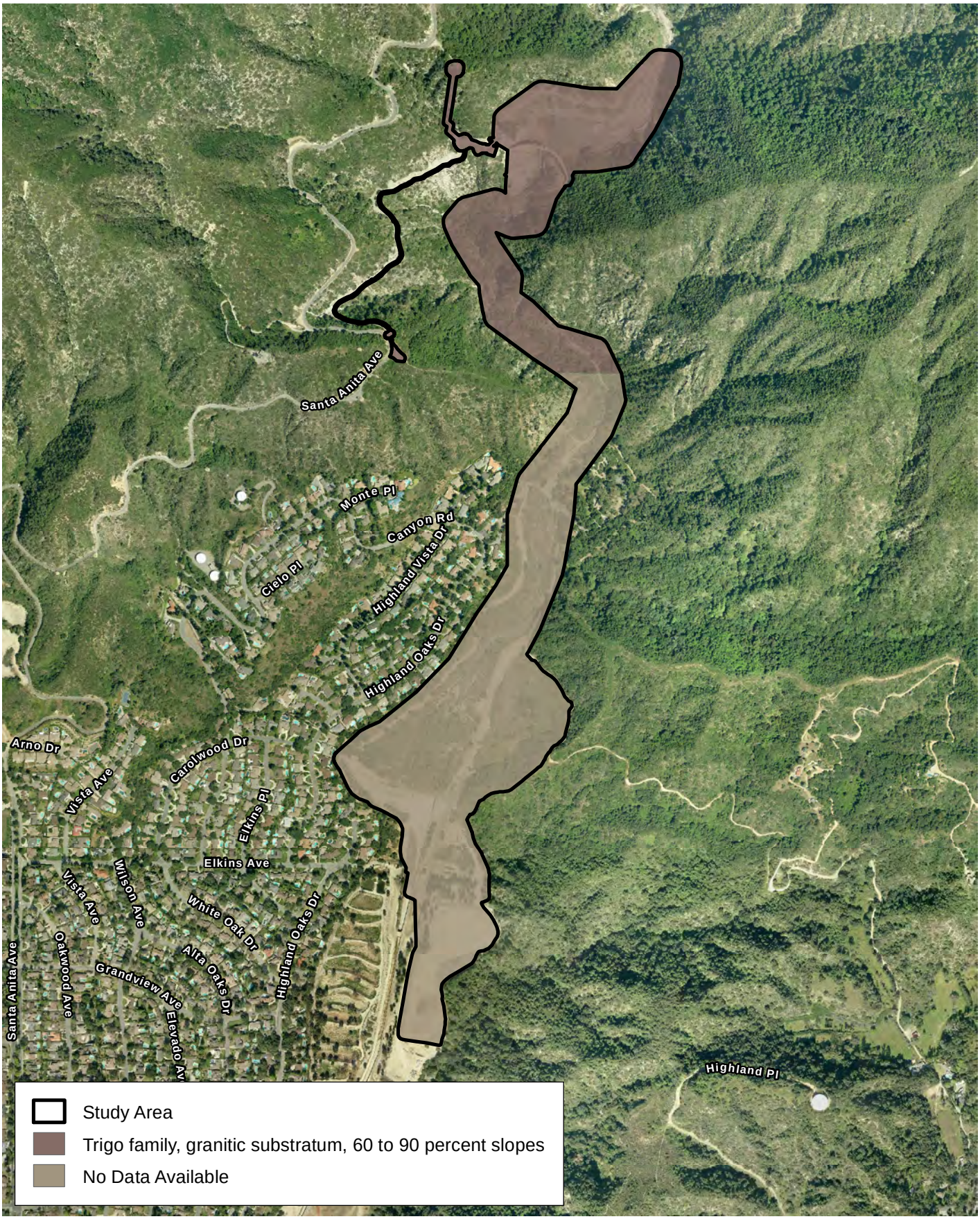
Aerial imagery from Google Earth shows that the reservoir above the Dam had been dewatered between March and July 2011; in other years, the reservoir was full. Above the Dam, vegetation grows along the canyon walls to the high water mark of the reservoir. Below the Dam, vegetation is present in the wash and throughout the debris basin. Downstream of the debris basin, Santa Anita Wash is channelized.

U.S. Department of Agriculture, Natural Resources Conservation Service. The presence of hydric soils is one of the chief indicators of jurisdictional wetlands. BonTerra reviewed U.S. Department of Agriculture (USDA) soil data for the Study Area (USDA NRCS 2006).

A formal soil survey has not been conducted for the southern portion of the Study Area. The following soil type has been mapped in the northern portion of the Study Area: Trigo family, granitic substratum, 60 to 90 percent slopes (Exhibit 3). This soil is not listed as "hydric" on the National Hydric Soils List (USDA NRCS 2012).

U.S. Fish and Wildlife Service, National Wetlands Inventory: The Wetlands Mapper shows wetland resources available from the Wetlands Spatial Data Layer of the National Spatial Data Infrastructure (USFWS 2013). This resource provides the classification of known wetlands following the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). This classification system is arranged in a hierarchy of (1) Systems that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors (i.e., Marine, Estuarine, Riverine, Lacustrine, and Palustrine); (2) Subsystems (i.e., Subtidal and Intertidal; Tidal, Lower Perennial, Upper Perennial, and Intermittent; or Littoral and Limnetic); (3) Classes, which are based on substrate material and flooding regime or on vegetative life forms; (4) Subclasses; and (5) Dominance Types, which are named for the dominant plant or wildlife forms. In addition, there are modifying terms applied to Classes or Subclasses.

Multiple riparian and wetland resources are mapped in the Study Area (USFWS 2013), but the actual jurisdictional wetlands are determined in the field.



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Soil Types

Exhibit 3

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

1,000 500 0 1,000 Feet

BonTerra PSOMAS

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2.5 JURISDICTIONAL DELINEATION

In September 2008, the USACE issued the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region.* This regional supplement is designed for use with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Both the 1987 Wetlands Manual and the Arid West Supplement to the manual provide technical methods and guidelines for determining the presence of "waters of the U.S." and wetland resources. A 3-parameter approach is used to identify wetlands and requires evidence of wetland hydrology, hydrophytic vegetation, and hydric soils. Wetlands generally include swamps, marshes, bogs, and similar areas. In order to be considered a wetland, an area must exhibit at least minimal hydric characteristics within the 3 parameters. However, problem areas may periodically or permanently lack certain indicators due to seasonal or annual variability of the nature of the soils or plant species on site. Atypical wetlands lack certain indicators due to recent human activities or natural events. Guidance for determining the presence of wetlands in these situations is presented in the regional supplement. Non-wetland "waters of the U.S." are delineated based on the limits of the OHWM, which can be determined by a number of factors including erosion, the deposition of vegetation or debris, and changes in vegetation.

It should be noted that the RWQCB shares USACE jurisdiction unless isolated conditions are present. If isolated waters conditions are present, the RWQCB takes jurisdiction using the USACE's definition of the OHWM and/or the 3-parameter wetlands methodology pursuant to the 1987 Wetlands Manual. The CDFW's jurisdiction is defined as the top of the bank to the top of the bank of the stream, channel, or basin or to the outer limit of riparian vegetation located within or immediately adjacent to the river, stream, creek, pond, or lake or other impoundment.

The analysis contained in this report uses the results of a field survey conducted by BonTerra Regulatory Technicians David Hughes and Allison Rudalevige on April 23, 2013, and by Mr. Hughes and BonTerra Regulatory Specialist Gary Medeiros on April 25, 2013. Jurisdictional features were delineated using a 1 inch equals 200 feet (1″ = 200′) scale aerial photograph with 2-foot topographic contours. The field survey included the collection of vegetation, soils, and hydrologic data from 11 sampling points in the Study Area; this information was recorded on Wetland Determination Data Forms (Attachment A). Representative photographs of the Study Area and sampling points are included in Attachment B. In addition, the OHWM limits (i.e., Active Floodplain) occurring in the Study Area were further verified using methodologies contained in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*, *A Delineation Manual* (Lichvar and McColley 2008) and *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) In the Arid West Region of the Western United States* (Curtis and Lichvar 2010).

3.0 JURISDICTIONAL DELINEATION

The following section provides a quantification of existing and impacted resources under the jurisdiction of the USACE, the RWQCB, and the CDFW within the Study Area. For the purposes of all impact discussions below, all impacts are categorized as being either permanent or temporary. Permanent impact areas are defined as changes to or removal of an existing vegetation type or "other areas," including disturbed or developed (e.g. paved) that are permanent as a result of Project implementation. These impact areas are labeled with a red boundary on relevant graphics.

Temporary access/impact areas are defined as areas that may be subject to traversing vehicles or other mobile equipment, staging of equipment, stockpiles of soil, minor soil disturbance where there is no permanent alteration to the existing grade (e.g. no permanent holes, trenches, or berms), and no vegetation or tree removal. These impact areas are labeled with a yellow boundary on relevant graphics.

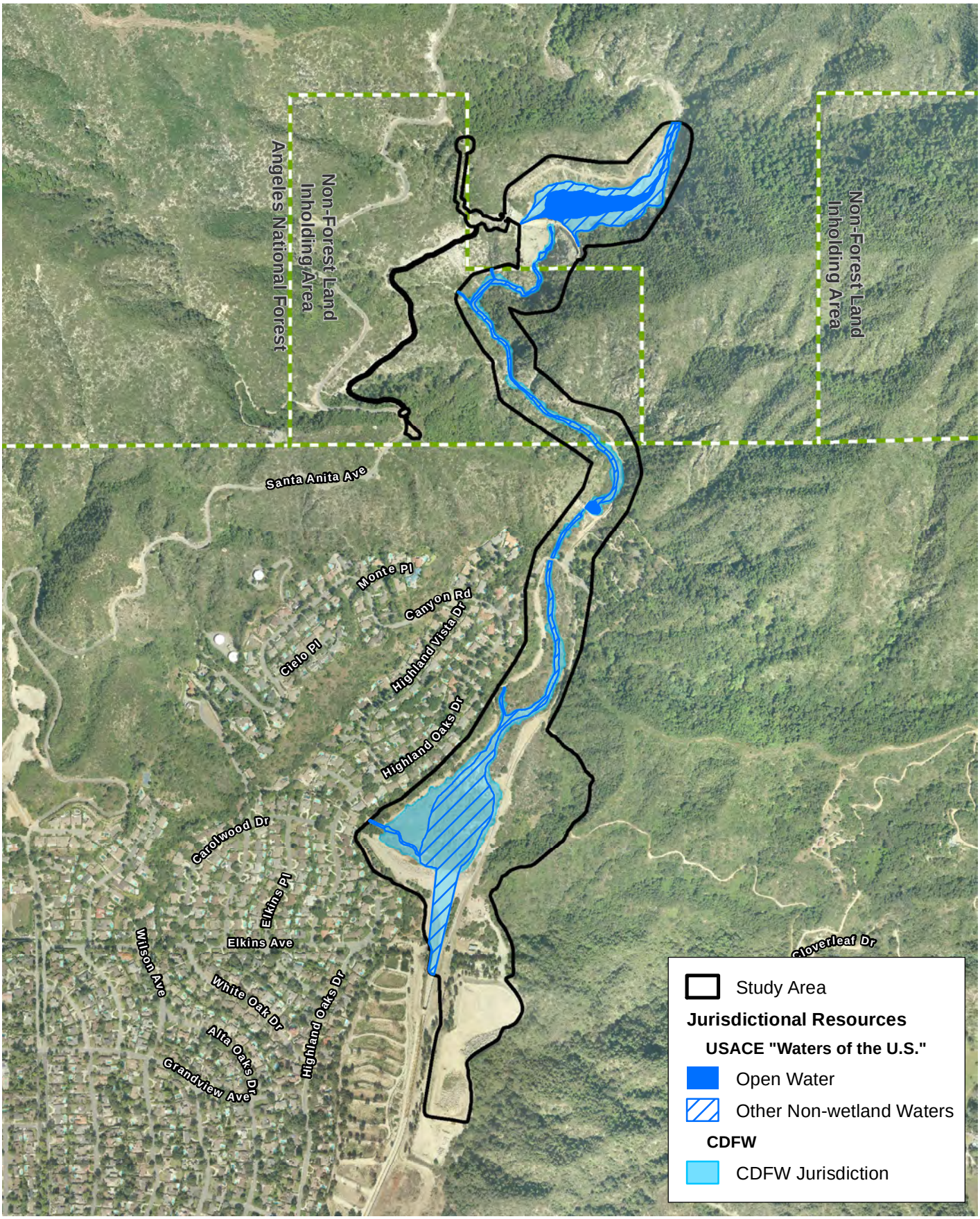
3.1 U.S. ARMY CORPS OF ENGINEERS DETERMINATION

3.1.1 "Waters of the U.S." Determination (Non-wetland).

Santa Anita Wash meanders from its headwaters in the San Gabriel Mountains to the Rio Hondo, which joins the Los Angeles River (a TNW) at approximately 21 river miles (18 aerial miles) from the Study Area. The Los Angeles River drains into the Pacific Ocean in the City of Long Beach. Santa Anita Wash was modified by the construction of the Dam in 1927; it is channelized downstream of the debris basin. The portion of Santa Anita Wash upstream of the Santa Anita Headworks has relatively permanent flow; however, the amount of water released by the Dam is regulated, so the amount of surface water downstream of the headworks varies. Santa Anita Wash has the capacity to carry pollutants and flood waters downstream to a TNW. Therefore, the USACE would take jurisdiction over Santa Anita Wash as a relatively permanent, non-navigable tributary to a TNW (upstream of the headworks) and as a non-navigable tributary that is not relatively permanent (downstream of the headworks) that has a significant nexus with a TNW.

Non-wetland "waters of the U.S." are drainage features that conduct water at some point during the year, evidenced by the presence of an OHWM, but do not satisfy all three criteria to be considered a wetland. The limits of non-wetland "waters of the U.S." were defined by the presence of the OHWM. The amount of water in Santa Anita Wash is dependent on release of water from the Dam; however, evidence of OHWM was present throughout Santa Anita Wash. Evidence of OHWM observed during the delineation consists of the presence of mudcracks and the active area stripped of vegetation below the OHWM; drift deposits, wrack line, and water staining at the OHWM; and a change in vegetation community composition to upland species above the OHWM. The OHWM within the reservoir was considered to be the high water line. Arid West Ephemeral and Intermittent Streams OHWM Datasheets were completed for representative areas within the drainage that reflect the overall characteristics of the drainage and are contained in Attachment C.

Based on the field observations and data collected, approximately 19.421 acres of non-wetland "waters of the U.S." (consisting of 3.003 acres of open water and 16.418 acres of other non-wetland waters) occur in the Study Area (Exhibit 4; Table 2). Based on the current project limits of disturbance, a total of 3.392 acres of non-wetland "waters of the U.S." (0.576 acre open water; 2.816 acres other non-wetland waters) are within the work area (Exhibit 5; Table 2).



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Jurisdictional Resources

Exhibit 4

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

1,000 500 0 1,000 Feet

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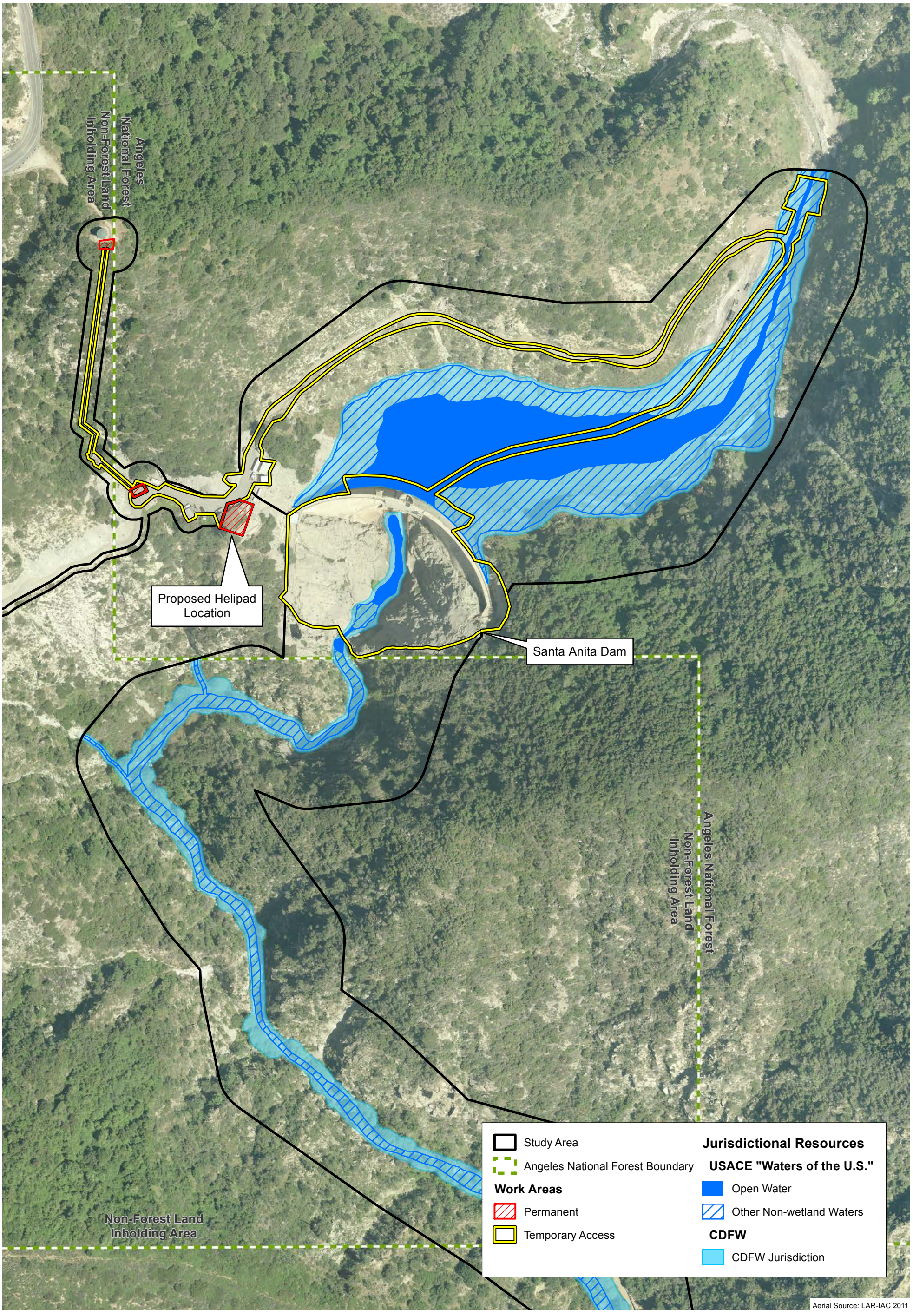

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Project Work Areas – Jurisdictional Resources – Dam

Exhibit 5A

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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Project Work Areas – Jurisdictional Resources – Dam (Access Road)

Exhibit 5B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

150 75 0 150 Feet

BonTerra PSOMAS

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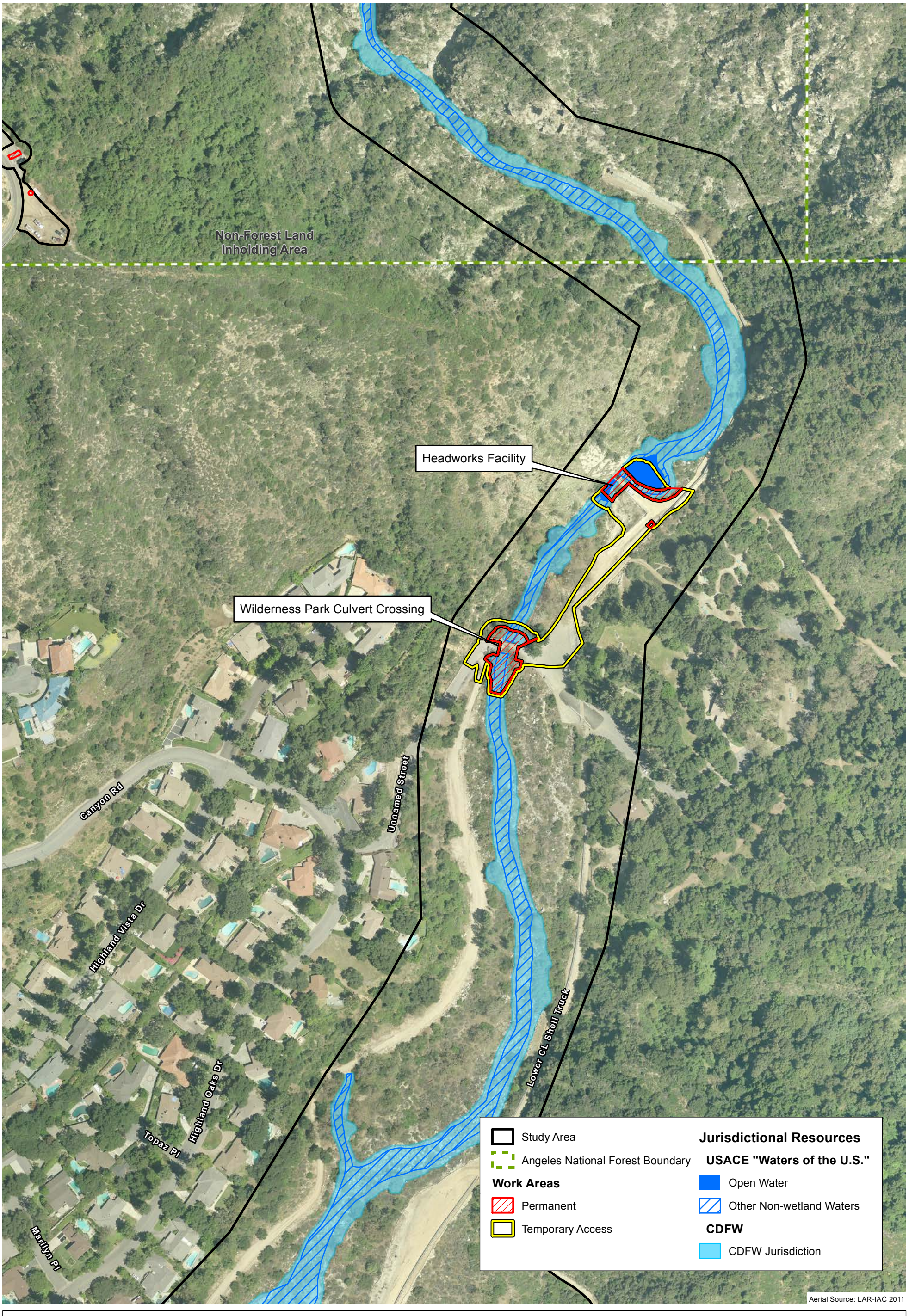

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Project Work Areas – Jurisdictional Resources – Headworks and Wilderness Park Culvert Crossing Exhibit 5C

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

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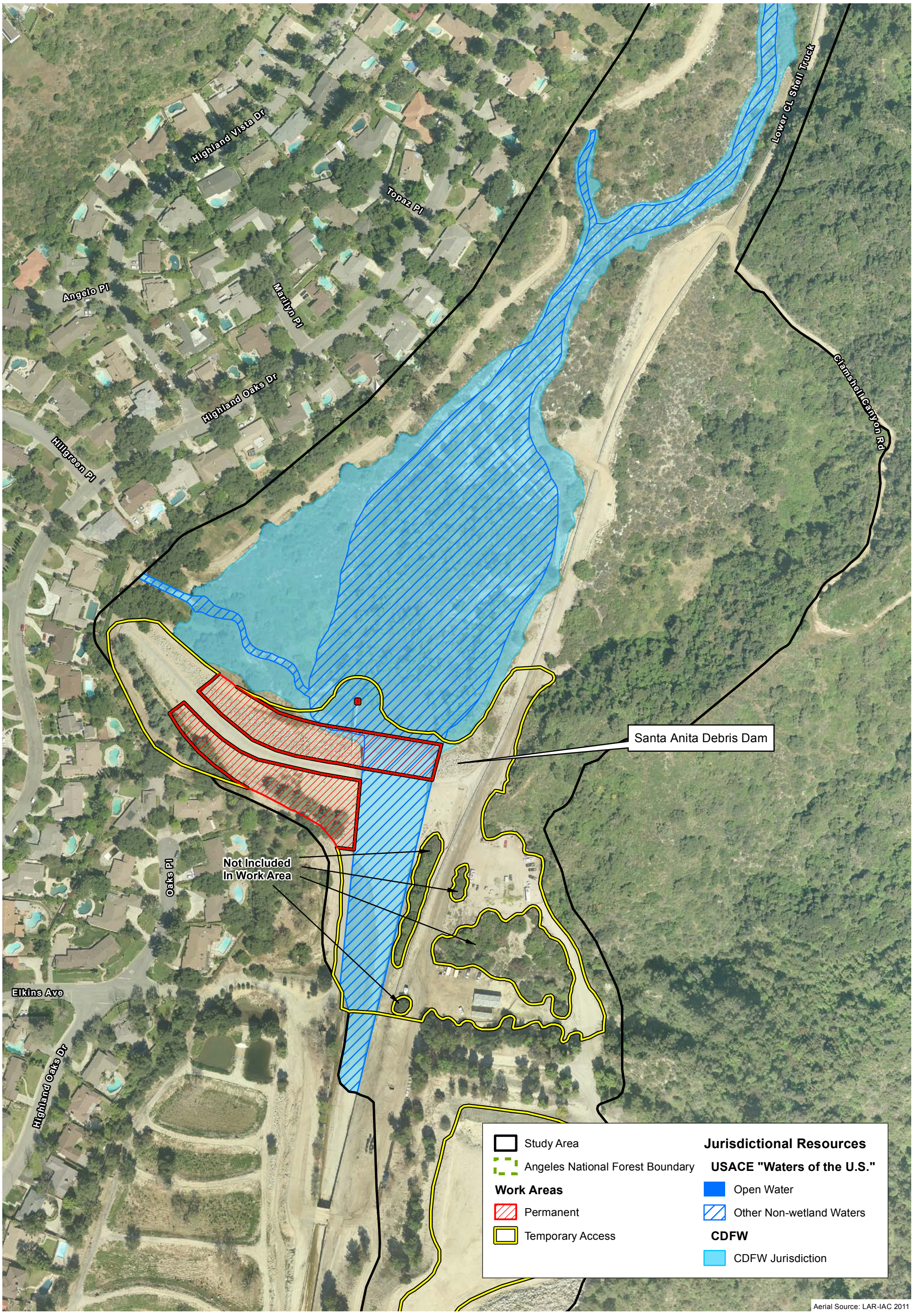

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Project Work Areas – Jurisdictional Resources – Debris Dam

Exhibit 5D

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

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Project Work Areas – Jurisdictional Resources – Debris Dam (Sediment Placement Site) Exhibit 5E

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

200 100 0 200 Feet

BonTerra PSOMAS

(Rev: 9-22-2014 JAZ) H:\Projects\CoLADPW (DPW)\J166\Graphics\JD\Ex5_impacts.pdf

TABLE 2
SUMMARY OF JURISDICTIONAL RESOURCES IN THE STUDY AREA

Jurisdictional Resources	Existing (acres)	Dam		Headworks		Debris Dam		Total Permanent Structure (acres)	Total Temporary Access (acres)	Total (acres)
		Permanent Structure (acres)	Temporary Access (acres)	Permanent Structure – Headworks and Wilderness Park Bridge (acres)	Temporary Access (acres)	Permanent Structure (acres)	Temporary Access (acres)			
Total USACE Jurisdiction	19.421	0.000	0.958	0.100	0.113	0.324	1.897	**424**	**2.968**	**3.392**
Open Water	3.003	0.000	0.482	0.011	0.083	0.000	0.000	**0.011**	**0.565**	**0.576**
Other Non-wetland "Waters of the U.S."	16.418	0.000	0.476	0.089	0.030	0.324	1.897	**0.413**	**2.403**	**2.816**
Total RWQCB Jurisdiction	19.421	0.000	0.958	0.100	0.113	0.324	1.897	**0.424**	**3.533**	**3.392**
Total CDFW Jurisdiction	26.985	0.000	1.125	0.172	0.138	0.353	1.920	**0.525**	**3.183**	**3.708**

USACE: U.S. Army Corps of Engineers; RWQCB: Regional Water Quality Control Board; CDFW: California Department of Fish and Wildlife.

3.1.2 Wetlands Determination

As previously described in Section 2.0 of this report, an area must exhibit all 3 wetland parameters, as described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008c) and the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) in order to be considered a jurisdictional wetland. Eleven sampling points were assessed for the presence of hydrophytic vegetation, hydric soils, and wetland hydrology (Table 3; Attachment A).

TABLE 3
SUMMARY OF SAMPLING POINT DATA

Sampling Point	Vegetated	Dominance Test Result*	Prevalence Index Result	Meets Hydrophytic Vegetation Criterion?	Meets Hydric Soil Criterion?	Meets Wetlands Hydrology Criterion?	Wetland?
1	Yes	75%	2.81	Yes	No	Yes	No
2	Yes	50%	2.12	Yes	No	Yes	No
3	Yes	100%	2.07	Yes	No	Yes	No
4	Yes	66.67%	3.25	Yes	No	Yes	No
5	Yes	50%	2.68	Yes	No	Yes	No
6	Yes	75%	2.84	Yes	No	Yes	No
7	Yes	80%	2.37	Yes	No	Yes	No
8	Yes	50%	2.13	Yes	No	Yes	No
9	Yes	25%	4.25	No	No	Yes	No
10	Yes	50%	3.4	No	No	Yes	No
11	No	N/A	N/A	No	No	Yes	No

* Percent of dominant species that are OBL, FACW, or FAC.

Vegetation

Vegetation in the Study Area includes coastal sage scrub, southern mixed chaparral, riparian forests and woodlands, mule fat scrub, coast live oak woodland, mixed woodland, ornamental, and ruderal.

Vegetation was assessed in representative areas at or below the OHWM. Many areas had an open tree canopy composed of species such as Goodding's black willow (*Salix gooddingii*) (FACW), white alder (*Alnus rhombifolia*) (FACW), or western sycamore (*Platanus racemosa*) (FAC). The understory was either sparsely vegetated or contained herbaceous species such as cocklebur (*Xanthium strumarium*) (FAC), crofton weed (*Ageratina adenophora*) (FACU), or willow weed (*Persicaria lapathifolia* [*Polygonum l.*]) (FACW). There were 10 sampling points that either passed the dominance test or had a prevalence index less than 3.0. Therefore, the hydrophytic vegetation criterion was met at 10 sampling points. Sampling Point 11 was located below the typical high water line of the reservoir, which is unvegetated.

Soils

Soil test pits were dug in representative areas at or below the OHWM. Soil in the Study Area was primarily sand, with some areas having a loamy component; organic matter was present in the ponded area above the Santa Anita Headworks. None of the soils identified at any of the sampling points exhibited indicators of hydric soil. Therefore, the hydric soil criterion was not met in the Study Area.

Hydrology

Multiple indicators of wetland hydrology (e.g., surface water, high water table, saturation, surface soil cracks, inundation visible on aerial imagery, water marks, drift deposits, FAC-Neutral Test) were observed at all of the sampling points. Therefore, the wetland hydrology criterion was met at all 11 sampling points.

Results

The three criteria for wetlands were not met at any sampling point in the Study Area. Therefore, wetland "waters of the U.S." are not present in the Study Area.

3.2 CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD DETERMINATION

The RWQCB jurisdictional boundaries are defined as those determined for the USACE under "waters of the U.S.". However, the RWQCB takes jurisdiction over both connected and isolated waters. Isolated features (i.e., those that do not have a direct connection to a TNW or do not meet the "significant nexus" threshold) are under the jurisdiction of the RWQCB, but not the USACE.

No isolated waters are present in the Study Area; therefore, RWQCB jurisdiction is the same as that of the USACE. Therefore, approximately 19.421 acres under the jurisdiction of the RWQCB occur in the Study Area (Exhibit 4; Table 2). Based on the current project limits of disturbance, a total of 3.392 acres under the jurisdiction of the RWQCB (0.576 acre open water; 2.816 acres other non-wetland waters) are within Project Work Areas (Exhibit 5; Table 2).

3.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DETERMINATION

The limits of CDFW jurisdiction include not only the bed, bank, and channel of streambed features, but also the riparian habitat supported by a river, stream, or lake. The CDFW jurisdictional limits extend to the outer drip line of riparian trees in areas containing riparian vegetation. In areas that do not contain riparian habitat, the jurisdictional limits extend to the top of the stream bank. As a result, the CDFW jurisdictional limits overlap with the jurisdictional limits of the other agencies, but usually extend beyond the OHWM that defines USACE/RWQCB jurisdictional limits.

Approximately 26.985 acres of waters under the jurisdiction of the CDFW occur in the Study Area (Exhibit 4; Table 2). Based on the current project limits of disturbance, a total of 3.708 acres under the jurisdiction of the CDFW are within Project Work Areas (Exhibit 5; Table 2).

4.0 CONCLUSION OF REGULATORY APPROVAL PROCESS

4.1 REGULATORY PERMIT REQUIREMENTS

The following summarizes the various permits, agreements, and certifications that are expected to be required prior to initiation of Project activities that involve work within areas under the jurisdiction of the USACE, the RWQCB, and the CDFW.

- USACE Section 404 Permit;
- RWQCB Section 401 Water Quality Certification; and
- CDFW Section 1602 Lake or Streambed Alteration Agreement (LSAA).

It should be noted that all regulatory permit applications can be processed concurrently. The USACE permit would be issued subject to the receipt of the RWQCB's Section 401 Water Quality Certification. There is no filing fee for the Section 404 Permit. The Section 401 Water Quality Certification filing fee has a $944 base fee with additional fees based on the size of the dredge or fill unless the project qualifies for a flat fee. For low impact discharges (e.g., discharge of less than 0.1 acre, 200 linear feet, and 25 cubic yards), there is no charge above the base fee. For fill and excavation discharges, there is a rate of $4,059 per acre of discharge. For dredging discharges, there is a rate of $0.15 per cubic yard of dredge volume. For discharges to isolated waters the applicable fee is doubled, except for restoration projects. In addition, pursuant to Section 6103 of the *California Government Code*, public entities (such as the County) are exempt from the fees set forth in this schedule.

The CDFW's LSAA filing fee is based on project cost and length of permit authorization. For projects lasting 5 years or less, the maximum fee is $4,482.75 for projects costing $500,000 or more; the fee decreases as cost decreases. For projects lasting longer than 5 years, there is a base fee of $2,689.50 plus a maximum of $4,482.75. The current fee schedule can be found on the CDFW website at: http://www.dfg.ca.gov/habcon/1600/forms.html. The CDFW will not deem the application to be complete until the application fees have been paid and the agency is provided with a certified California Environmental Quality Act (CEQA) document and a signed copy of the receipt of County Clerk filing fees for the Notice of Determination (NOD). In addition, land use jurisdictions can no longer make "de minimis" findings if they determine that the project will not impact resources under the CDFW's jurisdiction. Therefore, the finding of "No Impact" to the CDFW jurisdictional resources must now be made by the CDFW prior to the payment of CDFW fees.

A detailed explanation of the regulatory permitting requirements for work within jurisdictional resources is provided in Sections 4.2 through 4.5.

4.2 U.S. ARMY CORPS OF ENGINEERS

Regulatory authorization in the form of an NWP is provided for certain categories of activities (e.g., repair, rehabilitation, or replacement of a structure or fill which was previously authorized; utility line placement; bank stabilization). The current set of NWPs became effective on March 19, 2012, and will expire in on March 18, 2017. NWPs authorize only those activities with minimal adverse effects on the aquatic environment and are valid only if the conditions applicable to the permits are met or waivers to these conditions are provided in writing from the USACE. Please note that waivers may require consultation with affected federal and State agencies, a lengthy process with no mandated processing time frames. If the NWP conditions cannot be met, an Individual Permit (IP) will be required. "Waters of the U.S." temporarily filled, flooded, excavated,

or drained but restored to pre-construction contours and elevations after construction are not included in the measurement of loss of "waters of the U.S.". The appropriate permit authorization will be based on the amount of impacts to "waters of the U.S.", as determined by the USACE.

The proposed Project may be authorized under NWP 3 (Maintenance), which includes the repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure. Activities authorized under paragraph (a) of the NWP (i.e., repair/rehabilitation/replacement of a previously authorized structure) do not require pre-construction notification. However, activities authorized under paragraph (b) of the NWP (i.e., removal of sediment/debris and/or placement of new or additional riprap) do require pre-construction notification. The complete description of NWP 3 is included as Attachment D. However, if the USACE does not concur in this NWP recommendation, an IP would then be required to authorize this project.

4.2.1 Jurisdictional Determinations

Pursuant to USACE Regulatory Guidance Letter (RGL) 08-02 (dated June 26, 2008), the USACE can issue 2 types of jurisdictional determinations to implement Section 404 of the CWA: Approved Jurisdictional Determinations and Preliminary Jurisdictional Determinations (USACE 2008a). An Approved Jurisdictional Determination is an official USACE determination that jurisdictional "waters of the U.S.", "Navigable waters of the U.S.", or both are either present or absent on a site. An Approved Jurisdictional Determination also identifies the precise limits of jurisdictional waters on a project site.

The USACE will provide an Approved Jurisdictional Determination when (1) an applicant requests an official jurisdictional determination; (2) an applicant contests jurisdiction over a particular water body or wetland; or (3) when the USACE determines that jurisdiction does not exist over a particular water body or wetland. The Approved Jurisdictional Determination then becomes the USACE's official determination that can then be relied upon over a five-year period to request regulatory authorization as part of the permit application.

In addition, an Applicant may decline to request an Approved Jurisdictional Determination and instead obtain a USACE IP or General Permit Authorization based on a Preliminary Jurisdictional Determination or, in certain circumstances (e.g., authorizations by non-reporting nationwide general permits), with no Jurisdictional Determination.

Preliminary Jurisdictional Determinations are non-binding, advisory in nature, and may not be appealed. They indicate that there may be "waters of the U.S." on a project site. An applicant may elect to use a Preliminary Jurisdictional Determination to voluntarily waive or set aside questions regarding CWA jurisdiction over a site, usually in the interest of allowing the applicant to move ahead expeditiously with the permitting process. The USACE will determine what form of Jurisdictional Determination is appropriate for a particular project site. It is anticipated that a Preliminary Jurisdictional Determination will be adequate; therefore, this form is included as Attachment E.

On January 31, 2007, the USACE published a memorandum clarifying the Interim Guidance for amendments to the National Historic Preservation Act and the Advisory Council on Historic Preservation (ACHP) implementing regulations (USACE 2007b). The Interim Guidance applies to all Department of the Army requests for authorization/verification, including Individual Permits (standard permits and letters of permission) and all Regional General Permits (RGPs) and NWPs. The State or Tribal Historic Preservation Officer (SHPO/THPO) has 30 days to respond to a determination that a proposed activity, that otherwise qualifies for an NWP or RGP, has no effect or no adverse effect on a historic property. If the SHPO/THPO does not respond within 30 days of

notification, the Los Angeles District may proceed with verification. If the SHPO/THPO disagrees with the District's determination, the District may work with the SHPO/THPO to resolve the disagreement or request an opinion from the ACHP. The USACE will submit the Draft Jurisdictional Delineation Report to the SHPO/THPO for review prior to initiating the actual regulatory process.

The USACE Regulatory Branch Offices will coordinate with the USEPA Regional Office and USACE Headquarters (HQ), as outlined in its January 28, 2008, memorandum entitled the "Process for Coordinating Jurisdictional Delineations Conducted Pursuant to Section 404 of the Clean Water Act in Light of the *Rapanos* and *SWANCC* Supreme Court Decisions" (USACE 2008b). The guidance provided in this memorandum is quoted as follows:

1. Effective immediately, unless and until paragraph 5(b) of the June 5, 2007, Rapanos guidance coordination memorandum is modified by a joint memorandum from Army and EPA, we will follow these procedures:
    a. For jurisdictional determinations involving significant nexus determinations, USACE districts will send copies of draft jurisdictional delineations via e-mail to appropriate EPA regional offices. The EPA regional office will have 15 calendar days to decide whether to take the draft jurisdictional delineation as a special case under the January 19, 1989, "Memorandum of Agreement Between the Department of the Army and the USEPA Concerning the Determination of the Section 404 Program and the Application of the Exceptions under Section 404(f) of the Clean Water Act." If the EPA regional office does not respond to the district within 15 days, the district will finalize the jurisdictional determination.
    b. For jurisdictional determinations involving isolated waters determinations, the agencies will continue to follow the procedure in paragraph 5(b) of June 5, 2007, coordination memorandum, until a new coordination memorandum is signed by USACE and EPA. (In accordance with paragraph 6 of the June 5, 2007, coordination memorandum, this is a 21-day timeline that can only be changed through a joint memorandum between agencies).
2. Approved JDs are not required for non-reporting NWPs, unless the project proponent specifically requests an approved JD. For proposed activities that may qualify for authorization under a State Programmatic General Permit (SPGP) or RGP, an approved JD is not required unless requested by the project proponent.
3. The USACE will continue to work with EPA to resolve the JDs involving significant nexus and isolated waters determinations that are currently in the elevation process.
4. USACE districts will continue posting completed Approved JD Forms on their web pages.

Please note that if the USACE determines that the drainages are jurisdictional and would be impacted by project implementation, the Applicant will be required to obtain a CWA Section 401 Water Quality Certification from the RWQCB before the USACE will issue the Section 404 permit. That is, the USACE may issue a "Denial Without Prejudice" as part of the issuance of the Section 404 permit that makes the permit valid once the Section 401 Water Quality Certification is issued. If the USACE determines that the impacted drainage is not jurisdictional, the Applicant will be required to obtain RWQCB authorization under the provisions of a Report of Waste Discharge (ROWD).

Please also note that the USACE has prepared Draft Guidelines on Identifying Waters Protected by the Clean Water Act (Act) to implement the U.S. Supreme Court's decisions concerning the extent of waters covered by the Act (*Solid Waste Agency of Northern Cook County v. USACE* [SWANCC] and *Rapanos v. United States* [Rapanos]). The review period for the draft guidelines ended in July 2011. It is not certain when the USEPA and the USACE will revise and finalize the guidelines and undertake rulemaking consistent with the Administrative Procedure Act. However, once this occurs, the result will be a "nonbinding guidance" for the identification of resources under the jurisdiction of the USACE. The final guidance will not affect jurisdictional delineations that have already received approval from the USACE.

4.3 REGIONAL WATER QUALITY CONTROL BOARD

As noted above, issuance of the USACE Section 404 permit would be contingent upon the approval of a Section 401 Water Quality Certification from the Los Angeles RWQCB. Also, the RWQCB requires certification of the project's CEQA documentation before it will approve the Section 401 Water Quality Certification or ROWD. The RWQCB, as a responsible agency, will use the project's CEQA document to satisfy its own CEQA-compliance requirements.

Upon acceptance of a complete permit application, the RWQCB has between 60 days and 1 year to make a decision regarding the permit request. That is, USACE regulations indicate that the RWQCB has 60 days from the date of receipt of a completed application that requests water quality certification to make a decision (33 CFR §325.2[b][1][ii]). The USACE District Engineer may specify a longer time (up to 1 year) or shorter time based on his/her determination of a reasonable processing time (33 CFR §325.2[b][1][ii]). If the RWQCB determines that more than 60 days are needed to process the request, it has the option of requesting additional time from the USACE. Also, the RWQCB has the option of issuing a "Denial Without Prejudice", which does not mean that the request is denied, but that it requires more information in order to make a decision. This effectively stops the processing clock until this information is provided.

The RWQCB is required under *California Code of Regulations* (CCR) (Title 23, §3858[a]) to have a "minimum 21 day public comment period" before any action can be taken on the Section 401 application. This period closes when the RWQCB acts on the application. Since projects often change or are revised during the Section 401 permit process, the comment period can remain open. The public comment period starts as soon as an application has been received. Generally, the RWQCB Section 401, USACE Section 404, and CDFW Section 1602 permit applications are submitted at the same time. However, the RWQCB Section 401 Water Quality Certification may take longer to process.

The RWQCB requires the Applicant to address urban storm water runoff during and after construction in the form of Best Management Practices (BMPs). These BMPs are intended to address the treatment of pollutants carried by storm water runoff and are required in all complete applications. The notification/application for a CWA Section 401 Water Quality Certification must also address compliance with the Basin Plan. Please note that the application would also require the payment of an application fee, which would be based on project impacts.

4.4 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

The CDFW regulates all work (including initial construction and ongoing operation and maintenance) that may substantially divert or obstruct the natural flow of or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake through its Lake or Streambed Alteration Program. An Applicant must enter into an agreement with the CDFW to ensure no net loss of wetland values and acreages.

Impacts resulting from Project implementation will require a Section 1602 LSAA. The LSAA must address the initial construction and long-term operation and maintenance of any structures (such as a culvert or a desilting basin) within any river, stream, or lake that may require periodic maintenance if these are included in the project design.

Prior to construction, a notification (LSAA application) must be submitted to the CDFW that describes any proposed streambed alteration contemplated by the proposed Project. In addition to the formal application materials and the fee, a copy of the appropriate environmental document (e.g., Mitigated Negative Declaration) should be included in the submittal, consistent with CEQA requirements. The CDFW will prepare a draft LSAA, which will include standard measures to protect sensitive plant and wildlife resources during project construction and during ongoing operation and maintenance of any project element that occurs within a CDFW jurisdictional area.

If an LSAA is required, the CDFW may want to conduct an on-site inspection. The CDFW then prepares a draft Agreement, which will include measures to protect fish and wildlife resources that will be directly or indirectly impacted by project construction. The draft agreement will be transmitted to the Applicant within 60 calendar days of the CDFW's determination that the notification is complete. It should be noted that the 60-day timeframe may not apply to long-range agreements.

The Applicant has 30 calendar days to notify the CDFW concerning the acceptability of the proposed terms, conditions, and measures. If the Applicant agrees with these terms, conditions, and measures, the agreement must be signed and returned to the CDFW. The agreement becomes final once the CDFW executes it and an LSAA is issued. Please note that all application fees must be paid and the final certified CEQA documentation must be provided prior to the CDFW's execution of the agreement.

If the CDFW does not respond in writing concerning the completeness of the Notification within 30 days of its submittal, the Notification automatically becomes complete. If the CDFW does not submit a draft LSAA to the Applicant within 60 days of the determination of a completed Notification package, the CDFW will issue a letter that either (1) identifies the final date to transmit a draft LSAA or (2) indicates that an LSAA was not required. The CDFW will also indicate that it was unable to meet this mandated compliance date and that, by law, the Applicant is authorized to complete the project without an LSAA as long as the applicant constructs the project as proposed and complies with all avoidance, minimization, and mitigation measures described in the submitted Notification package. Please note that if the project requires revisions to the design or project construction, the CDFW may require submittal of a new notification/application with an additional 90-day permit process.

4.5 RECOMMENDATIONS

Based on the conclusions of this Jurisdictional Delineation Report, the following recommendations are identified:

1. Schedule a pre-application meeting with USACE, CDFW, and RWQCB staff to discuss site conditions; biological and jurisdictional resources; the proposed Project; impacts to these resources resulting from the proposed Project; proposed minimization measures and the mitigation program to offset these impacts; and the regulatory permit process, including concurrence from the USACE that a Preliminary Jurisdictional Determination is appropriate.

2. Prepare and process a USACE Section 404 Permit; an RWQCB Section 401 Water Quality Certification; a CDFW Section 1602 LSAA; and the appropriate jurisdictional determination form approved by the USACE. It should be noted that if a Section 408 Permit is determined to be required the USACE District Engineer, it may be processed concurrently with the Section 404 Permit.

Prior to initiation of Project activities, the Los Angeles County Flood Control District (LACFCD) shall obtain all necessary permits for impacts to USACE, the RWQCB, and the CDFW jurisdictional areas. Mitigation for the loss of jurisdictional resources shall be negotiated with the resource agencies during the regulatory permitting process. Potential mitigation options may include (1) payment to a mitigation bank or regional riparian enhancement program (e.g., invasive plant or wildlife species removal); (2) removal of exotic species from onsite LACDPW facilities; and/or (3) restoration of riparian habitat either on site or off site at a ratio of no less than 1:1, determined through consultation with the U.S. Forest Service (USFS), the USACE, the RWQCB, and the CDFW. Mitigation ratios for mitigation from impacts to USACE "waters of the U.S." would be identified through the completion of the USACE mitigation checklist pursuant to the USACE's Standard Operating Procedure for Determination of Mitigation Ratios (USACE 2012). If the USFS requires a restoration plan to mitigate for impacts on USFS lands, a restoration plan detailing the methodology and performance standards will be prepared in accordance with requirements specified by the USFS, the USACE, the RWQCB, and the CDFW. If a restoration plan is required for Project impacts to jurisdictional features not on USFS lands, a restoration plan will be prepared in accordance with requirements specified in permits/agreements issued by the USACE, the RWQCB, and the CDFW.

5.0 REFERENCES

BonTerra Consulting. 2012 (October 26). *Results of Focused Presence/Absence Surveys for Special Status Fish Species for the Santa Anita Dam Proposition 1E Stormwater Management and Seismic Strengthening Project in Arcadia and the Angeles National Forest, Los Angeles County, California*. Irvine, CA: BonTerra Consulting.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States* (Version 04DEC1998). Washington, D.C.: U.S. Fish and Wildlife Service. http://www.npwrc.usgs.gov/resource/wetlands/classwet/index.htm.

Curtis, K.E. and R.W. Lichvar. 2010 (July). *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

Curtis, K.E., R.W. Lichvar, and L.E. Dixon. 2011 (July). *Ordinary High Flows and the State-Discharge Relationship in the Arid West Region*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1). Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Los Angeles County Department of Public Works (LACDPW). 2013. Stream Gaging Station Information: Santa Anita Wash below Foothill Blvd. (Station No. F260C-R). Alhambra, CA: LACDPW. http://dpw.lacounty.gov/wrd/runoff/design.cfm?facinit=F260C-R.

Lichvar, R.W. and J.J. Gillrich. 2011 (September). *Final Protocol for Assigning Wetland Indicator Status Ratings during National Wetland Plant List Update*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

Lichvar, R.W. and J.T. Kartesz. 2009. *North American Digital Flora: National Wetland Plant List, Version 2.4.0*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory and Chapel Hill, NC: Biota of North America. https://wetland_plants.usace.army.mil.

Lichvar, R.W. and S.M. McColley. 2008 (August). *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, A Delineation Manual*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

Munsell Color. 1994. Munsell Soil Color Charts. New Windsor, NY: Kollmorgen Instruments Corp.

Reed, P.B., Jr. 1988. *National List of Plant Species That Occur In Wetlands: National Summary* (Biological Report 88 [24]). Washington, D.C.: USFWS.

Regional Water Quality Control Board (RWQCB). 1994. *Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties*. Monterey Park, CA: Los Angeles RWQCB.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2012 (April). Hydric Soils: National List – 2012 (Excel document). Washington, D.C.: USDA, NRCS. http://soils.usda.gov/use/hydric/index.html.

———. 2008 (August 28, last modified). Hydric Soils – Introduction. Washington, D.C.: USDA NRCS. http://soils.usda.gov/use/hydric/intro.html.

———. 2006 (December 14). Soil Survey Geographic (SSURGO) Database for Angeles National Forest Area, California. Fort Worth, TX: USDA, NRCS.

U.S. Army Corps of Engineers (USACE). 2012 (February 20). *Standard Operating Procedure for Determination of Mitigation Ratios*. San Francisco, CA: USACE, South Pacific Division.

———. 2008a (June 26). Regulatory Guidance Letter. Jurisdictional Determinations. Washington, D.C.: USACE.

———. 2008b (January 28). *Memorandum for Commander, Major Subordinate Commands and District Commands. Process for Coordinating Jurisdictional Delineations Conducted Pursuant to Section 404 of the Clean Water Act in Light of the Rapanos and SWANCC Supreme Court Decisions.* Washington, D.C.: USACE.

———. 2008c. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).* (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

———. 2007a (June 5). *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. Washington, D.C.: USACE.

———. 2007b (January 31). Memorandum: Interim Guidance for Amendments to the National Historic Preservation Act and the Advisory Council on Historic Preservation (ACHP) Implementing Regulations. Washington, D.C.: USACE.

U.S. Fish and Wildlife Service 2013. Wetland Mapper. Washington D.C.: USFWS, National Wetlands Inventory. http://www.fws.gov/wetlands/Data/Mapper.html.

ATTACHMENT A

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/23/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 1

Investigator(s): Allison Rudalevige, David Hughes Section, Township, Range: 15, T1N, R11W

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): CA Lat: 34.17089 Long: -118.02188 Datum: NAD83

Soil Map Unit Name: N/A NWI classification: PEMCh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

Sampling point located in a debris basin in Santa Anita Creek downstream of the Santa Anita Dam. The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix gooddingii	20	yes	FACW
2. Tamarix ramosissima	5	yes	UPL
3.			
4.			
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Xanthium strumarium	80	yes	FAC
2. Juncus sp.	25	yes	FACW*
3. Ricinus communis	5	no	FACU
4. Cuscuta sp.	2	no	UPL
5.			
6.			
7.			
8.			
	112	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	80	x 3 =	240
FACU species	5	x 4 =	20
UPL species	7	x 5 =	35
Column Totals:	137 (A)		385 (B)

Prevalence Index = B/A = 2.81

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

* Juncus species are typically listed as FACW or OBL; considered FACW for purposes of dominance test and prevalence index.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR4/1	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
✓ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Inundation visible on Google Earth aerials dated 1/8/2008, 3/27/2005, and 5/30/1994.

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/23/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 2

Investigator(s): Allison Rudalevige, David Hughes Section, Township, Range: 15, T1N, R11W

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): CA Lat: 34.17118 Long: -118.02168 Datum: NAD83

Soil Map Unit Name: N/A NWI classification: PFOCh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix gooddingii	85	yes	FACW
2.			
3.			
4.			
	85	= Total Cover	

Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Cyperus sp.	5	yes	FACU*
2. Xanthium strumarium	1	no	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	6	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 95 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	85	x 2 =	170
FAC species	1	x 3 =	3
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	91 (A)		193 (B)

Prevalence Index = B/A = 2.12

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

Cyperus species are listed as FACU to OBL; considered FACU for purposes of dominance test and prevalence index.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/3	100					sand	
8-11	10YR 4/1	100					sand	
11-20	10YR 4/2	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✓ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Inundation visible on Google Earth aerials dated 1/8/2008, 3/27/2005, and 5/30/1994.

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/23/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 3

Investigator(s): Allison Rudalevige, David Hughes Section, Township, Range: 15, T1N, R11W

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): CA Lat: 34.17143 Long: -118.02219 Datum: NAD83

Soil Map Unit Name: N/A NWI classification: PFOCh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix gooddingii	70	yes	FACW
2.			
3.			
4.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Xanthium strumarium	5	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 95 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	75 (A)		155 (B)

Prevalence Index = B/A = 2.07

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 3/2	100					clayey silt	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
✓ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
✓ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Inundation visible on Google Earth aerials dated 1/8/2008, 3/27/2005, and 5/30/1994.

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/23/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 4

Investigator(s): Allison Rudalevige, David Hughes Section, Township, Range: 15, T1N, R11W

Landform (hillslope, terrace, etc.): stream bed Local relief (concave, convex, none): none Slope (%): 5

Subregion (LRR): CA Lat: 34.17334 Long: -118.02074 Datum: NAD83

Soil Map Unit Name: N/A NWI classification: R4SBA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

Sampling point in Santa Anita Wash. The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus racemosa	10	yes	FAC
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Baccharis salicifolia	20	yes	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Pennisetum setaceum	5	yes	UPL
2. Polypogon monspeliensis	1	no	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	6 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 95 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	36 (A)		117 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/2	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: cobble

Depth (inches): 8

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
✓ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

✓ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
✓ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/23/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 5

Investigator(s): Allison Rudalevige, David Hughes Section, Township, Range: 15, T1N, R11W

Landform (hillslope, terrace, etc.): stream bed Local relief (concave, convex, none): none Slope (%): 2-5

Subregion (LRR): CA Lat: 34.17756 Long: -118.01900 Datum: NAD83

Soil Map Unit Name: N/A NWI classification: Rp1FO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rhombifolia	65	yes	FACW
2.			
3.			
4.			
	65 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Ricinus communis	10	yes	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Persicaria cf. lapathifolium [Polygonum l.]	30	yes	FACW
2. Ageratina adenophora	25	yes	FACU
3. Cyperus sp.	5	no	FACU*
4. Stipa miliacea [Piptatherum m.]	5	no	UPL
5.			
6.			
7.			
8.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 35 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	95	x 2 =	190
FAC species	0	x 3 =	0
FACU species	40	x 4 =	160
UPL species	5	x 5 =	25
Column Totals:	140 (A)		375 (B)

Prevalence Index = B/A = 2.68

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

Cyperus species are listed as FACU to OBL; considered FACU for purposes of dominance test and prevalence index.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/3	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: cobble

Depth (inches): 14

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✓ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0

Water Table Present? Yes ✓ No ___ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/23/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 6

Investigator(s): Allison Rudalevige, David Hughes Section, Township, Range: 15, T1N, R11W

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): CA Lat: 34.17805 Long: -118.01809 Datum: NAD83

Soil Map Unit Name: N/A NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Baccharis salicifolia	5	yes	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Persicaria cf. lapathifolia [Polygonum l.]	30	yes	FACW
2. Artemisia douglasiana	10	yes	FAC
3. Melilotus indicus	10	yes	FACU
4. Lactuca serriola	5	no	FACU
5. Ricinus communis	5	no	FACU
6.			
7.			
8.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	15	x 3 =	45
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	65 (A)		185 (B)

Prevalence Index = B/A = 2.84

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					mucky sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 6

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

approximately 1/2 inch of organic matter on the surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✓ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/23/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 7

Investigator(s): Allison Rudalevige, David Hughes Section, Township, Range: 15, T1N, R11W

Landform (hillslope, terrace, etc.): streambed Local relief (concave, convex, none): none Slope (%): 8

Subregion (LRR): CA Lat: 34.17838 Long: -118.01788 Datum: NAD83

Soil Map Unit Name: N/A NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix gooddingii	35	yes	FACW
2. Alnus rhombifolia	25	yes	FACW
3. Platanus racemosa	15	yes	FAC
4.			
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1. Baccharis salicifolia	15	yes	FAC
2.			
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Ageratina adenophora	2	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	2	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 98 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	30	x 3 =	90
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	92 (A)		218 (B)

Prevalence Index = B/A = 2.37

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/4	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: cobble

Depth (inches): 4

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✓ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/23/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 8

Investigator(s): Allison Rudalevige, David Hughes Section, Township, Range: 10, T1N, R11W

Landform (hillslope, terrace, etc.): stream bed Local relief (concave, convex, none): none Slope (%): 8

Subregion (LRR): CA Lat: 34.1798 Long: -118.0188 Datum: NAD83

Soil Map Unit Name: Trigo family, granitic substratum, 60 to 90 percent slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rhombifolia	90	yes	FACW
2.			
3.			
4.			
	90 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Ageratina adenophora	5	yes	FACU
2. Cyperus sp.	1	no	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	6 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 94 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	6	x 4 =	24
UPL species	0	x 5 =	0
Column Totals:	96 (A)		204 (B)

Prevalence Index = B/A = 2.13

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

Cyperus species are listed as FACU to OBL; considered FACU for purposes of dominance test and prevalence index.

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/4	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: cobble

Depth (inches): 7

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✓ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✓ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/25/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 9

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 15, T1N, R11W

Landform (hillslope, terrace, etc.): streambed Local relief (concave, convex, none): none Slope (%): 5

Subregion (LRR): CA Lat: 34.16893 Long: -118.02022 Datum: NAD83

Soil Map Unit Name: N/A NWI classification: PSSA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✓ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Sambucus nigra ssp. caerulea	10	yes	FAC
2. Quercus agrifolia	5	yes	UPL
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1. Baccharis salicifolia	5	yes	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Toxicodendron diversilobum	20	yes	UPL
2.			
	20	= Total Cover	

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	25	x 5 =	125
Column Totals:	40 (A)		170 (B)

Prevalence Index = B/A = 4.25

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks:

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/4	100					gravelly sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock/cobble

Depth (inches): 5

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
✓ Drift Deposits (B3) (**Riverine**)
✓ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/25/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 10

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 10, T1N, R11W

Landform (hillslope, terrace, etc.): plunge pool Local relief (concave, convex, none): concave Slope (%): 0-5

Subregion (LRR): CA Lat: 34.183286 Long: -118.019557 Datum: NAD83

Soil Map Unit Name: Trigo family, granitic substratum, 60 to 90 percent slopes NWI classification: PFOA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The 2012-2013 water year has had below normal precipitation. The site is immediately downstream of the plunge pool.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ficus carica	40	yes	FACU
2. Salix gooddingii	30	yes	FACW
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1. Baccharis salicifolia	20	yes	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Ageratina adenophora	50	yes	FACU
2. Urtica dioica	10	no	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	60	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	30	x 3 =	90
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	150 (A)		510 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks:

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
N/A								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 0

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

No soil. The substrate is rock (plunge pool).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Santa Anita Dam City/County: Arcadia/Los Angeles Sampling Date: 4/25/2013

Applicant/Owner: LACDPW State: CA Sampling Point: 11

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 10, T1N, R11W

Landform (hillslope, terrace, etc.): reservoir Local relief (concave, convex, none): none Slope (%): 5-10

Subregion (LRR): CA Lat: 34.184998 Long: -118.016877 Datum: NAD83

Soil Map Unit Name: Trigo family, granitic substratum, 60 to 90 percent slopes NWI classification: PUBHh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The 2012-2013 water year has had below normal precipitation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks:

The sampling point is located below the typical high water line of the reservoir; however, water levels this year are unusually low. This area is unvegetated.

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/4	100					sand	
1-20	N 2.5/	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): adjacent

Water Table Present? Yes ✓ No ___ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 2

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ATTACHMENT B

SITE PHOTOGRAPHS

View from the top of the Santa Anita debris dam overlooking the debris dam reservoir, facing north.

View from the northern end of Santa Anita Debris Dam Reservoir, facing south.

View from the northern end of Santa Anita Debris Dam Reservoir, facing north.

View from the west side of Santa Anita Wash, facing east, looking at a pipe conveying storm water flow from Lower Clamshell Truck road.

View from the west side of Santa Anita Wash, facing northeast, looking at the bridge and pipe culverts downstream from the Santa Anita Headworks.

View from south of the Santa Anita Headworks, facing north.

D:\Projects\COLADPW\J166\Graphics\JD\ex_SP1.ai

Site Photographs

Attachment B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(05/02/2013 JAZ) R:\Projects\CoLADPW-S\J166\Graphics\JD\AttC1_SP.pdf & H:\PAS\Projects\CoLADPW\J166\Graphics\JD\AttB1_SP.pdf

View from the top of Santa Anita Dam, facing northeast.

View from the top of Santa Anita Dam, facing southwest.

View from the bottom of Santa Anita Reservoir, facing south, looking at Santa Anita Dam.

View of a side drainage approximately 500 feet downstream of Santa Anita Dam, facing west.

View of a side drainage approximately 1,000 feet downstream of the Santa Anita Dam, facing west.

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Site Photographs

Attachment B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(05/02/2013 JAZ) R:\Projects\CoLADPW-S\J166\Graphics\JD\AttC2_SP.pdf & H:\PAS\Projects\CoLADPW\J166\Graphics\JD\AttB2_SP.pdf

Sampling Point 1.

Sampling Point 2.

Sampling Point 3.

Sampling Point 4.

Sampling Point 5.

Sampling Point 6.

D:\Projects\COLADPW\J166\Graphics\JD/ex_SP3.ai

Site Photographs

Attachment B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(05/02/2013 JAZ) R:\Projects\CoLADPW-S\J166\Graphics\JD\AttC3_SP.pdf & H:\PAS\Projects\CoLADPW\J166\Graphics\JD\AttB3_SP.pdf

Sampling Point 7.

Sampling Point 8.

Sampling Point 9.

Sampling Point 10.

Sampling Point 11.

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Site Photographs

Attachment B

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

BonTerra PSOMAS

(05/02/2013 JAZ) R:\Projects\CoLADPW-S\J166\Graphics\JD\AttC4_SP.pdf & H:\PAS\Projects\CoLADPW\J166\Graphics\JD\AttB4_SP.pdf

ATTACHMENT C

OHWM DATASHEETS

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Anita Dam
Project Number: CoLADPW J166
Stream: Santa Anita debris basin
Investigator(s): David Hughes, Allison Rudalevige
Date: 4/23/2013 **Time:**
Town: Arcadia **State:** CA
Photo begin file#: **Photo end file#:**

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☐ Is the site significantly disturbed?

Location Details: Soil pit #1

Projection: Lat/long **Datum:** NAD 83
Coordinates: 34.17089° / -118.02188°

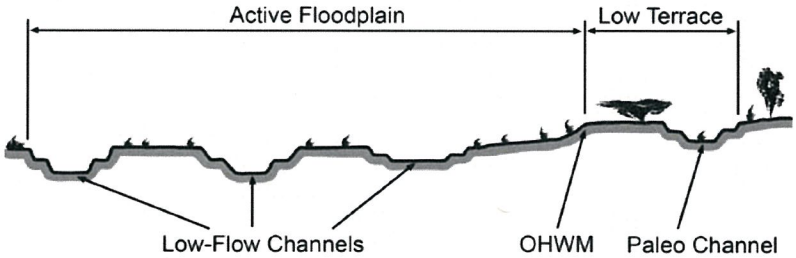
Potential anthropogenic influences on the channel system:
Sampling location is within debris basin that traps sediment. Santa Anita dam is upstream

Brief site description:
Area is within Santa Anita debris/desilting basin

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☐ Geologic maps
- ☒ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

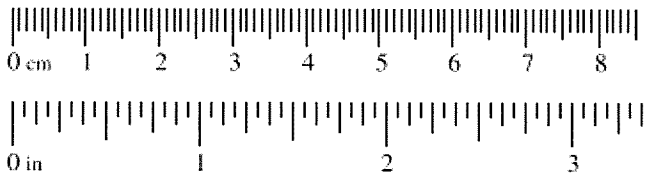


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☒ GPS
   - ☐ Other:

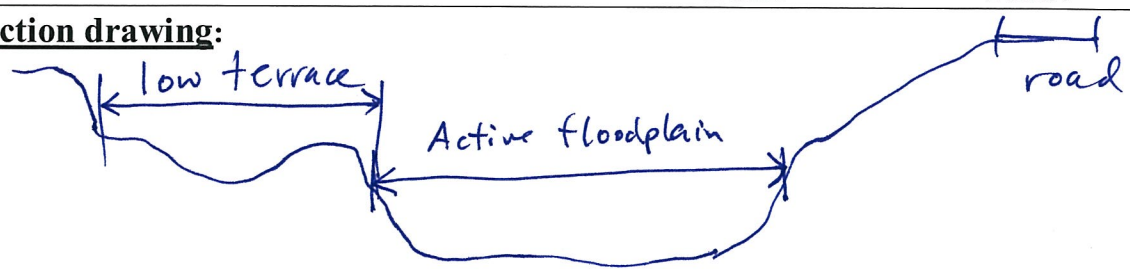
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
	10.08	256	Boulder	
	2.56	64	Cobble	Gravel
	0.157	4	Pebble	
	0.079	2.00	Granule	
	0.039	1.00	Very coarse sand	
	0.020	0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	Sand
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	
1/32	0.00061	0.0156	Medium silt	Silt
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: _____

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

OHWM is identified by change in vegetation to west (mule fat on bank, above which is CSS species) To the east, OHWM is flood limits on bank.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: N/A

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: 90 % Tree: 20 % Shrub: 5 % Herb: 80 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Low-flow channel does not readily exist in basin. Basin is flat bottomed with deep sand deposition.

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 34.17111°/-118.02239

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: 80 % Tree: 60 % Shrub: 5 % Herb: 70 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Active floodplain limits based on limits of inundation within basin.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: 34.17166°/-118.02317

Characteristics of the floodplain unit:

Average sediment texture: sandy silt

Total veg cover: 100 % Tree: 10 % Shrub: 90 % Herb: 10 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

A low terrace area exists west of the active floodplain with upland native plant species, mostly sage scrub.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Anita Dam
Project Number: COLADOW J166
Stream: Santa Anita Wash
Investigator(s): David Hughes, Allison Rudalevige
Date: 4/23/2013
Town: Arcadia
Photo begin file#:
Time:
State: CA
Photo end file#:

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details: Soil pit #4

Projection: 34.17334 **Datum:** NAD 83
Coordinates: 118.02074

Potential anthropogenic influences on the channel system:
Santa Anita dam is upstream, therefore hydrology is managed.

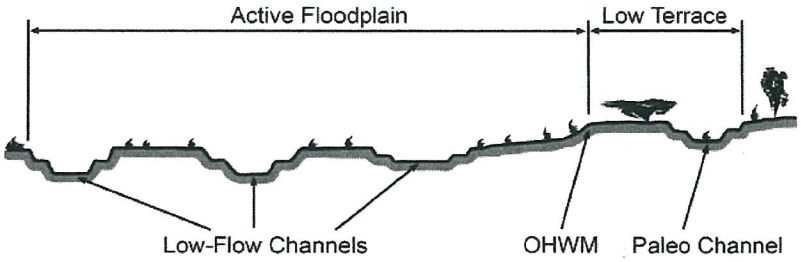
Brief site description:
Area is upstream of Santa Anita debris/desilting basin, channel contains large boulders with deep sand

Checklist of resources (if available):

- [X] Aerial photography
  Dates: 2011
- [X] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [ ] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

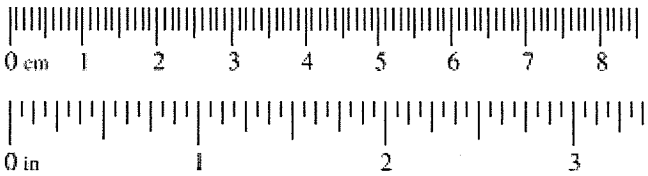


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [X] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [ ] GPS
   - [ ] Other:

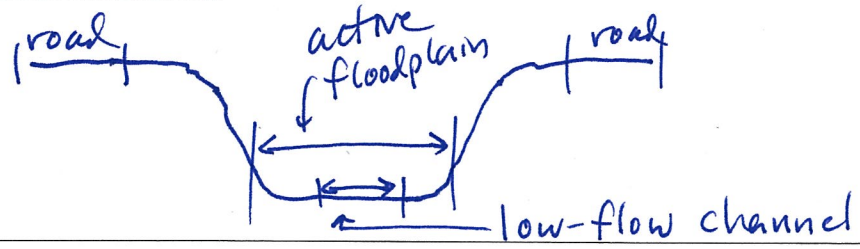
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
	10.08	256	Boulder	
	2.56	64	Cobble	Gravel
	0.157	4	Pebble	
	0.079	2.00	Granule	
	0.039	1.00	Very coarse sand	
	0.020	0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	Sand
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	
1/32	0.00061	0.0156	Medium silt	Silt
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: 34.17334, 118.02074

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☒ Other: scour, shelving
- ☐ Other: _____

Comments:

channel is well-defined, with steep banks

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 34.17334, 118.02074

Characteristics of the floodplain unit:

Average sediment texture: sand, rock

Total veg cover: 10% Tree: 0 % Shrub: 5 % Herb: 10 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 34.17334, 116.02074

Characteristics of the floodplain unit:

Average sediment texture: sand

Total veg cover: 25 % Tree: 10 % Shrub: 20 % Herb: 5 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

channel has very steep banks, therefore no low terrace area exists.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Anita Dam
Project Number: CoLAPPW J166
Stream: Santa Anita Canyon
Investigator(s): David Hughes, Allison Rudalevige

Date: 4/23/2013 **Time:**
Town: Arcadia **State:** CA
Photo begin file#: **Photo end file#:**

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details: Soil pit #5

Projection: ~~NAD 83~~ **Datum:** NAD 83
Coordinates: 34.17756° / 118.0190°

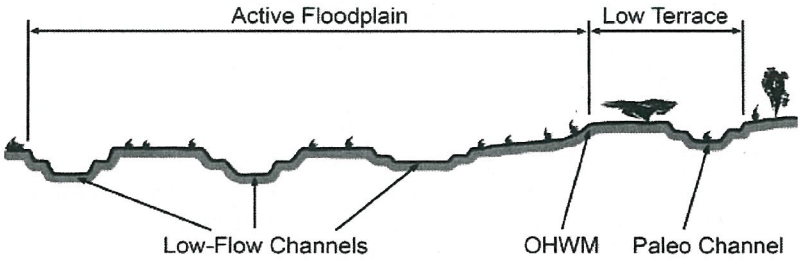
Potential anthropogenic influences on the channel system:
Managed hydrology; Santa Anita Dam is upstream as is a weir (immediately upstream of this location).

Brief site description:
Site is a shallow stream with running water adjacent to Arcadia Wilderness Park

Checklist of resources (if available):

- [X] Aerial photography
  Dates: 2011
- [X] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [ ] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

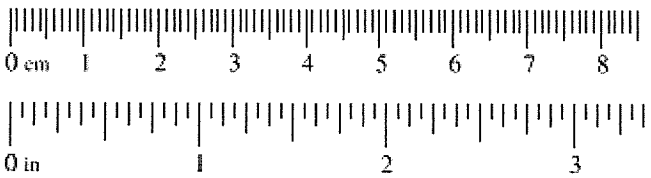


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [X] Mapping on aerial photograph
   - [ ] GPS
   - [ ] Digitized on computer
   - [ ] Other:

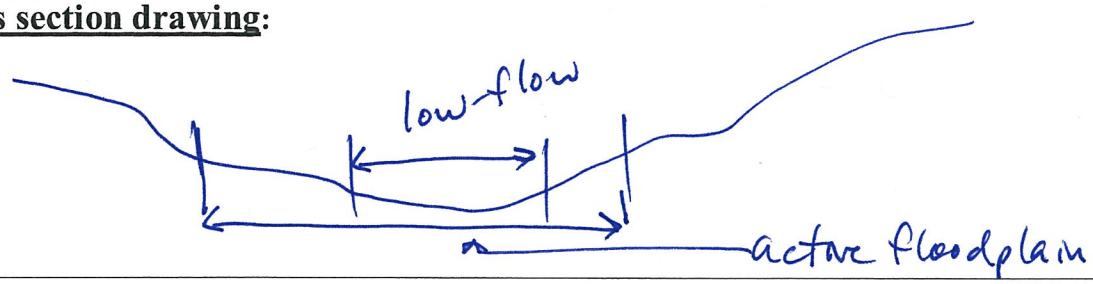
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
	10.08	256	Boulder	Gravel
	2.56	64	Cobble	
	0.157	4	Pebble	
	0.079	2.00	Granule	
	0.039	1.00	Very coarse sand	Sand
	0.020	0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	Silt
1/32	0.00061	0.0156	Medium silt	
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: 34.17756°/ 118.0190°

Indicators:

- [ ] Change in average sediment texture
- [ ] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Scour, shelving
- [ ] Other: _____

Comments:

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: 34.17756°/ 118.0190°

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: 90 % Tree: 60 % Shrub: 10 % Herb: 30 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [x] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [ ] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [x] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

low-flow channel had surface flow at time of survey.

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 34.17756° / 118.0190°

Characteristics of the floodplain unit:

Average sediment texture: silt

Total veg cover: 90 % Tree: 60 % Shrub: 10 % Herb: 30 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Anita Dam
Project Number: COLADPW 1166
Stream: Santa Anita Canyon
Investigator(s): David Hughes, Allison Rudalevige

Date: 4/23/2013 **Time:**
Town: Arcadia **State:** CA
Photo begin file#: **Photo end file#:**

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details: Soil pit #8

Projection: Lat/long **Datum:** NAD 83
Coordinates: 34.1798, -118.0188

Potential anthropogenic influences on the channel system:
managed hydrology – Santa Anita Dam is upstream

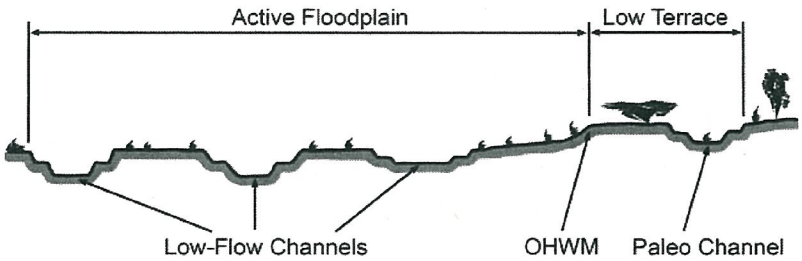
Brief site description:
Area is at end of access road, north of Arcadia Wilderness Park, flowing stream, alder woodland

Checklist of resources (if available):

- [X] Aerial photography
  Dates: 2011
- [X] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [ ] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

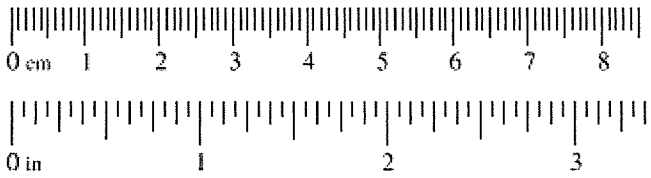


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [X] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [ ] GPS
   - [ ] Other:

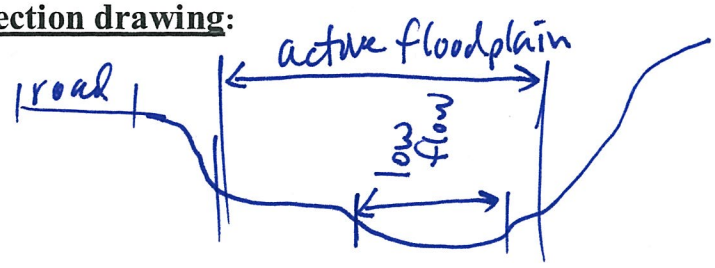
Wentworth Size Classes

Inches (in)	Millimeters (mm)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
		Granule	
0.079	2.00		
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: 34.1798, 118.0188

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☒ Other: shelving, wrackline
- ☐ Other: _____

Comments:

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 34.1798; 118.0188

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: 90 % Tree: 90 % Shrub: 0 % Herb: 5 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

flowing water at time of survey.

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 34.1798°, 116.0188°

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: 90 % Tree: 90 % Shrub: Ø % Herb: 5 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☒ Other: scour, wrackline
- ☐ Other: _____
- ☐ Other: _____

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

no low terrace.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Anita Dam
Project Number: CoLADPW J166
Stream: Santa Anita Canyon
Investigator(s): David Hughes, Gary Medeiros

Date: 4/25/13
Town: Arcadia
Photo begin file#:

Time:
State: CA
Photo end file#:

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [X] / N [ ] Is the site significantly disturbed?

Location Details: upper end of Santa Anita Reservoir

Projection: lat/long **Datum:** NAD 83
Coordinates: 34.18499, 118.01687

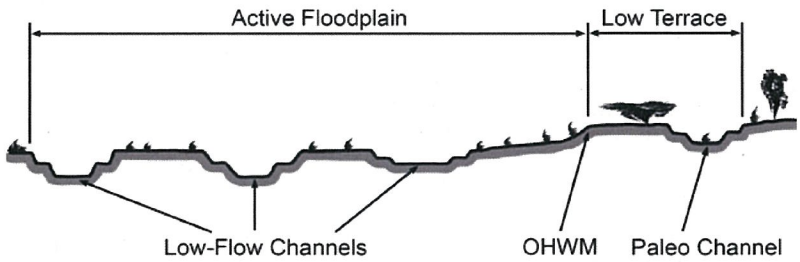
Potential anthropogenic influences on the channel system:
Site is at upper end of Santa Anita Reservoir, within inundation footprint, subject to sediment removal.

Brief site description:
upper end of reservoir, minimally vegetated due to inundation.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [ ] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

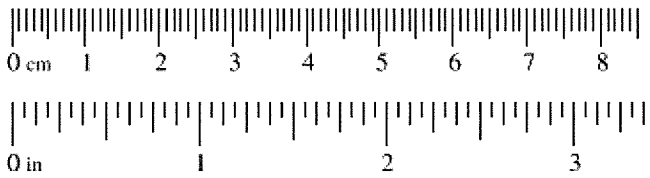


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [X] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [ ] GPS
   - [ ] Other:

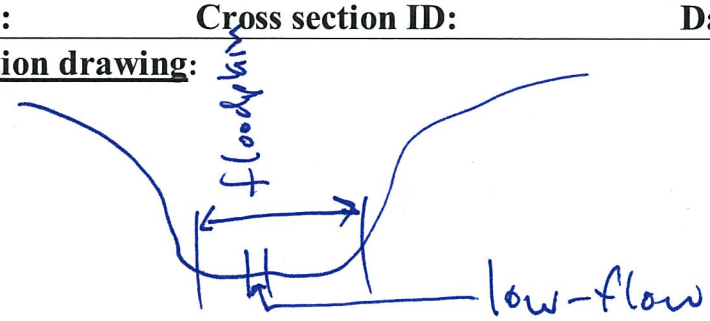
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
	10.08	256	Boulder	
	2.56	64	Cobble	Gravel
	0.157	4	Pebble	
	0.079	2.00	Granule	
	0.039	1.00	Very coarse sand	
	0.020	0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	Sand
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	
1/32	0.00061	0.0156	Medium silt	Silt
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: 34.18499, 118.01687

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

site is within narrow canyon, OHWM defined by inundation water marks

Floodplain unit:

☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 34.18499, 118.01687

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: Ø % Tree: Ø % Shrub: Ø % Herb: Ø %

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☒ Other: flowing water
- ☐ Other: _____
- ☐ Other: _____

Comments:

flowing water at time of survey

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 34.18499, 118.01687

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: 10 % Tree: Ø % Shrub: 10 % Herb: Ø %

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☒ Other: water marks
- ☐ Other:
- ☐ Other:

Comments:

active floodplain delineated by water marks on canyon sides

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other:
- ☐ Other:
- ☐ Other:

Comments:

no low terrace - site is within narrow canyon.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Anita DB
Project Number: CoLADPW J166
Stream: trib to Santa Anita Wash
Investigator(s): DTH, GAM

Date: 4/25/13
Town: Arcadia
Photo begin file#:

Time: 0830
State: CA
Photo end file#:

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [X] / N [ ] Is the site significantly disturbed?

Location Details: Soil pit 9

Projection: lat/long **Datum:** NAD 83
Coordinates: 34.1689° / 118.0202

Potential anthropogenic influences on the channel system:
land cleared for staging / storage by County DPW

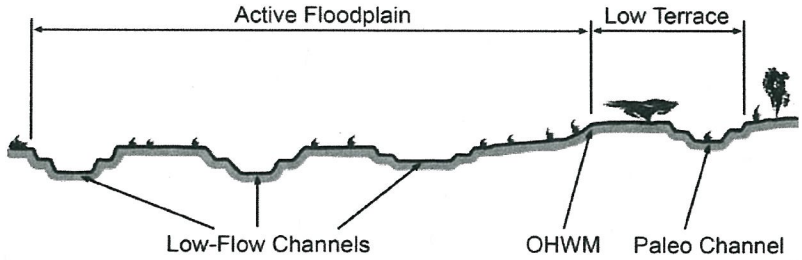
Brief site description:
ephemeral side channel, downstream of desilting basin

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [ ] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

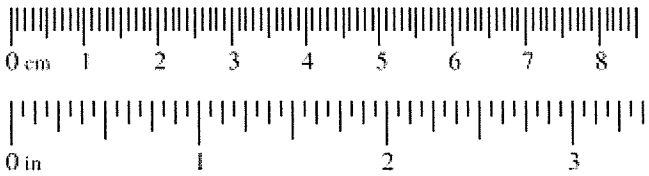


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [X] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [ ] GPS
   - [ ] Other:

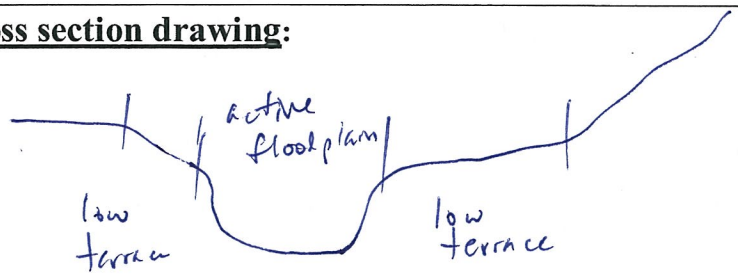
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
	10.08	256	Boulder	Gravel
	2.56	64	Cobble	
	0.157	4	Pebble	
	0.079	2.00	Granule	
	0.039	1.00	Very coarse sand	Sand
	0.020	0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	Silt
1/32	0.00061	0.0156	Medium silt	
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: ~~Wypt 091~~ 34.1689, 118.0202

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: gravelly sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

low-flow channel is unvegetated, has layer of oak litter

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

active floodplain largely is identical with low-flow channel

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: Sand

Total veg cover: 30 % Tree: 20 % Shrub: 10 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

low terrace largely unvegetated, modest coverage of Sambucus nigra, Quercus agrifolia, Po. sw oak, mule fat.

ATTACHMENT D

NATIONWIDE PERMIT SUMMARY

The following is a summary of Nationwide Permit 3 (Maintenance):

NWP 3. Maintenance. (a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, requirements of other regulatory agencies, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. Any stream channel modification is limited to the minimum necessary for the repair, rehabilitation, or replacement of the structure or fill; such modifications, including the removal of material from the stream channel, must be immediately adjacent to the project or within the boundaries of the structure or fill. This NWP also authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(b) This NWP also authorizes the removal of accumulated sediments and debris in the vicinity of existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) and/or the placement of new or additional riprap to protect the structure. The removal of sediment is limited to the minimum necessary to restore the waterway in the vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend farther than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an area that has no waters of the United States unless otherwise specifically approved by the district engineer under separate authorization. The placement of new or additional riprap must be the minimum necessary to protect the structure or to ensure the safety of the structure. Any bank stabilization measures not directly associated with the structure will require a separate authorization from the district engineer.

(c) This NWP also authorizes temporary structures, fills, and work necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

(d) This NWP does not authorize maintenance dredging for the primary purpose of navigation. This NWP does not authorize beach restoration. This NWP does not authorize new stream channelization or stream relocation projects.

Notification: For activities authorized by paragraph (b) of this NWP, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 31). The pre-construction notification must include information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals. (Sections 10 and 404)

Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act Section 404(f) exemption for maintenance.

General Condition 31. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either: (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information: (1) Name, address and telephone numbers of the prospective permittee; (2) Location of the proposed project; (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans); (4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the

special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate; (5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan. (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level. (2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5. (3) In cases of where the prospective permittee is not a Federal agency, the

district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act. (4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

ATTACHMENT E

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: | File/ORM #: | PJD Date:

State: CA | City/County: Arcadia and Monrovia/Los Angeles

Nearest Waterbody: Santa Anita Dam Reservoir

Location: TRS, LatLong or UTM: T1N, R11W, sec 10
11 406152 mE, 3783039 mN

Name/ Address of Person Requesting PJD: Matt Frary, P.E.
Water Resources Division
Los Angeles County Department of Public Works
900 South Fremont Ave, 2nd Floor
Alhambra, CA 91803-1331

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: linear ft | width | 19.42 acres | Stream Flow: Perennial

Wetlands: 0.00 acre(s) | Cowardin Class:

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: | Non-Tidal:

☐ Office (Desk) Determination
☐ Field Determination: | Date of Field Trip:

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: BonTerra Consulting 2013
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☑ U.S. Geological Survey map(s). Cite quad name: Mt. Wilson 7.5-minute quadrangle
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: USDA NRCS, Angeles National Forest Area, CA
- ☑ National wetlands inventory map(s). Cite name: Online mapper for Study Area, 2013.
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): Aerials Express 2009; Google Earth various dates
  - ☑ Other (Name & Date): Site photographs; BonTerra Consulting 2013
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager
(REQUIRED)

Signature and Date of Person Requesting Preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office: Los Angeles District | File/ORM #: | PJD Date:

State: CA | City/County: Arcadia and Monrovia/Los Angeles | Person Requestinq PJD: Matt Frary, P.E.

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	34.17089	-118.02188	Palustrine, emergent		Non-Section 10 non-wetlanc
2	34.17118	-118.02168	Palustrine, forested		Non-Section 10 non-wetlanc
3	34.17143	-118.02219	Palustrine, forested		Non-Section 10 non-wetlanc
4	34.17334	-118.02074	Riverine		Non-Section 10 non-wetlanc
5	34.17756	-118.01900	Riverine		Non-Section 10 non-wetlanc
6	34.17805	-118.01809	Riverine		Non-Section 10 non-wetlanc

Notes:

Information on Additional Sites:
7; latitude 34.17838 longitude -118.01788; Riverine; Non-Section 10 not-wetlands
8; latitude 34.1798 longitude -118.0188; Riverine; Non-Section 10 non-wetlands
9; latitude 34.16893 longitude -118.02022; Palustrine, scrub-shrub; Non-Section 10 non-wetlands
10; latitude 34.183286 longitude -118.019557; Palustrine, forested; Non-Section 10 non-wetlands
11; latitude 34.184998 longitude -118.016877; Palustrine, unconsolidated bottom; Non-Section 10 non-wetlands

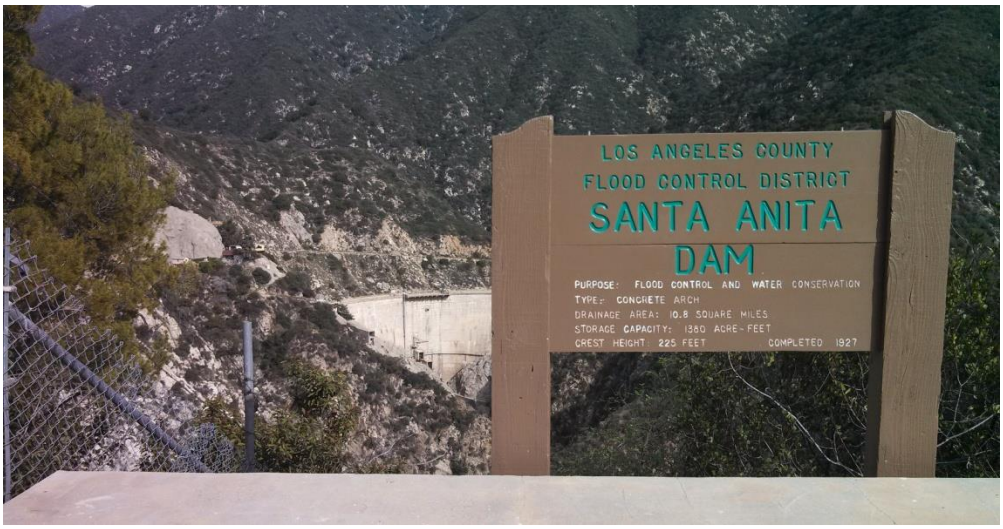
APPENDIX C

PHASE I CULTURAL RESOURCES ASSESSMENT

Phase I Cultural Resources Assessment

Santa Anita Stormwater Management and Seismic Strengthening Project

USGS **Mt. Wilson** 7.5 Minute Quadrangle in Township 1 North; Range 11 West, Sections 10 and 15; (*S.B.B.M*).



Prepared for

Los Angeles County Flood Control District
900 South Fremont Avenue
Alhambra, California 91803-1331

Prepared by

BonTerra Psomas
225 South Lake Avenue, Suite 1000
Pasadena, California 91101
Contact: Patrick Maxon, M.A., RPA
T: (626) 351-2000 F: (626) 351-2030

October 2014

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PHASE I CULTURAL RESOURCES ASSESSMENT: SANTA ANITA STORMWATER FLOOD MANAGEMENT AND SEISMIC STRENGTHENING PROJECT

by

Patrick Maxon, M.A., RPA

June 2014

Submitted by:

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Pasadena, California 91101
T: (626) 351-2000 F: (626) 351-2030

Submitted to:

Los Angeles County Flood Control District
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803-1331

USGS *Mt. Wilson* 7.5 Minute Quadrangle in Township 1 North; Range 11 West, Sections 10 and 15 (*S.B.B.M*).

BonTerra Psomas
Project Number: CoLADPW J166

Key Words: Santa Anita Dam Complex, USGS Mt. Wilson,

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EXECUTIVE/MANAGEMENT SUMMARY

PURPOSE AND SCOPE

BonTerra Psomas prepared this Phase I Cultural Resources Assessment to assess the potential impacts to cultural resources that would result from the implementation of the Santa Anita Stormwater Flood Management and Seismic Strengthening Project (Project). This document has been prepared to satisfy the requirements of the California Environmental Quality Act (CEQA). The format of this report follows *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Office of Historic Preservation 1990).

DATES OF INVESTIGATION

Patrick Maxon, RPA conducted cultural resources literature reviews on December 3, 2012, at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton and at the United States Department of Agriculture Forest Service (USFS) offices in the City of Arcadia on January 9, 2013 (Appendix A). Native American consultation was initiated on December 20, 2012, with a letter to the Native American Heritage Commission (NAHC). The NAHC responded on December 21, 2012, and letters were sent to Native American tribes and individuals on January 2, 2013 (Appendix B). A cultural resources survey of the property was conducted by Patrick Maxon on January 9, 2013 (refer to USFS Permit #LAR9048 in Appendix C). BonTerra Architectural Historian Pamela Daly completed a historic assessment and evaluation of the historic resources in the study area (refer to Appendix D). Subsequently, in April of 2014, several Dam Ancillary Facilities Improvements were added to the project. Mr. David Smith of BonTerra Psomas surveyed those areas slated for the improvements. Mr. Maxon prepared and completed this technical report in February 2013 and Mr. Smith revised this report in May of 2014. Resumes of BonTerra Psomas staff are provided in Appendix E.

FINDINGS OF THE INVESTIGATION

No significant archaeological or paleontological resources are recorded and none were discovered within the Area of Potential Effects (APE) as a result of this study. The historic resources associated with the Santa Anita Dam APE were determined to be not significant.

INVESTIGATION CONSTRAINTS

Much of the APE has been disturbed and developed by construction of the dam and reservoir, access roads, the Santa Anita Headworks structure, channels, and Santa Anita Debris Dam. Both native and non-native vegetation remains on site.

RECOMMENDED MITIGATION MEASURES

Mitigation Measure 1

Should archaeological resources be found during ground-disturbing activities for the Project, an Archaeologist shall be hired to first determine whether it is a “unique archaeological resource” pursuant to Section 21083.2(g) of the *California Public Resources Code* (PRC) or a “historical resource” pursuant to Section 15064.5(a) of the State CEQA Guidelines. If the archaeological resource is determined to be a “unique archaeological resource” or a “historical resource”, the Archaeologist shall formulate a mitigation plan in consultation with the LACFCD that satisfies the requirements of the above-referenced sections. If the Archaeologist determines that the archaeological resource is not a “unique archaeological resource” or “historical resource”, s/he may record the site and submit the recordation form to the California Historic Resources

Information System at the South Central Coastal Information Center at California State University, Fullerton.

Implementation of MM 1 would ensure that impacts to archaeological resources are reduced to a less than significant level.

Mitigation Measure 2

If human remains are encountered during excavation activities, all work shall halt in the immediate vicinity of the discovery and the County Coroner shall be notified (*California Public Resources Code* §5097.98). The Coroner shall determine whether the remains are of forensic interest. If the Coroner, with the aid of the County-approved Archaeologist, determines that the remains are prehistoric, s/he will contact the Native American Heritage Commission (NAHC). The NAHC shall be responsible for designating the most likely descendant (MLD), who will be responsible for the ultimate disposition of the remains, as required by Section 7050.5 of the *California Health and Safety Code.* The MLD shall make his/her recommendation within 48 hours of being granted access to the site. The MLD's recommendation shall be followed if feasible, and may include scientific removal and non-destructive analysis of the human remains and any items associated with Native American burials (*California Health and Safety Code* §7050.5). If the landowner rejects the MLD's recommendations, the landowner shall rebury the remains with appropriate dignity on the property in a location that will not be subject to further subsurface disturbance (*California Public Resources Code* §5097.98).

Implementation of MM 2 would ensure that impacts to human remains are reduced to a less than significant level.

DISPOSITION OF DATA

This report will be filed with the Los Angeles County Flood Control District (LACFCD); with BonTerra Psomas; with the USFS; and at the SCCIC. All field notes and other documentation related to the study are on file at BonTerra Psomas.

1.0 PROJECT DESCRIPTION

1.1 PROJECT COMPONENTS

The Project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, including the Santa Anita Dam, Santa Anita Headworks, Wilderness Park Culvert Crossing, and the Santa Anita Debris Dam. The Project benefits and the contributing LACFCD facility improvements are as follows:

- Reduce flood risk to downstream communities by:
    - Modifying the Santa Anita Dam spillway to safely pass the Probable Maximum Flood
    - Remediating seismic safety issues at the Santa Anita Dam and Debris Dam
- Enhance sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre-feet per year by:
    - Restoring storage capacity at Santa Anita Debris Dam

- Rehabilitating the Santa Anita Headworks for more reliable diversion of stormwater runoff to the spreading grounds
- Modernizing facilities and implementing new monitoring and control systems

Improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing

1.1.1 Dam

The Dam would be structurally altered to accommodate a new spillway with sufficient capacity to pass the probable maximum flood (PMF) of 26,100 cfs in order to reduce the risk of Dam failure from uncontrolled overtopping during major storm events. The proposed improvements to the Dam would not result in changes to the existing maximum water surface elevation restrictions; therefore, the reservoir's capacity to retain water would not be altered by Project implementation.

The spillway modification would consist of cutting a "notch" in the Dam crest to allow the PMF to overtop in a controlled manner. The proposed notch would be centered on the crest of the Dam, similar to the existing emergency crest spillway, and would require concrete removal from the Dam. An existing spillway on the far western edge of the Dam would remain and be unaltered by the Project; however, the existing auxiliary orifice spillway beneath the proposed new spillway would be removed. A new pedestrian bridge would be constructed over the notch and the existing hoist system would be upgraded to have a higher load capacity and re-aligned to accommodate the new spillway. The upgrade work includes the relocation of the lower hoist tower along the Dam crest (and potentially cantilevered of the back side, if necessary). The proposed improvements would not change the height of the Dam; the crest of the Dam would remain at an elevation of 1,325 feet above msl and the parapet wall would remain at an elevation of 1,328 feet above msl.

To better manage stormwater runoff and to ensure reliability and efficiency of operations, six of the existing valves would be replaced (three control valves and three backup valves), along with new electrical and control systems. The Dam's structural concrete would be repaired to ensure that it meets acceptable standards consistent with the required seismic performance of the Dam.

The downstream canyon walls and the toe of the Dam would be re-armored with additional reinforced gunite or equivalent concrete erosion protection to dissipate the energy from the potential overtopping water as the flow cascades through the spillway notch and the orifice spillway or sluiceway. The flow would be directed onto the downstream armoring before flowing into the channel downstream of the Dam. The new re-armoring would reinforce the existing armoring that extends approximately 100 feet downstream from the toe of the Dam. The re-armoring would be held in position with tie-back anchors to be drilled and grouted into the bedrock. The tie-ins for the re-armoring may include superficial rock excavation, grading, and subsurface pressure grouting. The color of the material used for re-armoring would be the same as the existing concrete.

The Project would also include improvements to ancillary facilities of the Dam. The existing garage/storage shed would be demolished and replaced with a new three-bay garage (the third bay would house a new back-up generator). The existing Dam Operator's house would be removed and replaced with a helipad to provide aerial access to the Dam in the event of an emergency. It is anticipated that the helipad would only be used 1 or 2 times per year. The existing relief quarters and control house would remain to serve as an office. Although the Dam Operator would no longer reside at the Dam, he/she would still be on-site daily and available on-call after hours. The Project would include remote control capabilities that provide redundant control options from multiple off-site locations. The Dam also has a built-in safety mechanism to

automatically pass water through the Dam once the reservoir surface level reaches the California Department of Water Resources, Division of Safety of Dams (DSOD) restriction.

The existing potable water system that serves the Dam site would be replaced. The water system currently consists of a 60,000-gallon upper tank located off Chantry Flats Road that connects to two 5,000-gallon lower tanks located near the Dam access road via a pipeline that runs down the mountainside. The slope adjacent to the upper tank has erosion damage and would be repaired as part of the Project. To repair the slope, an approximate 216-square-foot eroded gully located near the tank's foundation would be grubbed and stabilized with engineered fill and geotextile fabric or with support piles. The exposed portions of the existing water pipeline would be removed while any underground portions would be capped and abandoned in place. The replacement pipeline would run along the same general alignment as the existing pipeline. The two lower tanks would be removed and would not require replacement.

The existing manual swing gate at Chantry Flats Road that provides secured entry to the Dam access road would be replaced with a new electric slide gate. In order to provide electricity to the gate and new lighting/intercom systems, a power line would be strung on up to 7 new power poles to be installed along the outer edge of the Dam's access road, or where possible, in conduit along the inner slope of the access road.

1.1.2 Headworks and Wilderness Park Culvert Crossing

Headworks

The Headworks structure would be replaced and the associated earthen levee would be partially reconstructed to better manage the diversion of flows to the downstream spreading grounds and the downstream Debris Dam. A rehabilitation of the Headworks is needed to protect facilities from stormwater damage and to direct stormwater runoff to the spreading grounds for groundwater recharge. Redevelopment of the Headworks would include reconstruction of the levee to ensure it can withstand flows produced by a 25-year storm event and replacement of the existing tainter gate (used to divert flows) with a new rubber diversion structure. The new rubber diversion structure would be a pneumatically operated, bottom hinged, spillway gate system.

The majority of the existing Headworks structure would be demolished and removed, including the tainter gate, supporting walls, catwalk, and keys. The new facility would increase the width of the structure by approximately 20 feet in order to house the 34-foot rubber diversion structure. Operation of the rubber diversion structure would result in the retention of waters behind the levee to allow for the diversion of flows through the intake gates and into the existing 30-inch RCP leading to the Santa Anita Spreading Grounds and/or Sierra Madre Spreading Grounds. The pool created by the new rubber diversion structure would remain the same as under existing conditions. Construction of the new diversion structure would require work in the creekbed extending approximately 25 feet downstream of the Headworks, including the placement of new riprap on the downstream side.

The rehabilitation of the Headworks would also include a new control system, including remote operation capabilities, to increase efficiency of water conservation operations. Currently, the response time required for County personnel to drive to the Headworks and manually operate the tainter gate, along with the limited flow rates that can be bypassed, results in the loss of a water conservation opportunity. A new control system integrated with the control system of the other Project components would optimize water conservation. A control house for the rubber diversion structure would be constructed on the other side of the channel next to the access road.

The earthen levee would be reinforced and raised approximately five feet higher to match the height of the Headworks structure by removing and under-excavating the existing levee and rebuilding the new levee using a combination of imported fill and suitable material from the existing levee. It would then be recompacted to the proposed height. The access road leading to the facility would be modified to match the height of the reinforced earthen levee. The existing riprap on the upstream side of the levee would be reinforced. A subsurface conduit would be installed along the length of the levee to connect the rubber diversion structure to the control house on the other side.

Wilderness Park Culvert Crossing

In addition to the improvements at the Headworks, armoring of the roadway and construction of a replacement culvert crossing to the Wilderness Park is needed to ensure that the structure can withstand flows produced by a larger storm event. The existing Culvert Crossing located approximately 450 feet downstream of the Headworks, including the concrete slab and corrugated metal culverts, would be removed and replaced with a new crossing structure.

The Culvert Crossing would be approximately 30 feet wide on the deck plate, allowing for two-way traffic. The new Culvert Crossing would be built on top of a new abutment and would be designed with a permanent guard rail and flexible pavement driving surface adequate for emergency vehicles. The new roadway elevation of the Culvert Crossing would be raised above the existing roadway elevation by approximately 4.5 feet to accommodate higher flows. Approximately 1,800 square feet of the roadways leading to and from the Culvert Crossing would be repaved and sloped to join the existing grade.

Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing would be grubbed and graded to accommodate the new Culvert Crossing. It is anticipated that adequate vehicular and pedestrian access could be provided to the Arcadia Wilderness Park for the majority of the construction period for the Culvert Crossing, with only occasional closures required for periods of about a week or less at any given time during construction. Notification of any temporary closures would be posted at the entrance to the Wilderness Park. Those brief closures would avoid important events at the Wilderness Park, such as the overnight Boy Scout campouts every Friday and Saturday and youth day camps every weekday between mid-June to late-August. However, in order to provide a conservative analysis for impacts to Biological Resources, the assembly of a temporary bypass crossing located north of the existing Culvert Crossing, which could require removal of a sycamore tree, has been assumed and assessed, to account for the event that the temporary crossing is used.

Therefore, access to the Wilderness Park would be maintained throughout construction with minimal interruptions to access. Two existing sycamore trees located adjacent to the crossing on the eastern shore of the Wash, south of the Culvert Crossing, would need to be removed. One sycamore located on the eastern shore of the Wash, north of the Culvert Crossing, may need to be removed, depending on whether or not the temporary bypass crossing is installed. In order to provide a conservative analysis, this IS/MND assumes that all three upstream and downstream sycamore trees would be removed.

The LACFCD may transplant the root ball(s) of the sycamores to a suitable riparian location, and/or utilize the woody debris from the sycamore to enhance habitat value at another nearby location, if determined to be feasible and if approved by the County and other appropriate parties. In addition, new sycamore trees would be planted within a 100-foot radius of the original location of any removed existing trees.

New riprap would be installed upstream and downstream of the Culvert Crossing. The roadways leading to and from the Culvert Crossing would be armored, 36 feet on the upstream side and 84 feet on the downstream side, to withstand flows and sloped to join the existing grade. The existing water and sewer lines that run through the current Culvert Crossing would need to be relocated to the new height and alignment of the structure. The sewer force main is on the downstream surface of the Culvert Crossing and the water line is on the upstream surface of the Culvert Crossing. Additionally, the fire hydrant, vault, water valve and standpipe would be demolished and relocated approximately 15 feet to the north in the case that the temporary bypass crossing is utilized. All utility trenching and relocations would remain within the area anticipated for impacts by the Culvert Crossing construction activities, and there would be no changes in water/sewer quantities or demands as a result of the Project.

1.1.3 Debris Dam

Remediation of the seismic deficiencies at the Debris Dam would involve improvements to the existing structures, including the intake tower and embankment. As a result of the loss of water conservation capacity from the DSOD restrictions on the Dam, there is an increased need to capture as much stormwater runoff as possible in facilities below the Dam. As a result, the Debris Dam would also be enlarged by raising the existing spillway by four feet. Remediating the seismic deficiencies at the Debris Dam would result in the DSOD removing the operational restrictions on the facility, thereby restoring 119 acre-feet of water conservation capacity. Enlarging the Debris Dam would create an additional 40 acre-feet of additional storage capacity, for a total of 159 acre-feet. When captured stormwater is released from the Dam to the spreading grounds for groundwater recharge, the Debris Dam can then capture more runoff, which would allow for water storage capacity multiple times in a single season depending on the frequency, duration, and intensity of storm events.

The intake tower located in the Debris Dam is unable to resist seismic loading and would be strengthened or replaced. The improved intake tower would be connected to the existing 48-inch outlet pipe (being lined as part of this Project). The outlet pipe has an existing junction box, which is used to deliver water either into the spillway channel or into the spreading grounds. The upstream and downstream portions of the Debris Dam embankment and alluvial foundation material that are subject to potential liquefaction would be reinforced with structural buttressing. Currently, a cross-section of the Debris Dam resembles a triangle (e.g., sloped sides on the upstream and downstream sides of the dam) with a flat top (e.g., flattened to accommodate vehicular access). The top of the embankment ranges from an elevation of 796 feet above msl at its center to an elevation of 811 feet above msl at the western edge. The construction activities would involve the removal of the existing riprap exterior surface on portions of both the upstream (approximately 0.69 acre) and downstream (approximately 0.89 acre) slopes. Engineered fill materials beneath the riprap would be excavated and removed, and an engineered buttress would be constructed. Upon completion of construction activities, the sloped upstream and downstream surfaces of the Debris Dam would be reconfigured into a single stair-stepped terrace. The surface of the Debris Dam would be completed with a riprap similar to the existing condition.

As part of the improvements, six non-native deodar cedar trees located at the downstream toe of the embankment would be removed as mandated by the DSOD to ensure the structural integrity of the Debris Dam.

A new automated outlet gate and control system would be constructed to modernize operations and to ensure compatibility with other Project components. Upon completion of these improvements, the DSOD would issue a new certificate for the facility and remove the current operating restriction on the Debris Dam, which would increase the Debris Dam's available and allowable water conservation storage capacity from 0 acre-feet to 159 acre-feet.

1.2 EXHIBIT

Exhibit 1 depicts the Project Location and identifies the location of each project element. It is shown on a portion of the U.S. Geological Survey's (USGS') Mt. Wilson 7.5-minute quadrangle. Exhibit 2 depicts the project's Area of Potential Effects (APE) on an aerial photograph. In April of 2014, several Dam Ancillary Facilities Improvements were added to the project (Exhibit 3).

2.0 REGULATORY SETTING

This section contains a discussion of the applicable laws, ordinances, regulations, and standards that govern cultural resources and must be adhered to both prior to and during Project implementation. The report is intended to satisfy the requirements of the California Environmental Quality Act (CEQA) regulations (14 *California Code of Regulations* [CCR] §15064.5 and *California Public Resources Code* [PRC] §21083.2), as well as the requirements for a federal action under the National Environmental Policy Act (NEPA) and an analysis pursuant to Section 106 of the National Historic Preservation Act (16 *United States Code* [USC] 470f) and its implementing regulations listed in the *Code of Federal Regulations* (36 CFR, 800, Protection of Historic Properties).

2.1 FEDERAL

Cultural resources are considered during federal undertakings chiefly under Section 106 of National Historic Preservation Act (NHPA) of 1966 (as amended) through one of its implementing regulations (36 CFR 800, Protection of Historic Properties) and NEPA. Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of NHPA. Other federal laws include the Archaeological Data Preservation Act of 1974; the American Indian Religious Freedom Act of 1978; the Archaeological Resources Protection Act of 1979; and the Native American Graves Protection and Repatriation Act of 1989, among others.

Section 106 of NHPA (16 USC 470f) requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings (36 CFR 800.1). Under Section 106, the significance of any adversely affected cultural resource is assessed, and mitigation measures are proposed to reduce the impacts to an acceptable level. Significant cultural resources are those resources that are listed or are eligible for listing in the NRHP per the criteria listed at 36 CFR 60.4 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:
>
> (a) Are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) Are associated with the lives of persons significant in our past; or
>
> (c) 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
>
> (d) Have yielded, or may be likely to yield, information important in prehistory or history.

2.2 CEQA

CEQA requires a lead agency to determine whether a project would have a significant effect on one or more historical resources. Section 15064.5(a) of the State CEQA Guidelines defines a “historical resource” as a resource listed in or determined to be eligible for listing in the California Register of Historical Resources (CRHR) (PRC §21084.1); a resource included in a local register

of historical resources (14 *California Code of Regulations* [CCR], 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 (14 CCR), and Sections 21083.2 and 21084.1 of the CEQA Statutes were used as the basic guidelines for the cultural resources study. PRC 5024.1 requires evaluation of historical resources to determine their eligibility for listing on the CRHR. The purposes of the CRHR are 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 the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California is present in any object, building, structure, site, area, place, record, or manuscript that possesses integrity of location, design, setting, materials, workmanship, feeling and association and that:
>
> (1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; or
>
> (2) Is associated with the lives of persons important in our past; or
>
> (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; or
>
> (4) Has 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 (14 CCR), a resource is considered historically significant if it meets the criteria for listing in the NRHP (per the criteria listed at 36 CFR 60.4). 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 in 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 the APE or whether any cultural resources can reasonably be expected to exist in the subsurface. If resources are discovered, management recommendations would be required for evaluation of the resources for NRHP or CRHR eligibility.

Broad mitigation guidelines for treating historical resources are codified in Section 15126.4(b) of the State CEQA Guidelines. To the extent feasible, public agencies should seek to avoid significant effects to historical resources, with preservation in place being the preferred alternative. If not feasible, a data recovery plan shall be prepared to guide subsequent excavation. Mitigation for historical resources such as buildings, bridges, and other structures that are consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks and Grimmer 1995) will generally be considered mitigated below a level of significance.

2.3 SENATE BILL 18

Senate Bill (SB) 18 (*California Government Code* §65352.3) incorporates the protection of California traditional tribal cultural places into land use planning for cities, counties, and agencies by establishing responsibilities for local governments to contact, refer plans to, and consult with California Native American tribes as part of the adoption or amendment of any general or specific plan proposed on or after March 1, 2005. A general plan or specific plan amendment or adoption is not required for this Project; therefore, formal consultation under SB 18 is not necessary; however, informal scoping was undertaken with local tribes through notification via informational letter.

2.4 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 shall 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 which, in turn, must identify the person or persons it believes to be the most likely descended from the deceased Native American. The descendents 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.

3.0 SETTING

3.1 NATURAL

The area surrounding the Santa Anita Dam APE is undeveloped and includes several vegetation types including mixed coastal sage scrub, disturbed mixed coastal sage scrub, southern mixed chaparral, southern mixed chaparral/mixed coastal sage scrub, disturbed southern mixed chaparral/mixed coastal sage scrub, southern mixed chaparral/rock outcroppings, southern cottonwood willow riparian forest, sycamore alluvial woodland/southern riparian forest, southern sycamore alder riparian woodland, mule fat scrub, coast live oak woodland, mixed woodland, coast live oak woodland/southern mixed chaparral, and ornamental, ornamental/coast live oak woodland. The APE is also host to ruderal species, disturbed areas, developed areas, open water, and rock outcroppings.

Steep vertical walls border the majority of the reservoir, which is surrounded by mountains. The topography steeply slopes down into the canyon; elevations range from approximately 800 to 1,320 feet above mean sea level (msl).

3.2 CULTURAL

3.2.1 Prehistoric

The prehistory of coastal Southern California has been described by a number of authors who generally agree on at least four major prehistoric periods (Wallace 1955; Warren 1968; Koerper and Drover 1983). These four sequential periods of time, sometimes called Horizons and sometimes Traditions, are each characterized by time-sensitive artifacts. The periods then are not arbitrary, but likely reflect material/cultural changes at those times.

The earliest occupations of the Southern California coastal area are debated to begin as early as 50,000 years before present, or “B.P.” (Bada et al. 1974).[1] The earliest radiocarbon dates, however, were derived from Los Angeles Man and Laguna Woman at 23,600 and 17,150 B.P. respectively (Berger et al. 1971). Unfortunately, little is known of the material culture of finds of this antiquity and subsequent analysis has undermined the antiquity of the discoveries (Erlandson et al. 2007). The earliest archaeological culture known in any detail is that of San Dieguito, named after the drainage of the same name near Del Mar, California where implements dating to 8,000 B.P. were found. Although the subsistence strategy of this tradition is unknown, Warren (1968:2) has inferred a hunting economy (cf. Koerper and Drover 1983; Drover et al. 1983). Typical artifacts would include percussion flaked implements, elongated knives, domed scrapers, teshoa flakes, crescentics, and an absence of millingstone tools. The San Dieguito culture is defined primarily from its single type site, the Harris Site of San Diego County, CA–SDi–149 (Warren 1966).

After San Dieguito, the next prehistoric period for coastal Southern California is termed “Millingstone” and “Encinitas” by Wallace (1955) and Warren (1968), respectively. The Millingstone Horizon or Encinitas Tradition are very similar as described by each author and have a time span beginning about 7,000 to 8,000 B.P. and ending between 3,000 to 4,000 B.P. The onset of Holocene climatic conditions may have brought about the cultural changes associated with this period. Processing tools like manos and metates (millingstone) reflect an increased dependence on plant foods. Projectiles are rare, but, when found, suggest the use of the atlatl or

[1] “Before Present” assumes that 1950 is “present”.

throwing stick. The material culture characteristic of this period is longer-lived the further one travels south of Santa Barbara.

The third period following Encinitas, or Millingstone, is known as the “Intermediate Horizon” and “Campbell Tradition” by Wallace (1955) and Warren (1968), respectively. This period is strongly represented north of the Los Angeles area and is only suggested in the San Diego area. Numerous, smaller projectile points suggesting increased hunting and the introduction of the use of the bow and arrow characterize this period. It is during the Intermediate Horizon, or Campbell Tradition that true maritime exploitation and occupation of the Channel Islands flourishes (Meighan 1959). The duration of this period is roughly 3,000 to 1,000 B.P. In general, the emphasis seems to shift from the hard seed orientation of the Milling Stone Tradition to the growing practice of balanophagy (acorn consumption) and processing of other soft, pulpy seeds. While mortars and pestles become more common in comparison to manos and metates, the latter survive into European contact times attesting to the use of hard seeds in the diet.

In the southern end of Los Angeles County, several traits make an appearance rather late in the Tradition; these include pottery and ground painting, which give rise to speculation that significant culture contact from the southeast was occurring (Meighan 1954). This complex is thought to owe its basic cultural orientations to the Southwestern United States.

A general picture emerges through time of growing population pressure resulting in intensified land use patterns. Increases in population or siltation of coastal estuaries are examples of intensifying the local carrying capacity (e.g., Newport Bay during the Milling Stone Tradition). Occasionally, siltation may actually progress to the point of making an estuary less productive as in the case of northern Orange County (Newport Back Bay) resulting in local populations adapting to other environments such as acorn processing.

3.2.2 Ethnographic

Gabrielino

While of limited use to much of prehistory, data acquired in contact times is somewhat useful as an analogy to the Late Prehistoric Period. At the time of contact in 1769, the Gabrielino Native Americans occupied the area around the APE. The Spanish named the Gabrielino after the Mission San Gabriel Archangel. The Gabrielino spoke Takic (Shoshonean) languages.

Settlement

According to Bean and Smith (1978:538), the Gabrielino is, in many ways, one of the least known groups of California’s native inhabitants. In addition to much of the Los Angeles Basin, they occupied the offshore islands of Santa Catalina, San Nicolas, and San Clemente. Gabrielino populations are difficult to reconstruct. However, at any one time, as many as 50 to 100 villages were simultaneously occupied. Like the prehistoric culture before them, the Gabrielino were a hunter/gatherer group who lived in small sedentary or semi-sedentary groups of 50 to 100 persons, termed rancherias. These rancherias were occupied by at least some of the people all of the time. Location of the encampment was determined by water availability. Houses were circular in form and constructed of sticks covered with thatch or mats. Each village had a sweat lodge as well as a sacred enclosure (Bean and Smith 1978). Although the earliest description of the Gabrielino dates back to the Cabrillo expedition of 1542, the most important and extensive accounts were those written by Father Geronimo Boscana about 1822 and Hugo Reid in 1852.

Subsistence

Gabrielino subsistence relied heavily on plant foods, but was supplemented with a variety of meat, especially from marine resources. Food procurement consisted of hunting and fishing by men and gathering of plant foods and shellfish by women. Hunting technology included use of bow and arrow for deer and smaller game, throwing sticks, snares, traps, and slings. Fishing was conducted with the use of shell fishhooks, bone harpoons, and nets. Seeds were gathered with beaters and baskets. Seeds and other foods were stored in baskets. Seeds were prepared with manos and metates and/or mortars and pestles. Food was cooked in baskets coated with asphaltum, in stone pots, on steatite frying pans, and by roasting in earthen ovens (Bean and Smith 1978).

Trade

Most trade between settlements was through reciprocity (barter), indicated by strings of Olivella shell beads used as a medium of exchange throughout Southern California (Ruby 1970). Gabrielino and Juaneño from the mainland probably traded trade beads, game, and plant foods in exchange for shell beads and steatite, and plant foods from the islanders. Steatite artifacts along with fish, shell money, and animal pelts were traded by the mainlander Gabrielino into the interior for seeds and deer skin. According to Bean and Saubel (1972), the Gabrielino traded with the Serrano and the Cahuilla to the east. The Gabrielino traded goods such as shell beads, dried fish, sea otter pelts, asphaltum, and steatite for goods such as salt, obsidian, deer hides, furs, and acorns. There is evidence of trade between the Arizona Hohokam and the Gabrielino, probably with the Mojave people as middleman (Mason et al. 1997). *Glycymeri*s shell bracelets, ceramics, and blankets may have been exchanged for Pacific shells and shell beads (Mason et al. 1997).

Religion

Aside from shamanistic curing rituals, principal religious activity is related to the Chinigchinich cult that emphasized correct behavior as promulgated by a mythical figure, Chinigchinich. The Chinigchinich religion developed in Gabrielino territory and spread southeast to the Juaneño/Luiseño, Cupeño, and Ipai. It is a cult that is tied into an older creation myth. Chinigchinich is said to give laws and punishment for those who are disobedient in which shamans were given responsibilities to oversee the cult. It was an extensive system of polar opposites (duality) that are united under higher principals (unity) (Applegate 1979). Male-Female dualism found in the creation myth is also present in the origin myth (Applegate 1979). Chinigchinich cult ceremonies included boys' puberty ceremonies using *toloache,* a drug made from Jimson Weed (*Datura stramonium*). During the vision quest, a personal protector or totemic animal was acquired. Such totems could be bear, coyote, crow, or rattlesnake. Other ceremonies were to obtain vengeance on enemies, to express thanks for victory, and to commemorate the dead. The focus of the ceremonies was a circular sacred enclosure found in each village. The emphasis on male rites of passage and war may be a response to the increasing population and resultant competition for territory and access to resources; or it may be a response to the arrival of the Spanish since the Chinigchinich religion seems to be of recent (not prehistoric) origin.

Both inhumation (burial in a grave) and cremation was practiced. During cremations, the goods of the deceased and his hut were often buried with him. Annual mourning ceremonies were held in the late summer for all who had died during the previous year. Clothes of the deceased and an image of the deceased were often burned at this time. Eagles were sacrificed for recently deceased chiefs (Applegate 1979).

The Gabrielino community of *Aluupkenga* was located on the Rancho Santa Anita, a 13,319-acre land grant controlled by Hugo Reid—a Scotsman with Mexican citizenship—that included the present day cities of Arcadia and Monrovia among others (McCawley 1996:44).

3.2.3 Local History

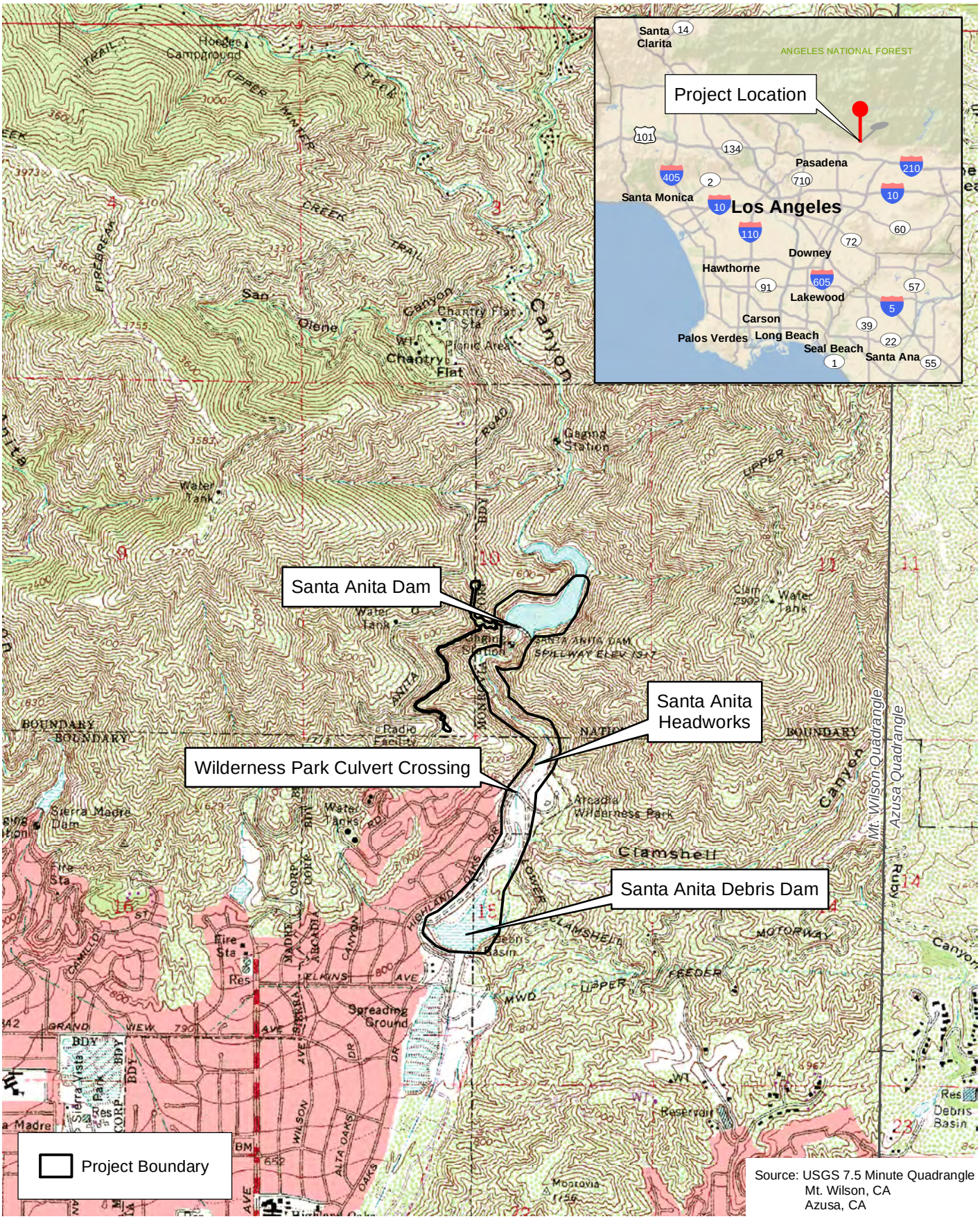
Arcadia saw its first notable settler in Hugo Reid who was deeded the land by the Spanish government, making him the first individual land owner of the area and the first to make a modern impact on the land by stocking cattle and building the first structure.

A succession of owners followed and the one who made a lasting impression on the area was Elias J. "Lucky" Baldwin who in 1875 bought a large area of land including what is known as Arcadia for $200,000 ($25 an acre). When Lucky Baldwin first saw the land of Arcadia with its beautiful foothill landscape, lush greenery and oak trees, fertile growing land, and acres full of potential, Lucky Baldwin was amazed and declared "By Gads! This is paradise". Upon buying the land, Baldwin chose to make the area his home and immediately started erecting buildings and cultivating the land for farming, orchards and ranches. It did not take long before he turned his sights to cityhood for the blossoming area he named Arcadia.

With a population of 500 and a booming economy that was somewhat based on entertainment, sporting, hospitality, and gambling opportunities, Arcadia became a city in 1903. Since then, Arcadia has grown and matured into a city in which Lucky Baldwin would have been proud – one of distinction, heritage, success and beauty (City of Arcadia 2013).

To protect the most populated communities located down slope of the San Gabriel Mountains, a $35 million bond measure was passed in May 1924, to have the LACFCD construct dams in Pacoima, Santa Anita Canyon, and a storm channel from the Los Flores Canyon in Altadena. The Big Santa Anita dam was to be 225-feet-high with a reservoir capacity of 1,500 acre feet. The Dam was completed in 1927 (Daly 2013).

Please refer to the Historic Resources Assessment report (Daly 2013) in Appendix D for a more detailed historic setting.



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Project Location

Exhibit 1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra PSOMAS

(Rev: 10-16-2014 JAZ) H:\PAS\Projects\CoLADPW\J166\Graphics\Cultural\Ex1_LV_usgs.pdf

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Area of Potential Effects

Exhibit 2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N
W E
S

1,000 500 0 1,000
Feet

BonTerra PSOMAS

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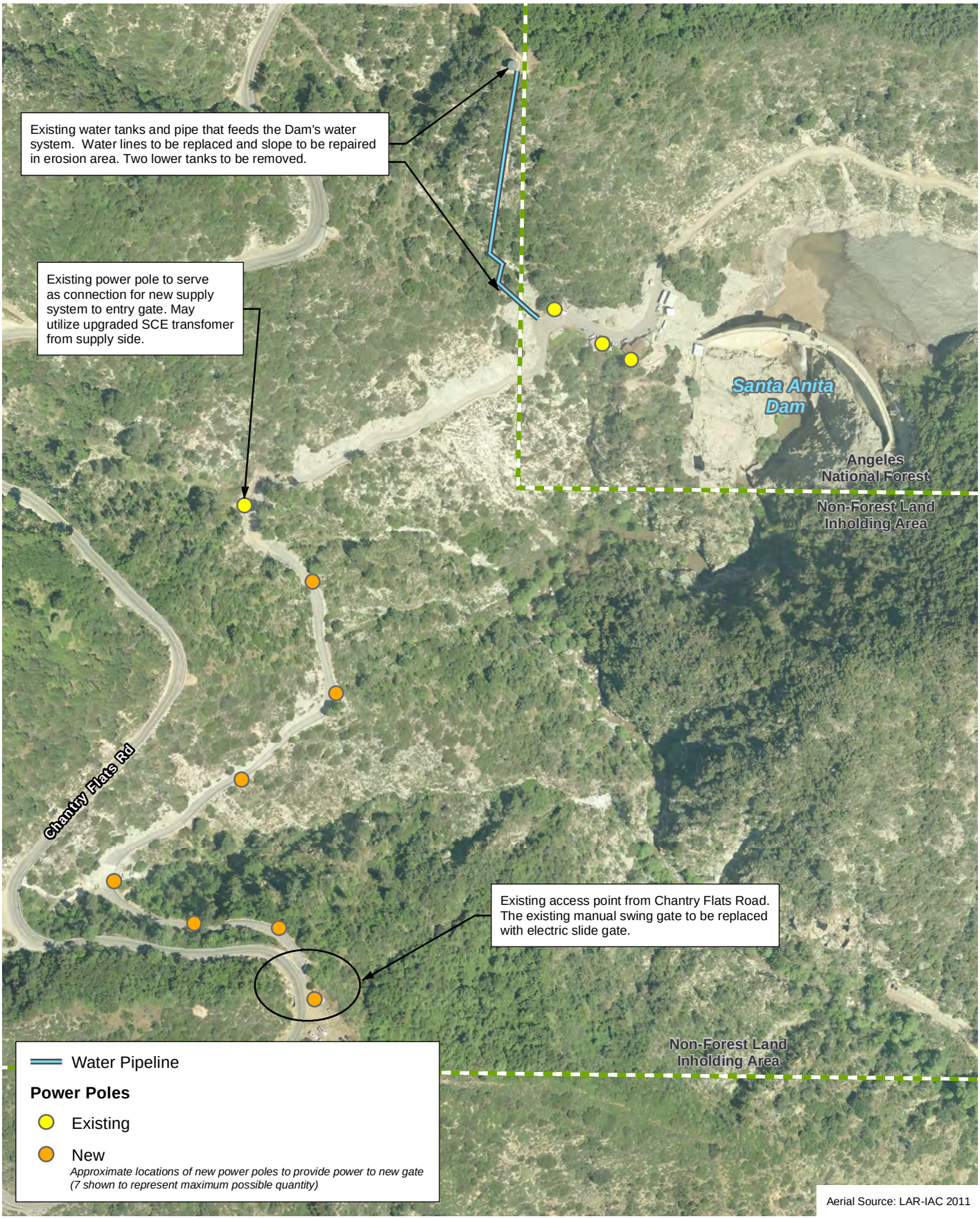

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Dam Ancillary Facilities Improvements

Exhibit 3

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N W E S

300 150 0 300 Feet

BonTerra PSOMAS

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4.0 METHODS

4.1 CULTURAL RESOURCES RECORDS SEARCH

A literature review of documents on file at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton was completed by Patrick Maxon on December 3, 2012, and he completed a second records search at the USFS offices in Arcadia on January 9, 2013, with assistance from USFS Archaeologist Darrell Vance (Appendix A). The SCCIC review consisted of an examination of the USGS' Mt. Wilson, California 7.5-minute quadrangle to evaluate the APE for any sites recorded or cultural resources studies conducted on the parcel and within a one-mile radius. The SCCIC is the designated branch of the California Historical Resources Information System and houses records concerning archaeological and historic resources in Los Angeles, Orange, and Ventura Counties. The records search provided data on known archaeological and built environment resources as well as previous studies within one mile of the APE. Data sources consulted at the SCCIC included archaeological records; Archaeological Determinations of Eligibility; historic maps; and the Historic Property Data File (HPDF) maintained by the California Office of Historic Preservation (OHP). The HPDF contains listings for the CRHR and/or NRHP, California Historical Landmarks, and California Points of Historical Interest.

4.2 NATIVE AMERICAN SCOPING

An inquiry was made of the NAHC, located in Sacramento on December 20, 2012, to request a review of the Sacred Lands File 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 NAHC responded on December 21, 2012, and also provided a list of Native American groups and individuals who may have knowledge regarding Native American cultural resources not formally listed on any database. Each of these groups and individuals were mailed an informational letter January 2, 2013, describing the Project and requesting any information regarding resources that may exist on or near the APE. Information regarding the results of the Native American coordination/consultation is provided in Appendix B.

4.3 CULTURAL RESOURCES FIELD SURVEY

An archaeological survey of the APE was conducted by BonTerra Archaeologist and Director of Cultural Resources, Patrick Maxon, RPA on January 9, 2013. The survey focused on those portions of the APE where the subsurface might be impacted by the Project: the Dam, the Headworks, and the Debris Dam. Although these areas have undergone much historic modification, the Headworks and Debris Dam were surveyed closely for archaeological materials. The remainder of the APE was examined as necessary via windshield survey. A historic resources survey was undertaken on January 9, 2013 by architectural historian Pam Daly of Daly and Associates. Additionally, Mr. David Smith of BonTerra Psomas surveyed several Dam ancillary facilities on May 20, 2014.

5.0 RESULTS

5.1 CULTURAL RESOURCES RECORDS SEARCH – SCCIC

Twenty-two archaeological studies have been conducted within a one-mile radius of the Project's APE. Four of the studies included at least a portion of the APE. Twelve previously recorded resources are located within one mile of the APE. One recorded resource is located within the APE.

Table 1 identifies the four previous cultural resources studies that include at least a portion of the APE.

TABLE 1
CULTURAL RESOURCES STUDIES WITHIN THE APE

Report Number	Author(s) (Year)	Type of Study/Comments
LA3308	Bissell (1993)	Cultural Resources Reconnaissance of the Madison/Cloverleaf Specific Plan Area, Monrovia, Los Angeles County, California
LA3372	Triem (1993)	Historic Resources Evaluation and Management Plan, United State Forest Service, Angeles National Forest
LA6859	LSA Associates (1996)	Arcadia General Plan
LA10598	Strauss et al. (2007)	Cultural Resources Assessment for the Proposed Santa Anita Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, California

Table 2 describes the twelve known cultural resources within one mile of the APE. One cultural resource noted in Table 2 is within the APE of the proposed Project: P-19-188707, the Santa Anita Dam.

TABLE 2
CULTURAL RESOURCES ON OR WITHIN ONE MILE OF THE APE

Site Number	Recorder/(Year)	Comment	Resource Within APE
CA-LAN-1951H	McIntyre (1991)	Zion Trail	No
CA-LAN-2102H	Becker et al. (1993)	Lux Cabin	No
CA-LAN-2103H	Becker and Gregory (1993)	Two Chimneys	No
CA-LAN-2014H	Becker and Stevens (1993)	Survey Monument 2	No
CA-LAN-2106H	Bissell (1993)	Survey Monument 1	No
CA-LAN-2109H	Becker and Gregory (1993)	Concrete Channel	No
P-19-150017	Gregory (1993)	Shinoda Property - 610-620 Cloverleaf Drive	No
P-19-150018	Gregory (1993)	Quest's End - 1250 Cloverleaf Drive	No
P-19-150019	Gregory (1993)	Clover Crest, Lux Arboretum Annex	No
P-19-150025/26	Stone (1992)	Sierra Madre Ranger Station	No
P-19-187819	Huckabee(2006)	Chantry Road, 2N41	No
P-19-188707	EDAW (2007)	Santa Anita Dam Complex	Yes

P-19-188707

This site is the Santa Anita Dam Complex. It consists of the Santa Anita Dam, shelter house, hoist house, relief quarters, storage shed, sluice gate control house, dam keeper's house and garage, and paint shed. The Dam was completed in 1927 while the remaining resources were built after 1936. The complex was recorded by EDAW, Inc. (2007) as a part of the Santa Anita Riser Modification Project and subsequently evaluated for significance by EDAW's Christy Dolan. It was determined to be not significant under all California Register of Historical Resources and National Register of Historic Places significance criteria (Dolan 2007).

5.2 CULTURAL RESOURCES RECORDS SEARCH – U.S. FOREST SERVICE

A second records search was undertaken at the USFS office in Arcadia. Mr. Maxon and Architectural Historian Pam Daly of Daly and Associates met Forest Service Archaeologist Darrell Vance at the USFS's Arcadia headquarters on January 9, 2013. Mr. Vance pointed out the location of reports and site records which BonTerra accessed independently. The reports and records documented work done outside of the proposed Project's APE. No sites or studies are recorded within the APE. It was determined that the EDAW assessment completed for the Santa Anita Riser Modification Project (Strauss et al. 2007) and the accompanying site record for the Dam (Dolan 2007) were missing from USFS archives. The 2007 EDAW report and site record was provided to Mr. Vance.

5.3 NATIVE AMERICAN SACRED LANDS FILE REVIEW

The NAHC Search of the Sacred Lands File on December 21, 2012, did not identify the presence of Native American cultural resources on the APE. The NAHC provided a list of Native American groups and individuals that may have knowledge of the religious and/or cultural significance of resources that may be in and near the APE. The NAHC listed the following groups and individuals:

- Ron Andrade, Director, LA City/County Native American Indian Commission;
- Cindi Alvitre, Chairwoman-Manisar, Ti'At Society/Inter-Tribal Council of Pimu;
- John Tommy Rosas, Tribal Administrator, Tongva Ancestral Territorial Tribal Nation;
- Anthony Morales, Chairperson, Gabrielino/Tongva San Gabriel Band of Mission Indians;
- Sam Dunlap, Cultural Resources Director, Gabrielino Tongva Nation;
- Robert Dorame, Tribal Chair/Cultural Resources, Gabrielino Tongva Indians of California Tribal Council;
- Bernie Acuña, Chairperson, Gabrielino-Tongva Tribe;
- Linda Candelaria, Chairwoman, Gabrielino-Tongva Tribe;
- Andrew Salas, Chairperson, Gabrielino Band of Mission Indians; and
- Conrad Acuña, Gabrielino-Tongva Tribe.

Each of these Native American groups and individuals were mailed an informational letter on January 2, 2013, describing the Project and requesting any information regarding resources that may exist on or near the APE. Two responses have been received to date from the Native American groups and individuals contacted.

On January 22, 2013, Robert Dorame, Tribal Chair/Cultural Resources, Gabrielino Tongva Indians of California Tribal Council responded by telephone, stating that this area was his family's territory and it is sensitive for the presence of archaeological resources. In the event of a discovery of resources during grading, Mr. Dorame would like to be informed. On January 25, 2013, Anthony Morales, Chairperson, Gabrielino/Tongva San Gabriel Band of Mission Indians responded by telephone. His call was returned by Mr. Maxon on February 12, 2013. Mr. Morales stated that the presence of water always increases the chances of presence of Native American cultural material and/or human remains, and that all due diligence should be completed to determine the impacts of the Project on those resources. All Native American correspondence can be viewed in Appendix C.

5.4 ARCHAEOLOGICAL FIELD SURVEY

On January 9, 2013, BonTerra's Patrick Maxon and Pamela Daly conducted a pedestrian survey of the APE. For the purposes of archaeological resources, the survey area can be described as three distinct areas: the Santa Anita Dam; the Santa Anita Headworks and culvert crossing; and the Santa Anita Debris Dam, with additional built environment elements interspersed among these areas. Additionally, Mr. David Smith of BonTerra Psomas surveyed several Dam ancillary facilities on May 20, 2014.

5.4.1 Santa Anita Dam

This area was not directly accessed, but a large part of it (mainly on the southwest side of the Dam) could be clearly seen from various vantage points just west of APE. The improvements to the Dam facilities would be limited to existing engineered structures and are not expected to disturb any native sediments. The photograph below, taken from the southwest and looking northeast, depicts the Dam.

5.4.2 Santa Anita Headworks

The Headworks area was examined for exposed archaeological resources. None were noted, but minimal impacts to previously undisturbed subsurface around the Headworks are anticipated. The excavations related to upgrading the Headworks would involve disturbance of sediments surrounding the existing Headworks facility and minimal, if any, undisturbed native sediments will be impacted. The replacement of the culvert crossing and disturbance to portions of the upstream channel is within the existing drainage and there is minimal chance that cultural material is present

there. Therefore, there is little opportunity for disturbing archaeological resources even if they are present in the area. The photograph below depicts the Headworks.

5.4.3 Santa Anita Debris Dam

The Debris Dam area was examined on foot and in the car. The entire Debris Dam area has been greatly modified by modern human activity and yet much of the current surface within the APE is undisturbed. Project plans are to remove the existing spillway and replace it with a new one immediately to the east. This would necessitate excavations into the ridge and slope to the east to prepare it for construction of the new spillway. These planned excavations will impact the bedrock that make up this ridge. However, the bedrock unit that will be impacted is composed of Granodioritic rock which does not contain fossil resources since it was once molten rock and any fossils near the rock would be destroyed. The photograph below depicts a portion of the Debris Dam, Spillway, and existing ridge, from right to left in the foreground.

5.5 HISTORICAL RESOURCES SURVEY

On January 9, 2013, BonTerra's Pamela Daly conducted a pedestrian survey of the APE to identify and assess the significance of portions of the Santa Anita flood control facilities. Ms. Daly identified and evaluated several historic resources on the site that are a part of the flood control facilities. They include:

- **Santa Anita Dam.** The complex includes the Dam; the dam keeper's house and garage; a paint and explosives shed; a sluice gate control house; and a shelter house. The complex was previously evaluated and determined not eligible for listing on the CRHR or NRHP (Strauss et al., 2007; Dolan 2007);

- **Sediment Transport Tunnel.** This tunnel was constructed to dispose of sediment that had accumulated in the Santa Anita Reservoir;

- **Headworks.** This structure intercepts the flow released from the Dam and redirects portions of it to the Spreading Grounds or allows it to continue to the Debris Dam;

- **Culvert Crossing.** The channel crossing, located approximately 450 feet southwest of the Headworks and adjacent to Arcadia Wilderness Park, consists of a concrete-slab road bed 29-feet-wide set on concrete walls. Four large steel culvert pipes have been set in concrete under the road bed to allow the flow of water and protect the culvert crossing;

- **Debris Dam and Spillway.** This area consists of an embankment constructed of compacted earth; an excavated area within the basin to catch debris; an outlet conduit to permit normal flow of water to pass through and drain the basin after a storm; and a concrete spillway to permit water to flow out of the basin when it is filled during a storm; and,

All the elements described above were evaluated for significance and all were determined not eligible for listing in the NRHP or CRHR. Refer to Daly (2013) in Appendix D and to the Project impact analysis in Section 6.0.

6.0 CEQA IMPACT ANALYSIS

This impact analysis is provided to assist in the preparation of an environmental document for the proposed Project and provides discussion regarding each significance criterion for cultural resources.

6.1 SIGNIFICANCE CRITERIA

Appendix G of the State CEQA Guidelines contains the Environmental Checklist form, which includes questions relating to cultural resources. The issues presented in the Environmental Checklist have been used as significance criteria. Accordingly, a project may result in a significant environmental impact if:

- *The project would cause a substantial adverse change in the significance of a historical resource as defined in §15064.5.*
- *The project would cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5.*
- *The project would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.*
- *The project would disturb any human remains, including those interred outside of formal cemeteries.*

6.2 PROJECT IMPACT ANALYSIS

Would the project cause a substantial adverse change in the significance of a historical resource?

The Santa Anita Dam (Dam) was constructed from 1924 to 1927 by the LACFCD. The Dam was previously evaluated and found not eligible for the NRHP (Dolan 2007). It was in the 1950s that the Headworks and Culvert Crossing; and Debris Dam and spillway, were constructed to control and capture the flow of water from the Dam to protect life and property as populations rose. The Sediment Transport Tunnel was constructed only to provide access to the basin of the Dam reservoir so that accumulated silt could be removed and deposited elsewhere. Surveyors were able to use the most modern technology available in the form of laser beams to direct the mining operations associated with constructing a 9-foot-wide tunnel through the mountain.

Under National Register and/or California Register criteria relating to the association of the built-environment structures located within the APE with significant historical events that exemplify broad patterns of our history, the Santa Anita Dam, Headworks and Culvert Crossing, Debris Dam and spillway, and Sediment Transport Tunnel, and Dam Ancillary Facilities Improvements do not appear to qualify as significant historic resources individually or collectively. Throughout the world, debris basins and dams (masonry, earthen or timber) have been constructed by both private and public entities to control seasonal rainfall, and to protect people and property. The structures located within the APE are just one of many flood control systems that were constructed in the canyons of San Gabriel Mountain. There is no evidence that any of the structures in the APE are eligible for listing under Criteria A/1.

Under National Register and/or California Register criteria related to the Project structure's association with persons of historic importance, the Santa Anita Dam, Headworks, Culvert Crossing, Debris Dam and spillway, and Sediment Transport Tunnel, and Dam Ancillary Facilities Improvements do not appear to qualify, individually or collectively, as significant resources. The

design plans for the structures located in the Santa Anita Wash were prepared by LACFCD staff engineers or the USACE as part of their normal tasks and duties. There is no evidence that any of the structures in the APE are eligible for listing under Criteria B/2.

Under National Register and/or California Register criteria relating to the distinctive characteristics of a type, period, region, or method of construction, the built-environment structures located in the APE are not significant as they do not, individually or collectively, embody any innovative engineering design or method of construction, or high artistic design. The Headworks was designed using common technology to channel water from the Dam towards the Debris Dam or into the pipe leading to the Sierra Madre Spreading Grounds. The Debris Dam was constructed by excavating a water containment area in the Santa Anita Wash, and a spillway was erected to hold heavier debris back during high rainfall events. The technology used to create the basin and associated spreading grounds were commonplace, as was the use of concrete to hold, channel, divert, and control the water as it came down from the foothills. The Santa Anita Dam, Headworks, Culvert Crossing, Debris Dam and spillway, and Sediment Transport Tunnel, and Dam Ancillary Facilities Improvements do not appear to present any technological achievement in the history of water systems locally, regionally or nationally, and are therefore not eligible for listing either individually or collectively under Criteria C/3.

Based upon a survey of the above-ground historic period resources in the APE, the resources have not yielded, nor do they appear to have the potential to yield, information important to the history of the local area, California or the nation pursuant to National Register and/or California Register criteria D/4.

In summation, the Santa Anita Dam, Headworks; Culvert Crossing; Debris Dam and spillway; and Sediment Transport Tunnel, and Dam Ancillary Facilities Improvements are not eligible for listing in the National Register and/or the California Register, because they do not, individually or collectively, meet any of the criteria necessary for listing in the registries. No further consideration must be given to these resources during completion of the proposed Project.

Would the project cause a substantial adverse change in the significance of an archaeological resource?

The proposed improvements to the Dam facilities would be limited to existing engineered structures and gunite surfaces and are not expected to disturb any native sediments. However, construction activities at the Headworks and the Wilderness Park Culvert Crossing will require excavations within the native soils of the creekbed. Construction at the Debris Dam will require disturbance of accumulated sediment and possibly native soils within the water retention area to install the new/replacement intake tower and the Debris Dam embankment.

Given that the proposed construction activities have the potential to disturb native soils, it is possible that archaeological materials would be uncovered during construction activities at the Headworks/Wilderness Park Culvert Crossing and Debris Dam facilities. Although the likelihood of encountering archaeological resources in the APE is considered low, this impact is potentially significant. MM 1 describes procedures for monitoring and protocols to be followed in the event that archaeological resources are discovered during construction activities. Implementation of this MM 1 would reduce this potentially significant impact to a less than significant level.

Would the project disturb or encounter any significant paleontological remains?

The proposed improvements to the Dam facilities would be limited to existing engineered structures and gunite surfaces and would not require deep excavations that may disturb underlying fossil remains. Construction activities at the Dam would have no impact on

paleontological resources or unique geologic features. At the Headworks and the Wilderness Park Culvert Crossing, the proposed improvements would involve localized excavations, shallow grading, and fill materials to construct the new facilities, but would not excavate into paleontologically sensitive rock units. Because the Project would not excavate into paleontologically sensitive rock units, the Project would have a less than significant impact on paleontological resources and no mitigation is required.

Would the project disturb any human remains, including those interred outside of formal cemeteries?

There is no indication that human remains are present within the Project area. The records search and field survey indicates no evidence of human remains on or near the Dam, Headworks/Wilderness Park Culvert Crossing, or Debris Dam. Recently deposited sediment, debris, and vegetation that flowed with storm waters into the Debris Dam are not expected to contain any human remains, including those interred outside formal cemeteries.

In the unlikely event of an unanticipated encounter with human remains in Project site, the *California Health and Safety Code* and the *California Public Resources Code* require that any activity in the area of a potential find be halted and the Los Angeles County Coroner be notified, as described in MM 2. Compliance with MM 2 would ensure that impacts would be less than significant.

7.0 RECOMMENDED MITIGATION MEASURES

MITIGATION MEASURE 1

Should archaeological resources be found during ground-disturbing activities for the Project, an Archaeologist shall be hired to first determine whether it is a “unique archaeological resource” pursuant to Section 21083.2(g) of the *California Public Resources Code* (PRC) or a “historical resource” pursuant to Section 15064.5(a) of the State CEQA Guidelines. If the archaeological resource is determined to be a “unique archaeological resource” or a “historical resource”, the Archaeologist shall formulate a mitigation plan in consultation with the LACFCD that satisfies the requirements of the above-referenced sections. If the Archaeologist determines that the archaeological resource is not a “unique archaeological resource” or “historical resource”, s/he may record the site and submit the recordation form to the California Historic Resources Information System at the South Central Coastal Information Center at California State University, Fullerton.

Implementation of MM 1 would ensure that impacts to archaeological resources are reduced to a less than significant level.

MITIGATION MEASURE 2

If human remains are encountered during excavation activities, all work shall halt in the immediate vicinity of the discovery and the County Coroner shall be notified (*California Public Resources Code* §5097.98). The Coroner shall determine whether the remains are of forensic interest. If the Coroner, with the aid of the County-approved Archaeologist, determines that the remains are prehistoric, s/he will contact the Native American Heritage Commission (NAHC). The NAHC shall be responsible for designating the most likely descendant (MLD), who will be responsible for the ultimate disposition of the remains, as required by Section 7050.5 of the *California Health and Safety Code.* The MLD shall make his/her recommendation within 48 hours of being granted access to the site. The MLD’s recommendation shall be followed if feasible, and may include scientific removal and non-destructive analysis of the human remains and any items associated with Native American burials (*California Health and Safety Code* §7050.5). If the landowner rejects the MLD’s recommendations, the landowner shall rebury the remains with appropriate dignity on the property in a location that will not be subject to further subsurface disturbance (*California Public Resources Code* §5097.98).

Implementation of MM 2 would ensure that impacts to human remains are reduced to a less than significant level.

8.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this cultural resources report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: June 2014 SIGNED:

_____

Patrick O. Maxon, M.A., RPA
Director, Cultural Resources

9.0 REFERENCES

Applegate, R.B.
1979 The Black, the Red, and the White: Duality and Unity in the Luiseño Cosmos. *The Journal of California and Great Basin Anthropology* 1(1):71-88.

Arcadia, City of
2013 http://www.ci.arcadia.ca.us/home/index.asp?page=1102

Bada, J. L., R. A. Schroeder, and G. G. Carter
1974 New Evidence for the antiquity of man in North America deduced from aspartic acid racemization. Science 184

Bean, J.L. and Saubel
1972 *Temalpakh: Cahuilla Indian Knowledge and Usage of Plants.* Malki Museum, Inc., Banning, California.

Bean, L.J., and C.R. Smith
1978 Gabrielino. In *Handbook of North American Indians: California*, Vol. 8, edited by R.F. Heizer, pp. 530-549. Smithsonian Institution, Washington, D.C.

Berger, R., R. Protsch, R. Reynolds, C. Rozaire, and J. Sackett
1971 *New Radiocarbon date based on bone collagen of California Paleoindians*. Berkeley: Contributions of the University of California Archaeological Research Facility 12:43-49.

Daly, P
2013 Historic Resources Assessment Report: Santa Anita Stormwater Flood Management and Seismic Strengthening Project Description Santa Anita Wash Headworks and Debris Dam, Arcadia, Los Angeles County, CA

Dolan, Christy
2007 DPR 523B Site Recording Form, P-19-188707: Santa Anita Dam Complex Building, Structure, and Object Record.

Drover, C.E., H.C. Koerper, and P.E. Langenwalter II
1983 Early Holocene Human Adaptation on the Southern California Coast: A Summary Report of Investigations at the Irvine Site (CA-ORA-64), Newport Bay, Orange County, California. *Pacific Coast Archaeological Society Quarterly* 19 (3+4): 1-84.

EDAW, Inc.
2007 DPR 523 Site Recording Form, P-19-188707: Santa Anita Dam Complex.

Erlandson, J., T. Rick, T. Jones, & J. Porcasi
2007 One if by Land, Two If by Sea: Who Were the First Californians? In, *California Prehistory: Colonization, Culture, and Complexity* (T. Jones & K. Klar (eds.), Altamira Press, Lanham, Maryland.

Koerper, H.C., and C.E. Drover
1983 Chronology Building for Coastal Orange County: The Case from ORA-119-A. *Pacific Coast Archaeological Society Quarterly* 19(2):1-34.

Mason, R.D., W.H. Bonner, S.J. Bouscaren, L. Carbone, R.O. Gibson, L.P. Klug, M.L. Peterson and V. Popper

1997 San Joaquin Hills Transportation Corridor Results of Data Recovery at CA-ORA-225, vol. 2. Chambers Group, Inc., Irvine, California. Submitted to Sverdrup Corporation, Irvine, California and Transportation Corridor Agencies, Santa Ana, California.

McCawley, W.

1996 The First Angelinos: The Gabrielino Indians of Los Angeles. Malki Museum Press.

Meighan, C.W.

1959 The Little Harbor Site, Catalina Island: An example of ecological interpretation in archaeology. *American Antiquity* 24(4):383-405.-

1954 A Late Complex in Southern California Prehistory. Southwestern Journal of Anthropology 10:215-227

Office of Historic Preservation

1990 *Archaeological Resource Management Reports (ARMR): Recommended Contents and* Format*.* Department of Parks and Recreation, Office of Historic Preservation, Sacramento, California.

Ruby, J.

1970 *Culture Contact Between Aboriginal Southern California and the Southwest*. Ph.D. dissertation, University of California, Los Angeles.

Strauss, M., C. Dolan, and S. Dietler

2007 Cultural Resources Assessment for the Proposed Santa Anita Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, California. On file, South Central Coastal California Information Center, California State University, Fullerton.

Wallace, William J.

1955 A Suggested Chronology for Southern California Coastal Archaeology. Southwestern Journal of Anthropology II :214-23th

Warren, C.N.

1966 Cultural Tradition and Ecological Adaptation on the Southern California Coast*.* In Archaic Prehistory in the Western United States, *Eastern New Mexico University Contributions in Anthropology* 1 (3):1-14.

Weeks, K. and Grimmer, A.

1995 *The Secretary of The Interior's Standards for the Treatment of Historic Properties: With Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings*. U.S. Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships, Heritage Preservation Services (Washington, D.C.).

APPENDIX A

CULTURAL RESOURCES RECORDS SEARCH (SCCIC)

SCCIC Bibliography: Santa Anita Dam

LA-00247

Author(s): Woodward, Jim
Year: 1988
Title: Archaeological Survey of Lux Arboretum City of Monrovia, California
Affiliation: California Departement of Parks and Recreation
Resources:
Quads: MT WILSON
Pages:
Notes:

LA-00371

Author(s): Malone, Terry
Year: 1977
Title: Archaeological Survey Report on a Tentative Tract of 48.3 Acres Located in the City of Monrovia, County of Los Angeles
Affiliation: Scientific Resource Surveys, Inc.
Resources:
Quads: AZUSA, MT WILSON
Pages:
Notes:

LA-01499

Author(s): Gilliland, Donald B.
Year: 1985
Title: K.m.a.x. Radio Tower (arcadia Electronic Site) ARR
Affiliation: U.S. Forest Service
Resources:
Quads: MT WILSON
Pages:
Notes:

LA-02568

Author(s): Unknown
Year: 1992
Title: A Cultural Resource Assessment Conducted for a Ten-acre Parcel in Sierra Madre, Los Angeles County, California
Affiliation:
Resources:
Quads: MT WILSON
Pages:
Notes:

LA-02936

Author(s): Kerr, David
Year: 1993
Title: Chantry Picnic Area (los Angeles County)
Affiliation: Angeles National Forest
Resources:
Quads: MT WILSON
Pages:
Notes:

SCCIC Bibliography: Santa Anita Dam

LA-03308

Author(s): Bissell, Ronald M.
Year: 1993
Title: Cultural Resources Reconnaissance of the Madison/cloverleaf Specific Plan Area, Monrovia, Loa Angeles County, California
Affiliation: RMW Paleo Associates, Inc.
Resources: 19-002102, 19-002103, 19-002104, 19-002106, 19-002107, 19-002108, 19-002109
Quads: AZUSA, MT WILSON
Pages:
Notes:

LA-03372

Author(s): Triem, Judith
Year: 1993
Title: Historic Resources Evaluation and Management Plan, United States Forest Service, Angeles National Forest
Affiliation: San Buenaventura Research Associates
Resources: 19-000248, 19-001010, 19-001870, 19-150023, 19-150024, 19-150025, 19-150026, 19-150027, 19-150028, 19-150029, 19-150030, 19-150031, 19-150032, 19-150033
Quads: CONDOR PEAK, CRYSTAL LAKE, GLENDORA, LAKE HUGHES, MT BALDY, MT WILSON, PASADENA, VALYERMO, WARM SPRINGS MOUNTAIN, WHITAKER PEAK
Pages:
Notes:

LA-04486

Author(s): Skaggs, Glenn A.
Year: 1998
Title: Archaeological Reconnaissance Report: Chantry Flats Bee Apiary & Communications Site Expansion, Los Angeles Co.
Affiliation: Angeles National Forest
Resources:
Quads: MT WILSON
Pages:
Notes:

LA-04734

Author(s): Kerr, David
Year: 1996
Title: Clamshell Fuelbreak
Affiliation: U.S. Forest Service
Resources:
Quads: AZUSA, MT WILSON
Pages:
Notes:

SCCIC Bibliography: Santa Anita Dam

LA-05513

Author(s): McIntyre, Michael J.
Year: 2000
Title: Archaeological Reconnaissance Report: Big Santa Anita Recreation Residence Tract, Angeles National Forest, Los Angeles County, California
Affiliation: Angeles National Forest
Resources: 19-001529, 19-001530, 19-001533, 19-001951, 19-001964, 19-002052, 19-002409, 19-002477
Quads: MT WILSON
Pages:
Notes:

LA-05514

Author(s): Vance, Darrell W.
Year: 2000
Title: Cultural Resource Evaluation of the Chantry Flat Firestation, Angeles National Forest
Affiliation: Angeles National Forest
Resources: 19-001951
Quads: MT WILSON
Pages: 20
Notes:

LA-06859

Author(s): Unknown
Year: 1996
Title: Arcadia General Plan
Affiliation: LSA Associates, Inc.
Resources: 19-001868
Quads: EL MONTE, MT WILSON
Pages:
Notes:

LA-07205

Author(s): Bartoy, Kevin M.
Year: 2003
Title: Big Santa Anita Canyon Telephone Line (special Use Permitlar 438401) Angeles National Forest, Los Angeles County, California
Affiliation: Pacific Legacy, Inc.
Resources:
Quads: MT WILSON
Pages:
Notes: ARR Number: 01-05-00-889

LA-07207

Author(s): Bartoy, K.
Year: 2003
Title: Archaeological Reconnaissance Report, Federal Communications Commission Communications Site (Special Use Permit LAR003201). Angeles National Forest, Los Angeles County
Affiliation: Pacific Legacy, Inc.
Resources:
Quads: MT WILSON
Pages: 6
Notes:

SCCIC Bibliography: Santa Anita Dam

LA-07213

Author(s): Bartoy, Kevin M.
Year: 2004
Title: Big Santa Anita Tract Recreation Residence Community Defense Zone Project, Angeles National Forest, Los Angeles, California
Affiliation: Pacific Legacy, Inc.
Resources: 19-001951
Quads: MT WILSON
Pages:
Notes: ARR No. 05-01-00896

LA-07217

Author(s): Bartoy, Kevin M.
Year: 2003
Title: Los Angeles County Flood Control Water Line (special Use Pertmit Lar101403) Angeles National Forest, Los Angeles County, California
Affiliation: Pacific Legacy, Inc.
Resources:
Quads: MT WILSON
Pages:
Notes: ARR Number: 05-01-00-873

LA-08138

Author(s): Jordan, Stacey C.
Year: 2007
Title: Revised Archaeological Survey Report for the Sce Deteriorated Pole Replacement Program for H-frame Poles 1927071e and 1927072e on the Pearblossom-vincent 220kv Circuit (wo#4753-0301) and Pole 884941e on the Arboretum 16kv Circuit (wo#6027-4800, Ji#6-4869)
Affiliation: Jones & Stokes
Resources:
Quads: MT WILSON, PALMDALE
Pages:
Notes:

LA-09710

Author(s): Solis, Laurie
Year: 2007
Title: Santa Anita Canyon Reservoir Project, Los Angeles Department of Public Works, Los Angeles County, California. ARR No. 05-01-01065
Affiliation: Angeles National Forest
Resources: 19-187819
Quads: MT WILSON
Pages: 13
Notes:

SCCIC Bibliography: Santa Anita Dam

LA-09716

Author(s): Brasket, Kelli
Year:
Title: Mt. Wilson Trails Maintenance Project, Angeles National Forest, Los Angeles River Ranger District, Los Angeles County, Ca. (ARR # 05-01-1012)
Affiliation: Angeles National Forest
Resources: 19-001951, 19-187820, 19-187821, 19-187822
Quads: MT WILSON
Pages: 12
Notes:

LA-10598

Author(s): Strauss, Monica, Christy Dolan, and Sara Dietler
Year: 2007
Title: Cultural Resources Assessment for the Proposed Santa Anita Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, California
Affiliation: EDAW, Inc.
Resources: 19-188707
Quads: MT WILSON
Pages: 85
Notes:

LA-11322

Author(s): Peebles, David S.
Year: 2009
Title: Eligibility Assessment and National Register Evaluation of the Chantry Flat and Crystal Lake Administrative Sites
Affiliation: Unknown
Resources: 19-001951
Quads: CRYSTAL LAKE, MT WILSON
Pages: 69
Notes:

LA-11833

Author(s): Hoffman, Laura
Year: 2012
Title: Letter Report for Cultural Resources Survey and Monitoring for Southern California Edison Survey and Monitoring for Replacement of Pole Numbers 1363621E and 780599E/4524817E, Angeles National Forest, Los Angeles County, California
Affiliation: SWCA Environmental Consultants
Resources:
Quads: CRYSTAL LAKE, MT WILSON
Pages: 11
Notes:

APPENDIX B

NATIVE AMERICAN CONSULTATION (NAHC)

BonTerra CONSULTING

TRANSMITTAL

DATE: December 20, 2012

TO:	Mr. Dave Singleton	**FAX NUMBER:**	(916) 657-5390
	Program Analyst	**TEL NUMBER:**	(916) 653-6251
	Native American Heritage Comm.	**PROJECT:**	**Santa Anita Dam Project**
	915 Capitol Mall, Rm. 364		
	Sacramento, CA 95814	**FROM:**	Patrick Maxon, RPA

☒ Fax / Pages__ ☐ E-Mail ☐ Fed Ex / Overnite Express ☐ Delivery / Courier

REGARDING: Sacred Lands File Search and Contact List Request

Dear Mr. Singleton:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed **Santa Anita Dam Project** located in unincorporated Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines).

At your earliest convenience, please conduct a search of the Sacred Lands File for the proposed project, located within Township 1 North; Range 11 West of the USGS **Mt. Wilson, CA** 7.5 Minute Quadrangle. Refer to attached exhibit.

The Santa Anita Stormwater Flood Management and Seismic Strengthening Project will modify four existing facilities related to the Santa Anita Dam along Santa Anita Wash. These facilities are the Santa Anita Dam itself, the Santa Anita Debris Basin approximately one mile downstream, and the Santa Anita Headworks situated between them. These facilities, which are operated and maintained by the Los Angeles County Flood Control District, serve to control and conserve the floodwaters of the Santa Anita Canyon watershed. This watershed is mostly undeveloped with the majority of it located in the Angeles National Forest within the San Gabriel Mountains, which are very steep and among the most highly erosive mountains in the world. This watershed is also susceptible to wildfires, which result in tremendous debris flows during subsequent storm events. The facilities are located within one mile of the Sierra Madre Fault, which is capable of a producing a maximum credible earthquake (MCE) of magnitude 7.5.

The proposed Project will improve District facilities to better manage stormwater runoff from the Santa Anita Canyon watershed and achieve the following goals: 1) reduce flood damage to the downstream communities, 2) increase recharge of the local groundwater basin and 3) improve public safety by remediating seismic safety issues at the Dam and the Debris Basin.

Please fax the results to me at (714) 444-9599, or e-mail to p.maxon@bonterraconsulting.com, referencing your letter to the "**Santa Anita Dam Project** ".

If you have any questions or require any additional information, please do not hesitate to contact me at (714) 444-9199 or via email.

Sincerely,

2 Executive Circle, Suite 175 Irvine, CA 92614 (714) 444-9199 (714) 444-9599 Fax

BONTERRA CONSULTING

Patrick Maxon, RPA
Director, Cultural Resources

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

December 21, 2012

Mr. Patrick Maxon, RPA, Director – Cultural Resources
BONTERRA CONSULTING
2 Executive Circle, Suite 175
Irvine, CA 92614

Sent by FAX to: 714-444-9599
No. of Pages: 5

Re: Sacred Lands File Search and Native American Contacts list for the proposed Sacred Lands File Search and Native American Contacts list for the proposed **Santa Anita Dam Project** ;" located in the Santa Anita Canyon Watershed, mostly in the Angeles National Forest; Los Angeles County County, California

Dear. Mr. Maxon:

:

The Native American Heritage Commission (NAHC) conducted a search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (Area of Potential Effect or APE) referenced above. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American traditional cultural places or cultural landscapes in any APE. While in this case, a search of the NAHC *Sacred Lands File* did not indicate the presence of Native American cultural sites within one-half mile of the APE location data you provided However, there are Native American cultural resources in close proximity to the APE.

Also, a Native American tribe or individual may be the only source for the presence of traditional cultural places. For that reason, enclosed is a list of Native American individuals/organizations who may have knowledge of traditional cultural places in your project area. This list should provide a starting place in locating any areas of potential adverse impact.

California Public Resources Code §§5097.94 (a) and 5097.96 authorize the NAHC to establish a Sacred Land Inventory to record Native American sacred sites and burial sites. These records are exempt from the provisions of the California Public Records Act pursuant to. California Government Code §6254 (r). The purpose of this code is to protect such sites from vandalism, theft and destruction.

In the 1985 Appellate Court decision (170 Cal App 3rd 604), the court held that the NAHC has jurisdiction and special expertise, as a state agency, over affected Native American resources, impacted by proposed projects including archaeological, places of religious significance to Native Americans and burial sites

The California Environmental Quality Act (CEQA – CA Public Resources Code §§ 21000-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes

archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. CA Government Code §65040.12(e) defines "environmental justice" provisions and is applicable to the environmental review processes. The NAHC recommends *avoidance* as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy Native American cultural resources and California Public Resources Code Section 21083.2 (Archaeological Resources) that requires documentation, data recovery of cultural resources, construction to avoid sites and the possible use of covenant easements to protect sites.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Local Native Americans may have knowledge of the religious and cultural significance of the historic properties of the proposed project for the area (e.g. APE). Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). We urge consultation with those tribes and interested Native Americans on the list that the NAHC has provided in order to see if your proposed project might impact Native American cultural resources. Lead agencies should consider avoidance as defined in §15370 of the CEQA Guidelines when significant cultural resources as defined by the CEQA Guidelines §15064.5 (b)(c)(f) may be affected by a proposed project. If so, Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "substantial," and Section 21083.2 which requires documentation, data recovery of cultural resources.

The NAHC makes no recommendation or preference of any single individual, or group over another. All of those on the list should be contacted, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The aforementioned Secretary of the Interior's *Standards* include recommendations for all 'lead agencies' to consider the historic context of proposed projects and to "research" the cultural landscape that might include the 'area of potential effect.'

Partnering with local tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C 4321-43351) and Section 106 4(f), Section 110 and (k) of the federal NHPA (16 U.S.C. 470 *et seq*), Section 4(f) of the Department of Transportation Act of 1966 (23 CFR 774); 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq.* and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to

all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The NAHC remains concerned about the limitations and methods employed for NHPA Section 106 Consultation.

Also, California Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery', another important reason to have Native American Monitors on board with the project.

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. An excellent way to reinforce the relationship between a project and local tribes is to employ Native American Monitors in all phases of proposed projects including the planning phases.

Confidentiality of "historic properties of religious and cultural significance" may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibility threatened by proposed project activity.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton

Attachment: Native American Contact List

Native American Contacts
Los Angeles County
December 19, 2012

LA City/County Native American Indian Comm
Ron Andrade, Director
3175 West 6th St, Rm. 403
Los Angeles , CA 90020
randrade@css.lacounty.gov
(213) 351-5324
(213) 386-3995 FAX

Gabrielino Tongva Nation
Sam Dunlap, Cultural Resources Director
P.O. Box 86908 Gabrielino Tongva
Los Angeles , CA 90086
samdunlap@earthlink.net

(909) 262-9351 - cell

Ti'At Society/Inter-Tribal Council of Pimu
Cindi M. Alvitre, Chairwoman-Manisar
3094 Mace Avenue, Apt. B Gabrielino
Costa Mesa, , CA 92626
calvitre@yahoo.com
(714) 504-2468 Cell

Gabrielino Tongva Indians of California Tribal Council
Robert F. Dorame, Tribal Chair/Cultural Resources
P.O. Box 490 Gabrielino Tongva
Bellflower , CA 90707
gtongva@verizon.net
562-761-6417 - voice
562-761-6417- fax

Tongva Ancestral Territorial Tribal Nation
John Tommy Rosas, Tribal Admin.
Private Address Gabrielino Tongva
,
tattnlaw@gmail.com
310-570-6567

Gabrielino-Tongva Tribe
Bernie Acuna, Chairperson
1875 Century Pk East #1500 Gabrielino
Los Angeles , CA 90067
(619) 294-6660-work
(310) 428-5690 - cell
(310) 587-0170 - FAX
bacuna1@gabrieinotribe.org

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel , CA 91778
GTTribalcouncil@aol.com
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 -FAX

Gabrielino-Tongva Tribe
Linda Candelaria, Chairwoman
1875 Century Pk East #1500 Gabrielino
Los Angeles , CA 90067
palmsprings9@yahoo.com
626-676-1184- cell
(310) 587-0170 - FAX

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the 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 applicable for contacting local Native Americans with regard to cultural resources for the proposed Santa Anita Dam Project; located in the Santa Anita Canyon Watershed, mostly in the Angeles National Forest; Los Angeles County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Native American Contacts
Los Angeles County
December 19, 2012

Gabrieleno Band of Mission Indians
Andrew Salas, Chairperson
P.O. Box 393 Gabrielino
Covina , CA 91723
(626) 926-4131
gabrielenoindians@yahoo.com

Gabrielino-Tongva Tribe
Conrad Acuna,
1875 Century Pk East #1500 Gabrielino
Los Angeles , CA 90067
310-587-2203

310-587-2203

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the 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 applicable for contacting local Native Americans with regard to cultural resources for the proposed Santa Anita Dam Project; located in the Santa Anita Canyon Watershed, mostly in the Angeles National Forest; Los Angeles County, California for which a Sacred Lands File search and Native American Contacts list were requested.

BonTerra CONSULTING
2 Executive Circle, Suite 175 Irvine, CA 92614
T: (714) 444-9199 F: (714) 444-9599 | www.BonTerraConsulting.com

January 2, 2013

Mr. Bernie Acuña, Chairperson
Gabrielino-Tongva Tribe
1875 Century Park East 1500
Los Angeles, California 90067

Subject: Santa Anita Dam Project

Dear Mr. Acuña:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Santa Anita Dam Project located in the Angeles National Forest in unincorporated Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

Location

The project site is located in the Angeles National Forest, within Township 1 North; Range 11 West of the USGS Mt. Wilson, CA 7.5 Minute Quadrangle. Refer to attached exhibit.

Project

The Santa Anita Stormwater Flood Management and Seismic Strengthening Project will modify four existing facilities related to the Santa Anita Dam along Santa Anita Wash. These facilities are the Santa Anita Dam itself, the Santa Anita Debris Basin approximately one mile downstream, and the Santa Anita Headworks situated between them. These facilities, which are operated and maintained by the Los Angeles County Flood Control District, serve to control and conserve the floodwaters of the Santa Anita Canyon watershed. This watershed is mostly undeveloped with the majority of it located in the Angeles National Forest within the San Gabriel Mountains, which are very steep and among the most highly erosive mountains in the world. This watershed is also susceptible to wildfires, which result in tremendous debris flows during subsequent storm events. The facilities are located within one mile of the Sierra Madre Fault, which is capable of a producing a maximum credible earthquake (MCE) of magnitude 7.5.

The proposed Project will improve District facilities to better manage stormwater runoff from the Santa Anita Canyon watershed and achieve the following goals: (1) reduce flood damage to the downstream communities, (2) increase recharge of the local groundwater basin, and (3) improve public safety by remediating seismic safety issues at the Dam and the Debris Basin.

NAHC Notification

A Sacred Lands File Search conducted by the Native American Heritage Commission (NAHC) failed to identify Native American cultural resources in the project area of potential affect (APE). The NAHC also provided BonTerra Consulting with a list of Native American individuals/organizations that may have knowledge of cultural resources in the project area. Your name and contact information was included on the list and serves as the basis for this letter.

Records Search

An archaeological/historic records search was conducted at the Eastern Information Center (EIC) at the California State University, Fullerton on December 3, 2012 to evaluate the existing conditions of the project site. Thirteen archaeological sites have been recorded within one mile of the project site. None are recorded on the project site. A cultural resources survey of the property will be conducted in January 2013 to identify any exposed cultural resources.

Your participation in this local planning process is important. If you have any additional knowledge of Native American Sacred Lands or other cultural resources on or near the study area, or any comment on the project, please contact me at your earliest convenience at (714) 444-9199 or via email at pmaxon@bonterraconsulting.com, with a subject line referencing the "Santa Anita Dam Project".

Sincerely,

BONTERRA CONSULTING

Patrick O. Maxon, RPA
Director, Cultural Resources

R:\Projects\CoLADPW-S\J175\Cultural\Scoping\Santa Anita NA Letters-010213.doc

BonTerra CONSULTING
2 Executive Circle, Suite 175 Irvine, CA 92614
T: (714) 444-9199 F: (714) 444-9599 | www.BonTerraConsulting.com

January 2, 2013

Mr. Conrad Acuña
Gabrielino-Tongva Tribe
1875 Century Park East 1500
Los Angeles, California 90067

Subject: Santa Anita Dam Project

Dear Mr. Acuña:

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Sincerely,

BONTERRA CONSULTING

Patrick O. Maxon, RPA
Director, Cultural Resources

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BonTerra CONSULTING
2 Executive Circle, Suite 175 Irvine, CA 92614
T: (714) 444-9199 F: (714) 444-9599 | www.BonTerraConsulting.com

January 2, 2013

Ms. Cindi Alvitre, Chairwoman-Manisar
Ti'At Society/Inter-Tribal Council of Pimu
3094 Mace Avenue, Apt B
Costa Mesa, California 92626

Subject: Santa Anita Dam Project

Dear Ms. Alvitre:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Santa Anita Dam Project located in the Angeles National Forest in unincorporated Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

Location

The project site is located in the Angeles National Forest, within Township 1 North; Range 11 West of the USGS Mt. Wilson, CA 7.5 Minute Quadrangle. Refer to attached exhibit.

Project

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The proposed Project will improve District facilities to better manage stormwater runoff from the Santa Anita Canyon watershed and achieve the following goals: (1) reduce flood damage to the downstream communities, (2) increase recharge of the local groundwater basin, and (3) improve public safety by remediating seismic safety issues at the Dam and the Debris Basin.

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Sincerely,

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Patrick O. Maxon, RPA
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January 2, 2013

Mr. Ron Andrade, Director
LA City/County Native American Indian Comm.
3175 W. 6th Street, Rm. 403
Los Angeles, California 90020

Subject: Santa Anita Dam Project

Dear Mr. Andrade:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Santa Anita Dam Project located in the Angeles National Forest in unincorporated Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

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January 2, 2013

Ms. Linda Candelaria, Chairwoman
Gabrielino-Tongva Tribe
1875 Century Park East 1500
Los Angeles, California 90067

Subject: Santa Anita Dam Project

Dear Ms. Candelaria:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Santa Anita Dam Project located in the Angeles National Forest in unincorporated Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

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BONTERRA CONSULTING

Patrick Maxon

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Director, Cultural Resources

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January 2, 2013

Mr. Robert Dorame, Tribal Chair/Cultural Resources
Gabrielino Tongva Indians of California Tribal Council
PO Box 490
Bellflower, California 90707

Subject: Santa Anita Dam Project

Dear Mr. Dorame:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Santa Anita Dam Project located in the Angeles National Forest in unincorporated Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

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January 2, 2013

Mr. Samuel H. Dunlap, Cultural Resources Director
Gabrielino Tongva Nation
PO Box 86908
Los Angeles, California 90086

Subject: Santa Anita Dam Project

Dear Mr. Dunlap:

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January 2, 2013

Mr. Anthony Morales, Chairperson
Gabrieleno/Tongva San Gabriel Board of Mission Indians
P.O. Box 693
San Gabriel, California 91778

Subject: Santa Anita Dam Project

Dear Mr. Morales:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Santa Anita Dam Project located in the Angeles National Forest in unincorporated Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

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January 2, 2013

Mr. John Tommy Rosas, Tribal Administrator
Tongva Ancestral Territorial Tribal Nation

VIA EMAIL
tattnlaw@gmail.com

Subject: Santa Anita Dam Project

Dear Mr. Rosas:

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January 2, 2013

Mr. Andrew Salas, Chairperson
Gabrieleno Band of Mission Indians
P.O. Box 393
Covina, California 91723

Subject: Santa Anita Dam Project

Dear Mr. Salas:

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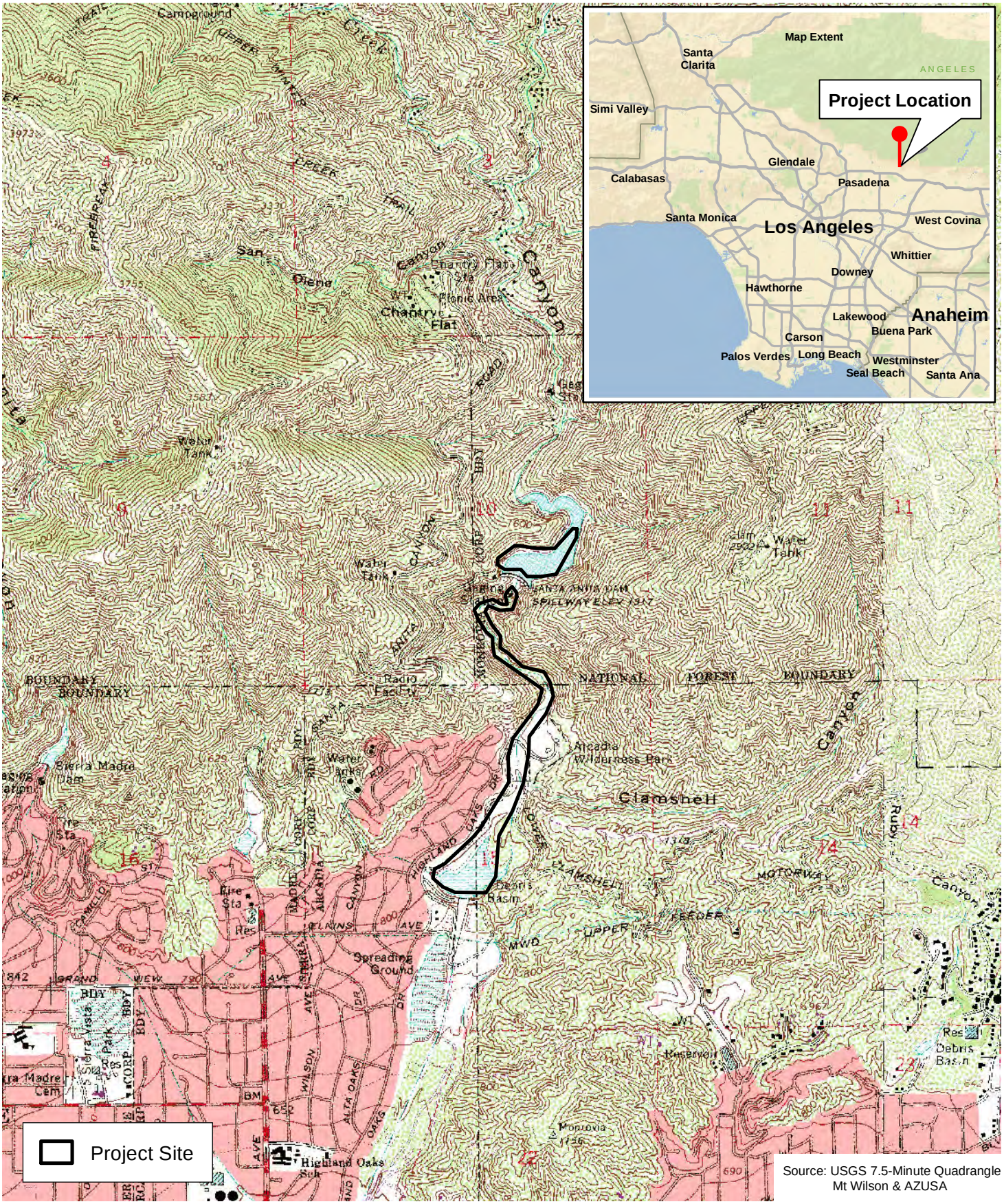

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Project Site

Exhibit 1

Santa Anita Dam

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

(11-29-2012 JAZ) Projects\CoLADPW\J175\Graphics\Cultural\Ex1_LV_USGS.pdf

APPENDIX C

FOREST SERVICE PERMIT

Submit

Authorization ID: LAR9048
Contact ID: BON TERRA
Expiration Date: 12/10/2013

FS-2700-32 (10/09)
OMB No. 0596-0082

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

PERMIT FOR ARCHAEOLOGICAL INVESTIGATIONS

Authority:
The Antiquities Act of 1906, 16 U.S.C. 431-433
The Organic Act of 1897, 16 U.S.C. 551

1. Holder **BON TERRA CONSULTING**	**2. Date of corresponding application** 11/14/2012
3. Address 2 Executive Circle, Suite 175 Irvine, CA 92614	**4. Telephone numbers** 714-444-9199 949-677-2393 (cell#) **5. Email addresses** pmaxon@bonterraconsulting.com
6. Name of authorized officer Michael J. McIntyre, District Ranger Telephone numbers 626-574-1613 x275 (Darrel Vance) Email addresses Dvance@fs.fed.us	**7. Name of principal investigators** Patrick Maxon Telephone numbers 949-677-2393 Email addresses pmaxon@bonterraconsulting.com
8. Name of field directors authorized to carry out field projects Pamela Daly Patrick Maxon Albert Knight Dave Smith	**Telephone numbers** Maxon:714-444-9199 Knight:818-426-4730 Smith:949-922-9952 Daly:909-649-5149 **Email addresses** pmaxon@bonterraconsulting.com ahunknight@msn.com ehcaddis@sbcglobal.net daly.rvrsde@sbcglobal.net

9. Activities authorized

- Consulting: Project-specific
- Non-ground-disturbing activities (such as surveys)

10. Description of National Forest System lands authorized for use (hereinafter referred to as "the permit area")

83 acres along the Santa Anita Wash by existing facilities (Santa Anita Dam, Santa Anita Debris Basin, Santa Anita Head works) operated and maintained by the Los Angeles County Flood Control District. See attached map

11. Permit term

From December 26, 2012 To December 10, 2013

12. Name and address of the curatorial facility in which collections, records, data, photographs, and other documents resulting from activities conducted under this permit shall be deposited for permanent preservation

on behalf of the United States Government.

Angeles National Forest Attn: Darrel Vance 701 N. Santa Anita Ave. Arcadia, CA 91006

TERMS AND CONDITIONS

I. GENERAL TERMS

A. AUTHORITY. This permit is issued pursuant to The Organic Act of 1897, 16 U.S.C. 551 , 36 CFR Part 251, Subpart B, 36 CFR Part 296, the Uniform Rules and Regulations of the Antiquities Act of 1906, 43 CFR Part 3, and applicable Forest Service policies and procedures and is subject to their provisions.

B. AUTHORIZED OFFICER. The authorized officer for this permit is the Forest Supervisor or a subordinate officer with delegated authority.

C. ANNUAL REVIEW. If this permit is issued for more than one year, it shall be reviewed annually by the authorized officer.

D. RENEWAL AND EXTENSION. This permit is not renewable. The holder may request an extension of this permit for a limited, specified period to complete activities authorized under this permit. Requests for an extension must be submitted in writing at least one month before expiration of this permit.

E. AMENDMENT. This permit may be amended in whole or in part by the Forest Service when, at the discretion of the authorized officer, such action is deemed necessary or desirable to incorporate new terms that may be required by law, regulation, the applicable land management plan, or projects and activities implementing a land management plan pursuant to 36 CFR Part 215. Any amendments to individuals named in or activities authorized by this permit that are needed by the holder must be approved by the authorized officer in writing.

F. COMPLIANCE WITH LAWS, REGULATIONS, AND OTHER LEGAL REQUIREMENTS. In exercising the privileges granted by this permit, the holder shall comply with all present and future federal laws and regulations and all present and future state, county, and municipal laws, regulations, and other legal requirements that apply to the permit area, to the extent they do not conflict with federal law, regulations, or policy. The Forest Service assumes no responsibility for enforcing laws, regulations, and other legal requirements that fall under the jurisdiction of other governmental entities.

G. NON-EXCLUSIVE USE. The use and occupancy authorized by this permit are not exclusive. The Forest Service reserves the right of access to the permit area, including a continuing right of physical entry to the permit area for inspection, monitoring, or any other purpose consistent with any right or obligation of the United States under any law or regulation. The holder shall allow the authorized officer or the authorized officer's representative full access to the permit area at any time the holder is in the field for purposes of examining the permit area and any recovered materials and related records. The Forest Service reserves the right to allow others to use the permit area in any way that is not inconsistent with the holder's rights and privileges under this permit, after consultation with all parties involved.

H. ASSIGNABILITY. This permit is not assignable or transferable.

II. OPERATIONS

A. OPERATING PLAN. The application corresponding to this permit is incorporated as the operating plan for this permit and is attached as Appendix A. The authorized officer may supplement the information contained in the application as appropriate or necessary.

B. REQUIRED PERMITS. The holder shall obtain all other permits required for conducting the activities authorized by this permit.

C. QUALIFIED INDIVIDUALS. Archaeological project design, literature review, development of regional historical contexts, site evaluation, conservation and protection measures, and recommendations for subsequent investigations shall be developed with direct involvement of an individual who meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation. Fieldwork shall be overseen by an individual who meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

D. CONDITION OF OPERATIONS. The holder shall maintain the authorized improvements and permit area to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer and consistent with other provisions of this permit. Standards are subject to periodic change by the authorized officer.

E. PROHIBITION ON USE OF MECHANIZED EQUIPMENT IN WILDERNESS AREAS. The holder shall not use mechanized equipment in wilderness areas and shall not use mechanized equipment in proposed or potential wilderness areas without prior written approval from the authorized officer.

F. PROHIBITION ON FLINT KNAPPING AND LITHIC REPLICATION EXPERIMENTS. The holder shall not conduct any flint knapping or lithic replication experiments at any archaeological site, aboriginal quarry source, or non-archaeological site that might be mistaken for an archaeological site as a result of such experiments.

G. PROHIBITION ON IMPEDING OR INTERFERING WITH OTHER USES. The holder shall perform the activities authorized by this permit so as not to impede or interfere with administrative or other authorized uses of National Forest System lands.

H. RESTRICTION ON MOTOR VEHICLE USE. The holder shall restrict motor vehicle use to designated roads, trails, and areas, unless specifically provided otherwise in the operating plan.

I. MINIMIZING GROUND DISTURBANCE. The holder shall keep ground disturbance to a minimum consistent with the nature and purpose of the authorized fieldwork.

J. RESOURCE PROTECTION. The holder shall conduct all activities so as to prevent or minimize scarring, erosion, littering, and pollution of National Forest System lands, water pollution, and damage to watersheds. In addition, the holder shall take precautions at all times to prevent wildfire. The holder may not burn debris without prior written approval from the authorized officer.

K. PREVENTION OF INJURY. The holder shall take precautions to protect livestock, wildlife, the public, and other users of National Forest System lands from accidental injury at any excavation site.

L. DESTRUCTION AND REMOVAL OF TREES. The holder shall not destroy or remove any trees on National Forest System lands without prior written approval from the authorized officer.

M. RESOURCE MANAGEMENT FACILITIES. The holder shall not disturb resource management facilities, such as fences, reservoirs, and other improvements, within the permit area without prior written approval from the authorized officer. Where disturbance of a resource management facility is necessary, the holder shall return it to its prior location and condition.

N. BACKFILLING. The holder shall backfill all subsurface test and excavation sites as soon as possible after recording the results and shall restore subsurface test and excavation sites as closely as possible to their original contour.

O. REMOVAL OF STAKES AND FLAGGING. The holder shall remove temporary stakes and flagging installed by the holder upon completion of fieldwork.

P. SITE RESTORATION. The holder shall restore all camp and work areas to their original condition before vacating the permit area. Refuse shall be carried out and deposited in disposal areas approved by the authorized officer.

Q. TITLE TO ARTIFACTS AND ASSOCIATED DOCUMENTATION. Archaeological and historical artifacts excavated or removed from National Forest System lands and any associated documentation shall remain the property of the United States.

R. NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION (NAGPRA). In accordance with 25 U.S.C. 3002 (d) and 43 CFR 10.4, if the holder inadvertently discovers human remains, funerary objects, sacred objects, or objects of cultural patrimony on National Forest System lands, the holder shall immediately cease work in the area of the discovery and shall make a reasonable effort to protect and secure the items. The holder shall immediately notify the authorized officer by telephone of the discovery and shall follow up with written confirmation of the discovery. The activity that resulted in the inadvertent discovery may not resume until 30 days after the authorized officer certifies receipt of the written confirmation, if resumption of the activity is otherwise lawful, or at any time if a binding written agreement has been executed between the Forest Service and the affiliated Indian tribes that adopts a recovery plan for the human remains and objects.

S. ADDITIONAL REQUIREMENTS. Prior to beginning any fieldwork under the authority of this permit, the holder shall contact the authorized officer responsible for administering the lands involved to obtain further instructions regarding current land and resource conditions.

III. REPORTING REQUIREMENTS

A. PRELIMINARY REPORT. The holder shall submit a preliminary report to the authorized officer within 30 days of completion of the first stage of fieldwork. The preliminary report shall enumerate what was done during the first stage of fieldwork, how it was done, by whom, where, and with what results, including maps, global positioning satellite data, an approved site form for each newly recorded archaeological site, and the holder's professional recommendations regarding resource significance, as appropriate. Depending on the scope, duration, and nature of the work, the authorized officer may require progress reports periodically for the duration of the authorized activities.

B. DRAFT FINAL REPORT. Within 60 days of completion of fieldwork, the holder shall submit an edited draft final report to the authorized officer for review to ensure conformance with applicable laws, regulations, policies, and procedures and the terms and conditions of this permit.

C. FINAL REPORT. The holder shall submit the original final report and at least two copies to the authorized officer within 90 days after completion of fieldwork.

D. BLANKET SURVEY CONSULTING PERMIT. If this is a multi-year survey consulting permit, at the end of each calendar year, the holder shall submit to the authorized officer a report enumerating all activities conducted under this permit.

E. DEPOSIT OF MATERIALS AND DOCUMENTS WITH A CURATORIAL FACILITY. Within 90 days of the date the final report is submitted to the authorized officer, the holder shall deposit all artifacts, samples, and collections and original or clear copies of all records, data, photographs, and other documents resulting from activities authorized by this permit with the curatorial facility named in block 12.

F. CATALOGUE AND EVALUATION OF DEPOSITED MATERIALS. The holder shall provide the authorized officer with a catalogue and evaluation of all materials deposited with the curatorial facility named in block 12, including the facility's accession or catalogue numbers, and confirmation, signed by an authorized curatorial facility official, that artifacts, samples, and collections were deposited with the approved curatorial facility. The confirmation shall include the date the materials were deposited and the type, number, and condition of the deposited materials.

G. CONFIDENTIALITY OF SENSITIVE RESOURCES. The holder agrees to keep the specific location of sensitive resources confidential. Sensitive resources include but are not limited to threatened, endangered, and rare species; archaeological sites; caves; fossil sites; minerals; commercially valuable resources; and traditional cultural properties.

H. CONFIDENTIALITY OF INFORMATION IDENTIFYING ARCHAEOLOGICAL SITES. Without the authorized officer's prior written approval, the holder shall not publish any locational or other information identifying archaeological sites that could compromise their protection and management by the federal government.

I. IDENTIFICATION OF FOREST SERVICE PERMIT. Any published article, paper, or book containing results of work conducted under this permit shall specify that the work was performed in the Angeles National Forest under a Forest Service permit.

J. SUBMISSION OF WRITTEN MATERIALS. The holder shall submit a copy of any published or unpublished report, article, paper, or book resulting from the authorized activities (other than reports required by clauses III.A, B, and C) to the authorized officer and the appropriate official of the curatorial facility named in block 12. The holder shall submit tabular and spatial data to the authorized officer in the format specified in Appendix A.

IV. RIGHTS AND LIABILITIES

A. LEGAL EFFECT OF THE PERMIT. This permit, which is revocable and terminable, is not a contract or a lease, but rather a federal license. The benefits and requirements conferred by this authorization are reviewable solely under the procedures set forth in 36 CFR Part 251, Subpart C, and 5 U.S.C. 704. This permit does not constitute a contract for purposes of the Contract Disputes Act, 41 U.S.C. 601. The permit is not real property, does not convey any interest in real property, and may not be used as collateral for a loan.

B. VALID OUTSTANDING RIGHTS. This permit is subject to all valid outstanding rights. Valid outstanding rights include those derived from mining and mineral leasing laws of the United States. The United States is not liable to the holder for the exercise of any such right.

C. ABSENCE OF THIRD-PARTY BENEFICIARY RIGHTS. The signatories of this permit do not intend to confer any rights on any third party as a beneficiary under this permit.

D. DAMAGE TO UNITED STATES PROPERTY. The holder has an affirmative duty to protect from damage the land, property, and other interests of the United States. Damage includes but is not limited to fire suppression costs, and all costs and damages associated with or resulting from the release or threatened release of a hazardous material occurring during or as a result of activities of the holder or the holder's heirs, assigns, agents, employees, contractors, or lessees on, or related to, the lands, property, and other interests covered by this permit. For purposes of clause IV.F, "hazardous material" shall mean any hazardous substance, pollutant, contaminant, hazardous waste, oil, and/or petroleum product, as those terms are defined under any federal, state, or local laws or regulations.

E. INDEMNIFICATION. The holder shall indemnify, defend, and hold harmless the United States for any costs, damages, claims, liabilities, and judgments arising from past, present, and future acts or omissions of the holder in connection with the use and occupancy authorized by this permit. This indemnification and hold harmless provision includes but is not limited to acts and omissions of the holder or the holder's family, guests, invitees, heirs, assignees, agents, employees, contractors, or lessees in connection with the use and occupancy authorized by this permit which result in (1) violations of any laws and regulations which are now or which may become applicable; (2) judgments, claims, demands, penalties, or

THIS PERMIT IS ACCEPTED SUBJECT TO ALL ITS TERMS AND CONDITIONS.

BEFORE ANY PERMIT IS ISSUED TO AN ENTITY, DOCUMENTATION MUST BE PROVIDED TO THE AUTHORIZED OFFICER OF THE AUTHORITY OF THE SIGNATORY FOR THE ENTITY TO BIND IT TO THE TERMS AND CONDITIONS OF THE PERMIT.

ACCEPTED:

Patrick Maxon, Director-CR, Bon Terra Cons. 12/19/12

HOLDER NAME, PRECEDED BY NAME AND TITLE OF PERSON SIGNING ON BEHALF OF HOLDER, IF HOLDER IS AN ENTITY | SIGNATURE | DATE

APPROVED:

Robert J GARCIA 12/28/2012

NAME AND TITLE OF AUTHORIZED OFFICER | SIGNATURE | DATE

FOR MIKE McINTYRE

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond, to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and, where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

Submit

Use Code: 411
Authorization ID: Bon
Contact ID: ~~562~~ LMC 9048

FS-2700-30 (Rev 05/06)
OMB No. 0596-0082

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

APPLICATION FOR PERMIT FOR ARCHAEOLOGICAL INVESTIGATIONS

<USER NOTES FOR AUTHORITY>
<Select all authorities that apply. Delete any that do not apply.>

Authority:

Archaeological Resources Protection Act of 1979,
16 U.S.C. 470aa-mm

Antiquities Act of 1906,
16 U.S.C. 431-433

Organic Act of 1897
16 U.S.C. 551

Instructions: Complete and return two copies of this application form and required attachments to the appropriate Forest Service administrative unit. All information requested must be completed before the application will be considered. Use separate pages if more space is needed to complete a section.

1. Name of applicant (individual, institution, corporation, partnership, or other entity)
Patrick Maxon, RPA
BonTerra Consulting

2. Mailing address
2 Executive Circle, Suite 175
Irvine, CA 92614

3. Telephone numbers
714-444-9199 (office)
949-677-2393 (mobile)

4. Email addresses
pmaxon@bonterraconsulting.com

5. Nature of archaeological work proposed

- [x] Survey and recordation
- [ ] Limited testing (shovel tests, scrapes, probes)
- [ ] Formal testing and/or surface collection (project-specific)
- [ ] Excavation and/or removal (project-specific)
- [ ] Conservation and protection, e.g., ruin stabilization, restoration, rock art conservation, ARPA damage assessments (project-specific)

6. Location of proposed work (attach additional sheets)

The proposed Project is located in Los Angeles County with the majority of the project site in the Angeles National Forest within the San Gabriel Mountains. Portions are within the City of Monrovia.

Project area is shown on the USGS 7.5 minute Mount Wilson, CA quadrangle (1995); Township 1 North, Range 11 West. A copy of the attached map showing the specific project area depicts the proposed survey area.

The Forest Service administrative unit is the Angeles National Forest Los Angeles River Ranger District.

7. Duration of proposed work

Duration of entire project: From December 10, 2012 To December 10, 2013

Duration of fieldwork: 1 day of field work From 12/10/12 To 12/10/13

8. Principal investigator
Patrick Maxon

Principal investigator contact information
949-677-2393 (mobile)
Email addresses:
pmaxon@bonterraconsulting.com

9. Field directors	**Field director contact information**
Patrick Maxon (archaeology) Albert Knight (archaeology) Dave Smith (archaeology) Pamela Daly (history)	**Maxon:** 714-444-9199 (office) 949-677-2393 (mobile) pmaxon@bonterraconsulting.com **Knight** 818-426-4730 (mobile) ahunknight@msn.com **Smith** 949-922-9952 (mobile) ehcaddis@sbcglobal.net **Daly** 909-649-5149 (mobile) daly.rvrsde@sbcglobal.net
10. Permit holder Patrick Maxon, RPA Name of individual who will be responsible for fulfilling the terms and conditions of the permit or who has authority to bind the entity applying for the permit to its terms and conditions.	**Permit holder contact information** Telephone numbers: 714-444-9199 (office) 949-677-2393 (mobile) Email addresses: pmaxon@bonterraconsulting.com

11. The applicant must attach the following to the application form:

a. A description of the purpose, nature, and extent of the work proposed, including how and why it is proposed to be conducted (include research design, methods, and curation).

b. A summary of support capabilities, including the location and a description of necessary facilities and equipment, the personnel to be involved in the proposed work, and, in the case of an applicant that is an entity, its organizational structure and staffing.

c. A summary of the applicant's experience in completing the kind of work proposed, including similar projects and government contracts and federal permits that were previously held, that are currently in force, with their effective dates, and that are pending or planned, by agency and region or state, reports or publications resulting from similar work, and any other pertinent experience.

d. For each individual named in blocks 8 and 9, a resume including education, training, and experience in the kind of work proposed and in the role proposed.

e. A written certification, signed by an authorized official of the proposed curatorial facility, attesting to the facility's capability and willingness to accept any collections, records, data, photographs, and other documents generated during the proposed permit term and to assume permanent curatorial responsibility for those materials on behalf of the United States Government pursuant to 36 CFR Part 79. Archaeological and historical artifacts excavated or removed from National Forest System lands and their associated documentation shall remain the property of the United States. Custody of any Native American human remains or cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001-3013, that are removed from National Forest System lands shall be determined in accordance with NAGPRA and its implementing regulations at 43 CFR Part 10.

12. Proposed publications for results of work conducted under the permit

Section 106 compliant Cultural Resources Assessment report using Archaeological Resource Management Reports (ARMR) guidelines.

13. Signature of individual named in block 10	**14. Date signed**
Patrick Maxon	11/14/12

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (800) 975-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

ARPA Permit Attachment

a. The Santa Anita Stormwater Flood Management and Seismic Strengthening Project (Project) will modify four existing facilities along Santa Anita Wash. These facilities are the Santa Anita Dam (Dam), the Santa Anita Debris Basin (Debris Basin), and the Santa Anita Headworks (Headworks). These facilities, which are operated and maintained by the Los Angeles County Flood Control District (District), serve to control and conserve the floodwaters of the Santa Anita Canyon watershed. This Project will improve District facilities to better manage stormwater runoff from the Santa Anita Canyon watershed and achieve the following goals: (1) reduce flood damage to the downstream communities, (2) increase recharge of the local groundwater basin, and (3) improve public safety by remediating seismic safety issues at the Dam and the Debris Basin.

   The purpose of the cultural resources study is to ensure that the proposed project does not adversely impact significant cultural resources. The study will consist of (1) a review of the records search completed for the 2007 Environmental Impact Report (EIR), and an updated records search through the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center, California State University, Fullerton; (2) Native American Heritage Commission (NAHC) and Native American scoping; (3) a one-day pedestrian survey of the Area of Potential Effects (APE) by Patrick Maxon, Albert Knight and/or Dave Smith and by historian Pamela Daly; and (4) completion of a technical cultural resources report (following Archaeological Resource Management Report [ARMR] guidelines) that summarizes the findings of the study and offers management recommendations.

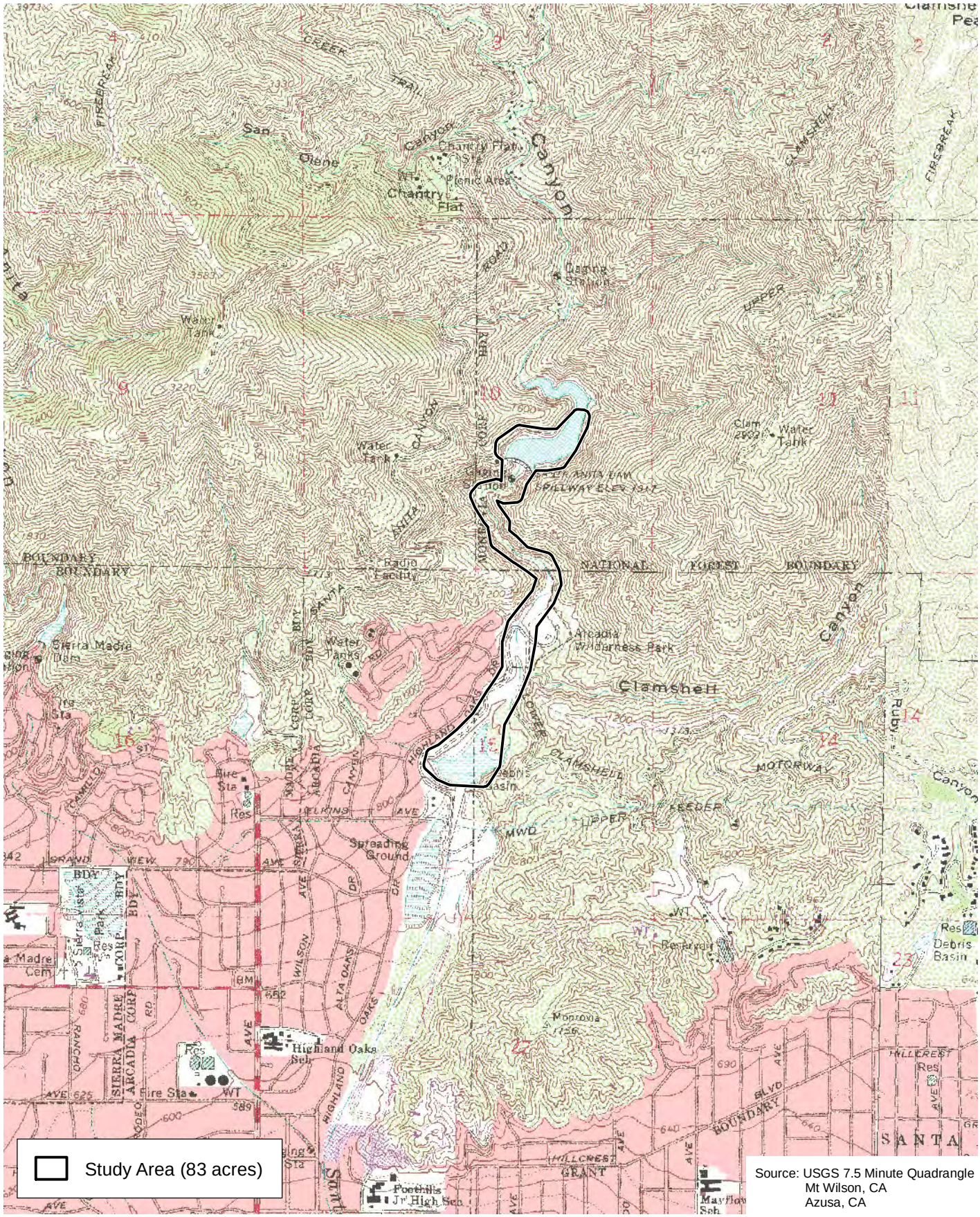
b. Patrick Maxon (Principal Investigator), Albert Knight (Archaeology Field Director), and Dave Smith (Archaeology Field Director) will be involved as archaeologists in the study. They meet the Secretary of Interior's Professional Qualification Standards for Archaeology. Pamela Daly (Architectural History) will complete the historical portion of the study. Ms. Daly meets the Secretary of Interior's Professional Qualification Standards for Architectural History.

   BonTerra Consulting office support will consist of GIS capabilities to construct project maps, staff support, and computers for documentation purposes. No specialized equipment is necessary.

c. Mr. Maxon has completed scores of reconnaissance studies over the past 18 years. Mr. Maxon has held ARPA and other use Permits for the Forest Service, Bureau of Reclamation, and USACE; BLM use permits; and permits for the California Energy Commission. In 2010, a Forest Service archaeological investigation permit (LAR9036CRI) was issued to survey portions of Big Tujunga Canyon Road for the County of Los Angeles Department of Public Works (LADPW), and in April 2011 an archaeological permit (LAR9039CRI) was acquired from the Forest Service for a sediment removal project by the LADPW at the Pacoima Reservoir.

d. Resumes for Patrick Maxon, Albert Knight, Dave Smith and Pamela Daly are attached.

e. By agreement with the Angeles National Forest, no collections will be made. All items of historical or archaeological nature will be left in place within the Forest and remain property of the United States Government.



Source: USGS 7.5 Minute Quadrangle
Mt Wilson, CA
Azusa, CA

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Local Vicinity

Exhibit 2

Santa Anita Prop 1E Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex2_LV_usgs.pdf

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Survey Area

Exhibit 3

Santa Anita Prop 1E Project

N
W E
S

1,000 500 0 1,000
Feet

BonTerra CONSULTING

(Rev: 8-23-2012 JAZ) Projects\CoLADPW\J166\Graphics\Plants\Ex3_SurveyArea.pdf

Patrick O. Maxon, RPA
Cultural Resources Manager

Education

Master of Arts, Anthropology, California State University, Fullerton, CA, 1994

Bachelor of Arts, Psychology/Sociology, Towson State University, Maryland, MD, 1987

Professional Certifications

Registered Professional Archaeologist (National), 1999 – present

Certified Archaeologist – Riverside County TLMA, 2008 – present

Certified Archaeologist – Orange County Environmental Management Agency, 1998 – present

Cultural Resources Specialist – California Energy Commission, 2004

Professional Summary

Patrick Maxon is a Registered Professional Archaeologist, is certified by the County of Orange Environmental Management Agency and the Riverside County Transportation and Land Management Agency. He has 18 years of experience in all aspects of cultural resources management, including prehistoric and historic archaeology, paleontology, ethnography, and tribal consultation. He has expertise in compliance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), and the Clean Water Act (CWA), among others. Mr. Maxon has been previously certified by the City of San Diego, and meets the Secretary of Interior's standards for historic preservation programs for archaeology. Mr. Maxon has completed hundreds of cultural resources projects that have involved (1) agency, client, Native American, and subcontractor coordination; (2) treatment plans and research design development; (3) archival research; (4) field reconnaissance; (5) site testing; (6) data recovery excavation; (7) construction monitoring; (8) site recordation; (9) site protection/preservation; (10) mapping/cartography; (11) laboratory analysis; and (12) report production. He has managed a number of projects within the jurisdiction of the U.S. Army Corps of Engineers (USACE), the Bureau of Land Management (BLM), the Bureau of Reclamation, and other federal agencies that require compliance with Section 106 of the NHPA. He has also completed projects throughout Southern California under CEQA for State and local governments and municipalities, including the California Department of Transportation (Caltrans), the Department of General Services (DGS), the California Energy Commission (CEC), the California Department of Water Resources, the Los Angeles County Department of Public Works (LACDPW), the Los Angeles Department of Water and Power (LADWP), the Los Angeles Unified School District, and others.

Relevant Project Experience

Lancaster Solar Farm Initial Study/Mitigated Negative Declaration, Lancaster (CoLACAO). BonTerra Consulting is currently preparing an Initial Study/Mitigated Negative Declaration (MND) for the proposed Solar Energy Project to be developed on approximately 63 acres of undeveloped County-owned land within the City of Lancaster. The project site is surrounded on the east and west by several County facilities, and the California State Prison-Los Angeles County (CSP-LAC) is located to the south. The County is proposing to develop the project site with a solar facility capable of generating up to 4 megawatts of electricity under peak solar conditions, and the energy would be made equally available to the adjacent Mira Loma Detention Center and the Challenger Memorial Youth Center.

The cultural resources investigation at the site included a California Historical Resources Information System (CHRIS) records search and literature review for the project at the South Central Coastal Information Center (SCCIC) at the California State University, Fullerton. Native American consultation was initiated with the Native American Heritage Commission (NAHC) with a request for a Sacred Lands File Search and contact list, and informational letters were mailed to tribes requesting comment. A paleontological resources records search, completed previously by the Los Angeles County Natural History Museum (LACNHM) was reviewed for information on known paleontological resources in the project site and surrounding area. In addition, a current records review of the museum's vertebrate paleontology records for the project site and vicinity was undertaken and reviewed. A cultural resources survey of the project site was conducted and a Historic Resources Assessment involving a pedestrian survey of the project site and research into the historic development of the site and surrounding area, including individual property information available from archival sources, was also completed. The study concluded that five on-site structures of an extant but defunct wastewater treatment and reclamation system are eligible for listing in the National Register of Historic Places and the California Register of Historical Resources. Avoidance or formal documentation via a Historic American Engineering Report (HAER) to document the history of early sewage treatment and water reclamation systems of the type found in the project area, and the physical properties of the system, was recommended. No other significant cultural resources were identified as a result of the study; however, because of the presence of historic and prehistoric resources in the vicinity, and the possibility of significant resources buried under development at the project site, monitoring of grading was recommended.

Sylmar Ground Return Replacement Return System, City of Los Angeles (MWatson). BonTerra Consulting has been hired by Montgomery Watson Harza to perform an assessment of biological and cultural resources for the Sylmar Ground Replacement Return System Project in Los Angeles. The northern segment extends from north to south within the utility easement corridor that runs between the Sylmar West Converter Station in Sylmar to the Kenter Canyon Terminal Tower near Brentwood. The southern extension, from the Kenter Canyon Terminal Tower to the ocean, is currently being considered under three alternatives. Cultural resources work included a CHRIS records search and literature review for the project at the SCCIC at the California State University, Fullerton. Native American consultation was initiated with the NAHC with a request for a Sacred Lands File Search and contact list, and informational letters were mailed to tribes requesting comment. A paleontological resources records search was completed by the LACNHM to compile information on known paleontological resources in the project site and surrounding area. Brief, one-day field surveys were conducted for the northern segment and memo reports were produced that identified constraints to the construction work. Cultural resources surveys of the southern extension's three alternatives were subsequently conducted.

Centennial Specific Plan Environmental Impact Report, Cultural Resources Surveys, Los Angeles County. BonTerra Consulting is preparing the environmental documentation for the Centennial Specific Plan Environmental Impact Report (EIR) that involves a new community consisting of residential, commercial, business park, and cultural and civic/institutional uses and encompassing approximately 11,680 acres. Mr. Maxon, as the Cultural Resources Manager for the project, is managing the review, evaluation, and mitigation of cultural resources for this proposed project. To consider the current status of the project area's cultural and paleontological resources in the environmental analysis, others initially performed a Phase I cultural resources study of the entire project area. Mr. Maxon surveyed an off-site Caltrans right-of-way south of the project site. This included a records search at the South Central Coastal Information Center at the California State University, Fullerton; a paleontological records search

at the Los Angeles County Museum; and an intensive pedestrian survey to evaluate the project area for the presence of cultural and paleontological resources. Numerous cultural resources sites were discovered on the project site, and some were evaluated for significance. Those that were determined significant and were in the Phase I development area were preserved in place. As the project evolves and expands beyond the Phase I area, additional sites must be evaluated for significance. Some may need to undergo data recovery excavations, while one structure must be recorded and evaluated. Consultations with regulatory agencies, County staff, Native American tribes, the interested public, and Clients will be completed and their comments considered, and the monitoring of disturbances around the known sites will be undertaken when construction activities commence.

Newport Banning Ranch (City of Newport Beach), As project manager of the cultural resources portion of this on going project, Mr. Maxon conducted archaeological, historic, and paleontological investigations for resources potentially impacted by the proposed Newport Banning Ranch development. The investigation consisted of (1) a Phase II test level excavation of eight prehistoric and three historic archaeological sites present on the site; (2) an assessment and evaluation of the built environment resources associated with the West Newport Oil Company development on site; and (3) a paleontological assessment of the project site's potential for the presence of sensitive rock formations and fossil resources. Three archaeological sites were deemed significant as a result of the study and the paleontological significance of the project site was deemed as high. However, no historic resources associated with oil extraction operations were identified. Mr. Maxon oversaw the completion of fieldwork, the preparation of archaeological, historical and paleontological technical reports, and subsequently prepared the cultural resources section of the EIR for the project. Future work will include data recovery excavations and/or site protection/preservation of significant cultural and paleontological resources impacted by the proposed project. Archaeological/Paleontological monitoring will be undertaken during grading of the project site.

Poseidon Desalination Plant, Cultural Resources Services, Huntington Beach and Newport Beach. BonTerra Consulting completed cultural and biological resources Phase I and II studies for the proposed Poseidon Resources Desalination Plant project in the City of Huntington Beach and the associated desalination plant pump station in the City of Newport Beach. The project included a Phase I cultural resources reconnaissance study that consisted of a CHRIS records search and literature review for the project at the SCCIC at the California State University, Fullerton, Native American coordination with the Native American Heritage Commission and local Native American tribes and individuals, a pedestrian survey of both locations, and a cultural resources technical report describing the results of the study and offering management recommendations.

While no archaeological or paleontological resources were discovered, historic structures are present on the property and were evaluated for significance. The proposed desalination plant location in Huntington Beach, currently developed with three defunct fuel oil tanks and their infrastructure, is located within the existing AES Huntington Power Generation Plant facility in Huntington Beach. The second parcel is located in unincorporated County of Orange, immediately adjacent to the City of Newport Beach. It consists of an existing pump station site that will be expanded as part of the current project. Because they are nearly 50 years old, the fuel oil tanks in Huntington Beach were recorded on DPR Series 523 forms and evaluated for eligibility for listing in the California Register of Historical Resources. They were found not eligible. Mitigation for potential project effects included recommendations for the historic structures present on site and retention of an Archaeologist and/or Paleontologist in the event that cultural resources or fossil resources are discovered during grading.

Atlanta Ave Widening Project HPSR/ASR/XPI (KOMEX). As project manager for the Atlanta Avenue widening project, Mr. Maxon conducted a Phase I cultural resources study to evaluate the potential effects of the project on cultural resources. The initial work included consultation with Caltrans cultural resources specialists regarding the Area of Potential Effects (APE) to cultural resources; a cultural resources literature review; Native American consultation; a field survey of the project area; and submittal to Caltrans of an Archaeological Survey Report (ASR), and a Historic Property Survey Report (HPSR). After further consultation with Caltrans, Mr. Maxon directed the historic evaluation of the Pacific Mobile Home Park south of the site; and completed an Extended Phase I (XPI) study consisting of subsurface archaeological excavation to evaluate the presence of the archaeological site within the APE, An updated ASR, XPI report, DPR 523 site forms, and HPSR was submitted to Caltrans and SHPO for review and comment.

Wintersburg Channel (OrCo). Mr. Maxon performed a Phase I cultural resources study to determine if the proposed widening of the channel would have the potential to impact cultural resources. The study included a literature review at the SCCIC, a paleontological literature review at the Los Angeles County Museum, a pedestrian survey of the APE, and completion of the CEQA section describing the results of the study. As cultural resources project manager on this contract, Mr. Maxon also consulted with regulators at the USACE, Native American tribes and individuals, and with a local archaeologist who has extensive experience working in and around Bolsa Chica. Elements of the defunct Bolsa Chica Gun Club were identified in the wetlands, but it was determined that the channel work would have no impact on them. Recordation of the channel itself and the Slater Bridge to the north was subsequently completed by an architectural historian. Construction monitoring was recommended.

AFFILIATIONS AND COMMITTEES

Pacific Coast Archaeological Society (PCAS)

Society for California Archaeology (SCA)

Society for American Archaeology (SAA)

Association of Environmental Professionals (AEP) (Board of Directors, 2005–present)

American Cultural Resources Association (ACRA)

PROFESSIONAL EXPERIENCE

BonTerra Consulting, Director, Cultural Resources 2008–present

Chambers Group, Director, Cultural Resources 2006–2008

SWCA, Project Manager/Director, Cultural Resources 2001–2006

RMW Paleo Associates, Staff Archaeologist/Senior Project Manager 1994–2001

EDUCATION

Bachelor of Arts in Anthropology – Dean's Honors List, University of California, Santa Barbara, 1983

Various Archaeology Extension Classes, UCLA 1988-2002

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Archaeology Conservancy

Malki Museum

Autry National Center

Santa Susana Mountains Park Association (Lifetime)

Little Landers Historical Society (Lifetime)

Society for California Archaeology (Lifetime).

PROFESSIONAL SUMMARY

Albert Knight worked on his first student dig in 1975 and has been performing archaeological and anthropological research since 1986. Mr. Knight has worked as a Field Technician, a Crew Chief, and a Field Director on his own and others' projects. He has excavated many units, has performed field surveys at numerous locations across much of Southern and Central California, and has performed some lab work. Mr. Knight has conducted records searches and historical research; has performed construction monitoring on many large and small projects; and has written a variety of papers, including short project reports and professional articles, a few of which have been published. Mr. Knight has also conducted paleontological monitoring and is well informed about the geography, geology, and biology of Southern and Central California.

REPRESENTATIVE PROJECT EXPERIENCE

Sylmar-Kenter Electrode Upgrade Project Archaeology Assessment, Encino. In 2009, Mr. Knight was the Archaeological Field Surveyor for the County of Los Angeles Department of Public Work's Sylmar-Kenter Electrode Upgrade Project. Mr. Knight conducted an archaeological assessment in Encino and at the Van Norman Reservoir. Mr. Knight examined the proposed project area and prepared a summary of the field notes, the photographs, and a photographic log. Several archaeological sites were identified and visited in the vicinity of the alignment, but all will be avoided with project implementation.

Big Tujunga Canyon Road Archaeological Surveys, Angeles National Forest. From 2009 to 2010, Mr. Knight served as the Archaeological Field Surveyor for this project, which included 450 feet of Big Tujunga Canyon Road in the Angeles National Forest (ANF) for the County of Los Angeles Department of Public Works (LADPW). He conducted an archaeological assessment, performed a records check at the ANF Headquarters Heritage Resources Office in Arcadia, visited the proposed project location, walked portions of the proposed work area, made notes, photographed the area, and provided a summary of all work completed. No prehistoric resources were discovered as a result of the survey; however, Big Tujunga Canyon Road itself, and a rock wall extending along a portion of the road, were recognized as potentially historic and will be evaluated by an Architectural Historian.

Mullally Canyon Debris Dam Archaeological Assessment, County of Los Angeles Department of Public Works. In 2009, Mr. Knight served as the Archaeological Field Surveyor for an archaeological assessment at the Mullally Canyon Debris Dam. Mr. Knight examined the proposed project area and prepared a summary of the field notes, the photographs, and a photographic log. The Mullally Debris Basin was constructed in 1965 and therefore does not meet the minimum age requirements for evaluation as a historic resource. No other cultural resources were observed.

Pilot Desalination Plant Project Archaeological Monitoring, Long Beach. In 2008, Mr. Knight served as the Archaeological Monitor for the Pilot Desalinization Plant Project. He coordinated with Native American (Gabrielino) and Paleontological Monitors and with project personnel. The monitors observed all excavation work, and monitoring results were reported to the Client. No cultural resources were discovered during monitoring. It was later determined that the project area was an artificial beach, created from dredged sand that was deposited there many years ago, in what had been open ocean.

Broad Beach Waterline Project, Archaeological Monitoring, Malibu. In 2007, Mr. Knight served as an Archaeological Monitor during the installation of a new water line in Broad Beach Road. Mr. Knight recovered around two dozen prehistoric artifacts, which were cleaned and catalogued. All information was properly recorded using California Department of Parks and Recreation (DPR) 523 forms. After the artifacts were recorded and after consultation, Mr. Knight contacted the University of California, Los Angeles (UCLA) Fowler Museum of Cultural History, which curates artifacts from Southern California and which agreed to curate the artifacts recovered from the site. Mr. Knight also personally transferred the artifacts to UCLA.

Baker Ranch Sites CA-ORA-1004 and CA-ORA-1150 Archaeological Excavations, Orange County. In 2009, Mr. Knight worked as an Archaeologist for two sites on Baker Ranch in Orange County. Mr. Knight directed the excavations of test units and shovel test pits, directed the crew, recorded notes pertinent to the excavations, photographed the excavations, produced photographic logs, and monitored equipment. All work produced negative results.

Irwindale Materials Recovery Facility Archaeological Assessment, Valley County Water District, Irwindale. Mr. Knight served as the Archaeological Field Surveyor for this project and conducted an archaeological survey at the Irwindale Materials Recovery Facility. Mr. Knight examined the proposed project area and prepared a summary of the field notes, the photographs, and a photographic log. No significant cultural resources were discovered; however, monitoring for paleontological resources was recommended during deeper excavations.

Thomas Roads Improvement Project Archaeological Assessment, Bakersfield. Mr. Knight served as one of two Archaeological Field Surveyors for this project, and conducted an archaeological assessment for the proposed Rosedale Highway (State Route 58)/State Route 99 Interchange Study. Over the course of three days, Mr. Knight examined the proposed project area and prepared a summary of the field notes, the photographs, and a photographic log. Because the vast majority of the project area is developed, no archaeological resources were expected or discovered. Monitoring was recommended in many areas, especially along the Kern River, which courses through the project area.

EDUCATION

Bachelor of Science, Anthropology, University of California, Riverside, CA, 1991

PROFESSIONAL CERTIFICATIONS

Certified Archaeologist, Orange County Environmental Management Agency

Certified Archaeologist, Riverside County Transportation and Land Management Agency

Principle Investigator, Southern California, Bureau of Land Management

Hazwoper 40 Hour Certification

PROFESSIONAL SUMMARY

David Smith has 25 years of experience as a principal investigator, field director, project archaeologist, and project manager. His project experience has involved the Bureau of Land Management (BLM) and BOR-managed properties, pipelines, transmission lines developments, facilities, mines, and parks. He has expertise in National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) compliance involving surveys, inventories, monitoring, testing and data recovery, and Native American consultations. He is a certified archaeologist for Riverside County and has completed Riverside County cultural sensitivity training. He has extensive experience as a field and laboratory supervisor. He has conducted archaeological surveys in California, Nevada and Arizona, encompassing over 40,000 acres of private and public lands. These surveys were conducted for private and public clients. Agencies include the BLM in Arizona, California, and Nevada; the Prescott National Forest, the San Bernardino National Forest, the Cleveland National Forest, the Angeles National Forest, the Coconino National Forest, the Department of Defense, the Bureau of Reclamation, California State Lands Commission, Arizona State Lands, Arizona State Museum, the United States Army Corps of Engineers (USACE), and dozens of municipal, county, and state agencies.

Mr. Smith has extensive experience with agency, client, Native American, and subcontractor coordination; archival research; field reconnaissance; site testing; data recovery excavation; construction monitoring; site recordation; site protection/preservation; mapping; laboratory analysis; and report production. He has the practical experience necessary to staff, train, and manage field crews effectively to produce an accurate, reliable product for the client.

Mr. Smith's field experience includes all facets of safety training, education, and implementation to ensure compliance under the most rigid agency regulations.

REPRESENTATIVE PROJECT EXPERIENCE

Cultural Resources Survey, 51 Miles of the Ivanpah-Eldorado Transmission Project, CA/NV – Southern California Edison (SCE). Mr. Smith provided archaeological consulting, analysis, monitoring, and reporting services in support of SCE's Ivanpah-Eldorado Transmission Project. David Smith surveyed 51 miles of transmission lines and associated roads and updated all known sites throughout the right-of-way as well as recorded new sites on DPR records for the California segment and IMACS forms for the Nevada segment.

Class III Cultural Resource Inventories, Fiber Optic Cable Installation, Victorville, CA, to Las Vegas, NV, San Bernardino and Clark County – AT&T, sub to Forkert Engineering & Surveying, Inc.. The study area for the fiber optic cable installation project encompasses a

190-mile linear segment located primarily within the BLM. Mr. Smith served as the Project Archaeologist and conducted Class III cultural resources records search for the project Area of Potential Effect (APE) (including a one-mile query radius) at the San Bernardino Archaeological Information Center (SBAIC). A query was also sent to the California Native American Heritage Commission (NAHC) to determine whether any sacred sites or localities were located on or near the project site. Class III Inventories, consisting of high-resolution pedestrian surveys of the project site and adjacent areas, were also conducted. A survey report was prepared documenting the findings of the various record searches, information queries, and field inventories. David Smith will perform cultural resources construction monitoring.

Initial Study (IS), 220kV Alignment (25 sq. mi.), Riverside County – Riverside RTRD. The project consisted of an Initial Study to determine if archaeological resources would be impacted by any of three proposed utility alignments. Mr. Smith served as the Project Archaeologist and conducted studies included records and literature reviews for archaeological and paleontological resources.

Class III Cultural Resources Inventory, Two Pipeline Repair Excavations on the CALNEV Pipeline, California and Nevada – Bureau of Land Management, Barstow Resource Area. Mr. Smith served as the Project Archaeologist and performed Class III cultural resources inventory for two pipeline repair excavations on the CALNEV pipeline, Colton to Las Vegas. (2 acres). Mr. Smith conducted a Class III cultural resources inventory pursuant to Section 106 of the NHPA. The inventory consisted of a records search, Native American notifications, a pedestrian survey, and a written technical report documenting the results of the inventory.

Class III Inventory for Mile Post 140 and 145 on the CALNEV Pipeline. Bureau of Land Management, Barstow Resource Area. Mr. Smith served as the Project Archaeologist and conducted a Class III Cultural Resources Inventory pursuant to Section 106 of the National Historic Preservation Act. The inventory consisted of a records search, Native American notifications, a pedestrian survey, and a written technical report documenting the results of the inventory.

Testing and Data Recovery at 25 Sites, The Shady Canyon Archaeological Project, Orange County – City of Irvine. Mr. Smith served as the Project Manager and Project Archaeologist and managed the Phase II Testing and Evaluations for numerous sites and the Phase III Data Recovery for 25 sites located in Shady Canyon, County of Orange, California. Duties included field and laboratory management, Native American reburial coordination, technical writing, and technical editing.

Data Recovery at 7 Sites, The Bonita Mesa Archaeological Project, Irvine, Orange County – The Irvine Company. Mr. Smith served as the Project Archaeologist and managed the Phase II Testing and Evaluations and the Phase III Data Recovery for 25 sites located on Bonita Mesa. Duties included field and laboratory management, Native American reburial coordination, technical writing and technical editing.

PAMELA DALY

4486 University Ave., Riverside, California 92501 (951) 369-1366

Education

•Master of Science - Historic Preservation - University of Vermont, Burlington, Vermont. 1998
Awarded Graduate Teaching Fellowship in Historic Preservation.
•Bachelor of Science - Business Administration - Elmira College, Elmira, New York. 1994

Experience and Skills

Historic Preservation

• Federal Level Projects

Section 106 – Evaluate impact of proposed removal and storage of National Register-eligible object at Camp Parks Army Reserve Base, Dublin, CA.
Section 106 – Naval Air Station, North Island, San Diego, California. Historic Resources Survey and Eligibility Investigation of thirteen historic airplane hangars for eligibility to the National Register.
Section 106 - Edwards Air Force Base, California – Report of findings on 37 Historic Wells and Homesteads. Includes HAER documentation, analysis and curation of historic and pre-historic artifacts, site form preparation, archival research, Phase II and Phase III reports.
Section 106 – Air Force Research Laboratory, Mesa, Arizona – Historic Building Assessment and Evaluation Report. Project included archival research, historic context, building description and site form.
Section 106 – Army Corp of Engineers, 404 Permit review of the decommissioned Marine Corps Air Station El Toro, California. Project consisted of re-surveying 76 buildings and structures previously reviewed in 1996 for National Register Eligibility. Project included field survey, archival research, and updating site forms.
Section 106 - Nellis Air Force Base, Nevada – Historic Building Report on Capehart & Wherry Housing. Project included archival research, site forms, photography.
Section 106 - Andersen Air Force Base, Guam - Supervise archaeological subcontractors Phase III survey project for Air Force client.
Section 106 - Clear Air Force Base, Alaska – Project to create booklet, bronze plaque and outdoor interpretive signs to record the Cold War radar operations.
Section 106 – Bureau of Land Management, Kern Front Oil Fields, Bakersfield, CA - Historic Building Assessment and Evaluation Report for leaseholder. Project included archival research, historic context, building description, industrial archeology investigation and site form.
Section 106 – Army Corp of Engineers, Union Pacific Railroad - Historic Building Assessment and Evaluation Report of all the bridges and culverts located in 102 mile section. Project included field survey, archival research, historic context, bridge and culvert descriptions, and site forms.
Section 106 re-survey of decommissioned El Toro Air Station, Irvine, CA.
Section 106 review of Jim's Corner Store, Burlington, VT.
Section 106 Level 1 Reconnaissance of Jericho, VT, Rt 15 intersection.
Section 106 Level 1 Reconnaissance of Milton, VT, sidewalk project.
Section 106 Level 1 Reconnaissance of Essex, VT, sidewalk project.
Section 106 Level 1 Reconnaissance of Town of Hartford, VT, sidewalk/bike project.
National Register Historic Landscape survey of historic agricultural properties in Essex County, NY. Intensive level survey of 8 historic farmsteads.
National Register Nomination for Residential Historic District, Vergennes, VT. NR nomination of 110 residences and outbuildings dating ca. 1790 to 1950.
National Register Nomination of Fairfield Baptist Church, Fairfield, VT. Nomination of rural

community church with ties to President Chester Arthur.
National Register nomination for Laurel Hall, Cuttingsville, VT. Nomination of private country villa, conservatory, carriage barn, and mausoleum.
Integrated Cultural Resources Management Plan (ICRMP) Update – Corona Naval Weapons Center – update historic properties treatment.
Integrated Cultural Resources Management Plan (ICRMP) Update – Seal Beach Naval Weapons Center – update historic properties treatment.
Integrated Cultural Resources Management Plan (ICRMP) Update – Fort Hunter Liggett, U.S. Army Reserves Base – update historic properties treatment.
Integrated Cultural Resources Management Plan (ICRMP) Update – Camp Parks, U.S. Army Reserves Base – update historic properties treatment.
Integrated Cultural Resources Management Plan (ICRMP) – Moffat Field, U.S. Army Real Property – create historic properties treatment for ICRMP.

● **State Level Projects**

CEQA – Historic Resource Assessment Report for 4149 Chestnut Street, Riverside, CA.
CEQA – Historic Resource Assessment Report of Banning Ranch, Newport Beach, CA.
CEQA – Historic Resource Assessment Report for Centennial Ranch Project, Gorman, CA.
CEQA – Historic Resource Assessment Report of historic irrigation system, Turlock, CA.
CEQA – Historic Resource Assessment Report of residential structure in Rialto, CA.
CEQA – Historic Resource Assessment Report, Orange County Civic Center, Santa Ana, CA.
CEQA – Historic Resource Assessment Report of Los Angeles County Fire Station, Malibu, CA.
CEQA – Historic Resources Assessment Report of water diversion features, Sonoma, CA.
CEQA – Historic Resources Assessment Report for Fontana Fire Station #1, and American Legion Post 262, constructed in 1927.
CEQA – Historic Resources Assessment Report for Department of Water Resources, Redlands, CA. Record and research historic Cold War-era structures and landscape.
CEQA – Historic Resources Assessment Report of historic date and citrus farm in Coachella, CA.
CEQA – Historic Resources Assessment Report for Glendale College Expansion Project.
CEQA – Historic Resources Assessment Report of residential structure in Apple Valley, CA.
CEQA – Historic Resources Assessment Report of structures in Loma Linda, CA.
CEQA – Historic Resources Assessment Report of residence on Cedar Street, Glendale, CA.
CEQA – Historic Resources Assessement Report of 1894 carriage house in Los Angeles, CA.
CEQA – Historic Resources Assessment Report of farmhouse in the City of Moreno Valley, CA.
CEQA – Historic Resources Assessment Report of four properties on Carlton Avenue, Hollywood, CA.
CEQA - Wrightwood Housing Development – record and research historic structure located in the project ROW. Consult with San Bernardino County environmental department.
CEQA – White Springs Sulphur Pools, Riverside, CA – Phase I survey for determination of CRHR and NR eligibility.
CEQA – Fitch Avenue Bridge – Phase I survey determination of rural one-lane bridge.
CEQA –New Model Colony housing development – Phase I & II survey of rural agricultural properties, Ontario, CA.
CALTRANS survey of building and structures along State Route 99, Stockton, CA.
CALTRANS survey of 1915 railroad bridge for seismic repair project, El Monte, CA.
CALTRANS survey of 75 buildings and structures along State Route 99, Manteca, CA.
CALTRANS survey of Cherry Avenue and Pacific Coast Highway Interchange, Long Beach, CA.
CALTRANS review of residential structures located in the project area, Red Hill Avenue, Orange County.
NYSDOT survey of historic bridges in Owego, Oswego and Onodaga Counties, New York.
ISTEA Historic Resource survey, Lake Champlain Railroad Causeway/Bikepath, Colchester, VT.
VSA22 Historic Resource review, Goodrich Memorial Library, Newport, VT.
VAOT Highway Resurfacing Program, Dufresne-Henry Engineers. 2001-2003.

● Local Level Projects

Develop Mitigation Measures Plan (MMP) for historic resource listed on the National Register and California Register of Historic Resources, in accordance with the Secretary of the Interiors Standard of Treatment for Preservation of Historic Structures. Redlands, CA.
HAER-level documentation for mitigation of Reservoir #1, Yorba Linda, CA.
HABS-level documentation for mitigation of Fire Station #1, Fontana, CA.
HABS-level documentation for mitigation of American Legion Post 261, Fontana, CA.
HABS level documentation for mitigation of Riverock bungalows in Riverside, CA.
HABS-level documentation for mitigation of The Quilt Stop, Sparks, NV.
HABS-level documentation for mitigation of the Snyder Ranch, Apple Valley, CA.
Historic resource evaluation of commercial property on Euclid Avenue, Ontario, CA.
Viewscape review for proposed housing development, Reno, NV.
Historic Sites and Structures Survey for the Town of Shelburne, VT. Phase II survey of 40 residential and agricultural properties
Survey Plan for the City of Burlington, Burlington, VT. Ten-year plan for future survey work in city.
Urban Survey, 2000, City of Burlington, Burlington, VT. Phase I survey and photographs of 250 urban historic resources.
Urban Survey, 2001, City of Burlington, Burlington, VT. Phase I survey and photographs of 220 urban historic resources.
Historic Sites and Structures Survey: Phase IV for the Town of Windsor, VT. Phase II survey of 40 structures and historic context of Buena Vista District.
Historic Sites and Structures Survey: Phase V for the Town of Windsor, VT. Review of 1977 National Register nomination, proposed additions, and additional description of resources.

● Architectural Conservation Projects (per Secretary of the Interior's Standards)
Develop design plans for the alteration of a historic cabin in the San Bernardino National Forest.
Develop exterior design plans for the rebuilding of historic cabin in San Bernardino National Forest.
Historic Structures Report, including conditions assessment and treatment plan for 1885 Lindo Lake Boathouse, Lakeside, CA.
Historic Structures Report, including conditions assessment and treatment plan for 1887 Bancroft Rock House, Spring Valley, CA.
Historic Structures Report, including conditions assessment and treatment plan for 1865Rutland Railroad Train Station, Vergennes, VT.
Historic Structures Report for emergency stabilization of endangered historic property in Essex, NY.
Repair and restoration of early 20th century house in Riverside, CA.
Architectural repair specifications for the 1805 Bradley Law Office, Westminster, VT
Project management of early 19th century house rehabilitation, St. Albans, VT.
Repairs and maintenance of converted barn in Ithaca, NY.
Historic paint finishes analysis for Town of Rockingham, VT.
Historic paint finishes analysis for Middlebury Town Hall, VT.
Historic paint finishes analysis for Labor Union Hall, Barre, VT.
Repair and restoration of cast iron fence for Greystone Mansion, Essex, NY.
Photo survey of Labor Union Hall, Barre, VT, prior to rehabilitation.
Evaluation and research of historic colonial tannery structure in Essex, NY.
Rehabilitation of 19th century barn for use as residence, Trumansburg, NY.

● Historic Preservation Educational Projects
Education and slide presentation of American architectural styles.
Education and slide presentation of California revival architectural styles.

Walking tours of Windsor, Vergennes and Shelburne, Vermont.
Research paper on decorative historic painted finishes created in Vermont public buildings during the late 19th century.

● Other Preservation Projects:
Adaptive Reuse – Downtown Development Project for six historic structures in Morrisville, VT.
Develop Revised Design Review and Zoning Guidelines, City of Burlington, VT. Part of team to develop guidelines for protecting historic resources in the city.
Presenter at Vermont Historic Preservation Conference on Industrial Archeology and site research.
Developed and implemented educational tours and day programs of historic sites and properties.
Awarded grant proposals for educational and historic preservation projects.
Developed and designed fundraising and publicity brochures.

● Preservation Skills
Maintenance and repairs to historic structures including painting, mortar analysis, mortar repointing, and plaster repair.
Historic Structures Reports - condition assessment reports.
Use of the Secretary of the Interiors Standards for the restoration, rehabilitation, or restoration of historic buildings.
Historical paint analysis (chromochronology).
Research of historic structures using deeds, wills, public records and archival documentation.
Nomination of historic sites and structures for the National Register of Historic Places.
Section 106 and 110 of the National Historic Preservation Act.
Federal Historic Preservation Tax Incentive program.

Business Management/Accounting

- Over 25 years experience in financial management and accounting.
- Competence in all accounting aspects: profit and not-for-profit organizations.
- Successful grant writing and funding from state, private and federal agencies.
- Extensive experience corresponding with federal, state, county and private organizations regarding agency fiscal requirements.
- Analyzed the efficiency of business internal accounting systems, implementing procedures to improve financial accuracy and operating cost-effectiveness.

Financial Project Management/Supervision

- Managed agency and individual project budgets from $350,000 to $2.5 million.
- Responsible for overseeing budget and direct labor requirements of Government contracts.
- Financial project management for 26 concurrent projects valued at $29 million.
- Coordinated five departments to meet financial and organizational goals.
- Supervised eight project managers to meet contractual agreements.
- Negotiated prime and sub-contractor agreements and purchase orders.
- Qualified contract specialist with U.S. Department of Defense, NASA and National Park Service. Experience with FAR, DFAR and associated regulations.

Employment History

2005 - present	Architectural Historian Consultant	Daly & Associates, Riverside, CA.
2003 – 2005	Sr. Architectural Historian	Earth Tech, Inc., Colton, CA.
1998 to June 2003	Architectural Historian Consultant	Daly & Associates, Shelburne, VT.

1998 (two semesters)	Teaching Assistant	Historic Preservation Dept., University of Vermont
1989 - 1997	Director of Contracts	Odyssey Research Assoc., Inc., Ithaca, NY.
1987 - 1989	Senior Corporate Accountant	Emerson Power Transmission, Ithaca, NY.
1982 - 1987	Director of Budget & Finance	Tompkins County Senior Citizens Council, Inc., Ithaca, NY.

Volunteer History

2007 – present	Old Riverside Foundation	Riverside, CA.
2000– 2003	Commission Member – Town of Shelburne, Vermont Historic Preservation Design Review Board.	
1996 - 1997	President - Board of Directors	Historic Ithaca, Ithaca, NY.
1993 - 1996	Board Member, Secretary	Historic Ithaca, Ithaca, NY.

Professional Affiliations

NTHP - National Trust for Historic Preservation - Forum Member
SIA - Society for Industrial Archeology
VAF - Vernacular Architecture Forum
CCPH – California Council for the Promotion of History
APT – Association for Preservation Technology

APPENDIX D

HISTORIC RESOURCES ASSESSMENT (DALY 2013)

HISTORIC RESOURCES ASSESSMENT REPORT

Of

Santa Anita Stormwater Flood Management and Seismic Strengthening Project
Santa Anita Wash, Headworks, and Debris Basin
Los Angeles County, CA

Maintained by: Los Angeles County Flood Control District
Owned by: County of Los Angeles Department of Public Works

(South ½ of Section 10 and Section 15, Township 1 North, Range 11 West San Bernardino Base and Meridian)

Prepared for:
BonTerra Consulting
2 Executive Circle, Suite 175
Irvine, CA 92614

Prepared by
Pamela Daly, M.S.H.P.
Daly & Associates
4486 University Avenue
Riverside, CA 92501

April 2013

EXECUTIVE SUMMARY

This assessment report documents and evaluates the federal, state, and local significance and eligibility of the Sediment Transport Tunnel, Headworks and Culvert Bridge, Debris Basin and spillway, located in the Area of Potential Effect (APE). The Big Santa Anita Dam was evaluated in 2007 by EDAW, Inc. and determined not eligible to be considered a historic resource. The collection of built-environment resources in the APE are owned and maintained by the County of Los Angeles Department of Public Works, Alhambra, California.

The historic resource assessment and evaluation of the built-environment resources located in the APE was conducted by Pamela Daly, M.S.H.P., Senior Architectural Historian. In order to identify and evaluate the subject area, and the potential historic resources, a multi-step methodology was utilized. An inspection of the Santa Anita Wash and existing structures, combined with a review of local and regional historic archives regarding the APE, was performed to document existing conditions and assist in assessing and evaluating the water-related structures for significance.

In evaluating the historical significance of the structures located within the APE, federal, state, and local criteria were applied. The structures identified in this study are not currently listed, individually or collectively, in either the National Register of Historic Places or the California Register of Historical Resources.

The Big Santa Anita Dam was constructed in 1924-1927 by the Los Angeles County Flood Control District. Because the area below the dam was not heavily populated until many years later, the water released by the Dam could just follow the Santa Anita Wash down into the Rio Hondo Wash, without too much damage to private property. But after World War II, the population in the areas of Arcadia, Sierra Madre, and Monrovia increased dramatically, and residents began to construct houses into the foothills of the San Gabriel Mountains. The water coming out of the various canyons had to be controlled to protect life and property. It was in the 1950s that the Headworks and Culvert Bridge, Debris Basin, and spillway were constructed to control and capture the flow from the Big Santa Anita Dam. The Sediment Removal Tunnel was constructed only to provide access to the basin of the Big Santa Anita Dam reservoir so that accumulated silt could be removed.

Under National Register and/or California Register criteria relating to the association of the built-environment structures located within the APE with significant historical events that exemplify broad patterns of our history, the Dam, Headworks and Culvert Bridge, Debris Basin and spillway, and Sediment Removal Tunnel, do not appear to qualify as significant historic resources individually or collectively. Throughout the world, debris basins and dams (masonry, earthen or timber) have been constructed by both private and public entities to control seasonal rain fall, to protect people and property. The structures located in the APE are just part of one of many flood-control systems that were constructed in the San Gabriel Mountain

canyons. There is no evidence that any of the structures in the APE is eligible for listing under Criteria A/1.

Under National Register and/or California Register criteria relating to the built-environment structures located within the APE's association with persons of historic importance, the Headworks and Culvert Bridge, Debris Basin and spillway, and Sediment Removal Tunnel, do not appear to qualify as significant resources, individually or collectively. The plans for the structures located in the Santa Anita Wash were prepared by the Los Angeles County Flood Control District staff engineers, or the Army Corp of Engineers, as part of their normal tasks and duties. There is no evidence that any of the structures in the APE are eligible for listing under Criteria B/2.

Under National Register and/or California Register criteria relating to the distinctive characteristics of a type, period, region, or method of construction, the built-environment structures located within the APE are not significant as they do not, individually or collectively, embody any innovative engineering design or method of construction, or high artistic design. The Headworks was designed using common technology to channel water from the Dam towards the Debris Basin or into the 30' pipe to the Sierra Madre spreading grounds. The Debris Basin was constructed by excavating a water containment area in the Santa Anita Wash, and a spillway was constructed to hold heavier debris back during high rainfall events. The technology used to create the basin was commonplace, as was the use of concrete to hold, channel, divert, and control the water as it came down the foothills. The Dam, Headworks and Culvert Bridge, Debris Basin and spillway, and Sediment Removal Tunnel, do not appear to present any technological achievement in the history of water systems locally, regionally or nationally, and are therefore not eligible for listing either individually or collectively under Criteria C/3.

Based upon a survey of the above-ground historic period resources within the APE performed in January 2013, the APE has not yielded, nor does it appear to have the potential to yield, information important to the history of the local area, California or the nation pursuant to National Register and/or California Register criteria D/4.

In summation, the Headworks and Culvert Bridge, Debris Basin and spillway, and Sediment Removal Tunnel, are not eligible for listing in the National Register and/or the California Register, as they do not, individually or collectively, meet any of the criteria necessary for listing in the registries.

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I. INTRODUCTION

A. PROJECT DESCRIPTION

The Santa Anita Stormwater Flood Management and Seismic Strengthening Project (Project) will modify existing facilities south of the Big Santa Anita Dam, located in Santa Anita Wash. These facilities are the Santa Anita Headworks (Headworks) and associated Culvert Bridge; Santa Anita Debris Basin (Debris Basin) and associated spillway; and the Sediment Removal Tunnel. These facilities, which are operated and maintained by the Los Angeles County Flood Control District (District), serve to control and conserve the floodwaters of the Santa Anita Canyon watershed. This watershed is mostly undeveloped with the majority of it located in the Angeles National Forest within the San Gabriel Mountains, which are very steep and among the most highly erosive mountains in the world. This watershed is also susceptible to wildfires, which result in tremendous debris flows during subsequent storm events. The facilities are located within one mile of the Sierra Madre Fault, which is capable of a producing an earthquake of magnitude 7.5.

This Project will improve District facilities to better manage stormwater runoff from the Big Santa Anita Canyon watershed and achieve the following goals: 1) reduce flood damage to the downstream communities, 2) increase recharge of the local groundwater basin and 3) improve public safety by remediating seismic safety issues at the Big Santa Anita Dam and the Debris Basin.

Rehabilitation of the Headworks structure will include: 1) reconstruction of the levee to ensure it can withstand flow of up to 1000 cubic feet per second (cfs); 2) armoring of the roadway and construction of a new culvert bridge to the Arcadia Wilderness Park to ensure the roadway and bridge can withstand flow of up to 2000 cfs; 3) removal of the tainter gate and replacement with an *Obermeyer*™ pneumatically operated spillway gate to allow for continued capability to divert flows through the spreading grounds diversion gates; 4) installation of new automated spreading grounds diversion gates; and 5) installation of new control systems integrated with the control systems of the other Project components to optimize water conservation. A critical component of the Headworks' control system is remote operation capability to allow for changes in flow rates to each of the spreading grounds based on available capacity.

The Debris Basin provides flood protection by capturing sediment laden stormwater runoff and discharging clear stormwater runoff to the channel downstream. If the Debris Basin were to sustain damage or to fail as a result of seismic activity, debris would be deposited in the downstream channel, reducing the ability to safely convey subsequent storm flows in the channel through the communities resulting in flood damage. In addition, a Debris Basin failure would result in the spreading grounds being washed out and incapable of recharging stormwater runoff into the underlying groundwater basin.

Remediation of the seismic deficiencies at the Debris Basin will consist of the following improvements: 1) replacement of the spillway tower due to inability of the existing tower to resist seismic loading, 2) replacement of a portion of the Debris Basin embankment subject to liquefaction, and 3) reconstruction of the spillway to address concerns with settlement/separation between the spillway and the embankment and to remove potential for failure in bending of the spillway walls. A new automated outlet gate and control system will be constructed to modernize operations and ensure compatibility with other Project components.

The evaluation of the built-environment resources south of the Big Santa Anita Dam has been prepared so that the Los Angeles County Department of Public Works may have available information necessary for any future alterations within the Santa Anita Wash project area. This report includes a discussion of the survey methodology used, a brief historic context, and formal evaluation of the built-environment structures within the project survey area.

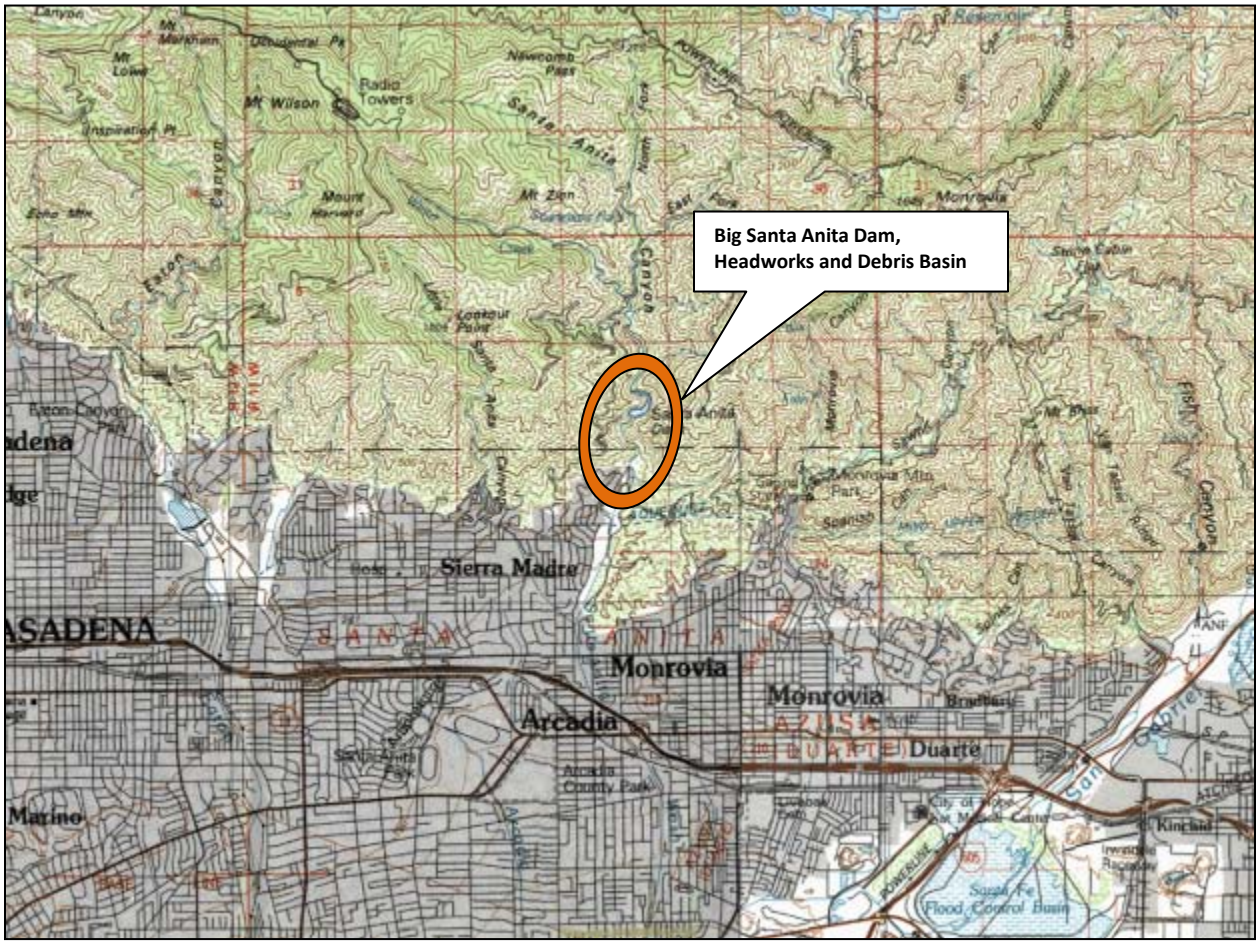

Figure 1: Regional Project Location
(U.S.G.S. Los Angeles Quad, 1:100,000)

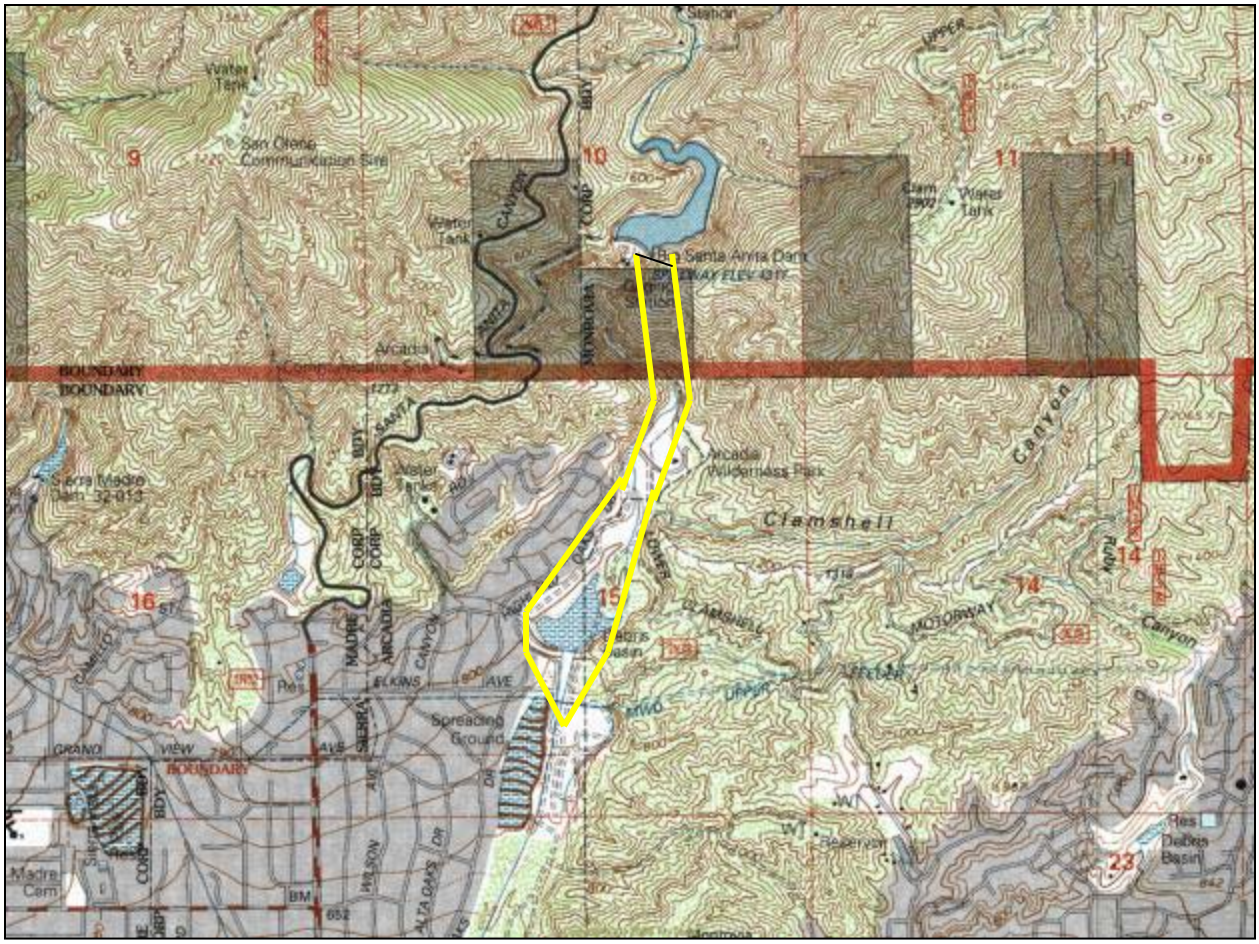

Figure 2: Area of Potential Effect (APE) for this evaluation report (U.S.G.S. Mt. Wilson Quad, 1:24,000)

B. BACKGROUND INFORMATION

The area of potential effect (APE) for the proposed project spans three legal jurisdictions. The northern portion of the project survey area is located in Section 10 of Township 1 North, Range 11 West. Section 10 is situated within the boundary of the Angeles National Forest overseen by the United States Forest Service. The Big Santa Anita Dam, reservoir, and portion of the Santa Anita Wash that runs south up to the boundary with Section 15 of Township 1 North, Range 11 West are under the control of the U.S. Army Corp of Engineers Los Angeles Division. The Sediment Removal Tunnel used for the disposal of silt from the bottom of Santa Anita Dam reservoir, spans south from the reservoir to the southern boundary of Section 10, and is located in the Angeles National Forest.

From there south, the project survey area is primarily on land that is located in the City of Arcadia. A small portion of undeveloped land south of Arcadia Wilderness Park belonging to the City of Monrovia protrudes into the APE, and appears to be comprised mostly of scrub

vegetation on loose creek bed. The Headworks, Culvert Bridge, Debris Basin, and spillway, are located on land in the City of Arcadia.

In November 2007, EDAW, Inc., prepared the document *Cultural Resources Assessment for the Proposed* [Big] *Santa Anita* [Dam] *Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, California*, authored by Monica Strauss, M.A., et. al. The report identified, described, and presented evaluations for only those built-environment resources located within the boundary of the Angeles National Forest that could be adversely impacted by proposed project activities. The report did not identify, document, or evaluate any built-environment resources located south of the Angeles National Forest boundary line. The EDAW report determined that the Big Santa Anita Dam and those built-environment resources closely associated with the dam and reservoir, described collectively as the Santa Anita Dam Complex, were not eligible for listing in the National Register of Historic Places as required by Section 106 of the National Historic Preservation Act. Project activities were also evaluated under requirements of the California Environmental Quality Act (CEQA) and were determined to have no potential to cause a significant impact to historic resources.

The current APE has not been previously surveyed for the presence of built-environment historic resources. The structures within the APE have not been evaluated for eligibility for listing in the National Register of Historic Places or California Register of Historical Resources.

C. METHODOLOGY

The historic resource assessment and evaluation for this report was conducted by Pamela Daly, M.S.H.P., Senior Architectural Historian. In order to identify and evaluate the subject property as a potential historic resource, a multi-step methodology was utilized. An inspection of the existing structure and associated features, combined with a review of accessible archival sources for this structure, was performed to document existing conditions and assist in assessing and evaluating the property for significance. Photographs were taken of the structure and associated structures and features, including photographs of architectural details or other points of interest, during the pedestrian-level survey.

The National Register of Historic Places (National Register) and California Register of Historical Resources (California Register) were employed to evaluate the significance of the structures within the Area of Potential Effect (APE.) The City of Arcadia does not have specific regulations in their municipal code for the preservation, alteration or demolition of historic resources. As such, the City of Arcadia uses the California Register criteria to evaluate the significance of built-environment resources over 50 years old.[1] In addition, the following tasks were performed for the study:

[1] *Arcadia General Plan: Parks Recreation and Community Resources, November 2010. Page 7-45.*

- The National Register and the California Historical Resources Inventory were searched.

- Site-specific research was conducted on the Big Santa Anita Dam, Debris Basin, Headworks and Santa Anita Wash utilizing maps, city directories, newspaper articles, historical photographs, and other published sources.

- Background research was performed at local historic archives and through internet resources.

- Ordinances, statutes, regulations, bulletins, and technical materials relating to federal, state, and local historic preservation, designation assessment processes, and related programs were reviewed and analyzed.

II. REGULATORY FRAMEWORK

Historic resources fall within the jurisdiction of several levels of government. Federal laws provide the framework for the identification, and in certain instances, protection of historic resources. Additionally, states and local jurisdictions play active roles in the identification, documentation, and protection of such resources within their communities. The National Historic Preservation Act of 1966 as amended (NHPA), and the California Register of Historical Resources (CRHR), are the primary federal and state laws and regulations governing the evaluation and significance of historic resources of national, state, regional, and local importance. A description of these relevant laws and regulations are presented below.

In analyzing the historic significance of the subject property, criteria for designation under federal, and State landmark programs were considered. Additionally, the Office of Historic Preservation (OHP) survey methodology was used to survey and rate the relative significance of the property.

A. FEDERAL LEVEL

1. National Register of Historic Places

First authorized by the Historic Sites Act of 1935, the National Register was established by the NHPA as "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment."[2] The National Register recognizes properties that are significant at the national, state and local levels.

To be eligible for listing in the National Register, the quality of significance in American history, architecture, archaeology, engineering, or culture must be in a district, site, building, structure, or object that possesses integrity of location, design, setting, materials, workmanship, feeling and association, and:[3]

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

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

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[2] *Code of Federal Regulations (CFR), 36 § 60.2.*

[3] *Guidelines for Completing National Register Forms, National Register Bulletin 16, U.S. Department of the Interior, National Park Service, September 30, 1986 ("National Register Bulletin 16"). This bulletin contains technical information on comprehensive planning, survey of cultural resources, and registration in the National Register of Historic Places.*

C. embodies the distinctive characteristics of a type, period, or method of construction or that represents 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. yields, or may be likely to yield, information important to prehistory or history.

A property eligible for listing in the National Register must meet one or more of the four criteria (A-D) defined above. In addition, unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for National Register listing.

In addition to meeting the criteria of significance, a property must have integrity. "Integrity is the ability of a property to convey its significance."[4] According to *National Register Bulletin 15*, within the concept of integrity, the National Register criteria recognize seven aspects or qualities that, in various combinations, define integrity. To retain historic integrity a property will always possess several, and usually most, of these seven aspects. The retention of specific aspects of integrity is paramount for a property to convey its significance.[5] The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association. The following is excerpted from *National Register Bulletin 15,* which provides guidance on the interpretation and application of these factors.

- Location is the place where the historic property was constructed or the place where the historic event occurred.[6]
- Design is the combination of elements that create the form, plan, space, structure, and style of the property.[7]
- Setting is the physical environment of a historic property.[8]
- 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.[9]

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[4] *National Register Bulletin 15, page 44.*

[5] *Ibid.*

[6] *"The relationship between the property and its location is often important to understanding why the property was created or why something happened. The actual location of historic property, complemented by its setting is particularly important in recapturing the sense of historic events and persons. Except in rare cases, the relationship between a property and its historic associations is destroyed if the property is moved." Ibid.*

[7] *"A property's design reflects historic functions and technologies as well as aesthetics. It includes such considerations as the structural system; massing; arrangement of spaces; pattern of fenestration; textures and colors of surface materials; type, amount, and style of ornamental detailing; and arrangement and type of plantings in a designed landscape." Ibid.*

[8] *National Register Bulletin 15, page 45.*

[9] *"The choice and combination of materials reveals the preferences of those who created the property and indicated the availability of particular types of materials and technologies. Indigenous materials are often the focus of regional building traditions and thereby help define an area's sense of time and place." Ibid.*

- Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.[10]
- Feeling is property's expression of the aesthetic or historic sense of a particular period of time.[11]
- Association is the direct link between an important historic event or person and a historic property.[12]

In assessing a property's integrity, the National Register criteria recognize that properties change over time; therefore, it is not necessary for a property to retain all its historic physical features or characteristics. The property must, however, retain the essential physical features that enable it to convey its historic identity.[13]

For properties that are considered significant under National Register criteria A and B, *National Register Bulletin 15* states that a property that is significant for its historic association is eligible if it retains the essential physical features that made up its character or appearance during the period of its association with the important event, historical pattern, or person(s).[14]

In assessing the integrity of properties that are considered significant under National Register criterion C, National Register Bulletin 15 provides that a property important for illustrating a particular architectural style or construction technique must retain most of the physical features that constitute that style or technique.[15]

The primary effects of listing in the National Register on private property owners of historic buildings is the availability of financial and tax incentives.[16] In addition, for projects that receive federal funding, the Section 106 clearance process must be completed. State and local laws and regulations may apply to properties listed in the National Register. For example,

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[10] *"Workmanship can apply to the property as a whole or to its individual components. It can be expressed in vernacular methods of construction and plain finishes or in highly sophisticated configurations and ornamental detailing. In can be based on common traditions or innovative period techniques." Ibid.*

[11] *"It results from the presence of physical features that, taken together, convey the property's historic character." Ibid.*

[12] *"A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to the observer. Like feeling, associations require the presence of physical features that convey a property's historic character…Because feeling and association depend on individual perceptions, their retention alone is never sufficient to support eligibility of a property for the National Register." Ibid.*

[13] *National Register Bulletin 15, page 46.*

[14] *Ibid.*

[15] *"A property that has lost some historic materials or details can be eligible if it retains the majority of the features that illustrate its style in terms of the massing, spatial relationships, proportion, patter of windows and doors, texture of materials, and ornamentation. The property is not eligible, however, if it retains some basic features conveying massing but has lost the majority of features that once characterized its style." Ibid.*

[16] *See 36 CFR 60.2(b) (c).*

demolition or inappropriate alteration of National Register eligible or listed properties may be subject to the California Environmental Quality Act (CEQA).

B. STATE LEVEL

The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also carries out the duties as set forth in the Public Resources Code (PRC) and maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the state's jurisdictions.

1. California Register of Historical Resources

Created by Assembly Bill 2881, which was signed into law on September 27, 1992, the CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change."[17] The criteria for eligibility for the California Register are based upon National Register criteria.[18] Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register.[19]

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

- California properties listed on the National Register of Historic Places and those formally Determined Eligible for the National Register of Historic Places;
- California Registered Historical Landmarks from No. 770 onward;
- Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion on the California Register.[20]

Other resources which may be nominated to the California Register include:

- Individual historical resources;
- Historical resources contributing to historic districts;

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[17] *California Public Resources Code § 5024.1(a).*

[18] *California Public Resources Code § 5024.1(b).*

[19] *California Public Resources Code § 5024.1(d).*

[20] *California Public Resources Code § 5024.1(d).*

- Historical resources identified as significant in historical resources surveys with significance ratings of Category 1 through 5;
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as a historic preservation overlay zone.[21]

To be eligible for listing in the California Register, a historic resource must be significant at the local, state, or national level under one or more of the following four 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; or

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

Additionally, a historic resource eligible for listing in the California Register must meet one or more of the criteria of significance described above and retain enough of its historic character or appearance to be recognizable as a historic resource and to convey the reasons for its significance. Historical resources that have been rehabilitated or restored may be evaluated for listing.[22]

Integrity under the California Register is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. The resource must also be judged with reference to the particular criteria under which it is proposed for eligibility. It is possible that a historic resource may not retain sufficient integrity to meet criteria for listing in the National Register, but it may still be eligible for listing in the California Register.[23]

2. California Office of Historical Preservation Survey Methodology

The evaluation instructions and classification system prescribed by the California Office of Historic Preservation in its Instructions for Recording Historical Resources provide a three-digit evaluation rating code for use in classifying potential historic resources. The first digit indicates one of the following general evaluation categories for use in conducting cultural resources surveys:

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[21] *California Public Resources Code § 5024.1(e).*

[22] *California Code of Regulations, California Register of Historical Resources (Title 14, Chapter11.5), Section 4852(c).*

[23] *Ibid.*

1. Listed on the National Register or the California Register;
2. Determined eligible for listing in the National Register or the California Register;
3. Appears eligible for the National Register or the California Register through survey evaluation;
4. Appears eligible for the National Register or the California Register through other evaluation;
5. Recognized as Historically Significant by Local Government;
6. Not eligible for any Listing or Designation; and
7. Not evaluated for the National Register or California Register or needs re-evaluation.

The second digit of the evaluation status code is a letter code indicating whether the resource is separately eligible (S), eligible as part of a district (D), or both (B). The third digit is a number that is used to further specify significance and refine the relationship of the property to the National Register and/or California Register. Under this evaluation system, categories 1 through 4 pertain to various levels of National Register eligibility. The California Register, however, may include surveyed resources with evaluation rating codes through level 5. In addition, properties found ineligible for listing in the National Register, California Register, or for designation under a local ordinance are given an evaluation status code of 6.

C. LOCAL LEVEL

1. City of Arcadia

As previously stated in this report, the City of Arcadia and unincorporated areas of Los Angeles County do not have specific historic resource regulations in their municipal codes. As such, built-environment resources in those areas use the California Register criteria to evaluate the significance of buildings, structures, objects, features and landscapes over 50 years old.

III. EVALUATION

A. HISTORIC CONTEXT

1. Arcadia

The city of Arcadia is located within the boundaries of land that was once associated with the San Gabriel Mission. Hugo Reid applied to the Mexican government to purchase the Rancho Santa Anita tract that spans across present-day Arcadia, Sierra Madre, and Monrovia. Reid took the possession of 13,319 acres of land in 1845, and set about to build a sizeable cattle ranch. Like so many cattle ranchers, the great drought of 1871 caused Reid to go into bankruptcy, and he was forced to sell his ranch for pennies on the dollar.

Having made his fortune in the silver mines, Elias "Lucky" Baldwin came to own the Santa Anita Rancho in 1875. He sold off large parcels of his holding to Nathaniel Carter in 1881 and William Monroe in 1883, who established the communities of Sierra Madre and Monrovia. While the Southern Pacific Railroad (SPRR) had built a line into Los Angeles in 1876, it was more than 10 years later when the Atchison, Topeka & Santa Fe Railroad (ATSF) was negotiating with land holders to buy land and construct train stations to compete with the SPRR. Baldwin sold land and a right-a-way to a subsidiary of ATSF in 1887. By 1896, both the ATSF and SPRR (Monrovia Branch) had lines running to Arcadia, with both stopping at the Arcadia railroad depot. Henry Huntington created the Pacific Railway (Red Car) system in 1901, primarily for passenger transportation. With these three main transportation systems stopping in Arcadia, to provide commercial and passenger travel needs, the future of the City of Arcadia was assured.

2. Big Santa Anita Canyon

The United States Government set aside 555,520 acres of undeveloped forest land to create the San Gabriel National Forest Reserve in 1892. Prior to that time, Timber Land Patents had been issued to Leonard H. Emerson in 1887 and Phillip M. Peterbaugh in 1889 for parcels of land in Section 10. In Section 15 to the south, "Lucky" Baldwin had purchased 431 acres of surplus railroad land in 1876, and added these to his extensive holdings. Owning this land would have been both extremely valuable for his having direct access to a fresh water source in the San Gabriel Mountain watershed, and a high risk from the danger of seasonal floods that could come surging down the Big Santa Anita Canyon creek.

To protect the most populated communities located down slope of the San Gabriel Mountains, a $35 million bond measure was passed in May 1924 to have the Flood Control District construct dams in Pacoima, Santa Anita Canyon, and a storm channel from the Los Flores Canyon in Altadena. The Big Santa Anita dam was to be 225 feet high with a reservoir

capacity of 1,500 acre feet, for a cost of $586.000.[24] The Big Santa Anita dam would be the repository for the watershed of a thirteen-mile area above Arcadia and Monrovia running into Big Santa Anita Canyon. By August of 1924, the estimated cost of the Big Santa Anita dam was $700,000, and the plans for the dam and reservoir had been approved by the State Engineer.[25]

Although not completed by September of 1926, J. W. Reagan, chief engineer of the Los Angeles Flood Control District gave a tour of the Big Santa Anita dam that was being constructed by Ross Construction Company. Over 40,000 cubic yards of concrete had been poured, and the dam wall had reached the height of 135 feet of the total goal of 235 feet.[26]

A five-day rainstorm in early March of 1938 brought over 10 inches of rain to the San Gabriel Mountains and the valley below. Chief Flood Control engineer C. H. Howell stated that the storm put the greatest test on the system since it had been constructed. The storm runoff had filled all of the 14 dams in the District's system, and the reservoir behind the Big Santa Anita dam had actually overflowed when the floodgates could not drain the water quickly enough. Fortunately, no serious damage from the Big Santa Anita Dam overflow occurred downstream.[27] The Los Angeles Times wrote an article in 1940 about the caretaker of the dam, Joseph Propst and his family, who had been living in the caretaker's house for the last 10 years. The dam was equipped with banks of electric spotlights that allow the caretaker to see the level of the water at night. The Propst's recalled the night of the great March flood of 1938, watching the waters reach the top of the dam and working the valves to open gates to relieve the pressure on the dam.[28]

In 1950, the Los Angeles County Flood Control District headed a consortium of local, state, and county governments, to construct a concrete diversion structure just south of the Big Santa Anita Dam in the Santa Anita Wash. A 30-inch pipe would be attached to the diversion structure sending water two-miles away to the 10-acre percolation grounds in Sierra Madre. The cost of the project was estimated at $240,000.[29]

The Los Angeles Flood Control District began the project to excavate a tunnel through 1,500 feet of solid rock, from the base of the Big Santa Anita Dam reservoir to a point almost due south near the existing Headworks, in 1968. The tunnel was to be used to remove some 825,000 cubic yards of silt that had been deposited in the reservoir since 1927 from the seasonal rains draining into the basin. The amount of silt coming off the hills had been exacerbated from when the vegetation that usually held the topsoil in place had been burned

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[24] *Los Angeles Times. "Start on Flood Job Urged." May 24, 1924.*

[25] *Los Angeles Times. "Speed on Flood Control Asked." August 24, 1924.*

[26] *Los Angeles Times. "Flood Dams of County Viewed." September 24, 1926.*

[27] *Los Angeles Times. "Small Losses Prove Value of Dam System." March 4, 1938.*

[28] *Los Angeles Times. "Couple Keep Lonely Vigil at Dam to Protect Lives of Lowlanders." February 2, 1940.*

[29] *Los Angeles Times. "Water Diversion Project Speeded by Sierra Madre." January 24, 1951.*

off in the occasional forest fires in the canyon. The tunnel project had come to the attention of the *Los Angeles Times* as the miners, working for the Clifford C. Bong & Company of Arcadia, were being guided through the base of the mountain by laser beams, heretofore only a tool of science fiction.[30] Once completed, the reservoir would be drained and the silt would be hauled by a conveyor-belt system through the tunnel and loaded onto trucks for depositing away from the tunnel. Using modern tunnel mining equipment, the tunnel was able to proceed at almost 20-feet per day.

[30] *Los Angeles Times. "Laser Beam Guides Miners Tunneling Through Mountain." September 1, 1968.*

B. HISTORIC RESOURCES IDENTIFIED

A site visit and pedestrian-level inspection of the APE was performed on January 9, 2013. The APE consists of a narrow area starting from the base of the Big Santa Anita Dam, and continuing south following the wash for approximately 1.7 miles. The APE is widest at 335 yards at the earthen berm Debris Basin dam and spillway. (Photograph 1) The built-environment resources over 45-years of age will be discussed below in order of their placement in the APE, from north to south. We have included copies of the original plans for structures and features located in the APE in Appendix A.

Photograph 1: Aerial view of the Big Santa Anita Dam, Headworks, and Debris Basin. (Source: Google Earth, 2013.)

Santa Anita Dam (also known as the Big Santa Anita Dam)

As previously discussed in Section I. B., EDAW, Inc., prepared the document *Cultural Resources Assessment for the Proposed* [Big] *Santa Anita* [Dam] *Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, California*, authored by Monica Strauss, M.A., et. al., in November 2007. The EDAW report determined that the Big Santa Anita Dam and those built-environment resources closely associated with the dam and reservoir, described collectively as the Santa Anita Dam Complex, were not eligible for listing in the National Register of Historic Places as required by Section 106 of the National Historic Preservation Act. Project activities were also evaluated under requirements of the California Environmental Quality Act (CEQA) and determined to have no potential to cause a significant impact to historic resources.

Sediment Removal Tunnel

The tunnel was constructed in 1968-1969 to provide a means of disposing years of accumulated silt that had been deposited by runoff into the Big Santa Anita reservoir. Because the dam and reservoir are located in a very steep canyon, it appears that District engineers found that creating a tunnel through solid rock for 1,500 feet would be a more prudent and cost-effective means of removing the silt rather than trying to haul the 825,000 cubic yards of dirt up to Chantry Flats Road. A 24-foot wide haul road was built from the southern portal of the tunnel to the Santa Anita Wash area below the Debris Dam, where the silt could be deposited. The entire tunnel is located within the boundary of the Angeles National Forest.

The unlined tunnel measured 9' 9" inches high, and wide. It was then clad with a 9 inch layer of concrete.[31] The conveyor belt system was installed inside the tunnel to carry silt from the bottom of the reservoir (which had been drained) to trucks waiting at the south portal of the tunnel. To insure that the tunnel was excavated in a straight line, the project contractor used a laser beam unit to guide the direction of digging. Today, only the large steel doors set in a large concrete frame are visible from the old haul road that runs north, towards the dam, from Arcadia Wilderness Park. (Photograph 2)

While using a laser beam in a commercial application in 1968 was worthy of being reported in the *Los Angeles Times*, the construction of the tunnel at Santa Anita Dam was not considered to be a significant technological or engineering event as it is a minor accomplishment compared to other mountain tunnels or mine adits.

[31] *Los Angeles County Flood Control District. Plans for Santa Anita Dam and Reservoir Removal of Debris. September 1966.*

Headworks

The Headworks structure is located approximately 263 yards downstream of the south portal of the Sediment Removal Tunnel, in the City of Arcadia. (Photograph 3) The Headworks intercepts the flow of the Santa Anita Wash released from the dam and redirects portions of that flow to the Santa Anita Wash spreading grounds and/or the Sierra Madre spreading grounds, where the water is recharged into the local groundwater basin (East Raymond Basin). The Headworks can also allow water to continue directly downstream to the Debris Basin. The Headworks consists of a curved earthen levee approximately 130 feet long used to slow and direct water towards the Headworks system, a bypass channel with an 8-foot tall tainter gate, and manual diversion gates, one each for the two different spreading grounds. A tainter gate is a type of radial arm floodgate use in dams and canal locks to control water flow, and was named after its inventor, the structural engineer Jeremiah Burnham Tainter in 1886. The Santa Anita Wash Headworks was designed in 1950 by Quinton Engineers, Ltd., Los Angeles.

The concrete diverter box that sends water to the Sierra Madre spreading grounds measures 7’ 6” wide by 13’ 6” long, and 10’ feet tall. The tainter gate is situated in a concrete channel box that measures 12’ 4” wide by approximately 34’ long, and 17’ high.

The tainter gate can direct flow to the two spreading grounds diversion gates. One gate diverts flow, up to 30 cfs, to the Sierra Madre spreading grounds, and the other gate diverts flow, up to 15 cfs, to the Santa Anita spreading grounds. Any flow not diverted to either of the spreading grounds will continue past the tainter gate and be directed downstream past the Wilderness Park to the Debris Basin. Currently, whenever changes to the flow rates to be delivered to either of the spreading grounds is needed, field crews must be contacted and sent to make manual adjustments to the gates. The response time required to make these adjustments results in lost water conservation.

These types of headwork configurations have been in use for hundreds of years. The fact that this headwork has been manually operated for over 50 years points to its design longevity and ease of operation. The Headworks is not a significant engineering or technological structure.

Culvert Bridge

The current channel crossing was designed by Quinton Engineers, Ltd. In 1950, and was most probably installed at the same time as the Headworks structure just upstream. The channel crossing consists of a concrete-slab road bed 29’ wide set on concrete walls lining the stream bed. Four large steel culvert pipes have been set in concrete under the road bed to control the flow of water and protect the bridge walls from erosion. (Photograph 4)

This type of bridge has been commonly used throughout the United States to span short distances for automobile and railroad use since the 1910s when large galvanized steel pipes

could be easily massed produced. The bridge is not a significant engineering or technological structure.

Debris Basin and Spillway

A debris basin consists of an embankment constructed of compacted earth, and excavated area within the basin to catch the debris, an outlet conduit to permit normal flow of water to pass through the basin and to drain the basin after a storm and a concrete spillway to permit water to flow out of the basin when it is filled during a storm. When a storm occurs; mud, boulders or any other debris is washed down the canyon by the stream. As the turbulent water enters the basin it is slowed down enough to cause it to drop most of this material into the excavation and the water continues to flow through the outlet conduit or the low pool drain. If an unusually large flood should occur, as the water stored in the basin nears the top of the embankment, the spillway then acts like the overflow in a bathtub and allows the excess to escape before it can endanger the earthen embankment.[32] Some of the water may be diverted to associated spreading grounds (percolation fields) so that the underground water table may be refreshed.

The Big Santa Anita Canyon Debris Basin is a 56' high earth embankment dam constructed in 1958 - 1960 by the U.S. Army Corps of Engineers (USACOE) for debris control and water conservation. The Debris Basin is located just over one mile downstream of the Dam and has a capacity of 245 acre-feet of water. Water could be directed through sluice gates into the adjacent spreading grounds or, excess water could escape over the spillway and into the storm channel. The Debris Basin spillway consists of an un-gated, smooth concrete-lined rectangular open channel, located within the Debris Basin embankment near the left abutment. (Photograph 5) The spillway is approximately 165 feet wide and has a capacity of allowing 38,000 cubic feet per second (cfs) wash over the crest of the structure. The width of the spillway gradually narrows to meet the width of the concrete-lined Santa Anita Wash storm channel. (Photograph 6)

After its completion, the Debris Basin was transferred from the USACOE to the District for operation and maintenance. Upon review of the Debris Basin in 1982, it was determined that it did not meet standards for seismic safety and it was required to keep the outlet gate open at all times to prevent any collection of water. Since then, the water conservation activities at the Debris Basin have ceased and it is used only to capture debris flows heading downstream.

The Santa Anita Debris Basin and spillway were designed using common engineering techniques for controlling water. Over thirty debris basins of various sizes were constructed throughout the canyons of the San Gabriel Mountains to control the runoff from seasonal rains. The Debris Basin and spillway are not significant structures.

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[32] *Los Angeles Times. "Debris Basins Stand Guard at Hillside Areas." December 13, 1954.*

Photograph 2: South portal of the tunnel that runs through the hills from the basin of the Big Santa Anita reservoir to a service road near the Headworks. View looking northwest.

Photograph 3: Headworks. View looking west.

Photograph 4: Bridge over 4-pipe culvert over Santa Anita Dam wash, near Arcadia Wilderness Park. View looking east.

Photograph 5: South elevation of spillway. View looking north.

Photograph 6: Santa Anita Wash storm channel adjacent to spreading grounds. View looking south.

C. SIGNIFICANCE

The Big Santa Anita Dam was constructed in 1924-1927 by the Los Angeles County Flood Control District. Because the area below the dam was not heavily populated until many years later, the water released by the Dam could just follow the Santa Anita Wash down into the Rio Hondo Wash, without too much damage to private property. But after World War II, the population in the areas of Arcadia, Sierra Madre, and Monrovia, began to increase and residents constructed houses in the foothills of the San Gabriel Mountains. The water coming out of the various canyons in the region had to be controlled to protect life and property. It was in the 1950s that the Headworks and Culvert Bridge, Debris Basin and spillway, were constructed to control and capture the flow of water from the Big Santa Anita Dam.

The Sediment Removal Tunnel was constructed only to provide access to the basin of the Big Santa Anita Dam reservoir so that accumulated silt could be removed and deposited elsewhere. Surveyors were able to use the most modern technology available in the form of laser beams to direct the mining operations of building a 9-foot wide tunnel through the mountain.

In assessing the historical significance of built-environment structures located within the APE and evaluated in this study, federal and state significance criteria were applied.[33] The structures identified in this study are not currently listed in either the National Register or the California Register.

Under National Register and/or California Register criteria relating to the association of the built-environment structures located within the APE with significant historical events that exemplify broad patterns of our history the Sediment Removal Tunnel, Headworks and Culvert Bridge, Debris Basin and spillway, do not appear to qualify as significant historic resources individually or collectively. Throughout the world, debris basins and dams (masonry, earthen or timber) have been constructed by both private and public entities to control seasonal rain fall, and to protect people and property. The structures located in the APE are just one of many flood-control systems that were constructed in the San Gabriel Mountain canyons. There is no evidence that any of the structures in the APE are eligible for listing under Criteria A/1.

Under National Register and/or California Register criteria relating to the built-environment structures located within the APE's association with persons of historic importance, the Dam, Sediment Removal Tunnel, Headworks and Culvert Bridge, Debris Basin and spillway, do not appear to qualify, individually or collectively, as significant resources. The design and plans for the structures located in the Santa Anita Wash were prepared by the Los Angeles County Flood Control District staff engineers, or the Army Corp of Engineers, as part of their normal tasks and duties. There is no evidence that any of the structures in the APE are eligible for listing under Criteria B/2.

Under National Register and/or California Register criteria relating to the distinctive characteristics of a type, period, region, or method of construction, the built-environment structures located within the APE are not significant as they do not, individually or collectively, embody any innovative engineering design or method of construction, or high artistic design. The Headworks was designed using common technology to channel water from the Dam towards the Debris Basin or into the 30' pipe to the Sierra Madre spreading grounds. The Debris Basin was constructed by excavating a water containment area in the Santa Anita Wash, and a spillway was erected to hold heavier debris back during high rainfall events. The technology used to create the basin and associated spreading grounds were commonplace, as was the use of concrete to hold, channel, divert, and control the water as it came down from the foothills. The Headworks and Culvert Bridge, Debris Basin and spillway, and Sediment Removal Tunnel, do not appear to present any technological achievement in the history of water systems locally, regionally or nationally, and are therefore not eligible for listing either individually or collectively under Criteria C/3.

Based upon a survey of the above-ground historic period resources within the APE performed in January 2013, the APE has not yielded, nor does it appear to have the potential to

[33] *The City of Arcadia does not have a formal set of significance criteria.*

yield, information important to the history of the local area, California or the nation pursuant to National Register and/or California Register criteria D/4.

In summation, the Headworks and Culvert Bridge, Debris Basin and spillway, and Sediment Removal Tunnel, are not eligible for listing in the National Register and/or the California Register, or as they do not, individually or collectively, meet any of the criteria necessary for listing in the registries.

IV. BIBLIOGRAPHY

A. PUBLICATIONS

California Corrugated Culvert Company. *Handbook of Water Control*. Lederer, Street and Zeus Company, Inc. Los Angeles, 1936. (Water Resources Institute archives, California State University San Bernardino.)

California Department of Transportation and JRP Historical Consulting Services. *Water Conveyance Systems in California*. State of California: Sacramento, 2000.

Etcheverry, B.A., *Irrigation Practice and Engineering, Volume 1, Use of Irrigation Water and Irrigation Practice*. McGraw-Hill Book Company, Inc., New York, 1915.

Etcheverry, B.A., *Irrigation Practice and Engineering, Volume 2, Conveyance of Water.* McGraw-Hill Book Company, Inc., New York, 1915.

Flinn, Alfred D. et. al. *Waterworks Handbook*. McGraw-Hill Book Company. New York, 1918. (Water Resources Institute archives, California State University San Bernardino.)

Office of State Historic Preservation. California Historic Resources Inventory, Survey Workbook (excerpts). State of California: Sacramento, 1986.

Office of State Historic Preservation. Historic Properties Directory. State of California: Sacramento, 1995.

Parker, Patricia L. *National Register Bulletin 24, "Guidelines for Local Surveys: A Basis for Preservation Planning".* Washington D.C.: U.S. Government Printing Office, 1985.

Strauss, Monica, Christy Dolan and Sara Dietler. *Cultural Resources Assessment for the Proposed Santa Anita Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, California*. Prepared by EDAW, Inc. for Los Angeles County Department of Public Works, Alhambra, CA. November 2007.

United States Department of the Interior. *National Register Bulletin 15, "How to Apply the National Register Criteria for Evaluation."* Washington, DC: National Park Service, Interagency Resources Division, rev. 1991.

Walker, Tory R., P.E., and Stephen L. Jamieson, P.E. *Dam Breach Analyses For Flood Control Dams*. GEI Consultants, Inc. Englewood, CO. http://www.trwengineering.com/Publications/dambrch.pdf

B. PUBLIC RECORDS, PRIOR REPORTS, OTHER

Angeles National Forest property records. Heritage Program, USDA Forest Service – Angeles National Forest, 701 North Santa Anita Avenue, Arcadia, CA.

City of Arcadia. "Cultural Resources and Preservation", City of Arcadia General Plan, November 2010. http://www.ci.arcadia.ca.us/home/index.asp?page=1586

County of Los Angeles Department of Public Works: Selected drawings, plans & details of Santa Anita Dam, Wash, Headworks, and Debris Basin. Provided by Design Division Plan Room Public Counter, 900 South Fremont Avenue, Alhambra, CA 91803.

Los Angeles Times.

"Start on Flood Job Urged." May 24, 1924.
"Speed on Flood Control Asked." August 24, 1924.
"Flood Dams of County Viewed." September 24, 1926.
"Small Losses Prove Value of Dam System." March 4, 1938.
"Couple Keep Lonely Vigil at Dam to Protect Lives of Lowlanders." February 2, 1940.
"Water Diversion Project Speeded by Sierra Madre." January 24, 1951.
"Laser Bam Guides Miners Tunneling Through Mountain." September 1, 1968.
"Debris Basins Stand Guard at Hillside Areas." December 13, 1954.

APPENDIX A – Selected Drawings

REV. NO.	DATE	REVISION	REV. BY	CKD BY
1	11-5-59	CHANGED DETAILS & TOLERANCE	AEW	JAS

CITY OF SIERRA MADRE
FLOOD CONSERVATION
WATER WORKS IMPROVEMENT

SPREADING GROUNDS
GRADING PLAN- NORTH AREA

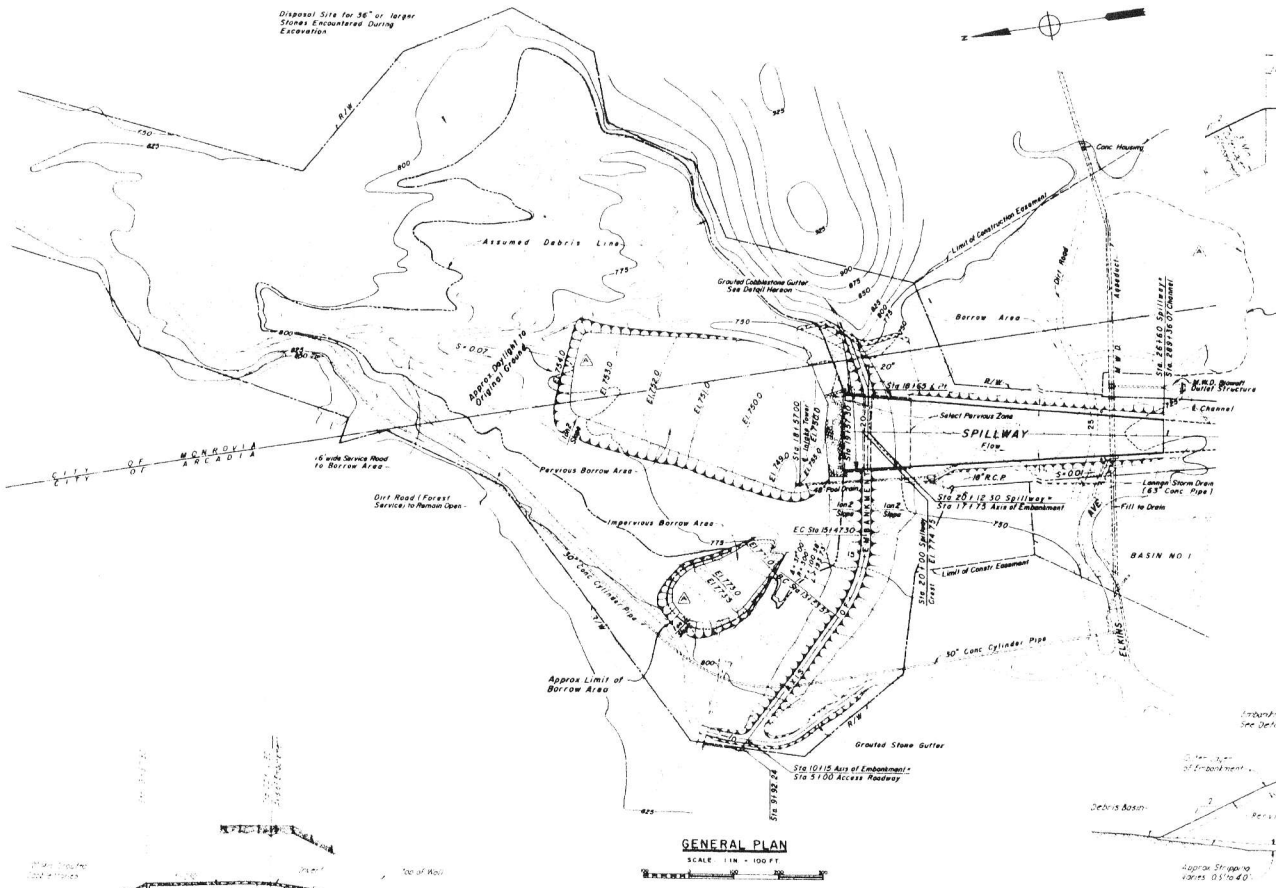
QUINTON ENGINEERS, LTD.
LOS ANGELES

DESIGNED	F.D.E. - H.W.L.	SCALE	1" = 40'-0"
DRAWN	N.S. - J.S.H.	DATE	SEPT. 28, 1959
CHECKED	COWER	JOB NO.	DRAWING NO.
APPROVED		5022	12

LOS ANGELES COUNTY FLOOD CONTROL DIST.
FILE NO. 36 -F 23.12
FILE COPY

CORPS OF ENGINEERS

U.S. ARMY



GENERAL PLAN

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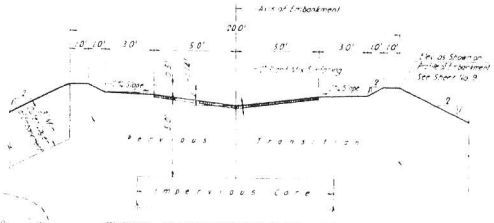

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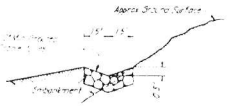

GROUTED COBBLESTONE GUTTER DETAIL

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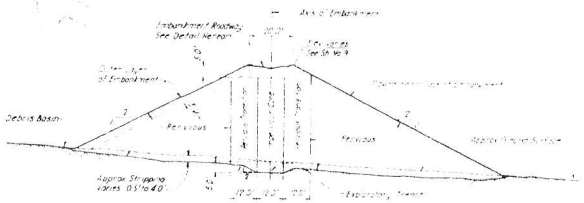

TYPICAL EMBANKMENT SECTION

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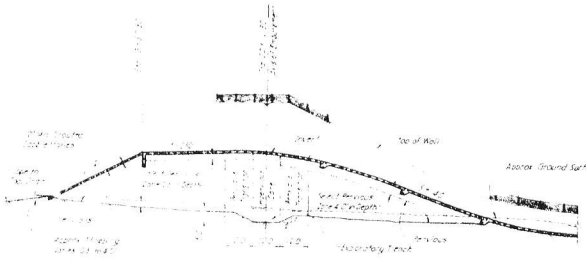


SECTION ON CENTER LINE OF SPILLWAY

(PIPE DRAINS NOT SHOWN)

SCALE 1 IN = 20 FT

REFERENCE DRAWINGS

For General Notes and Reference Drawings	See Sheet No. 3
For Foundation Investigation Debris Basin	See Sheet No. 5
For Embankment and Details of Access Roadway	See Sheet No. 9
For Details of Spillway	See Sheets No. 8
For Embankment Cross Sections	See Sheet No. 12

RECORD DRAWING - AS CONSTRUCTED

CONT. No. 13 SC REV. A DATE 10-3-66 BY N.A.

CONT. No. ____ REV. ____ DATE ____ BY ____

CONT. No. ____ REV. ____ DATE ____ BY ____

DATUM IS MEAN SEA LEVEL

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
LOS ANGELES, CALIFORNIA

ENGINEER

DRAWN BY H.S.P.

CHECKED BY A.A.

SUBMITTED BY

LOS ANGELES COUNTY DRAINAGE AREA, CALIFORNIA

SANTA ANITA WASH

SANTA ANITA WASH CHANNEL
DEBRIS BASIN TO A.T.&S.F. RY

DEBRIS BASIN, EMBANKMENT AND SPILLWAY GENERAL PLAN AND SECTIONS

NO.	DATE	REVISION	REV	CHK	APP
A	10-3-66	Extended & Extended Borrow Area	HSP		

APPROVAL RECOMMENDED

APPROVED

SCALE AS SHOWN

DATE OCTOBER, 1958

TO ACCOMPANY SPECIFICATIONS

CIVENG 04-353-59 19

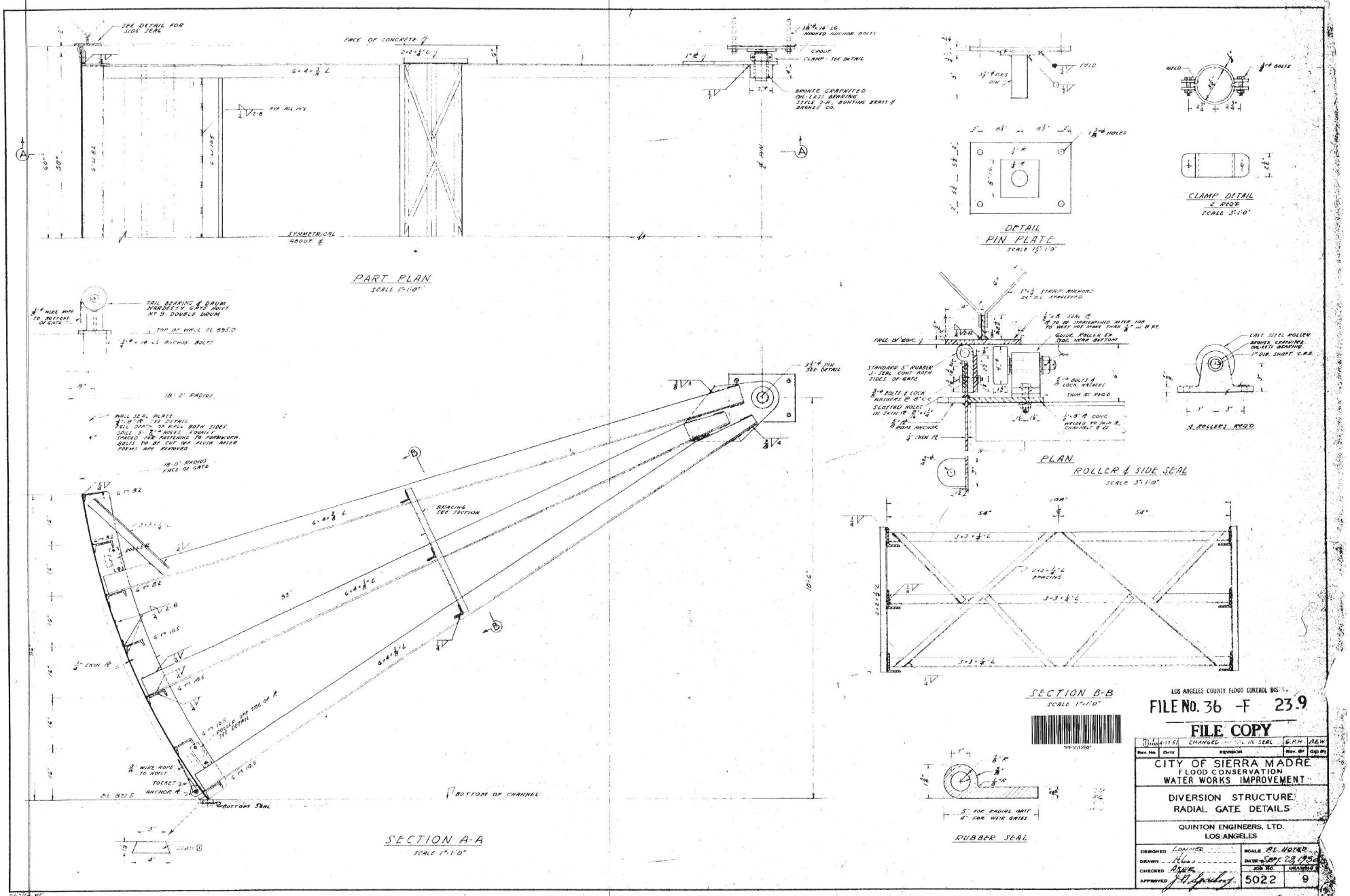
SHEET 7 OF 72

FILE NO. (D.O. SERIES) 186/7

PERLITER & SORING ● CONSULTING ENGINEERS
LOS ANGELES, CALIFORNIA

OCT. 1958
DATE

FOR THE ARCHITECT-ENGINEER



LOS ANGELES COUNTY FLOOD CONTROL DIST.

FILE NO. 36 -F 23.9

FILE COPY

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CITY OF SIERRA MADRE
FLOOD CONSERVATION
WATER WORKS IMPROVEMENT

DIVERSION STRUCTURE
RADIAL GATE DETAILS

QUINTON ENGINEERS, LTD.
LOS ANGELES

DESIGNED	LOUNSBERY	SCALE	AS NOTED
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CHECKED	AEE	JOB NO.	DRAWING
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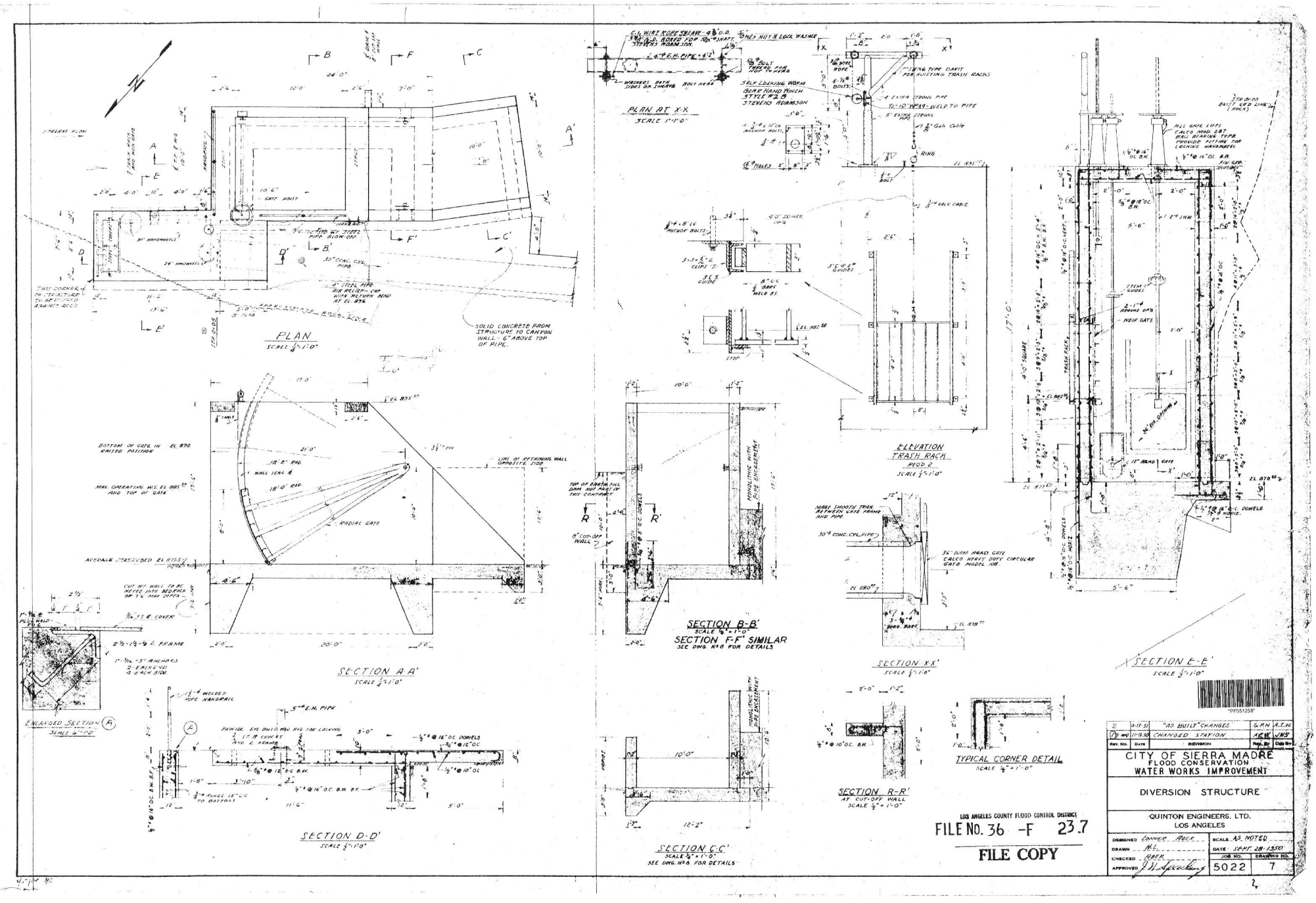
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SECTION A-A'
SCALE 1/4"=1'-0"
SECTION D-D'
SCALE 1/4"=1'-0"
ENLARGED SECTION (A)
SCALE 6"=1'-0"
PLAN AT X-X
SCALE 1"=1'-0"
ELEVATION
TRASH RACK
PROD 2
SCALE 1/4"=1'-0"
SECTION B-B'
SCALE 1/4"=1'-0"
SECTION F-F' SIMILAR
SEE DWG. No 6 FOR DETAILS
SECTION C-C'
SCALE 1/4"=1'-0"
SEE DWG. No 6 FOR DETAILS
SECTION X-X'
SCALE 1/4"=1'-0"
SECTION R-R'
AT CUT-OFF WALL
SCALE 1/4"=1'-0"
TYPICAL CORNER DETAIL
SCALE 1/4"=1'-0"
SECTION E-E'
SCALE 1/4"=1'-0"
RADIAL GATE
GATE HOIST
SOLID CONCRETE FROM STRUCTURE TO CANYON WALL - 6" ABOVE TOP OF PIPE.
THIS CORNER OF STRUCTURE TO BE STITCHED AGAINST ROCK
BOTTOM OF GATE IN EL 890 RAISED POSITION
MAX. OPERATING W.S. EL 885.5 AND TOP OF GATE
LINE OF RETAINING WALL OPPOSITE SIDE
AVERAGE STRESSED EL 877.5
CUT OFF WALL TO BE KEYED INTO ROCK FOR 1'-6" MIN. DEPTH
TOP OF EARTH FILL DAM NOT PART OF THIS CONTRACT
MONOLITHIC WITH PIPE ENCASEMENT
MAKE SMOOTH TRANS. BETWEEN GATE FRAME AND PIPE
30" CONC. CYL. PIPE
36" DIAM. HEAD GATE CALCO HEAVY DUTY CIRCULAR GATE MODEL 108.
CALCO HEAD GAT. BALL BEARING TYPE PROVIDE FITTING FOR LOCKING HANDWHEEL
TRASH RACKS
NEW GATE LIFT
NEW GATE
CITY OF SIERRA MADRE
FLOOD CONSERVATION
WATER WORKS IMPROVEMENT
DIVERSION STRUCTURE
QUINTON ENGINEERS, LTD.
LOS ANGELES
DESIGNED CONNER PARK
DRAWN AL
CHECKED PARK
APPROVED
SCALE AS NOTED
DATE APR. 28, 1950
JOB NO. 5022
DRAWING NO. 7
REV. NO. DATE REVISION
2 4-17-51 "AS BUILT" CHANGES G.P.H. A.E.W.
1 11-9-50 CHANGED STATION
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
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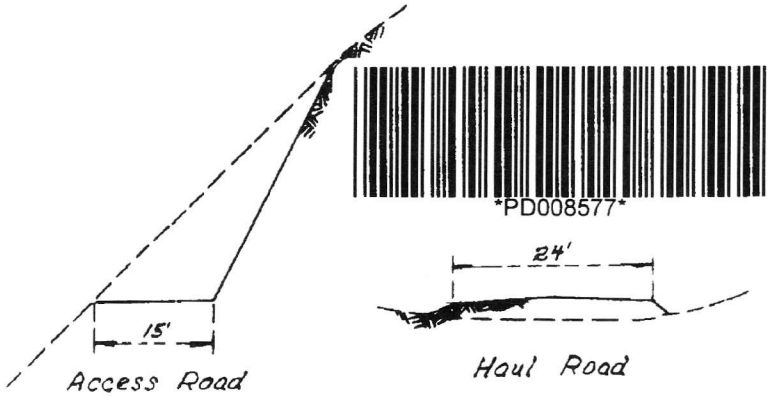

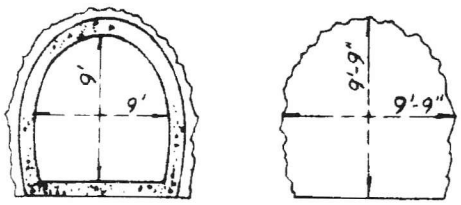

Lined Tunnel
Unlined Tunnel
(Conveyor system not shown)

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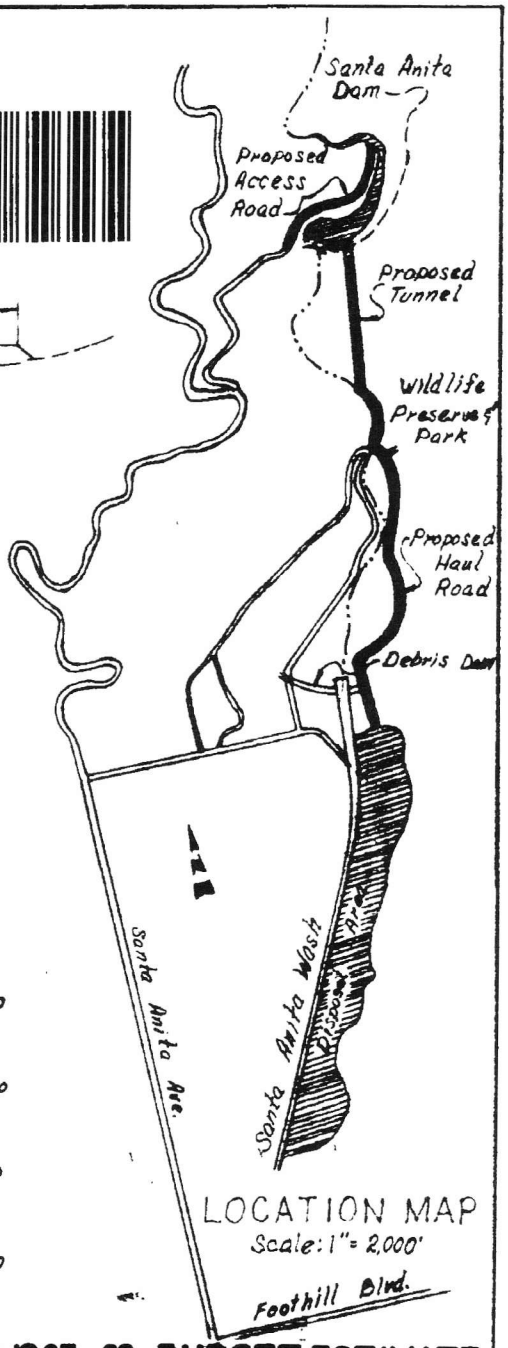

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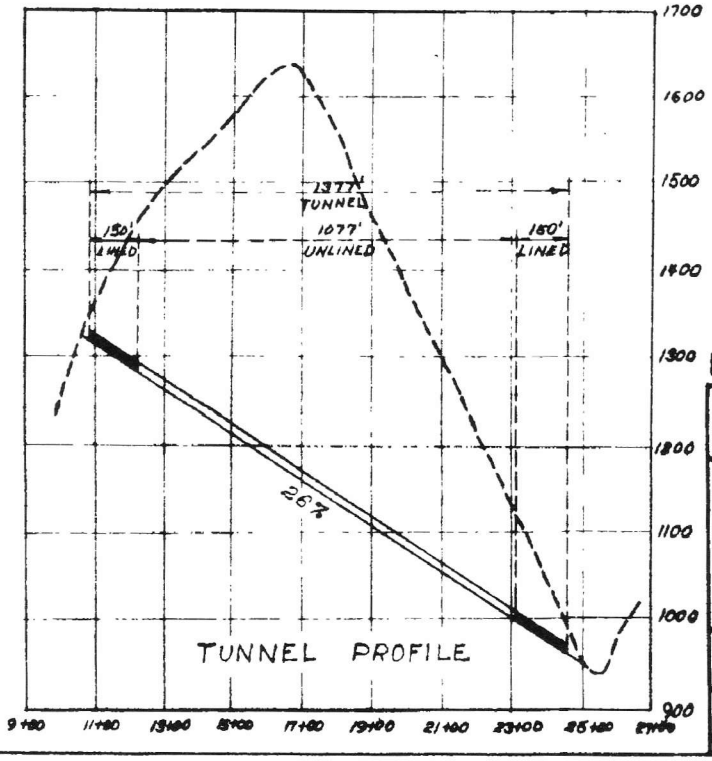


TUNNEL PROFILE

1967-68 BUDGET ESTIMATE

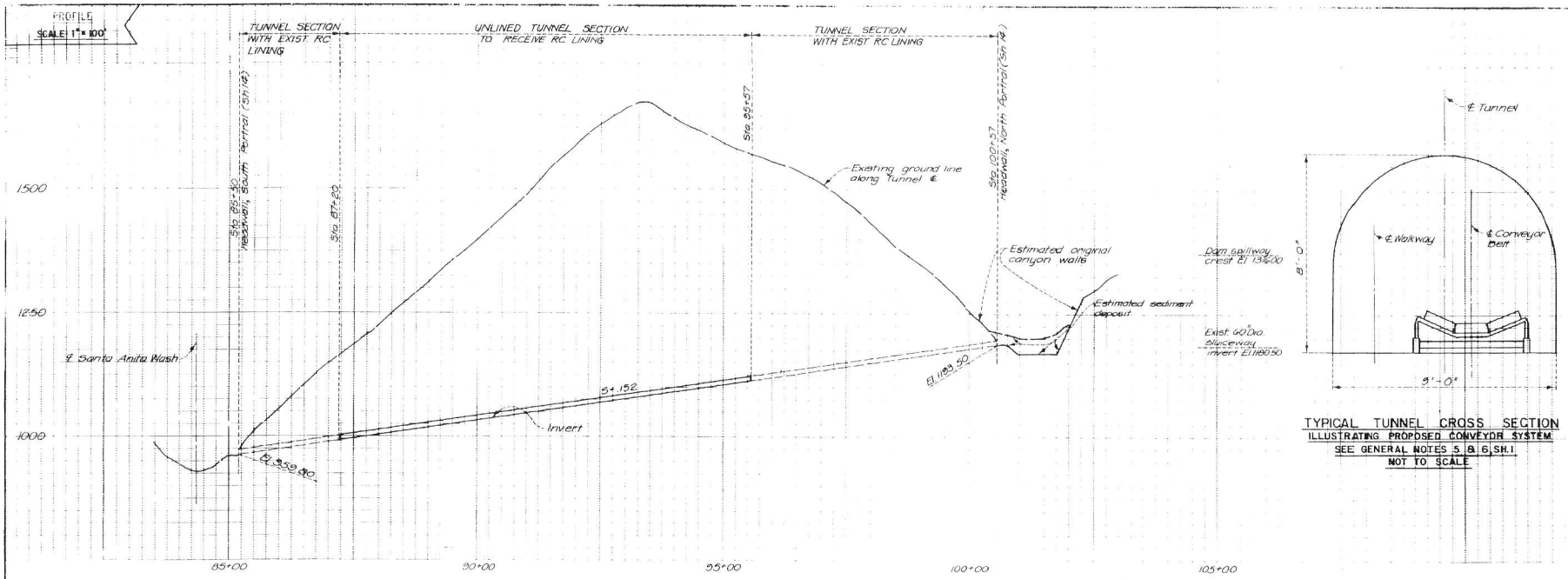
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

SANTA ANITA DAM AND RESERVOIR

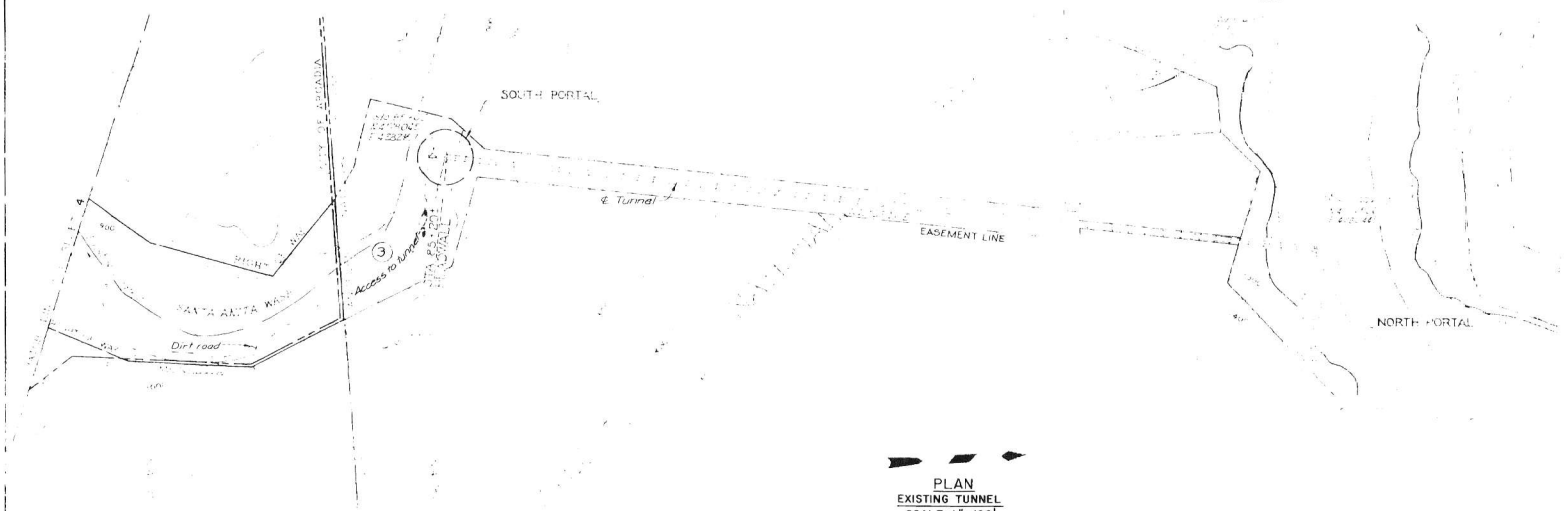
REMOVAL OF DEBRIS

APPROVED BY _____ CHIEF ENGINEER

SCALE	DATE	NO. 55-D54
AS SHOWN	SEP 1966	SHEET 1 OF 1



TYPICAL TUNNEL CROSS SECTION
ILLUSTRATING PROPOSED CONVEYOR SYSTEM
SEE GENERAL NOTES 5 & 6, SH. 1
NOT TO SCALE



PLAN
EXISTING TUNNEL
SCALE: 1" = 100'
CONTOUR INTERVAL = 25'
50 0 100 200

CITY OF LOS ANGELES DEPARTMENT OF

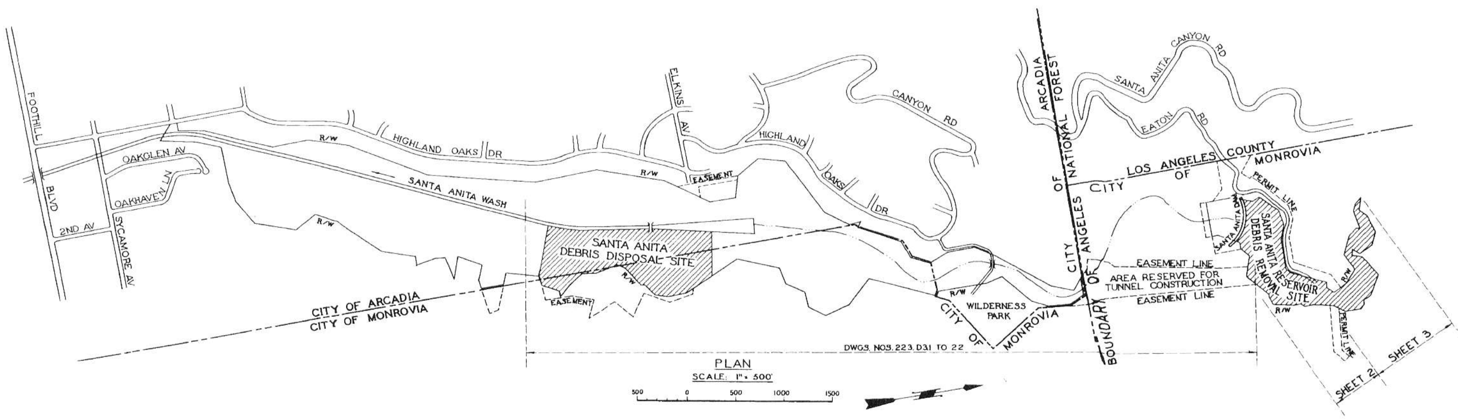
SANTA ANITA DAM
TUNNEL REHABILITATION

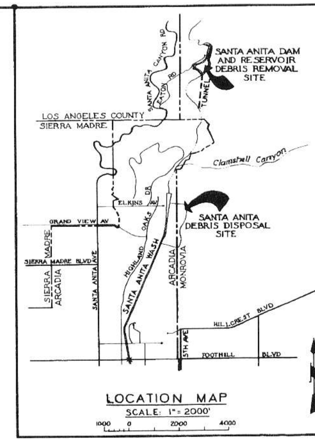
PLAN AND PROFILE
EXISTING TUNNEL

T. Dudley K. Salmassian M. Jeffers C033914

May '88
55-D86.5
SHT. 9 8

"AS BUILT" DRAWING





INDEX TO DRAWINGS

DWG. NO.	TITLE
55-D58.1	GENERAL PLAN, GENERAL NOTES, LOCATION MAPS, AND INDEX TO DRAWINGS
2	PLAN AND PROFILE
3	PLAN AND PROFILE
4	CROSS SECTIONS
5	CROSS SECTIONS
55-D59.1 TO 5	LOG OF BORINGS

GENERAL NOTES

1. *Elevations shown are in feet above the U.S.C.& G.S. Mean Sea Level datum, 1934 adjustment.*
2. *Sections shown on drawings are along the Control Line.*
3. *The contours and grades shown on these drawings are intended to give the Contractor an idea of the work to be performed; they do not necessarily show the exact limits of excavation. See Note 2, Drawing No. 55-D58.2.*
4. *See Drawings Nos. 223-D3.1 through 223-D3.22 for fill in debris disposal area associated with cleanout of reservoir depicted on this set of drawings.*

REFERENCES

Topography: C 280, 55T1, 55T26, 55-T29, 55-T35

Right of Way: 55-ML9, 55-RW2.1, Calc. Books 36-RW12.1 and 36-RW2.

Miscellaneous: 55-D57.1 to 5.

"AS BUILT" DWGS.

DRAWN BY	REVISIONS		
A.E.M.	MARK	DATE	DESCRIPTION
CHECKED BY R.D.Q.			
DESIGNED BY R.D.Q.			
SUBMITTED BY R.B.R.			

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

SANTA ANITA DAM AND RESERVOIR

GENERAL PLAN, GENERAL NOTES, LOCATION MAP, AND INDEX TO DRAWINGS

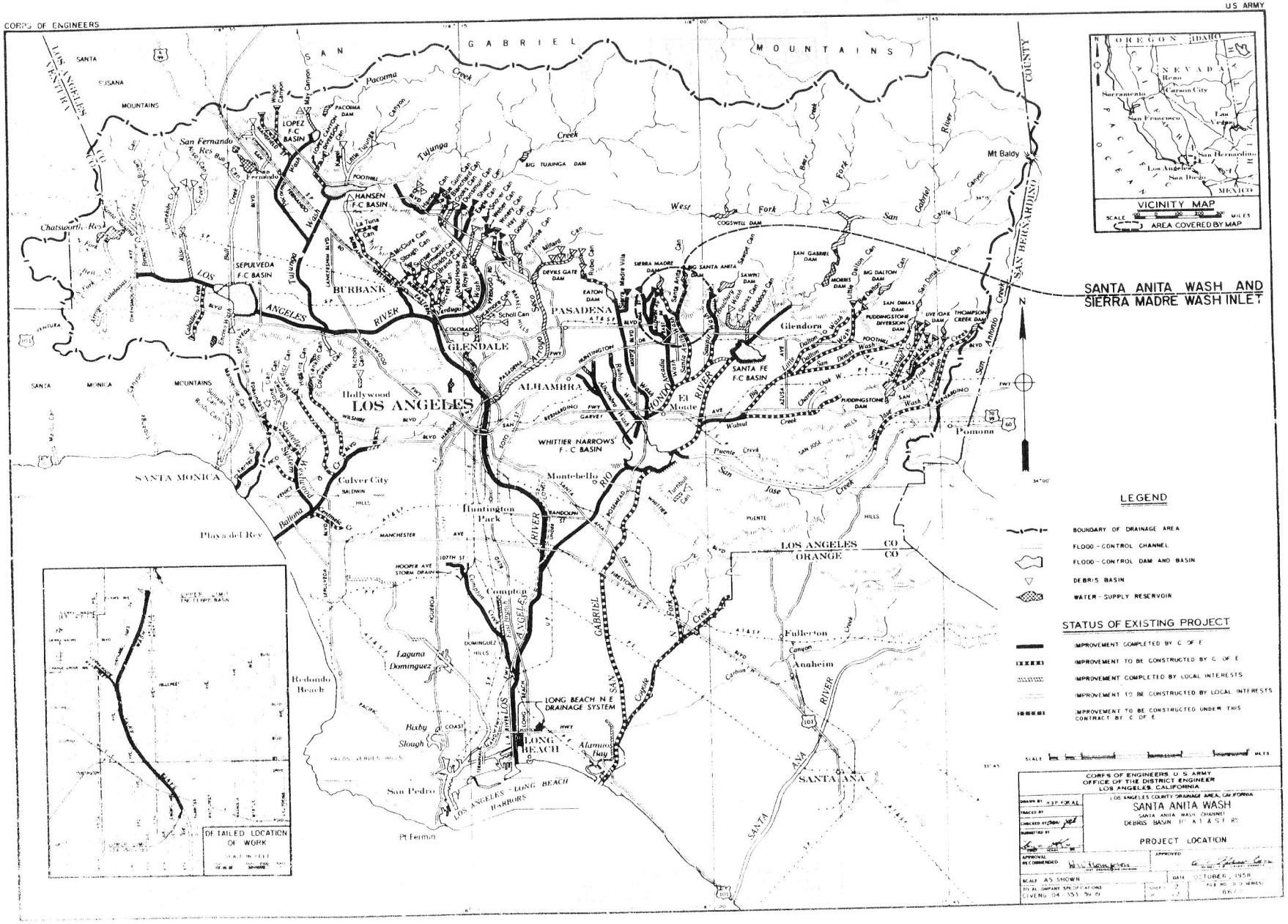
RECOMMENDED BY: C.F. Eshelby (signature), DIVISION ENGINEER (DESIGN)
APPROVAL RECOMMENDED BY: Milan W. Ransom (signature), ASS'T CHIEF DEPUTY ENGINEER
APPROVED BY: Walter J. Wood (signature), CHIEF ENGINEER

SCALE	DATE	DWG. NO. 55-D58.1
AS SHOWN	MAR., 1968	SHEET 1 OF 5

"AS BUILT" DRAWING

CORPS OF ENGINEERS

US ARMY



APPENDIX B – DPR Inventory Site Forms

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**	Primary # HRI # Trinomial NRHP Status Code	
Other Listings Review Code	Reviewer	Date

 ***Resource Name or #:** Santa Anita Wash Flood Control System Features south of Big Santa Anita Dam

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Mt. Wilson **Date:** 1995 **T** 1 N ; **R** 11 W; **Sec 15** **;** S.B.B.M.

c. Address: System features are located on land in the Angeles National Forest and City of Arcadia

d. UTM: See attached sheet of features for individual UTM coordinates.

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

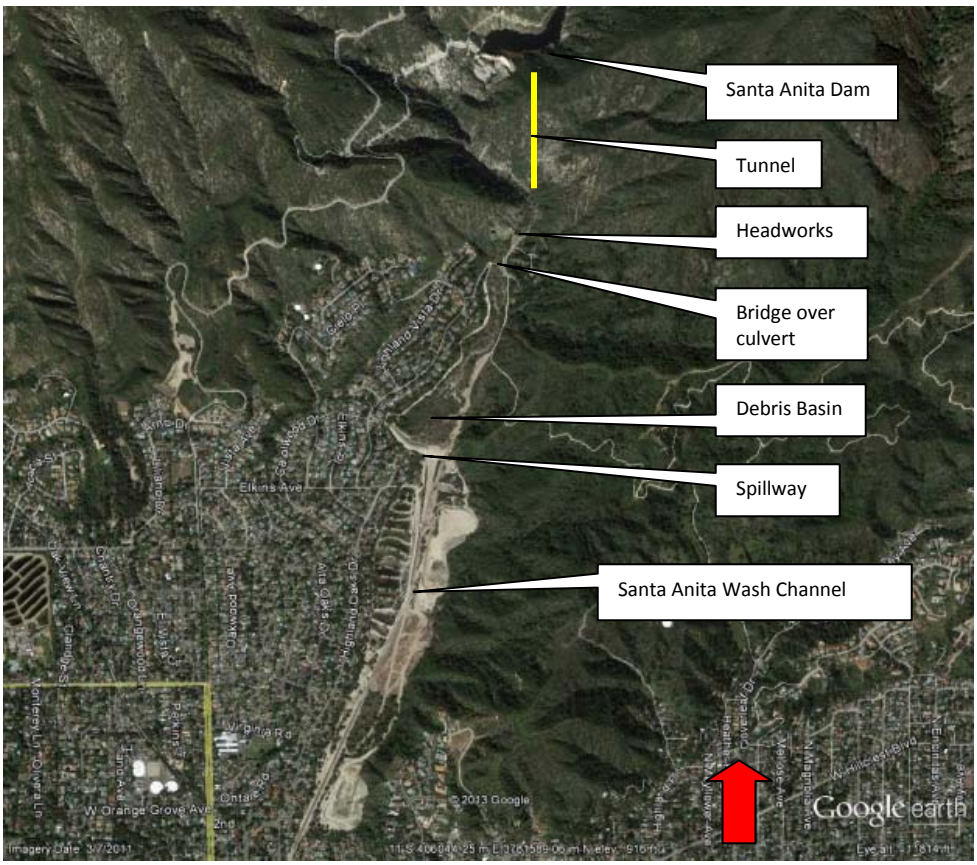
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The area of potential effect (APE) for the proposed project spans three legal jurisdictions. The northern portion of the project survey area is located in Section 10 of Township 1 North, Range 11 West. Section 10 is situated within the boundary of the Angeles National Forest overseen by the United States Forest Service. The Big Santa Anita Dam, reservoir, and portion of the Santa Anita Wash that runs south up to the boundary with Section 15 of Township 1 North, Range 11 West are under the control of the U.S. Army Corp of Engineers Los Angeles Division. The Sediment Removal Tunnel used for the disposal of silt from the bottom of Santa Anita Dam reservoir, spans south from the reservoir to the southern boundary of Section 10, and is located in the Angeles National Forest.

From there south, the project survey area is primarily on land that is located in the City of Arcadia. A small portion of undeveloped land south of Arcadia Wilderness Park belonging to the City of Monrovia protrudes into the APE, and appears to be comprised mostly of scrub vegetation on loose creek bed. The Headworks, Culvert Bridge, Debris Basin and spillway, are located on land in the City of Arcadia.

***P3b. Resource Attributes:** HP-11 (Engineering structure: flood control), AH-6 (Water conveyance system)

***P4. Resources Present:** ☐Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Aerial by Google Earth, 2013. View looking north.

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both 1950 - 1968 per LADPW.

***P7. Owner and Address:** Los Angeles County Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803

***P8. Recorded by:** Pamela Daly, M.S.H.P.
Daly & Associates
4486 University Avenue
Riverside, CA 92501

***P9. Date Recorded:** February 13, 2013

***P10. Survey Type:** CEQA – Intensive Level

***P11. Report Citation:** Historic Resources Assessment Report of Santa Anita Stormwater Flood Management and Seismic Strengthening Project, Santa Anita Wash, Headworks, and Debris Basin, Los Angeles County, CA.

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

P1. Other Identifier: Silt Tunnel

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Mt. Wilson **Date:** 1995 **T** 1N ; **R** 11W ; S ½ **of Sec** 10 **;** S.B.**B.M.**

c. Address: Angeles National Forest City: Zip:

d. UTM: Zone: 11 ; Point A: 406149 mE/ 3783006 mN; Point B: 406132 mE/ 3782591 mN. (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

The tunnel runs from the bottom of Big Santa Anita Dam in a straight line through the mountain to its south portal. There is a unpaved road that runs north up the canyon from Arcadia Wilderness Park, to the south portal.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The tunnel was constructed in 1968-1969 to provide a means of disposing years of accumulated silt that had been deposited by runoff into the Big Santa Anita reservoir. Because the dam and reservoir are located in a very steep canyon, it appears that District engineers found that creating a tunnel through solid rock for 1,500 feet would be a more prudent and cost-effective means of removing the silt rather than trying to haul the 825,000 cubic yards of dirt up to Chantry Flats Road. A 24-foot wide haul road was built from the southern portal of the tunnel to the Santa Anita Wash area below the Debris Dam, where the silt could be deposited. The entire tunnel is located within the boundary of the Angeles National Forest.

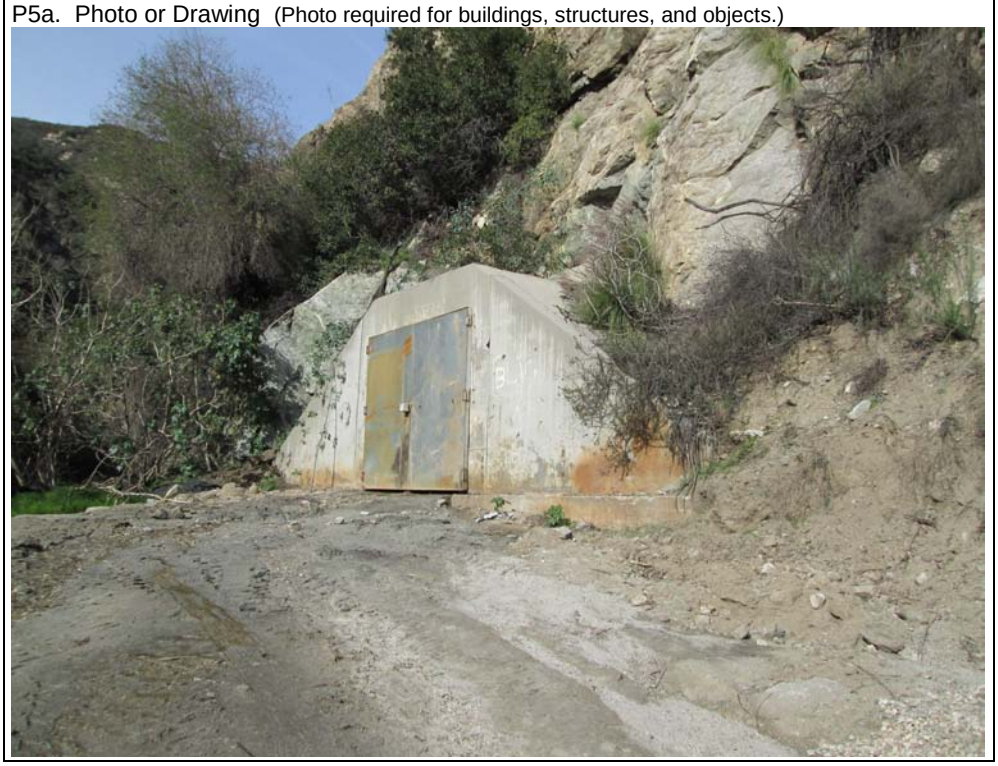
The unlined tunnel measured 9' 9" inches high, and wide. It was then clad with a 9 inch layer of concrete. The conveyor belt system was installed inside the tunnel to carry silt from the bottom of the reservoir (which had been drained) to trucks waiting at the south portal of the tunnel. To insure that the tunnel was excavated in a straight line, the project contractor used a laser beam unit to guide the direction of digging. Today, only the large steel doors set in a large concrete frame are visible from the old haul road that runs north, towards the dam, from Arcadia Wilderness Park.

While using a laser beam in a commercial application in 1968 was worthy of being reported in the *Los Angeles Times*, the construction of the tunnel at Santa Anita Dam was not considered to be a significant technological or engineering event as it is a minor accomplishment compared to other mountain tunnels or mine adits.

***P3b. Resource Attributes:** HP-11 (Engineering structure), HP-39 (Other: tunnel)

***P4. Resources Present:** ☐Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #) South portal of tunnel. January 9, 2013. View looking northwest.

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1968 per LA County DPW.

***P7. Owner and Address:**
Los Angeles County Department of Public Works
900 S. Freemont Avenue
Alhambra, CA 91803

***P8. Recorded by:** Pamela Daly
Daly & Associates
4486 University Avenue
Riverside, CA 92501

***P9. Date Recorded:**
February 12, 2013

***P10. Survey Type:**
CEQA – Intensive Level

***P11. Report Citation:**
Historic Resources Assessment Report of Santa Anita Stormwater Flood Management and Seismic Strengthening Project, Santa Anita Wash, Headworks, and Debris Basin, Los Angeles County, CA.

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

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**	Primary # HRI # Trinomial NRHP Status Code	
Other Listings Review Code	Reviewer	Date

 ***Resource Name or #:** Santa Anita Wash Headworks

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Mt. Wilson **Date:** 1995 **T** 1 N ; **R** 11 W; **Sec 15** **;** S.B.B.M.

c. Address: In Arcadia Wash north of Arcadia Wilderness Park City: Arcadia Zip:

d. UTM: Zone: 11 ; 406139 mE/ 3782378 mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 915 ft.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The Headworks intercepts the flow of the Santa Anita Wash released from the dam and redirects portions of that flow to the Santa Anita Wash spreading grounds and/or the Sierra Madre spreading grounds, where the water is recharged into the local groundwater basin (East Raymond Basin). The Headworks can also allow water to continue directly downstream to the Debris Basin. The Headworks consists of a curved earthen levee approximately 130 feet long used to slow and direct water towards the Headworks system, a bypass channel with an 8-foot tall tainter gate, and manual diversion gates, one each for the two different spreading grounds. A tainter gate is a type of radial arm floodgate use in dams and canal locks to control water flow, and was named after its inventor, the structural engineer Jeremiah Burnham Tainter in 1886. The Santa Anita Wash Headworks was designed in 1950 by Quinton Engineers, Ltd., Los Angeles. The concrete diverter box that sends water to the Sierra Madre Spreading Grounds measures 7' 6" wide by 13' 6" long, and 10' feet tall. The tainter gate is situated in a concrete channel box that measures 12' 4" wide by approximately 34' long, and 17' high.

These types of headwork configurations have been in use for hundreds of years. The fact that this headwork has been manually operated for over 50 years points to its design longevity and ease of operation. The Headworks is not a significant engineering or technological structure.

***P3b. Resource Attributes:** HP-11 (Engineering structure), AH-6 (Water conveyance system)

***P4. Resources Present:** ☐Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Headworks, January 9, 2013. View looking west.

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1950 per LADPW.

***P7. Owner and Address:**
Los Angeles County Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803

***P8. Recorded by:**
Pamela Daly, M.S.H.P.
Daly & Associates
4486 University Avenue
Riverside, CA 92501

***P9. Date Recorded:** February 13, 2013

***P10. Survey Type:**
CEQA – Intensive Level

***P11. Report Citation:**
Historic Resources Assessment Report of Santa Anita Stormwater Flood Management and Seismic Strengthening Project, Santa Anita Wash, Headworks, and Debris Basin, Los Angeles County, CA.

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

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**	Primary # HRI # Trinomial NRHP Status Code	
Other Listings Review Code	Reviewer	Date

 ***Resource Name or #:** Culvert Bridge over Santa Anita Wash

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Mt. Wilson **Date:** 1995 **T** 1 N ; **R** 11 W; **Sec 15** **;** S.B.B.M.

c. Address: On the road off of Highland Oaks Road that leads to Arcadia Wilderness Park City: Arcadia Zip:

d. UTM: Zone: 11 ; 406069 mE/ 3782260 mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 873 ft.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The current channel crossing was designed by Quinton Engineers, Ltd. In 1950, and was most probably installed at the same time as the Headworks structure just upstream. The channel crossing consists of a concrete-slab road bed 29' wide set on concrete walls lining the stream bed. Four large steel culvert pipes have been set in concrete under the road bed to control the flow of water and protect the bridge walls from erosion.

This type of bridge has been commonly used throughout the United States to span short distances for automobile and railroad use since the 1910s when large galvanized steel pipes could be easily massed produced. The bridge is not a significant engineering or technological structure.

***P3b. Resource Attributes:** HP-19 (Bridge), AH-6 (Water conveyance system)

***P4. Resources Present:** ☐Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Culvert bridge, January 9, 2013. View looking east.

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1950 per LADPW.

***P7. Owner and Address:**
Los Angeles County Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803

***P8. Recorded by:**
Pamela Daly, M.S.H.P.
Daly & Associates
4486 University Avenue
Riverside, CA 92501

***P9. Date Recorded:** February 13, 2013

***P10. Survey Type:**
CEQA – Intensive Level

***P11. Report Citation:**
Historic Resources Assessment Report of Santa Anita Stormwater Flood Management and Seismic Strengthening Project, Santa Anita Wash, Headworks, and Debris Basin, Los Angeles County, CA.

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

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**	Primary # HRI # Trinomial NRHP Status Code	
Other Listings Review Code	Reviewer	Date

 ***Resource Name or #:** Santa Anita Wash Debris Basin and Spillway

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Mt. Wilson **Date:** 1995 **T** 1 N ; **R** 11 W; **Sec 15** **;** S.B.B.M.

c. Address: Located at the east end of Elkins Avenue City: Arcadia Zip:

d. UTM: Zone: 11 ; 405761 mE/ 3781552 mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 774 ft.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The Big Santa Anita Canyon Debris Basin is a 56' high earth embankment dam constructed in 1958 - 1960 by the U.S. Army Corps of Engineers (USACOE) for debris control and water conservation. The Debris Basin is located just over one mile downstream of the Dam and has a capacity of 245 acre-feet of water. Water could be directed through sluice gates into the adjacent spreading grounds or, excess water could escape over the spillway and into the storm channel. The Debris Basin spillway consists of an un-gated, smooth concrete-lined rectangular open channel, located within the Debris Basin embankment near the left abutment. The spillway is approximately 165 feet wide and has a capacity of allowing 38,000 cubic feet per second (cfs) wash over the crest of the structure. The width of the spillway gradually narrows to meet the width of the concrete-lined Santa Anita Wash storm channel.After its completion, the Debris Basin was transferred from the USACOE to the District for operation and maintenance. Upon review of the Debris Basin in 1982, it was determined that it did not meet standards for seismic safety and it was required to keep the outlet gate open at all times to prevent any collection of water. Since then, the water conservation activities at the Debris Basin have ceased and it is used only to capture debris flows heading downstream.

The Santa Anita Debris Basin and spillway were designed using common engineering techniques for controlling water. Over thirty debris basins of various sizes were constructed throughout the canyons of the San Gabriel Mountains to control the runoff from seasonal rains. The Debris Basin and spillway are not significant structures.

***P3b. Resource Attributes:** HP-11 (Engineering structure: flood control), AH-6 (Water conveyance system)

***P4. Resources Present:** ☐Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Aerial by Google Earth, 2013. View looking north.

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1950 per LADPW.

***P7. Owner and Address:**
Los Angeles County Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803

***P8. Recorded by:**
Pamela Daly, M.S.H.P.
Daly & Associates
4486 University Avenue
Riverside, CA 92501

***P9. Date Recorded:** February 13, 2013

***P10. Survey Type:**
CEQA – Intensive Level

***P11. Report Citation:**
Historic Resources Assessment Report of Santa Anita Stormwater Flood Management and Seismic Strengthening Project, Santa Anita Wash, Headworks, and Debris Basin, Los Angeles County, CA.

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

B. 10. Significance:

The Big Santa Anita Dam was constructed in 1924-1927 by the Los Angeles County Flood Control District. Because the area below the dam was not heavily populated until many years later, the water released by the Dam could just follow the Santa Anita Wash down into the Rio Hondo Wash, without too much damage to private property. But after World War II, the population in the areas of Arcadia, Sierra Madre, and Monrovia, began to increase and residents constructed houses in the foothills of the San Gabriel Mountains. The water coming out of the various canyons in the region had to be controlled to protect life and property. It was in the 1950s that the Headworks and Culvert Bridge, Debris Basin and spillway, were constructed to control and capture the flow of water from the Big Santa Anita Dam.

The Sediment Removal Tunnel was constructed only to provide access to the basin of the Big Santa Anita Dam reservoir so that accumulated silt could be removed and deposited elsewhere. Surveyors were able to use the most modern technology available in the form of laser beams to direct the mining operations of building a 9-foot wide tunnel through the mountain.

In assessing the historical significance of built-environment structures located within the APE and evaluated in this study, federal and state significance criteria were applied. The structures identified in this study are not currently listed in either the National Register or the California Register.

Under National Register and/or California Register criteria relating to the association of the built-environment structures located within the APE with significant historical events that exemplify broad patterns of our history the Sediment Removal Tunnel, Headworks and Culvert Bridge, Debris Basin and spillway, do not appear to qualify as significant historic resources individually or collectively. Throughout the world, debris basins and dams (masonry, earthen or timber) have been constructed by both private and public entities to control seasonal rain fall, and to protect people and property. The structures located in the APE are just one of many flood-control systems that were constructed in the San Gabriel Mountain canyons. There is no evidence that any of the structures in the APE are eligible for listing under Criteria A/1.

Under National Register and/or California Register criteria relating to the built-environment structures located within the APE's association with persons of historic importance, the Dam, Sediment Removal Tunnel, Headworks and Culvert Bridge, Debris Basin and spillway, do not appear to qualify, individually or collectively, as significant resources. The design and plans for the structures located in the Santa Anita Wash were prepared by the Los Angeles County Flood Control District staff engineers, or the Army Corp of Engineers, as part of their normal tasks and duties. There is no evidence that any of the structures in the APE are eligible for listing under Criteria B/2.

Under National Register and/or California Register criteria relating to the distinctive characteristics of a type, period, region, or method of construction, the built-environment structures located within the APE are not significant as they do not, individually or collectively, embody any innovative engineering design or method of construction, or high artistic design. The Headworks was designed using common technology to channel water from the Dam towards the Debris Basin or into the 30' pipe to the Sierra Madre spreading grounds. The Debris Basin was constructed by excavating a water containment area in the Santa Anita Wash, and a spillway was erected to hold heavier debris back during high rainfall events. The technology used to create the basin and associated spreading grounds were commonplace, as was the use of concrete to hold, channel, divert, and control the water as it came down from the foothills. The Headworks and Culvert Bridge, Debris Basin and spillway, and Sediment Removal Tunnel, do not appear to present any technological achievement in the history of water systems locally, regionally or nationally, and are therefore not eligible for listing either individually or collectively under Criteria C/3.

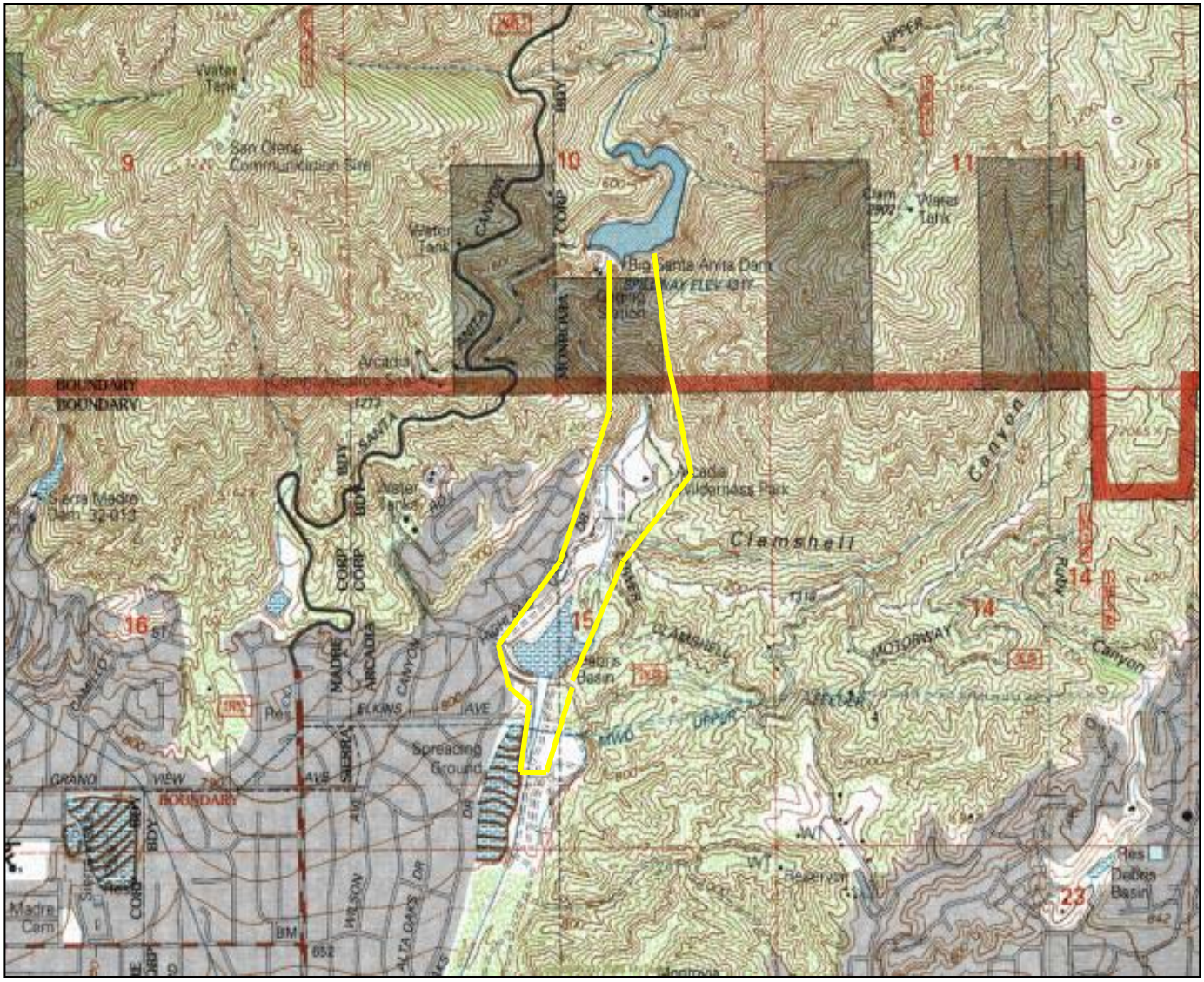
Based upon a survey of the above-ground historic period resources within the APE performed in January 2013, the APE has not yielded, nor does it appear to have the potential to yield, information important to the history of the local area, California or the nation pursuant to National Register and/or California Register criteria D/4.

In summation, the Headworks and Culvert Bridge, Debris Basin and spillway, and Sediment Removal Tunnel, are not eligible for listing in the National Register and/or the California Register, or as they do not, individually or collectively, meet any of the criteria necessary for listing in the registries.

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **LOCATION MAP**	Primary # HRI# Trinomial

 ***Resource Name or #:** Santa Anita Wash Flood Control System Features south of Big Santa Anita Dam

***Map Name:** Mt. Wilson ***Scale:** 1:24,000 ***Date of Map:** 1995



Area of Potential Effect (APE) for this evaluation report
(U.S.G.S. Mt. Wilson Quad, 1:24,000)

APPENDIX E

PERSONNEL QUALIFICATIONS

Patrick O. Maxon, RPA

Director, Cultural Resources

EDUCATION

1994 / Master of Arts, Anthropology / California State University, Fullerton, CA

1987 / Bachelor of Arts, Psychology/Sociology / Towson State University, Maryland, MD

PROFESSIONAL CERTIFICATIONS

Registered Professional Archaeologist (National), 1999 – present

Certified Archaeologist – Riverside County TLMA, 2008 – present

Certified Archaeologist – Orange County Environmental Management Agency, 1998 – present

Cultural Resources Specialist – California Energy Commission, 2004

AFFILIATIONS AND COMMITTEES

Pacific Coast Archaeological Society (PCAS)

Society for California Archaeology (SCA)

Society for American Archaeology (SAA)

Association of Environmental Professionals (AEP) (Board of Directors, 2005 to present)

American Cultural Resources Association (ACRA)

PROFESSIONAL EXPERIENCE

BonTerra Consulting, Director, Cultural Resources 2008–present

Chambers Group, Director, Cultural Resources 2006–2008

SWCA, Project Manager/Director, Cultural Resources 2001–2006

RMW Paleo Associates, Staff Archaeologist/Senior Project Manager 1994–2001

Patrick Maxon is a Registered Professional Archaeologist, is certified by the County of Orange Environmental Management Agency and the Riverside County Transportation and Land Management Agency. He has 20 years of experience in all aspects of cultural resources management, including prehistoric and historic archaeology, paleontology, ethnography, and tribal consultation. He has expertise in compliance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), and the Clean Water Act (CWA), among others. Mr. Maxon has been previously certified by the City of San Diego, and meets the Secretary of Interior's standards for historic preservation programs for archaeology. Mr. Maxon has completed hundreds of cultural resources projects that have involved (1) agency, client, Native American, and subcontractor coordination; (2) treatment plans and research design development; (3) archival research; (4) field reconnaissance; (5) site testing; (6) data recovery excavation; (7) construction monitoring; (8) site recordation; (9) site protection/preservation; (10) mapping/cartography; (11) laboratory analysis; and (12) report production. He has managed a number of projects within the jurisdiction of the U.S. Army Corps of Engineers (USACE), the Bureau of Land Management (BLM), the Bureau of Reclamation, and other federal agencies that require compliance with Section 106 of the NHPA. He has also completed projects throughout Southern California under CEQA for State and local governments and municipalities, including the California Department of Transportation (Caltrans), the Department of General Services (DGS), the California Energy Commission (CEC), the California Department of Water Resources, the Los Angeles County Department of Public Works (LADPW), the Los Angeles Department of Water and Power (LADWP), the Los Angeles Unified School District, and others.

Representative Project Experience

Lancaster Solar Farm Initial Study/Mitigated Negative Declaration, Lancaster (CoLACAO). BonTerra Consulting is currently preparing an Initial Study/Mitigated Negative Declaration (MND) for the proposed Solar Energy Project to be developed on approximately 63 acres of undeveloped County-owned land within the City of Lancaster. The project site is surrounded on the east and west by several County facilities, and the California State Prison-Los Angeles County (CSP-LAC) is located to the south. The County is proposing to develop the project site with a solar facility capable of generating up to 4 megawatts (MW) of electricity under peak solar conditions, and the energy would be made equally available to the adjacent Mira Loma Detention Center and the Challenger Memorial Youth Center.

The cultural resources investigation at the site included a California Historical Resources Information System (CHRIS) records search and literature review for the project at the South Central Coastal Information Center (SCCIC) at the California State University, Fullerton. Native

American consultation was initiated with the Native American Heritage Commission (NAHC) with a request for a Sacred Lands File Search and contact list, and informational letters were mailed to tribes requesting comment. A paleontological resources records search, completed previously by the Los Angeles County Natural History Museum (LACNHM) was reviewed for information on known paleontological resources in the project site and surrounding area. In addition, a current records review of the museum's vertebrate paleontology records for the project site and vicinity was undertaken and reviewed. A cultural resources survey of the project site was conducted and a Historic Resources Assessment involving a pedestrian survey of the project site and research into the historic development of the site and surrounding area, including individual property information available from archival sources, was also completed. The study concluded that five on-site structures of an extant but defunct wastewater treatment and reclamation system are eligible for listing in the National Register of Historic Places and the California Register of Historical Resources. Avoidance or formal documentation via a Historic American Engineering Report (HAER) to document the history of early sewage treatment and water reclamation systems of the type found in the project area, and the physical properties of the system, was recommended. No other significant cultural resources were identified as a result of the study; however, because of the presence of historic and prehistoric resources in the vicinity, and the possibility of significant resources buried under development at the project site, monitoring of grading was recommended.

Sylmar Ground Return Replacement Return System, City of Los Angeles (MWatson). BonTerra Consulting has been hired by Montgomery Watson Harza to perform an assessment of biological and cultural resources for the Sylmar Ground Replacement Return System Project in Los Angeles. The northern segment extends from north to south within the utility easement corridor that runs between the Sylmar West Converter Station in Sylmar to the Kenter Canyon Terminal Tower near Brentwood. The southern extension, from the Kenter Canyon Terminal Tower to the ocean, is currently being considered under three alternatives. Cultural resources work included a California Historical Resources Information System (CHRIS) records search and literature review for the project at the South Central Coastal Information Center (SCCIC) at the California State University, Fullerton. Native American consultation was initiated with the Native American Heritage Commission (NAHC) with a request for a Sacred Lands File Search and contact list, and informational letters were mailed to tribes requesting comment. A paleontological resources records search was completed by the Los Angeles County Natural History Museum (LACNHM) to compile information on known paleontological resources in the project site and surrounding area. Brief, one-day field surveys were conducted for the northern segment and memo reports were produced that identified constraints to the construction work. Cultural resources surveys of the southern extension's three alternatives were subsequently conducted.

Centennial Specific Plan Environmental Impact Report, Cultural Resources Surveys, Los Angeles County. BonTerra Consulting is preparing the environmental documentation for the Centennial Specific Plan EIR that involves a new community consisting of residential, commercial, business park, and cultural and civic/institutional uses and encompassing approximately 11,680 acres. Mr. Maxon, as the Cultural Resources Manager

for the project, is managing the review, evaluation, and mitigation of cultural resources for this proposed project. To consider the current status of the project area's cultural and paleontological resources in the environmental analysis, others initially performed a Phase I cultural resources study of the entire project area. Mr. Maxon surveyed an off-site Caltrans right-of-way south of the project site. This included a records search at the South Central Coastal Information Center at the California State University, Fullerton; a paleontological records search at the Los Angeles County Museum; and an intensive pedestrian survey to evaluate the project area for the presence of cultural and paleontological resources. Numerous cultural resources sites were discovered on the project site, and some were evaluated for significance. Those that were determined significant and were in the Phase I development area were preserved in place. As the project evolves and expands beyond the Phase I area, additional sites must be evaluated for significance. Some may need to undergo data recovery excavations, while one structure must be recorded and evaluated. Consultations with regulatory agencies, County staff, Native American tribes, the interested public, and Clients will be completed and their comments considered, and the monitoring of disturbances around the known sites will be undertaken when construction activities commence.

Newport Banning Ranch (City of Newport Beach), As project manager of the cultural resources portion of this on going project, Mr. Maxon conducted archaeological, historic, and paleontological investigations for resources potentially impacted by the proposed Newport Banning Ranch development. The investigation consisted of (1) a Phase II test level excavation of eight prehistoric and three historic archaeological sites present on the site; (2) an assessment and evaluation of the built environment resources associated with the West Newport Oil Company development on site; and (3) a paleontological assessment of the project site's potential for the presence of sensitive rock formations and fossil resources. Three archaeological sites were deemed significant as a result of the study and the paleontological significance of the project site was deemed as high. However, no historic resources associated with oil extraction operations were identified. Mr. Maxon oversaw the completion of fieldwork, the preparation of archaeological, historical and paleontological technical reports, and subsequently prepared the cultural resources section of the EIR for the project. Future work will include data recovery excavations and/or site protection/preservation of significant cultural and paleontological resources impacted by the proposed project. Archaeological/Paleontological monitoring will be undertaken during grading of the project site.

Poseidon Desalination Plant, Cultural Resources Services, Huntington Beach and Newport Beach. BonTerra Consulting completed cultural and biological resources Phase I and II studies for the proposed Poseidon Resources Desalination Plant project in the City of Huntington Beach and the associated desalination plant pump station in the City of Newport Beach. The project included a Phase I cultural resources reconnaissance study that consisted of a California Historical Resources Information System (CHRIS) records search and literature review for the project at the South Central Coastal Information Center (SCCIC) at the California State University, Fullerton, Native American coordination with the Native American Heritage Commission and local Native American tribes and individuals, a pedestrian survey of both

locations, and a cultural resources technical report describing the results of the study and offering management recommendations.

While no archaeological or paleontological resources were discovered, historic structures are present on the property and were evaluated for significance. The proposed desalination plant location in Huntington Beach, currently developed with three defunct fuel oil tanks and their infrastructure, is located within the existing AES Huntington Power Generation Plant facility in Huntington Beach. The second parcel is located in unincorporated County of Orange, immediately adjacent to the City of Newport Beach. It consists of an existing pump station site that will be expanded as part of the current project. Because they are nearly 50 years old, the fuel oil tanks in Huntington Beach were recorded on DPR Series 523 forms and evaluated for eligibility for listing in the California Register of Historical Resources. They were found not eligible. Mitigation for potential project effects included recommendations for the historic structures present on site and retention of an Archaeologist and/or Paleontologist in the event that cultural resources or fossil resources are discovered during grading.

Atlanta Ave Widening Project HPSR/ASR/XPI (KOMEX). As project manager for the Atlanta Avenue widening project, Mr. Maxon conducted a Phase I cultural resources study to evaluate the potential effects of the project on cultural resources. The initial work included consultation with Caltrans cultural resources specialists regarding the Area of Potential Effects (APE) to cultural resources; a cultural resources literature review; Native American consultation; a field survey of the project area; and submittal to Caltrans of an Archaeological Survey Report (ASR), and a Historic Property Survey Report (HPSR). After further consultation with Caltrans, Mr. Maxon directed the historic evaluation of the Pacific Mobile Home Park south of the site; and completed an Extended Phase I (XPI) study consisting of subsurface archaeological excavation to evaluate the presence of the archaeological site within the APE, An updated ASR, XPI report, DPR 523 site forms, and HPSR was submitted to Caltrans and SHPO for review and comment.

Wintersburg Channel (OrCo). Mr. Maxon performed a Phase I cultural resources study to determine if the proposed widening of the channel would have the potential to impact cultural resources. The study included a literature review at the South Central Coastal Information Center, a paleontological literature review at the Los Angeles County Museum, a pedestrian survey of the Area of Potential Effects, and completion of the CEQA section describing the results of the study. As cultural resources project manager on this contract, Mr. Maxon also consulted with regulators at the US Army Corps of Engineers, Native American tribes and individuals, and with a local archaeologist who has extensive experience working in and around Bolsa Chica. Elements of the defunct Bolsa Chica Gun Club were identified in the wetlands, but it was determined that the channel work would have no impact on them. Recordation of the channel itself and the Slater Bridge to the north was subsequently completed by an architectural historian. Construction monitoring was recommended.

APPENDIX D

NOISE TECHNICAL REPORT

Noise Impact Analysis

Santa Anita Stormwater Management and Seismic Strengthening Project, County of Los Angeles, California

Prepared for

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A Noise Level Measurement Results

1.0 PROJECT LOCATION AND DESCRIPTION

The proposed Santa Anita Stormwater Flood Management and Seismic Strengthening Project (Project) is located within the jurisdictions of the City of Arcadia, City of Monrovia, and a County-owned inholding within the U.S. Forest Service (USFS) boundary, and property within the USFS Angeles National Forest. The Project site is located in the foothills of the San Gabriel Mountains, in the western San Gabriel Valley in Los Angeles County, approximately 15 miles northeast of downtown Los Angeles, as depicted in Exhibit 1, Regional Location and Local Vicinity Map. Land uses adjacent to the Project area include the natural open space and mountains within the Angeles National Forest (i.e., San Gabriel Mountains) to the north; the recreational and open space uses associated with the City of Arcadia Wilderness Park and City of Monrovia to the east; and City of Arcadia single-family residential uses to the south and west.

The Los Angeles County Flood Control District's (LACFCD) Santa Anita Stormwater Management and Seismic Strengthening Project would modify existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, including the Santa Anita Dam, Santa Anita Headworks, Wilderness Park Culvert Crossing, and the Santa Anita Debris Dam. The Project benefits and the contributing LACFCD facility improvements are as follows:

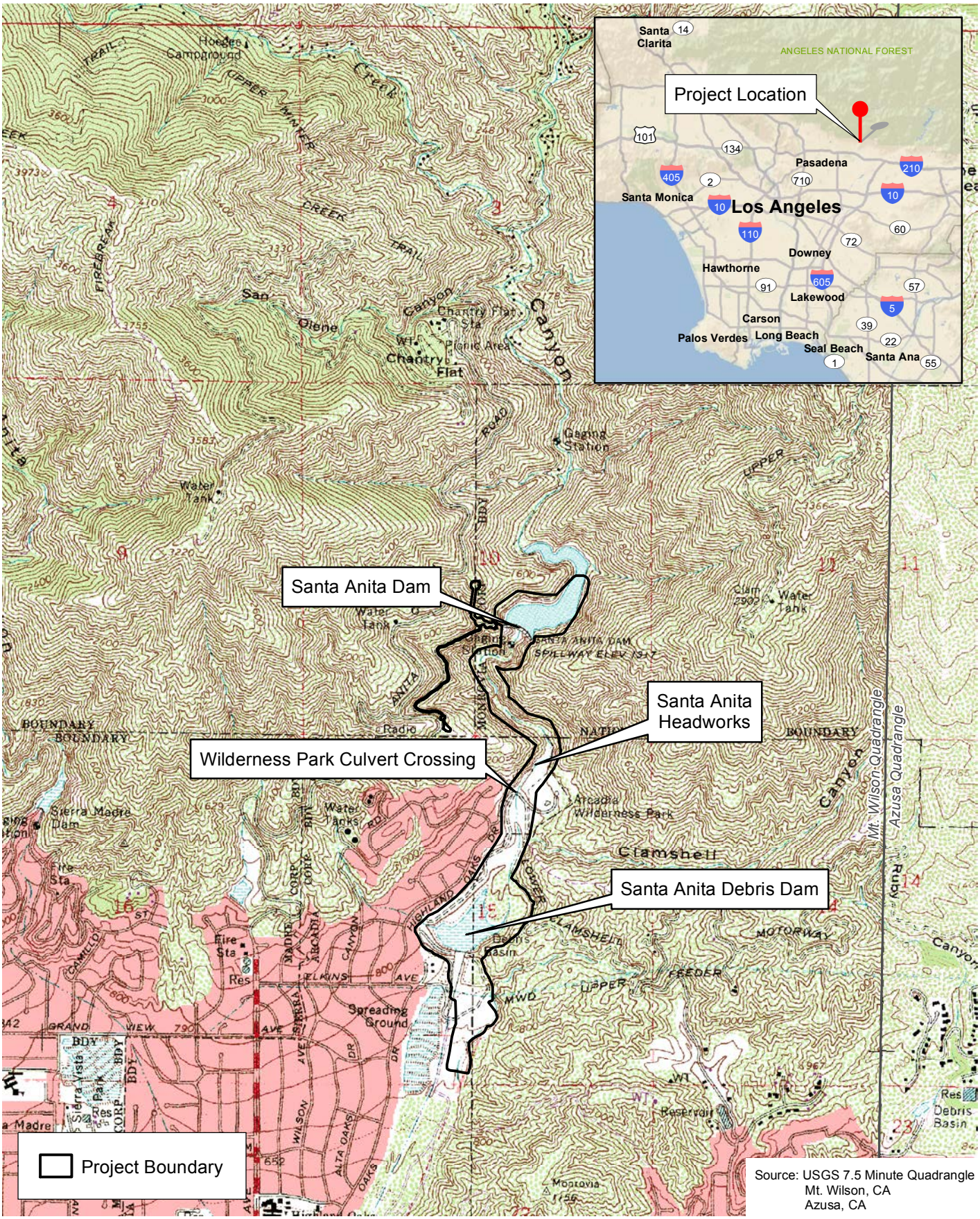
- Reduce flood risk to downstream communities by:
    - Modifying the Santa Anita Dam spillway to safely pass the Probable Maximum Flood
    - Remediating seismic safety issues at the Santa Anita Dam and Debris Dam
- Enhance sustainability of the local water supply and increase recharge to the groundwater basin by over 500 acre-feet per year by:
    - Restoring storage capacity at Santa Anita Debris Dam
    - Rehabilitating the Santa Anita Headworks for more reliable diversion of stormwater runoff to the spreading grounds
    - Modernizing facilities and implementing new monitoring and control systems

Improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing

1.1 DAM

The Dam would be structurally altered to accommodate a new spillway with sufficient capacity to pass the probable maximum flood (PMF) of 26,100 cubic feet per second (cfs) in order to reduce the risk of Dam failure from uncontrolled overtopping during major storm events. The proposed improvements to the Dam would not result in changes to the existing maximum water surface elevation restrictions; therefore, the reservoir's capacity to retain water would not be altered by Project implementation.

The spillway modification would consist of cutting a "notch" in the Dam crest to allow the PMF to overtop in a controlled manner. The proposed notch would be centered on the crest of the Dam, similar to the existing emergency crest spillway, and would require concrete removal from the Dam. An existing spillway on the far western edge of the Dam would remain and be unaltered by the Project; however, the existing auxiliary orifice spillway beneath the proposed new spillway would be removed. A new pedestrian bridge would be constructed over the notch and the existing



Source: USGS 7.5 Minute Quadrangle
Mt. Wilson, CA
Azusa, CA

Regional Location and Local Vicinity Map

Exhibit 1

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

N S E W

2,000 1,000 0 2,000 Feet

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hoist system would be upgraded to have a higher load capacity and re-aligned to accommodate the new spillway. The upgrade work includes the relocation of the lower hoist tower along the Dam crest (and potentially cantilevered of the back side, if necessary). The proposed improvements would not change the height of the Dam; the crest of the Dam would remain at an elevation of 1,325 feet above mean sea level (msl) and the parapet wall would remain at an elevation of 1,328 feet above msl.

To better manage stormwater runoff and to ensure reliability and efficiency of operations, six of the existing valves would be replaced (three control valves and three backup valves), along with new electrical and control systems. The Dam's structural concrete would be repaired to ensure that it meets acceptable standards consistent with the required seismic performance of the Dam.

The downstream canyon walls and the toe of the Dam would be re-armored with additional reinforced gunite or equivalent concrete erosion protection to dissipate the energy from the potential overtopping water as the flow cascades through the spillway notch and the orifice spillway or sluiceway. The flow would be directed onto the downstream armoring before flowing into the channel downstream of the Dam. The new re-armoring would reinforce the existing armoring that extends approximately 100 feet downstream from the toe of the Dam. The re-armoring would be held in position with tie-back anchors to be drilled and grouted into the bedrock. The tie-ins for the re-armoring may include superficial rock excavation, grading, and subsurface pressure grouting. The color of the material used for re-armoring would be the same as the existing concrete.

The Project would also include improvements to ancillary facilities of the Dam. The existing garage/storage shed would be demolished and replaced with a new three-bay garage (the third bay would house a new back-up generator). The existing Dam Operator's house would be removed and replaced with a helipad to provide aerial access to the Dam in the event of an emergency. It is anticipated that the helipad would only be used 1 or 2 times per year. The existing relief quarters and control house would remain to serve as an office. Although the Dam Operator would no longer reside at the Dam, he/she would still be on-site daily and available on-call after hours. The Project would include remote control capabilities that provide redundant control options from multiple off-site locations. The Dam also has a built-in safety mechanism to automatically pass water through the Dam once the reservoir surface level reaches the California Department of Water Resources, Division of Safety of Dams (DSOD) restriction.

The existing potable water system that serves the Dam site would be replaced. The water system currently consists of a 60,000-gallon upper tank located off Chantry Flats Road that connects to two 5,000-gallon lower tanks located near the Dam access road via a pipeline that runs down the mountainside. The slope adjacent to the upper tank has erosion damage and would be repaired as part of the Project. To repair the slope, an approximate 216-square-foot eroded gully located near the tank's foundation would be grubbed and stabilized with engineered fill and geotextile fabric or with support piles. The exposed portions of the existing water pipeline would be removed while any underground portions would be capped and abandoned in place. The replacement pipeline would run along the same general alignment as the existing pipeline. The two lower tanks would be removed and would not require replacement.

The existing manual swing gate at Chantry Flats Road that provides secured entry to the Dam access road would be replaced with a new electric slide gate. In order to provide electricity to the gate and new lighting/intercom systems, a power line would be strung on up to 7 new power poles to be installed along the outer edge of the Dam's access road, or where possible, in conduit along the inner slope of the access road.

1.2 HEADWORKS AND WILDERNESS PARK CULVERT CROSSING

1.2.1 Headworks

The Headworks structure would be replaced and the associated earthen levee would be partially reconstructed to better manage the diversion of flows to the downstream spreading grounds and the downstream Debris Dam. A rehabilitation of the Headworks is needed to protect facilities from stormwater damage and to direct stormwater runoff to the spreading grounds for groundwater recharge. Redevelopment of the Headworks would include reconstruction of the levee to ensure it can withstand flows produced by a 25-year storm event and replacement of the existing tainter gate (used to divert flows) with a new rubber diversion structure. The new rubber diversion structure would be a pneumatically operated, bottom hinged, spillway gate system.

The majority of the existing Headworks structure would be demolished and removed, including the tainter gate, supporting walls, catwalk, and keys. The new facility would increase the width of the structure by approximately 20 feet in order to house the 34-foot rubber diversion structure. Operation of the rubber diversion structure would result in the retention of waters behind the levee to allow for the diversion of flows through the intake gates and into the existing 30-inch RCP leading to the Santa Anita Spreading Grounds and/or Sierra Madre Spreading Grounds. The pool created by the new rubber diversion structure would remain the same as under existing conditions. Construction of the new diversion structure would require work in the creekbed extending approximately 25 feet downstream of the Headworks, including the placement of new riprap on the downstream side.

The rehabilitation of the Headworks would also include a new control system, including remote operation capabilities, to increase efficiency of water conservation operations. Currently, the response time required for County personnel to drive to the Headworks and manually operate the tainter gate, along with the limited flow rates that can be bypassed, results in the loss of a water conservation opportunity. A new control system integrated with the control system of the other Project components would optimize water conservation. A control house for the rubber diversion structure would be constructed on the other side of the channel next to the access road.

The earthen levee would be reinforced and raised approximately five feet higher to match the height of the Headworks structure by removing and under-excavating the existing levee and rebuilding the new levee using a combination of imported fill and suitable material from the existing levee. It would then be recompacted to the proposed height. The access road leading to the facility would be modified to match the height of the reinforced earthen levee. The existing riprap on the upstream side of the levee would be reinforced. A subsurface conduit would be installed along the length of the levee to connect the rubber diversion structure to the control house on the other side.

1.2.2 Wilderness Park Culvert Crossing

In addition to the improvements at the Headworks, armoring of the roadway and construction of a replacement culvert crossing to the Wilderness Park is needed to ensure that the structure can withstand flows produced by a larger storm event. The existing Culvert Crossing located approximately 450 feet downstream of the Headworks, including the concrete slab and corrugated metal culverts, would be removed and replaced with a new crossing structure.

The Culvert Crossing would be approximately 30 feet wide on the deck plate, allowing for two-way traffic. The new Culvert Crossing would be built on top of a new abutment and would be designed with a permanent guard rail and flexible pavement driving surface adequate for emergency vehicles. The new roadway elevation of the Culvert Crossing would be raised above

the existing roadway elevation by approximately 4.5 feet to accommodate higher flows. Approximately 1,800 square feet of the roadways leading to and from the Culvert Crossing would be repaved and sloped to join the existing grade.

Approximately 30 feet of the channel upstream and downstream of the existing Culvert Crossing would be grubbed and graded to accommodate the new Culvert Crossing. It is anticipated that adequate vehicular and pedestrian access could be provided to the Arcadia Wilderness Park for the majority of the construction period for the Culvert Crossing, with only occasional closures required for periods of about a week or less at any given time during construction. Notification of any temporary closures would be posted at the entrance to the Wilderness Park. Those brief closures would avoid important events at the Wilderness Park, such as the overnight Boy Scout campouts every Friday and Saturday and youth day camps every weekday between mid-June to late-August. However, in order to provide a conservative analysis, the assembly of a temporary bypass crossing located north of the existing Culvert Crossing, which could require removal of a sycamore tree, has been assumed and assessed, to account for the event that the temporary crossing is used.

Therefore, access to the Wilderness Park would be maintained throughout construction with minimal interruptions to access. Two existing sycamore trees located adjacent to the crossing on the eastern shore of the Wash, south of the Culvert Crossing, would need to be removed. One sycamore located on the eastern shore of the Wash, north of the Culvert Crossing, may need to be removed, depending on whether or not the temporary bypass crossing is installed. In order to provide a conservative analysis, this IS/MND assumes that all three upstream and downstream sycamore trees would be removed.

The LACFCD may transplant the root ball(s) of the sycamores to a suitable riparian location, and/or utilize the woody debris from the sycamore to enhance habitat value at another nearby location, if determined to be feasible and if approved by the County and other appropriate parties. In addition, new sycamore trees would be planted within a 100-foot radius of the original location of any removed existing trees.

New riprap would be installed upstream and downstream of the Culvert Crossing. The roadways leading to and from the Culvert Crossing would be armored, 36 feet on the upstream side and 84 feet on the downstream side, to withstand flows and sloped to join the existing grade. The existing water and sewer lines that run through the current Culvert Crossing would need to be relocated to the new height and alignment of the structure. The sewer force main is on the downstream surface of the Culvert Crossing and the water line is on the upstream surface of the Culvert Crossing. Additionally, the fire hydrant, vault, water valve and standpipe would be demolished and relocated approximately 15 feet to the north in the case that the temporary bypass crossing is utilized. All utility trenching and relocations would remain within the area anticipated for impacts by the Culvert Crossing construction activities, and there would be no changes in water/sewer quantities or demands as a result of the Project.

1.3 DEBRIS DAM

Re Remediation of the seismic deficiencies at the Debris Dam would involve improvements to the existing structures, including the intake tower and embankment. As a result of the loss of water conservation capacity from the DSOD restrictions on the Dam, there is an increased need to capture as much stormwater runoff as possible in facilities below the Dam. As a result, the Debris Dam would also be enlarged by raising the existing spillway by four feet. Remediating the seismic deficiencies at the Debris Dam would result in the DSOD removing the operational restrictions on the facility, thereby restoring 119 acre-feet of water conservation capacity. Enlarging the Debris Dam would create an additional 40 acre-feet of additional storage capacity, for a total of 159 acre-

feet. When captured stormwater is released from the Dam to the spreading grounds for groundwater recharge, the Debris Dam can then capture more runoff, which would allow for water storage capacity multiple times in a single season depending on the frequency, duration, and intensity of storm events.

The intake tower located in the Debris Dam is unable to resist seismic loading and would be strengthened or replaced. The improved intake tower would be connected to the existing 48-inch outlet pipe (being lined as part of this Project). The outlet pipe has an existing junction box, which is used to deliver water either into the spillway channel or into the spreading grounds. The upstream and downstream portions of the Debris Dam embankment and alluvial foundation material that are subject to potential liquefaction would be reinforced with structural buttressing. Currently, a cross-section of the Debris Dam resembles a triangle (e.g., sloped sides on the upstream and downstream sides of the dam) with a flat top (e.g., flattened to accommodate vehicular access). The top of the embankment ranges from an elevation of 796 feet above msl at its center to an elevation of 811 feet above msl at the western edge. The construction activities would involve the removal of the existing riprap exterior surface on portions of both the upstream (approximately 0.69 acre) and downstream (approximately 0.89 acre) slopes. Engineered fill materials beneath the riprap would be excavated and removed, and an engineered buttress would be constructed. Upon completion of construction activities, the sloped upstream and downstream surfaces of the Debris Dam would be reconfigured into a single stair-stepped terrace. The surface of the Debris Dam would be completed with a riprap similar to the existing condition.

As part of the improvements, six non-native deodar cedar trees located at the downstream toe of the embankment would be removed as mandated by the DSOD to ensure the structural integrity of the Debris Dam.

A new automated outlet gate and control system would be constructed to modernize operations and to ensure compatibility with other Project components. Upon completion of these improvements, the DSOD would issue a new certificate for the facility and remove the current operating restriction on the Debris Dam, which would increase the Debris Dam's available and allowable water conservation storage capacity from 0 acre-feet to 159 acre-feet.

2.0 NOISE BASICS AND TERMINOLOGY

"Sound" is a vibratory disturbance created by a moving or vibrating source and is capable of being detected. "Noise" is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment (Caltrans 1998).

2.1 DECIBELS AND FREQUENCY

In its most basic form, a continuous sound can be described by its frequency or wavelength (pitch) and its amplitude (loudness). Frequency is expressed in cycles per second, or hertz. Frequencies are heard as the pitch or tone of sound. High-pitched sounds produce high frequencies; low-pitched sounds produce low frequencies. Sound pressure levels are described in units called the decibel (dB).

Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB.

2.2 PERCEPTION OF NOISE AND A-WEIGHTING

A typical noise environment consists of a base of steady “background” noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. The local sources can vary from an occasional aircraft or train passing by, to intermittent periods of sound, such as amplified music, to virtually continuous noise from, for example, traffic on a major highway. In a large number of community attitudinal surveys, transportation noise has been ranked among the most significant causes of community dissatisfaction.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average healthy ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the “A-weighted” noise scale is used for measurements and standards involving human perception of noise. Noise levels using A-weighted measurements are written dB(A) or dBA. Human perception of noise has no simple correlation with acoustical energy. Due to subjective thresholds of tolerance, the annoyance of a given noise source is perceived very differently from person to person. The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at 3 feet from the noise source is approximately 60 dBA, while loud jet engine noises equate to 110 dBA, which can cause serious discomfort. Exhibit 2, Typical Noise Levels and Their Subjective Loudness and Effects, shows the relationship of various noise levels to commonly experienced noise events.

Studies show that noise increases trigger community reactions varying from sporadic complaints to widespread complaints, legal threats, and/or vigorous action. It is widely accepted that (1) the average healthy ear can barely perceive changes of 3 dBA; (2) a change of 5 dBA is readily perceptible; and (3) an increase/decrease of 10 dBA sounds twice/half as loud, respectively (Caltrans 1998). In community situations, noise exposure and changes in noise levels occur over a number of years, unlike the immediate comparison made in a field study situation. The generally accepted level at which changes in community noise levels become “barely perceptible” typically occurs at values greater than 3 dBA. Changes of 5 dBA are defined as “readily perceptible”, and a 10-dBA increase is considered twice as loud. The 3-dBA increase criterion represents a balance of community benefits and reasonableness; it has been widely published, discussed, and referred by many professionals in acoustics.

2.3 NOISE PROPAGATION

From the source to the receiver, noise changes both in level and frequency spectrum. Noise levels decrease as the distance from the source increases; the manner in which noise reduces with distance depends on many factors.

Geometric spreading from point and line sources: Sound from a small localized source (approximating a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates or drops off at a rate of 6 dBA for each doubling of the distance (i.e., if the noise level is 70 dBA at 25 feet, it is 64 dBA at 50 feet). The movement of the vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The sound level attenuates or drops off at a rate of 3 dBA per doubling of distance for line sources.

Ground absorption: To account for the ground-effect attenuation (absorption), two types of site conditions are commonly used in noise prediction: soft site and hard site conditions. Hard sites (i.e., sites with a reflective surface between the source and the receiver, such as parking lots or

Common Outdoor Activities	Common Indoor Activities	A - Weighted Sound Level dBA	Subjective Loudness	Effects of Noise
Threshold of Pain		140	Intolerable or Deafening	Hearing Loss
Near Jet Engine		130		
		120		
Jet Fly-Over at 1000 ft	Rock Band	110		
Loud Auto Horn		100	Very Noisy	
Gas Lawn Mower at 3 ft		90		
Diesel Truck at 50 ft, at 50 mph	Food Blender at 3 ft	80		Speech Interference
Noisy Urban Area, Daytime	Vacuum Cleaner at 10 ft	70	Loud	
Heavy Traffic at 300 ft	Normal Speech at 3 ft	60		
Quiet Urban Daytime	Large Business Office	50	Moderate	
Quiet Urban Nighttime	Theater, Large Conference Room (Background)	40		Sleep Disturbance
Quiet Suburban Nighttime	Library	30	Faint	No Effect
Quiet Rural Nighttime	Bedroom at Night, Concert Hall (Background)	20		
	Broadcast/Recording Studio	10	Very Faint	
Lowest Threshold of Human Hearing	Lowest Threshold of Human Hearing	0		

Source: Noise Technical Supplement by Caltrans

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Typical Noise Levels and Their Subjective Loudness and Effects

Exhibit 2

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

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smooth bodies of water) receive no excess ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. Soft sites are sites that have an absorptive ground surface (e.g., soft dirt, grass, or scattered bushes and trees) and receive an excess ground attenuation value of 1.5 dBA per doubling of distance.

Atmospheric effects: Wind speed will bend the path of sound to "focus" it on the downwind side and make a "shadow" on the upwind side of the source. At short distances, the wind has minor influence on the measured sound level. For longer distances, the wind effect becomes appreciably greater. Temperature gradients create effects similar to those of wind gradients, except that they are uniform in all directions from the source. On a sunny day with no wind, temperature decreases with altitude, giving a shadow effect for sound. On a clear night, temperature may increase with altitude, focusing sound on the ground surface.

Shielding by natural and man-made features, noise barriers, diffraction, and reflection: A large object in the path between a noise source and a receiver can significantly attenuate noise levels at that receiver location. The amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels. Natural terrain features (e.g., hills and dense woods) and man-made features (e.g., buildings and walls) can significantly alter noise levels. For a noise barrier to work, it must be high enough and long enough to block the view from the receiver to a road or to the noise source.

2.4 NOISE DESCRIPTORS

Several rating scales (or noise "metrics") exist to analyze effects of noise on a community. These scales include the equivalent noise level (L_{eq}), the community noise equivalent level (CNEL), and the day-night average sound level (DNL or L_{dn}). Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, which is the equivalent noise level for that period of time. The period of time averaging may be specified; $L_{eq(3)}$ would be a three-hour average. When no period is specified, a one-hour average is assumed. It is important to understand that noise of short duration (i.e., substantially less than the averaging period) is averaged into ambient noise during the period of interest. Thus, a loud noise lasting many seconds or a few minutes may have minimal effect on the measured sound level averaged over a one-hour period.

To evaluate community noise impacts, L_{dn} was developed to account for human sensitivity to nighttime noise. L_{dn} represents the 24-hour average sound level with a penalty for noise occurring at night. The L_{dn} computation divides the 24-hour day into 2 periods: daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM). The nighttime sound levels are assigned a 10-dBA penalty prior to averaging with daytime hourly sound levels. CNEL is similar to L_{dn} except that it separates a 24-hour day into 3 periods: daytime (7:00 AM to 7:00 PM), evening (7:00 PM to 10:00 PM), and nighttime (10:00 PM to 7:00 AM). The evening sound levels are assigned a 5-dBA penalty, and the nighttime sound levels are assigned a 10-dBA penalty prior to averaging with daytime hourly sound levels.

Several statistical descriptors are also often used to describe noise, including L_{max}, L_{min}, and L_x. L_{max} and L_{min} are respectively the highest and lowest A-weighted sound levels that occur during a noise event. L_x signifies the noise level that is exceeded "x" percent of the time; for example, L_{10} denotes the level that was exceeded 10 percent of the time.

2.5 NOISE-SENSITIVE RECEPTORS

Noise-sensitive receptors are generally considered to be humans who are engaged in activities or who are utilizing land uses that may be subject to the stress of significant interference from noise. Activities usually associated with sensitive receptors include but are not limited to talking,

reading, and sleeping. Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals and places where quiet is an essential element of the intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure to excessive, disturbing, or offensive interior or exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, hospitals, places of worship, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

There are no residential or other noise-sensitive land uses in the vicinity of the Dam, with the exception of the residence of the Dam Operator, located west if the dam. This residence would be removed by implementation of the Project; therefore, there would be no sensitive receptors in the vicinity of the Dam that could be impacted by construction noise.

There are no residential receptors in the vicinity of the Headworks. The nearest residences are approximately 550 feet southwest of the Headworks at the north end of Highland Vista Drive. There is no line of sight from the Headworks to these residences because of steep cliffs adjacent to the west and southwest side of the Headworks. There is also substantial forest growth between the Headworks and these homes that would attenuate noise.

The residences at the north end of Highland Vista Drive are approximately 250 feet west of the Wilderness Park Culvert Crossing. The elevation of the homes is approximately 150 feet above the crossing. The Wilderness Park is located east of the Wilderness Park Culvert Crossing and parking lot; the closest open space use area is approximately 150 feet east of the east end of the crossing.

There are single-family residences in the City of Arcadia adjacent to the west and south of the Debris Dam. The homes south of the Debris Dam are on Oaks Place. The homes west and northwest of the Debris Dam face Highland Oaks Drive. The residential structures closest to the Debris Dam are approximately 40 to 200 feet from the base (toe) of the downstream embankment. The homes near the Debris Dam are shown in Exhibit 4, Santa Anita Debris Dam Noise Monitoring Locations. The nearest sensitive receptors to the Debris Dam in the City of Monrovia are approximately ½ -mile east of the Debris Dam.

The Santa Anita Dam is in the Angeles National Forest. The Headworks, the Wilderness Park Culvert Crossing, the Wilderness Park, and the Debris Dam are in the City of Arcadia.

3.0 VIBRATION BASICS

Vibration is the periodic movement of mass over time. It is described in terms of frequency and amplitude, and unlike sound, there is no standard way of measuring and reporting amplitude. Vibration is described in units of velocity (inches per second [in/sec]), and discussed in dB units in order to compress the range of numbers required to describe vibration.

The frequency of a vibrating object describes how rapidly it is oscillating. The number of cycles per second of oscillation is the vibration frequency, which is described in terms of hertz (Hz). The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz.

3.1 VIBRATION PROPAGATION

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations reduce much more rapidly than low frequencies so that low frequencies tend to dominate the spectrum at large distances from the source. Discontinuities in the soil strata can also cause diffractions or channeling effects that affect the propagation of vibration over long distances. When vibration encounters a building, a ground-to-foundation coupling loss will usually reduce the overall vibration level. However, under certain circumstances, the ground-to-foundation coupling may also amplify the vibration level due to structural resonances of the floors and walls.

3.2 VIBRATION DESCRIPTORS

Vibration levels are usually expressed as single-number measure of vibration magnitude in terms of velocity or acceleration, which describes the severity of the vibration without the frequency variable. The peak particle velocity (ppv) is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in in/sec. Since it is related to the stresses that are experienced by buildings, ppv is often used in monitoring blasting vibration and the vibration of heavy construction equipment. Vibration is also described in decibel units, written as VdB, to distinguish from noise level decibels.

3.3 PERCEPTION OF VIBRATION

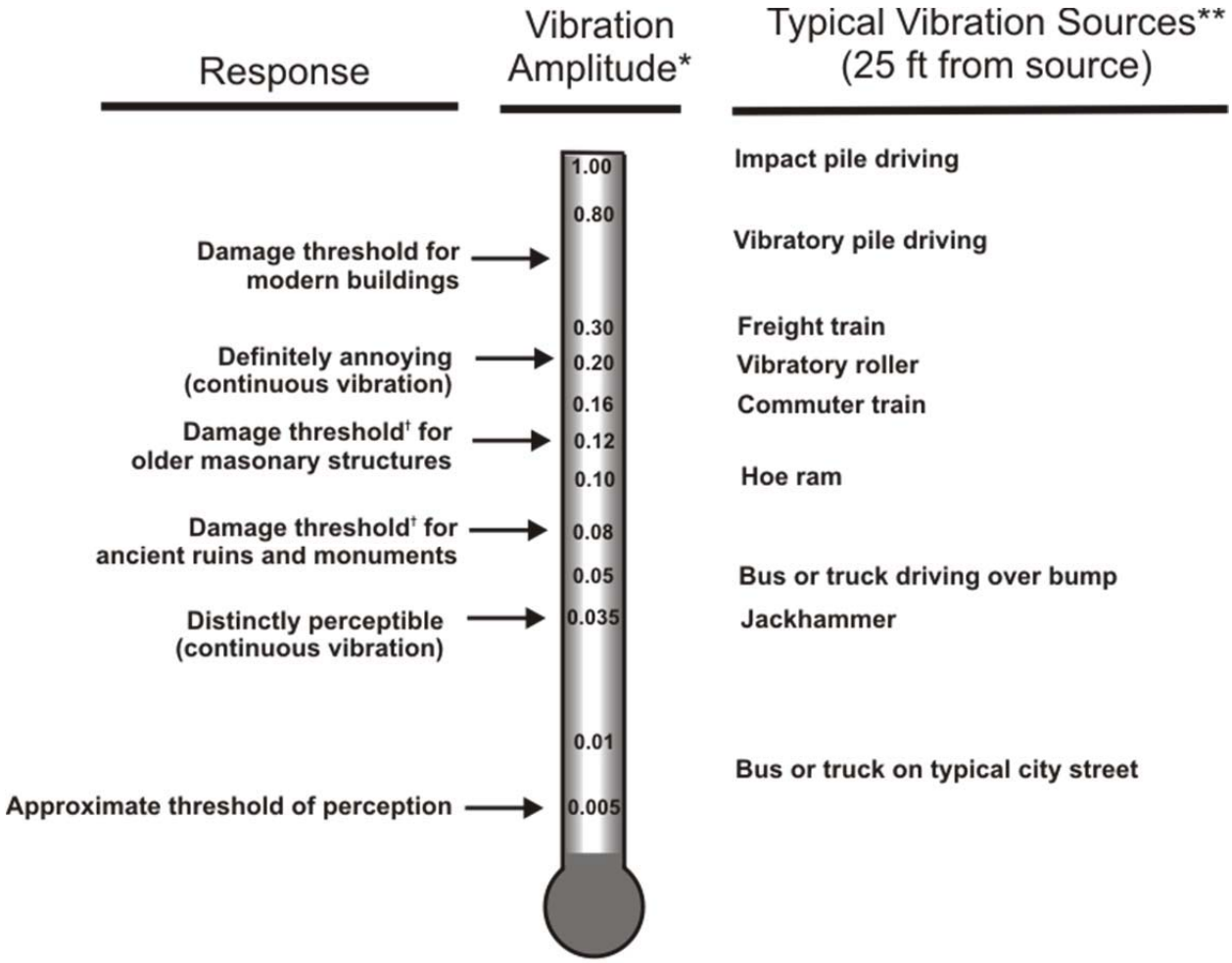
The primary concern from vibration is its ability to intrude and annoy local residents and other vibration-sensitive land uses. While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings caused by construction activities may be perceived as motion of building surfaces or rattling of windows, items on shelves, and pictures hanging on walls. Vibration of building components can also take the form of an audible low-frequency rumbling noise, which is referred to as groundborne noise.

The source of groundborne noise is typically from trains and similar transit vehicles and not from construction activities. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when the structure and the construction activity are connected by foundations or utilities, such as sewer and water pipes. Groundborne vibration is almost never annoying to people who are outdoors (FTA 2006).

Numerous studies have been conducted to characterize the human response to vibration and over the years, numerous vibration criteria and standards have been suggested by researchers, organizations, and governmental agencies. These studies suggest that the thresholds for perception and annoyance vary according to duration, frequency, and amplitude of vibration. Exhibit 3, Typical Vibration Amplitudes and Thresholds, illustrates common vibration sources and typical human and structural responses.

3.4 VIBRATION-SENSITIVE RECEPTORS

Vibration-sensitive receptors are generally considered to be humans who are engaged in activities or who are utilizing land uses that may be subject to significant interference from vibration. Activities and land uses often associated with vibration-sensitive receptors are similar to those associated with noise-sensitive receptors. Construction vibration is generally associated with pile driving and rock blasting. Occasionally, large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity. Vibration generated by construction activity has the potential



* Peak particle velocity (inches/sec)
** Actual vibration levels are dependent on many factors
† Approximate threshold for cosmetic damage

Source: WIA et al. 2012

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Typical Vibration Amplitudes and Thresholds

Exhibit 3

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

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to cause structural damage (i.e., cracking of floor slabs, foundations, columns, beams, or wells) or cosmetic/architectural damage (i.e., cracked plaster, stucco, or tile). Although it is possible for vibrations from construction projects to cause building damage, the vibrations from construction activities are almost never of sufficient amplitude to cause more than minor cosmetic damage to buildings (FTA 2006).

Vibration-sensitive receptors in the Project vicinity are the same as the noise-sensitive receptors previously described above and shown in Exhibit 4, Santa Anita Debris Dam Noise Monitoring Locations.

4.0 APPLICABLE NOISE AND VIBRATION STANDARDS

Public agencies have established noise guidelines and standards to protect citizens from potential hearing damage and other various adverse physiological and social effects associated with noise. The Santa Anita Dam is in U.S. Forest Service jurisdiction. The Headworks, the Wilderness Park Culvert Crossing, the Arcadia Wilderness Park, and the Debris Dam are in the City of Arcadia. The noise and vibration sensitive receptors associated with the Wilderness Park and the Debris Dam are located in the City of Arcadia. The City of Arcadia has not adopted quantitative noise standards for construction activity. Therefore, in order to quantitatively assess construction noise impacts, the County of Los Angeles Noise Ordinance standards have voluntarily been used in this analysis even though such activities are exempted from the ordinance. Since there are no sensitive receptors in the City of Monrovia adjacent to the Project site (only open space), the analysis using the County's noise standards would be appropriate.

4.1 COUNTY OF LOS ANGELES

4.1.1 County of Los Angeles General Plan Noise Element

The currently adopted General Plan Noise Element does not have quantitative noise standards but includes goals to reduce transportation noise, minimize future transportation noise, and address land use compatibility.

4.1.2 County of Los Angeles Noise Ordinance

Section 12.08 of the *County of Los Angeles Code* (County Code) contains the County's Noise Ordinance (Noise Ordinance). The Noise Ordinance prohibits unnecessary, excessive, and annoying sounds from sources on private properties by setting limits that cannot be exceeded at adjacent properties.

Transportation Sources

The County's Noise Ordinance requirements are not applicable to mobile noise sources such as automobiles or heavy trucks when traveling in a legal manner on public roadways or on private property. Mobile noise source control is preempted by federal and State laws. Los Angeles County does not address noise as it relates to land use compatibility for roadway noise in the Noise Ordinance.

Construction

Section 12.08.440 of the County Code prohibits construction noise between the hours of 7:00 PM and 7:00 AM on weekdays (including Saturday), and at any time on Sunday or a federal holiday if it creates a disturbance across a residential or commercial real-property line. The County also sets maximum construction noise levels "at residential structures". As shown in Table 1 below,

the daytime noise level limit at single-family residences for mobile construction equipment is 75 dBA.

TABLE 1
COUNTY OF LOS ANGELES CONSTRUCTION EQUIPMENT NOISE LIMITS

Time Interval	Single-Family Residential (dBA)	Multi-Family Residential (dBA)	Semi-Residential or Commercial (dBA)
Mobile Equipment			
Daily, except Sundays and legal holidays, 7:00 AM to 8:00 PM	75	80	85
Daily, 8:00 PM to 7:00 AM, and all day Sunday and legal holidays	60	64	70
Stationary Equipment			
Daily, except Sundays and legal holidays, 7:00 AM to 8:00 PM	60	65	70
Daily, 8:00 PM to 7:00 AM, and all day Sunday and legal holidays	50	55	60
dBA: A-weighted decibels Source: *County of Los Angeles Code* §12.08.			

4.1.3 Vibration Standards

Section 12.08.560 of the County Code states, "Operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of-way is prohibited. The perception threshold shall be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hertz."

4.2 CITY OF ARCADIA

4.2.1 General Plan

The City of Arcadia General Plan does not address construction noise except as follows:

> Recognizing that construction noise, amplified sound, and noise from late night commercial activities near residential neighborhoods represent the chief sources of intermittent loud noise and noise complaints, the noise ordinance addresses these sources specifically. Among other provisions, the ordinance states that "it shall be unlawful for any person to willfully make or continue, or cause to be made and continued, any loud, unnecessary and unusual noise which disturbs the peace or quiet of any neighborhood, or which causes discomfort or annoyance to residents of the area" (City of Arcadia 2010).

4.2.2 Municipal Code

Construction noise is addressed in Article IV, Chapter 2, Part 6, Nighttime Construction, Sections 4261 and 4262 (Arcadia 2013).

> 4261. - PROHIBITED HOURS DEFINED.
>
> The term “prohibited hours” as used in this Part shall mean any time after the hour of 7:00 p.m. of any day; any time before the hour of 7:00 a.m. of any day; any time on any Sunday; and any time on any of the following holidays: January 1 (New Year's Day); May 30 (Memorial Day); July 4; Labor Day; November 11 (Veteran's Day); Thanksgiving Day; and December 25 (Christmas Day); provided that if in any calendar year any such holiday falls on a Sunday, the following Monday shall constitute the holiday.
>
> 4262. - CONSTRUCTION LIMITED.
>
> Unless a permit so to do shall first have been obtained as provided in Section 4263, no person shall during prohibited hours engage in any earth excavation, land fill or earth moving operation or in the construction of any portion of a building or structure, nor shall any person during prohibited hours use or operate any truck, tractor, crane, rig or any mechanical equipment of any kind in connection with, in the performance of or in furtherance of any of the foregoing.

4.2.3 Vibration Standards

There are no City of Arcadia vibration standards applicable to the proposed Project.

5.0 EXISTING NOISE ENVIRONMENT

The Project vicinity is a relatively quiet, suburban area. Noise sources include vehicles coming to and from the local residences and Arcadia Wilderness Park; maintenance and inspection activities at the Project facilities; and typical residential neighborhood sounds such as landscape maintenance machinery, barking dogs, and trash collection.

5.1 AMBIENT NOISE SURVEY

Ambient noise level measurements were taken at the Project site on December 20, 2012, using a Larson Davis Laboratories Model 831 integrating sound level meter (LD 831). The LD 831 sound level meter and microphone was mounted on a tripod four to five feet above the ground and equipped with a windscreen during all measurements. The LD 831 was calibrated before and after use. Monitoring was conducted at the Debris Dam because there are sensitive receptors close to the proposed work sites.

The monitoring locations were approximately 55 to 70 feet from the closest residences. Each short-term measurement was taken for a duration of approximately 20 minutes to provide representative average daytime noise levels. These ambient noise measurement locations are shown in Exhibit 4, Santa Anita Debris Dam Noise Monitoring Locations, and the average, maximum, and minimum (L_{eq}, L_{max}, and L_{min}) values taken at each short-term ambient noise measurement location are summarized in Table 2. The complete noise monitoring results are included in Appendix A.

As shown in Table 2, average daytime noise levels in the Project area when there is no construction work at the Debris Dam range from 44 to 48 dBA L_{eq}. The existing background noise environment (i.e., ambient noise) in the Project area is primarily influenced by occasional vehicle traffic on the roads adjacent to the Project sites

TABLE 2
SUMMARY OF SHORT-TERM AMBIENT NOISE LEVEL MEASUREMENTS IN THE PROJECT AREA

Location No.[a]	Location	Start Time, Duration	Noise Levels (dBA)			Primary Noise Source	Notes
			L_{eq}	L_{max}	L_{min}		
1	Debris Dam, south of east end of dam, on Lower Clam Shell Truck Road	12:57 PM 20 min	48	61	40	Vehicles on service road, residences	Construction nearby but not close; barking dog
2	Debris Dam, south of west end of dam, on Lower Clam Shell Truck Road	1:24 PM, 20 min	44	59	34	Vehicles on service road, residences	Construction nearby but not close

dBA: A-weighted decibel; L_{eq}: average noise level over a period of minutes or hours expressed as the equivalent noise level for that time period; L_{max} and L_{min}: the highest and lowest (respectively) A-weighted sound level that occurs during that noise event; min: minutes.

[a] Locations shown on Exhibit 4.

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Noise Monitoring Locations

Exhibit 4

Santa Anita Stormwater Flood Management and Seismic Strengthening Project

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6.0 REGULATORY REQUIREMENTS

As required by the County Code and consistent with the City of Arcadia municipal code, the following regulatory requirement (RR) shall be included in the proposed Project.

RR Noise-1 In compliance with the County Code and consistent with the City of Arcadia Municipal Code, Project construction activities that generate substantial noise, such as the operation of construction equipment and mechanical equipment, shall be limited to the hours of 7:00 AM to 7:00 PM Monday through Saturday.

7.0 NOISE IMPACTS

Noise impacts associated with the proposed Project would be limited to the construction phases of the proposed Project. The operations of the Santa Anita Dam, Headworks, Wilderness Culvert Crossing and Debris Dam would be the same as, or very similar to the current operations.

The primary noise sources during typical construction are the diesel engines of construction equipment and the impact noise from operations such as pile driving, blasting, and jackhammering. No blasting or pile driving activities are anticipated for the Project; jackhammering may be used for some demolition work.

Construction equipment can be considered to operate in two modes: stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed-power operation, such as pumps, generators and compressors, or a variable noise operation, such as pile drivers, rock drills, and pavement breakers. Mobile equipment moves around the construction site with power applied in cyclic fashion, such as bulldozers, graders, and loaders (FTA 2006). Noise impacts from stationary equipment are assessed from the location of the specific equipment, while noise impacts from mobile construction equipment are assessed from the center of the equipment activity or construction site. As described in Section 2.3, the noise level at a receptor is dependent on the distance from the source to the receptor and the intervening topography and ground cover.

Variation in power is also a factor in characterizing the noise source levels from construction equipment. Power variation is accounted for by describing the noise at a reference distance from equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FTA 2006).[1] Typical duty cycles and noise levels generated by representative pieces of equipment are listed in Table 3, Typical Maximum Construction Equipment Noise Levels and Duty Cycles.

[1] The duty cycle is the percentage of time that the equipment is typically at full power.

TABLE 3
TYPICAL MAXIMUM CONSTRUCTION EQUIPMENT
NOISE LEVELS
AND DUTY CYCLES

Equipment	Noise Level (dBA) at 50 ft	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 KVA or less)	70	50%
Generator (more than 25 KVA)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
Insitu Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pile Driver, Impact (diesel or pneumatic)	101	20%
Pile Driver, Vibratory	95	20%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%

dBA: A-weighted decibels; ft: feet; KVA: kilovolt amps

Source: Thalheimer 2000, FTA 2006.

7.1 CONSTRUCTION PHASING

Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some would have higher continuous noise levels than others, and some have high-impact noise levels. The L_{eq} of each phase is determined by combining the L_{eq} contributions from each piece of equipment used in that phase (FTA 2006). Table 4, Project Construction Schedule, provides the projected construction start dates and duration for the various Project components. As shown in Table 4,

construction of the Project at the Dam is anticipated to commence in December 2015. While the schedule may be modified due to the date of County Project approval as well other Project approval/permits, this table illustrates the approximate duration of major Project activities.

TABLE 4
PROJECT CONSTRUCTION SCHEDULE

Construction Phase	Estimated Construction Start	Anticipated Duration
Dam	**December 2015**	10 months
Armor Canyon/Dam	December 2015	2 weeks
Garage, Helipad, Water System	December 2015	6 weeks
Remove/Replace Jib Crane	February 2016	2 weeks
Repair Concrete	February 2016	2 weeks
Hoist	March 2016	4 weeks
Construct New Spillway	April 2016	6 months
Install Valves	April 2016	2 weeks
Electrical	April 2016	4 weeks
Headworks and Wilderness Park Culvert Crossing	**March 2016**	**6 months**
Headworks Demolition	March 2016	1 week
Rubber Dam	March 2016	1 week
Construct Levee	March 2016	2 weeks
Culvert Crossing Demolition	April 2016	2 weeks
Site Clear/Grub	April 2016	4 weeks
Grading/Implement Temporary Access	May 2016	2 weeks
Abutments and Wing Walls	June 2016	4 weeks
Construct Culvert Crossing Deck	July 2016	6 weeks
Paving Culvert Crossing	August 2016	2 weeks
Debris Dam	**April 2016**	**6 months**
Modify Spillway	April 2016	2 months
Construct Buttresses	June 2016	2.5 months
Construct New Subdrain	August 2016	1 month
Remove/Construct Outlet Tower(s)	September 2016	2 weeks

7.1.1 Construction Equipment and Workforce

Trip generation for employees and delivery trucks would vary depending on the phase of construction. During the peak of construction, a typical day would include the transportation of workers; movement of heavy equipment; and transportation of materials. Detailed construction equipment and trip generation are shown in Table 5, Project Construction Equipment and Trip Generation, on the following page.

TABLE 5
ESTIMATED PROJECT CONSTRUCTION EQUIPMENT AND TRIP GENERATION

Construction Phase	Offroad Equipment	Worker Trips[a]	Truck Trips[a]
Dam			
Armor Canyon/Dam	1 Concrete Pump	3	500
Garage, Helipad, Water System	1 Concrete Pump, 1 Loader/Backhoe	5	10
Remove/Replace Jib Crane	1 Crane	3	5
Repair Concrete	1 Concrete Pump	3	5
Hoist	1 Crane	3	10
Construct New Spillway	1 Backhoe, 1 Concrete Pump, 1, Crane, 1 Loader, 1 Concrete Saw	8	56
Install Valves	1 Crane	3	5
Electrical	1 Crane	3	10
Headworks and Wilderness Park Culvert Crossing			
Headworks Demolition	1 Concrete Saw, 1 Excavator, 1 Backhoe	5	10
Rubber Dam	2 Backhoes	3	3
Construct Levee	1 Backhoe, 1 Concrete Pump	3	19
Culvert Crossing Demolition	1 Concrete Saw, 1 Excavator, 1 Backhoe	5	14
Site Clear/Grub	1 Backhoe	3	210
Grading/ Implement Temporary Access	2 Backhoes	5	--
Abutments and Wing Walls	2 Concrete Pumps	4	46
Construct Culvert Crossing Deck	1 Concrete Pump	3	18
Paving Culvert Crossing	1 Roller	3	15
Debris Dam			
Modify Spillway	1 Concrete Pump, 1 Concrete Saw, 1 Drilling Rig	4	63
Dam			
Construct Buttresses[b]	1 Excavator, 1 Dozer, 1 Backhoe, 1 Loader, 1 Water Truck	5	4,063
Construct New Subdrain	2 Loaders	3	157
Remove Outlet Tower	2 Backhoes, 1 Water Truck	3	5

[a] All trips are round trips.

[b] The 4,063 number of trips was estimated based on 65,000 cubic yards of material required for the buttressing, assuming use of 16 cubic yard trucks occurring over 55 workdays (i.e. 2.5 months). Approximately half of this material (32,500 cubic yards) is estimated to be harvested from the adjacent Sediment Placement Site (SPS); therefore, the first 27 workdays (i.e. 5 weeks) of the sediment/fill truck trips would occur on-site between the SPS and the Debris Dam, and would not affect local residential roadways. Once fill from the SPS is exhausted, the remaining fill amount would be imported to the Debris Dam site, requiring off-site trucking for approximately 5 weeks.

7.2 TEMPORARY CONSTRUCTION NOISE IMPACTS

Typical heavy construction equipment would include bulldozers, excavators, dump trucks, front-end loaders, graders, and industrial/concrete saws. Construction of the Project would include demolition, which would result in impact noise. Construction activities associated with the Project would not include blasting or pile driving.

Because of the effects of noise attenuation, the distance from the noise source to a receptor is a primary consideration in determining the noise level experienced at the receptor. The distances and locations of sensitive receptors near the Project site were discussed above and sensitive receptors near the Debris Dam are shown in Exhibit 4. Because different construction stages involve different pieces of equipment and may involve only localized portions of a site, each construction stage can result in different noise levels being generated depending on the distance to sensitive receptors. As described in RR Noise-1 above, all construction must be limited to the hours of 7:00 AM to 7:00 PM Monday through Saturday. However, in order to reduce construction-related impacts to nearby residences, the Project would only be under construction during the weekdays (Monday through Friday) and work would not occur on Saturdays.

7.2.1 Dam

Construction at the Dam would occur for approximately 10 months (starting in December 2015). There are no noise-sensitive receptors near the Dam or near the slope improvement area north of the Dam. Although construction activity would result in substantial temporary noise increases in the area near the Dam, there would be no impacts because there are no nearby sensitive receptors.

7.2.2 Headworks

Construction at the Headworks would occur for approximately one month (starting in March 2016). Construction noise would result in substantial temporary noise increases in the area around the Headworks. Although the nearest homes are more than 500 feet from the Headworks and there are topographic and vegetation barriers between the Headworks and the homes that would attenuate noise, some construction noise would be audible. Neither the magnitude nor the duration of the construction noise would be substantial and the impact would be less than significant.

7.2.3 Wilderness Park Culvert Crossing

Construction at the Wilderness Park Culvert Crossing would occur for approximately 4.5 months (starting in April 2016) after construction at the Headworks. Construction noise would result in substantial temporary noise increases in the area immediately adjacent to the Wilderness Park Culvert Crossing. The noisiest piece of equipment used at this site would be a concrete saw, which would be used intermittently in the demolition of the existing concrete slab and Culvert Crossing. As shown in Table 3, the maximum noise level for a concrete saw is 90 dBA at a distance of 50 feet. Another noise source would be the diesel engines of a bulldozer, excavator, truck, or backhoe. Two of the noisiest pieces of diesel engine driven equipment each generates noise levels of 85 dBA L_{max}, If operated at full power simultaneously, the combined maximum noise level would be 88 dBA at 50 feet. A concrete saw and a diesel engine at maximum noise levels together would be 91 dBA at 50 feet.

The nearest homes are approximately 250 feet from the Wilderness Park Culvert Crossing. At a distance of 250 feet and without absorbent vegetation or barriers blocking the line of sight, a noise level of 91 dBA at 50 feet would be reduced to 77 dBA. The topography between the homes and the Culvert Crossing (i.e., the bluff edges) would act as a barrier, blocking the line of sight; the topography would, therefore, act as a barrier along the noise transmission path between most or all of the construction activities and the homes, reducing noise by 3 to 5 dBA. Maximum noise levels, assuming they occur intermittently at the homes, are estimated at 72 to 74 dBA, and may be substantially less depending on the noise attenuation provided by the intervening topography. However, some construction noise would be audible and may occasionally be disturbing to persons in the backyards of the homes. The maximum noise levels would be less than the County

Noise Ordinance 75 dBA limit for construction noise from mobile equipment to single-family residential land uses. Therefore, the impact would be less than significant and no mitigation is required. However, in order to minimize noise impacts to residences in the vicinity of the Wilderness Park Culvert Crossing, the Project would implement MM NOI-1, which specifies construction practices to minimize noise effects upon sensitive receptors. The Project would also implement MM NOI-2, which would provide a process for identifying and correcting excessive construction noise levels. Neither MM NOI-1 nor MM NOI-2 is required to ensure that impacts at the Wilderness Park Culvert Crossing would be less than significant.

The County Noise Ordinance construction equipment noise limits are not applicable to the Wilderness Park because it is neither a residential nor commercial land use. However, it is noted that short-term construction noise levels at the Culvert Crossing may be annoying for some visitors. Construction noise is generally understood to be a temporary inconvenience, especially for people that are not obligated to stay near the noise source and can freely move to a quieter location. Therefore, there would be no impacts to park users from construction noise associated with the Culvert Crossing.

7.2.4 Debris Dam

Construction at the Debris Dam would occur for approximately six months (starting April of 2016). Construction noise would result in substantial temporary noise increases in the residential area immediately adjacent to the Debris Dam. The homes west and south of the Debris Basin are approximately 40 to 200 feet from the base of the downstream Debris Dam embankment, relatively close to the proposed structural buttressing that would occur at the toe of the downstream embankment. Excavation for the structural buttress at the toe of the Debris Dam would occur at distances 25 to 50 feet from the closest residences. When construction work would occur on the upstream side of the embankment, the embankment would act as a noise barrier to the residences on the downstream side, reducing the noise level at those receptors. Similarly, the Debris Dam would be a barrier between upstream receptors and noise generated on the downstream side. As previously discussed, the nearest sensitive noise receptors in the City of Monrovia are ½ mile to the east; noise impacts at that distance would be negligible. Thus, the focus of the noise analysis at the Debris Dam is potential impacts to receptors near the downstream embankment.

As previously discussed in Section 4.3, Air Quality, construction activities at the Debris Dam are expected to include one excavator, one dozer, one backhoe, one loader, as well as on-road trucks. As shown in Table 3, some of this equipment has a maximum noise level of 85 dBA at 50 feet. Two of the noisiest pieces of equipment, if at full power simultaneously, would have a maximum noise level of 88 dBA at 50 feet. If large diesel engine powered construction equipment would operate on or below the downstream embankment, the resulting noise level of 88 dBA at 50 feet would exceed the County Noise Ordinance 75 dBA limit at residences closer than 225 feet, and mitigation is required.

MM NOI-3 would be implemented, which requires, (1) the installation of a temporary 16 foot high noise barrier on between the Debris Dam and the residences closest to the downstream side of the Debris Dam to ensure a minimum noise transmission loss of 22 dBA and (2) that only 1 piece of equipment be operated at full power at any time for work that is done on the downstream side of the Debris Dam within 50 feet of residences.

For example, when a loader is at full power loading a truck, the truck should be shut down or on low idle; when the truck powers up to move, the loader should be shut down or a low idle. As previously noted, work on the structural buttress may occur as close as 25 feet from a residence. At that distance and without a noise barrier, the noise level from a piece of construction equipment that generates 85 dBA at 50 feet would be 91 dBA. With those parameters, the noise barrier would provide a minimum of 18 dBA noise reduction, reducing the maximum noise level to 73 dBA or less.

The effectiveness of a noise barrier, called insertion loss, varies with the locations of the noise source and receptor relative to the barrier. Table 6, Noise Levels with Noise Barrier, shows noise levels without and with a 16 foot high noise wall with various locations of the noise source.

TABLE 6
NOISE LEVELS WITH NOISE BARRIER

Source Noise Level at 50 ft (dBA)	Source to Receptor Distance (ft)	Receptor Noise Level w/o Wall (dBA)	Wall Height (ft)	Insertion Loss (dBA)	Receptor Noise Level with Wall (dBA)
85	25	91	16	18	73
85	50	85	16	16	69
85	75	81.5	16	16	65.5

dBA: A-weighted decibels; ft: feet

Note: Data for source and receptor at the same elevation. The source (construction equipment) may be at a higher elevation when working on the downstream side of the Debris Dam. In this case the effective wall height and insertion loss would be reduced, but noise levels at the receptor would not exceed 75 dBA.

Source: BonTerra Psomas 2014c (Appendix D).

As shown in Table 6, with one piece of equipment with a noise level of 85 dBA at 50 feet from the source, the receptor noise level would be 73 dBA at a 25-foot distance between the source and receptor with the 16-foot high noise barrier. A second piece of equipment with the same noise level would increase the receptor noise by 3 dBA, which would exceed the 75 dBA threshold. Therefore, MM NOI-3 limits the number of equipment at full power within 50 feet of residences. The proposed location of the noise barrier is shown on Exhibit 4. With implementation of MM NOI-3, construction equipment noise levels would not exceed 75 dBA at the adjacent residences and the impacts would be reduced to levels less than significant.

In order to further minimize noise impacts to residences in the vicinity of the Debris Dam, MM NOI-1 would be implemented, which specifies construction practices to minimize noise effects upon sensitive receptors. The Project would also implement MM NOI-2, which would provide a process for identifying and correcting excessive construction noise levels. Neither MM NOI-1 nor MM NOI-2 is required to ensure that impacts at the Debris Dam would be less than significant.

7.2.5 <u>On-Road Traffic Noise Impacts</u>

The Project would generate traffic on N. Santa Anita Avenue, Highland Oaks Drive, and Elkins Avenue. During the approximate 10-month construction period, the traffic noise impacts would be related to movement of construction equipment, trucks, and construction worker trips. Once construction equipment is transported to the various flood-control facilities, it is anticipated that

the equipment would remain on site until the end of each phase and all Project-related traffic noise would be related to workers entering and leaving the Project site during the workday. The anticipated number of worker trips are detailed in Table 5. Individual truck passbys would be heard at residences adjacent to the roads used; the noise would be similar to the occasional noise of waste collection trucks, which would be approximately 73 to 77 dBA at a distance of 50 feet from the centerline of the road, depending on the speed of the truck.

Peak trucking periods, including concrete trucks and dump trucks for hauling fill material, would occur at two distinct construction phases: (1) a two-week period in December 2015, when construction at the Dam (reinforcement of the armoring on the downstream canyon wall and construction of the helipad) would occur, concrete pours and other material deliveries would require approximately 50 daily round trips (e.g. equates to approximately 6.3 round trips per hour per workday-assuming 8 hours of activity) per day; and (2) over approximately 5 weeks starting in August 2016, when construction of the Debris Dam buttresses would require approximately 74 round trips for soil import per day (e.g. equates to approximately 9.2 round trips per hour per workday-assuming 8 hours of activity per day).[2] The anticipated schedule for construction activities are shown in Table 4 and the anticipated number of truck/worker trips during each period are shown in Table 5.

With the exception of noise generated during the two construction activities described above, the hourly average noise increase due to construction traffic would be less than 3 dBA. Because there is relatively little existing traffic noise on Highland Oaks Drive and Elkins Avenue, the hourly average noise level could increase up to 8 dBA during trucking to the Dam and Wilderness Park Culvert Crossing and up to 12 dBA during trucking to the Debris Dam. During these periods of concrete truck activity, there would be a clearly audible increase in periodic noise events (i.e. the noise increase associated with each truck pass); however, these two periods of increased traffic noise would be short-term and would occur over a period of approximately 7 weeks. It is also noted that the community noise equivalent level (CNEL) would not exceed 60 dBA during these two peak traffic noise periods, which is the City's "Normally Acceptable" noise compatibility guideline for development in a low density residential area. This guideline is not applicable to the Project because traffic noise is short-term due to construction activities, whereas the guideline refers to long-term operational noise sources. However, it is mentioned to provide context and illustrate that even short-term construction activities would be within the City's "Normally Acceptable" noise compatibility guideline. The impact would be less than significant.

7.2.6 Summary of Construction Noise Impact Analyses

Table 7 summarizes the noise impact analyses above.

[2] Estimated soil import requirements of 65,000 cubic yards, delivered in 16 cubic yard trucks, would result in 4,063 truck trips over the course of 2.5 months. Because approximately half of the import fill material would be obtained from the adjacent SPS, the first 5 weeks of soil import would not require the dump trucks to travel through the adjacent neighborhoods. Once the full amount of soil is obtained from the SPS, import will be required for the remaining 32,500 cubic yards, which would occur over the remaining 5 week period.

TABLE 7
SUMMARY OF NOISE IMPACT ANALYSES

Section	Topic	Maximum Noise Level (dBA)	Less than Significant?	Mitigation Measures Required	Maximum Noise Level with Mitigation (dBA)	Less than Significant with Mitigation?
7.2.1	Dam	NA[a]	Yes	None	NA	NA
7.2.2	Headworks	NA[b]	Yes	None	NA	NA
7.2.3	Wilderness Park Culvert Crossing	72 to 74	Yes	None	NA	NA
7.2.4	Debris Dam	88	No	NOI-3	73	Yes
7.2.5	On-Road Traffic	increase of 8 to 11	Yes	None	NA	NA

NA: Not applicable

[a] No sensitive receptors near the Dam.
[b] Distance and topography prevent substantial noise at receptors.

7.2.7 Construction Noise Mitigation Measures

To reduce potential construction-related noise impacts associated with Project construction, the following noise abatement measures would be incorporated into the Project.

MM Noise-1 Even though measures set forth in this mitigation are not required to reduce noise to less than significant levels at either the Culvert Crossing or the Debris Dam, these measures will be implemented at these construction sites to further reduce noise impacts.

- The construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.
- The construction contractors shall place all stationary construction equipment so that the equipment is as far as feasible from the noise-sensitive receptors and so that emitted noise is directed away from the noise-sensitive receptors.
- The construction contractors shall locate equipment staging in areas that will create the greatest distance between staging area noise sources and noise-sensitive receptors during all Project construction.
- The construction contractors shall limit haul truck deliveries to the same hours specified for operation of construction equipment.

MM Noise-2 Even though measures set forth in this mitigation are not required to reduce noise to less than significant levels at either the Culvert Crossing or the Debris Dam, these measures will be implemented at these construction sites to further reduce noise impacts.

At least two weeks but not more than one month prior to the start of noise-generating construction activities, notification shall be mailed to owners and occupants of all developed land uses within 300 feet of the Culvert Crossing and Debris Dam providing a schedule for major construction activities that will occur through the duration of the construction period. The notification shall include the

identification and contact number for a designated construction manager that would be available on site to monitor construction activities. Contact information for the Construction Manager shall also be located at the Arcadia City Hall and the Arcadia Police Department.

Complaints may be made during construction hours and a response shall be made within one work day. The Construction Manager shall document all complaints and resolutions and shall provide copies to the LACFCD within three working days of the complaint.

The Construction Manager, upon observation of excessive noise occurring near adjacent homes or upon receipt of a complaint about excessive noise shall do the following:

- Ensure that construction equipment is properly muffled according to industry standards and
- Modify operations to reduce the number of pieces of equipment operating near noise sensitive receptors or operating concurrently, unless the modification would prevent completion of the task or
- Implement corrective or additional noise-attenuation measures considered appropriate to address the complaint, which may include, but are not limited to, noise barriers or noise blankets.

MM Noise-3 Prior to the start of grading or similar heavy equipment operation on the downstream side of the Debris Dam, the County shall erect a temporary noise barrier between the structural buttressing work area and the residences to the southwest. The barrier shall be located along on the southwest edge of the site access road but the horizontal location may be adjusted as necessitated by geographical or topographical constraints or to avoid trees. The barrier shall be 16 feet high and solid from the ground to the top. The barrier shall be plywood of at least 0.75-inch thickness or other material with a noise transmission loss of 22 dBA or more.

When equipment is working on the downstream site of the Debris Dam within 50 feet of residences, only one piece of equipment shall be at full power at any time; other equipment shall be shut down or at low idle.

7.3 LONG-TERM OPERATIONAL NOISE IMPACTS

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Dam, Headworks, or Debris Dam. Helicopter flights to and from the new helipad at the Dam would occur only in emergencies and would not be anticipated to occur more than once or twice per year. These occasional noise events would not permanently affect the ambient noise levels. Therefore, there would be no Project-generated change in long-term ambient noise levels in the Project vicinity. There would be no impact.

7.3.1 Operational Noise Mitigation Measures

Since there would be no Project-generated change in long-term ambient noise levels, no operational mitigation measures are required.

7.4 AIRPORT AND PRIVATE AIRSTRIP NOISE IMPACTS

The proposed Project would not develop land uses that would locate persons in an area subject to noise from public or private airports. Noise generated by helicopter flights would occur only in emergencies, is not anticipated to occur more than once or twice per year, and would not be excessive. The impact would be less than significant. No mitigation measures are required.

8.0 VIBRATION IMPACTS

The proposed Project has the potential to generate vibration to the nearest homes adjacent to the west and south of the Debris Dam. There are no applicable standards for structural damage from vibration. The California Department of Transportation (Caltrans) vibration damage potential guideline thresholds are shown in Table 8, Guideline Vibration Damage Potential Threshold Criteria.

TABLE 8
GUIDELINE VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

Structure and Condition	Maximum ppv (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

ppv: peak particle velocity; in/sec: inch(es) per second

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans 2004.

8.1 SHORT-TERM CONSTRUCTION VIBRATION IMPACTS

Groundborne vibration generated by construction activities is usually highest during pile driving, blasting, soil compacting, jack-hammering, and demolition-related activities. No blasting or pile driving; however, the Project would require demolition activities that may require jackhammers. Next to demolition, grading activity has the greatest potential for vibration impacts as the largest and heaviest equipment would be used during this stage.

Table 9, Vibration Levels During Construction, summarizes typical vibration levels measured during construction activities for various vibration-inducing pieces of equipment at a distance of 25 feet and the calculation of these levels at a distance of 50 feet. Excavation for the structural buttress at the toe of the Debris Dam would occur at distances 25 to 50 feet from the closest residences.

TABLE 9
VIBRATION LEVELS DURING CONSTRUCTION

Equipment		PPV at 25 ft (in/sec)	PPV at 50 ft (in/sec)
Pile driver - impact	Upper range	1.518	0.617
	Typical	0.644	0.262
Large bulldozer		0.089	0.036
Caisson drilling		0.089	0.036
Loaded trucks		0.076	0.031
Jackhammer		0.035	0.014
Small bulldozer		0.003	0.001

ft: feet; in/sec: inches per second.

Source: FTA 2006.

Although it is possible for vibration from construction projects to cause building damage, vibration from construction activities are almost never of sufficient amplitude to cause more than minor cosmetic damage to buildings. There are no off-site structures near the Dam or the Headworks. The closest residential structures to the Wilderness Park Culvert Crossing are 250 feet away. The closest residential structures to the Debris Dam work area are 25 feet away. The highest potential vibration level at a distance of 25 feet shown in Table 9 above (i.e., a large bulldozer at 0.089 ppv in/sec) would be substantially less than the 0.3 ppv in/sec structural damage guideline for older residential structures. Therefore, there would be no potential for structural damage to existing structures near the Project site.

Section 12.08.560 of the Los Angeles County Code considers the vibration perception threshold is a motion velocity of 0.01 in/sec. As shown in Table 9, if large equipment were to operate frequently within 25 feet of an occupied residence, vibration level would be approximately 0.09 in/sec and would be distinctly perceptible. At a distance of 140 feet, the vibration level from the largest equipment shown in Table 9, a heavy bulldozer, would not exceed 0.01 in/sec. In order to limit vibration at the residences to less than 0.01 in/sec, MM NOI-4 would be implemented. MM NOI-4 would prohibit the use of large bulldozers and large loaded trucks on the Project site within 140 feet of an occupied residential structure. Jackhammer vibration would not exceed 0.01 in/sec at distances greater than 60 feet. While jackhammers may be used for some demolition activities at the Debris Dam, no demolition is planned within 60 feet of an occupied residence. With the implementation of MM NOI-4, the impact would be less than significant.

8.2 OPERATIONAL VIBRATION IMPACTS

Once the Project is complete, there would be no long-term changes to the regular inspection and maintenance operations at the Santa Anita Dam, Headworks, or Debris Dam. Therefore, there would be no Project-generated change in vibration levels in the Project vicinity.

8.2.1 Vibration Mitigation Measures

MM Noise-4 Large bulldozers and large loaded trucks shall not be operated on the Project site within 140 feet of an occupied residence. Consistent with the County Code, this restriction does not apply to trucks on a public right-of-way.

9.0 REFERENCES

Arcadia, City of. 2013 (Codified through Ordinance No. 2306, passed January 15, 2013). Arcadia Municipal Code. http://library.municode.com/index.aspx?clientId=16197.

———. 2010 (November). *Arcadia General Plan* (Chapter 9: Noise Element). Arcadia, CA: the City. http://www.ci.arcadia.ca.us/docs/gp_noise.pdf.

California Department of Transportation (Caltrans). 2004 (June). *Transportation- and Construction-Induced Vibration Guidance Manual* (prepared by Jones and Stokes). Sacramento, CA: Jones and Stokes. http://www.dot.ca.gov/hq/env/noise/pub/vibrationmanFINAL.pdf.

———. 1998 (October). *Technical Noise Supplement: A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA: Caltrans. http://www.dot.ca.gov/hq/env/noise/pub/Technical%20Noise%20Supplement.pdf.

Thalheimer, E. 2000. Construction Noise Control Program and Mitigation Strategy as the Central Artery/Tunnel Project. *Noise Control Engineering Journal* 48(5), Sep–Oct. Indianapolis, IN: Institute of Noise Control Engineering.

U.S. Department of Transportation (USDOT), Federal Transit Administration (FTA). 2006 (May). *Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06* (prepared by Harris Miller Miller & Hanson, Inc. [HMMH]). Vienna, VA: HMMH. http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf.

APPENDIX A

NOISE LEVEL MEASUREMENT RESULTS

Summary				
Filename	831_Data.045			
Serial Number	1742			
Model	831			
Firmware Version	2.000			
User				
Location	1 - Debris Basin SE			
Job Description				
Note				
Measurement Description				
Start	2012/12/20 12:45:31			
Stop	2012/12/20 13:16:57			
Duration	0:20:08.0			
Run Time	0:20:08.0			
Pause	0:00:00.0			
Pre Calibration	2012/10/31 11:53:43			
Post Calibration	None			
Calibration Deviation	---			
Overall Settings				
RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRM831			
Integration Method	Linear			
Gain	0.0 dB			
Overload	143.8 dB			
	A		**C**	**Z**
Under Range Peak	**76.3**		73.3	78.3
Under Range Limit	**26.3**		26.6	32.1
Noise Floor	17.1		17.5	22.7
Results	Laeq and LASmax adjusted to delete calibration signal			
LAeq	48.2 ~~85.7~~ dB			
LAE	116.5 dB			
EA	49.912 mPa²h			
LApeak (max)	2012/12/20 12:45:32		117.0 dB	
LASmax	2012/12/20 12:45:33		60.7 ~~114.0~~ dB	
LASmin	2012/12/20 13:08:52		39.5 dB	
SEA	-99.9 dB			
Statistics				
LAS5.00	53.7 dB			
LAS10.00	50.5 dB			
LAS33.30	47.5 dB			
LAS50.00	44.3 dB			
LAS66.60	42.4 dB			
LAS90.00	40.7 dB			

Record #	Date	Time	Duration	Run Time	LAeq	energy	runtime	weighted	LAE	LASmin	Time	LASmax	Time
1	2012/12/20	12:45:31	00:00:01.8	00:00:01.8	114.0				116.5	114.0	12:45:31	114.0	12:45:33
2	2012/12/20	12:56:48	00:00:11.6	00:00:11.6	40.7				51.4	40.3	12:56:57	41.1	12:56:53
3	2012/12/20	12:57:00	00:01:00.0	00:01:00.0	44.9	30899	60	30899	62.7	40.2	12:57:59	58.6	12:57:51
4	2012/12/20	12:58:00	00:01:00.0	00:01:00.0	42.1	16099	60	16099	59.8	40.2	12:58:04	47.5	12:58:29
5	2012/12/20	12:59:00	00:01:00.0	00:01:00.0	42.1	16381	60	16381	59.9	41.1	12:59:53	43.9	12:59:25
6	2012/12/20	13:00:00	00:01:00.0	00:01:00.0	41.6	14338	60	14338	59.3	39.7	13:00:30	46.1	13:00:23
7	2012/12/20	13:01:00	00:01:00.0	00:01:00.0	42.7	18835	60	18835	60.5	40.3	13:01:03	50.1	13:01:28
8	2012/12/20	13:02:00	00:01:00.0	00:01:00.0	47.9	61194	60	61194	65.6	42.2	13:02:01	54.0	13:03:00
9	2012/12/20	13:03:00	00:01:00.0	00:01:00.0	51.8	151933	60	151933	69.6	45.6	13:03:28	58.2	13:03:04
10	2012/12/20	13:04:00	00:01:00.0	00:01:00.0	49.2	83967	60	83967	67.0	42.5	13:04:56	53.7	13:04:33
11	2012/12/20	13:05:01	00:01:00.0	00:01:00.0	46.2	41828	60	41828	64.0	42.0	13:05:55	56.6	13:05:37
12	2012/12/20	13:06:01	00:01:00.0	00:01:00.0	47.6	57961	60	57961	65.4	41.9	13:07:00	54.7	13:06:40
13	2012/12/20	13:07:01	00:01:00.0	00:01:00.0	42.0	15689	60	15689	59.7	40.6	13:08:01	45.7	13:07:09
14	2012/12/20	13:08:01	00:01:00.0	00:01:00.0	41.3	13411	60	13411	59.1	39.5	13:08:52	49.7	13:08:14
15	2012/12/20	13:09:01	00:01:00.0	00:01:00.0	43.7	23487	60	23487	61.5	39.7	13:09:12	49.0	13:09:37
16	2012/12/20	13:10:01	00:01:00.0	00:01:00.0	43.2	21111	60	21111	61.0	40.1	13:10:31	49.2	13:10:22
17	2012/12/20	13:11:01	00:01:00.0	00:01:00.0	49.9	98482	60	98482	67.7	42.0	13:11:05	57.0	13:11:51
18	2012/12/20	13:12:02	00:01:00.0	00:01:00.0	45.2	32925	60	32925	63.0	41.9	13:12:56	50.2	13:12:10
19	2012/12/20	13:13:02	00:01:00.0	00:01:00.0	55.6	364616	60	364616	73.4	42.1	13:13:03	60.7	13:13:37
20	2012/12/20	13:14:02	00:01:00.0	00:01:00.0	49.6	91404	60	91404	67.4	48.4	13:14:20	50.8	13:14:53
21	2012/12/20	13:15:02	00:01:00.0	00:01:00.0	49.1	80387	60	80387	66.8	47.7	13:15:41	55.3	13:15:26
22	2012/12/20	13:16:02	00:00:54.6	00:00:54.6	49.2	82475	55	75052	66.5	48.3	13:16:47	50.3	13:16:33
						sum	1195	1309999		39.5		60.7	
						minutes	19.91			min		max	
						average		65796.0188					
						Leq		48.2					

Summary			
Filename	831_Data.046		
Serial Number	1742		
Model	831		
Firmware Version	2.000		
User			
Location	2 - Debris Basin SW		
Job Description			
Note			
Measurement Description			
Start	2012/12/20 13:23:38		
Stop	2012/12/20 13:44:09		
Duration	0:20:29.3		
Run Time	0:20:29.3		
Pause	0:00:00.0		
Pre Calibration	2012/10/31 11:53:43		
Post Calibration	None		
Calibration Deviation	---		
Overall Settings			
RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRM831		
Integration Method	Linear		
Gain	0.0 dB		
Overload	143.8 dB		
	A	**C**	**Z**
Under Range Peak	**76.3**	73.3	78.3 dB
Under Range Limit	**26.3**	26.6	32.1 dB
Noise Floor	17.1	17.5	22.7 dB
Results			
LAeq	43.6 dB		
LAE	74.5 dB		
EA	3.160 µPa²h		
LApeak (max)	2012/12/20 13:28:33	87.6 dB	
LASmax	2012/12/20 13:25:32	58.6 dB	
LASmin	2012/12/20 13:31:55	33.7 dB	
SEA	-99.9 dB		
Statistics			
LAS5.00	48.5 dB		
LAS10.00	46.9 dB		
LAS33.30	43.0 dB		
LAS50.00	41.3 dB		
LAS66.60	39.4 dB		
LAS90.00	37.2 dB		

Record #	Date	Time	Duration	Run Time	Pause	LAeq	LAE	LASmin	Time	LASmax	Time
1	2012/12/20	13:23:38	00:00:22.0	00:00:22.0	00:00:00.0	45.4	58.8	36.5	13:23:38	54.4	13:23:54
2	2012/12/20	13:24:00	00:01:00.0	00:01:00.0	00:00:00.0	43.2	61.0	35.9	13:24:57	56.7	13:24:22
3	2012/12/20	13:25:00	00:01:00.0	00:01:00.0	00:00:00.0	45.1	62.9	35.1	13:25:26	58.6	13:25:32
4	2012/12/20	13:26:00	00:01:00.0	00:01:00.0	00:00:00.0	42.2	59.9	35.2	13:26:14	52.4	13:26:37
5	2012/12/20	13:27:00	00:01:00.0	00:01:00.0	00:00:00.0	39.5	57.3	37.4	13:27:33	43.3	13:27:09
6	2012/12/20	13:28:00	00:01:00.0	00:01:00.0	00:00:00.0	45.4	63.1	37.0	13:28:58	53.7	13:28:33
7	2012/12/20	13:29:00	00:01:00.0	00:01:00.0	00:00:00.0	41.2	59.0	37.0	13:29:01	45.2	13:29:38
8	2012/12/20	13:30:00	00:01:00.0	00:01:00.0	00:00:00.0	39.5	57.3	37.5	13:30:55	43.8	13:30:03
9	2012/12/20	13:31:01	00:01:00.0	00:01:00.0	00:00:00.0	39.3	57.1	33.7	13:31:55	46.7	13:31:16
10	2012/12/20	13:32:01	00:01:00.0	00:01:00.0	00:00:00.0	37.0	54.8	33.7	13:32:10	40.6	13:32:52
11	2012/12/20	13:33:01	00:01:00.0	00:01:00.0	00:00:00.0	44.0	61.7	39.6	13:33:59	49.0	13:33:32
12	2012/12/20	13:34:01	00:01:00.0	00:01:00.0	00:00:00.0	41.9	59.7	36.4	13:35:00	45.3	13:34:24
13	2012/12/20	13:35:01	00:01:00.0	00:01:00.0	00:00:00.0	42.2	60.0	36.6	13:35:03	47.1	13:35:46
14	2012/12/20	13:36:01	00:01:00.0	00:01:00.0	00:00:00.0	41.0	58.8	36.9	13:36:26	46.6	13:36:02
15	2012/12/20	13:37:01	00:01:00.0	00:01:00.0	00:00:00.0	45.1	62.9	38.0	13:37:08	52.2	13:37:21
16	2012/12/20	13:38:01	00:01:00.0	00:01:00.0	00:00:00.0	43.5	61.3	40.1	13:38:36	47.6	13:38:20
17	2012/12/20	13:39:01	00:01:00.0	00:01:00.0	00:00:00.0	45.4	63.2	40.7	13:39:26	50.1	13:39:55
18	2012/12/20	13:40:02	00:01:00.0	00:01:00.0	00:00:00.0	48.8	66.5	42.8	13:40:50	55.2	13:40:11
19	2012/12/20	13:41:02	00:01:00.0	00:01:00.0	00:00:00.0	41.3	59.1	37.0	13:41:31	48.8	13:41:02
20	2012/12/20	13:42:02	00:01:00.0	00:01:00.0	00:00:00.0	44.1	61.8	36.8	13:42:24	50.1	13:42:35
21	2012/12/20	13:43:02	00:01:00.0	00:01:00.0	00:00:00.0	45.6	63.4	40.0	13:43:49	52.6	13:43:17
22	2012/12/20	13:44:02	00:00:07.3	00:00:07.3	00:00:00.0	44.2	52.8	42.9	13:44:02	45.1	13:44:09