

**Draft Supplemental Environmental Assessment/Negative Declaration**

**Updated Water Control Plan to Include  
Regulation for Water Quality**

**Seven Oaks Dam and Reservoir, Santa Ana River,  
San Bernardino County, California**



**May 2014**

Prepared by:  
U.S. Army Corps of Engineers  
Los Angeles District



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#### Appendix A: Initial Checklist

**U. S. Army Corps of Engineers  
South Pacific Division  
Los Angeles District**

**DRAFT FINDING OF NO SIGNIFICANT IMPACT**

**Updated Water Control Plan To Include Regulation for Water Quality, Seven Oaks Dam and Reservoir, Santa Ana River, San Bernardino County, California**

I have reviewed the Supplemental Environmental Assessment (SEA) that has been prepared for the Seven Oaks Dam (SOD) Updated Water Control Plan To Include Regulation for Water Quality (May 2014), San Bernardino County, California. The SEA is in compliance with the National Environmental Policy Act (NEPA) and all applicable environmental regulations.

The U.S. Army Corps of Engineers (Corps), in coordination with the non-Federal sponsors, San Bernardino County Flood Control District (SBCFCD), Orange County Flood Control District (OCFCD), and Riverside County Flood Control and Water Conservation District (RCFC&WCD), proposes to update the original SOD Water Control Plan (WCP) contained in the Water Control Manual (Sep 2003) to include regulation for water quality. The main change from the 2003 WCP introduced in the Updated Water Control Plan (May 2014) “2014 WCP” of the Water Control Manual (WCM) is with respect to the debris pool operation *only*. The 2014 WCP requires that the debris pool be built only during a significant runoff event, and then released completely down to the top of sediment pool elevation as soon as the runoff event passes during the flood seasons. The original WCP required that flows be restricted to 3 cubic feet per second (cfs) beginning 1 October to start the building of the seasonal debris pool. This requirement will no longer apply in the 2014 WCP. No other modifications are necessary to the existing physical components of Seven Oaks Dam and Reservoir in order to implement the 2014 WCP for water quality improvements.

The proposed modification will not significantly impact any environmental resources. The change in “debris pool” operation will improve water quality and overall will not impact the listed endangered species and habitat downstream of SOD. Both Corps and the non-Federal sponsors will continue to coordinate with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW). Evaluations of, and adjustments to, the environmental regulation plan will be made, as necessary, during the implementation of the 2014 WCP.

The project remains in compliance with all applicable federal and state laws and statutes. Based on the analyses in the SEA/ND, no new significant impacts were identified for the Proposed Action that were not already assessed in the original EIS/EIR, nor was it necessary to

change the conclusion of the kinds, levels, or locations of impacts described in the original EIS/EIR. I have determined that the proposed modification will not have a significant impact upon the existing environment or the quality of the human environment. Therefore, preparation of a Supplemental Environmental Impact Statement/Environmental Impact Report is not required.

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DATE

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Kimberly M. Colloton  
Colonel, US Army  
Commander and District Engineer

## **1. INTRODUCTION**

### **1. INTRODUCTION**

#### **1.1. Background and Authorizations**

This Draft Supplemental Environmental Assessment/Negative Declaration (DSEA/ND) addresses a proposed modification in the Updated Water Control Plan To Include Regulation for Water Quality, Seven Oaks Dam and Reservoir, Santa Ana River, San Bernardino County, California (May 2014) “2014 WCP”. Seven Oaks Dam is located on the Santa Ana River (SAR), in San Bernardino County, California. This DSEA/ND provides the required National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) documentation for the Proposed Action. The DSEA/ND assesses potential environmental impacts and benefits associated with the proposed modification to reduce or eliminate suspended sediment and turbidity issues associated with the current Water Control Plan, specifically the “Debris Pool” operation.

In 2011, a Seven Oaks Dam Water Quality Technical Analysis (using a water quality model developed for this purpose) was completed and documented in a report by the U.S. Army Engineer Research and Development Center (ERDC). The purpose of the water quality analysis was to investigate any post-construction water quality issues related to the construction of Seven Oaks Dam, as mandated by Congress. Although the period of record for water quality data and sampling was limited to approximately 5 years and the existing data is somewhat inconclusive, the proposed plan is projected to improve water quality to the extent that impacts to downstream water agencies and their respective operations will be minimized. The proposed plan is a modification of the existing WCP to eliminate the “full-time” debris pool during flood season.

**Authorization for Water Quality Analysis.** The authorization for the Seven Oaks Dam Water Quality Analysis is contained in the Energy and Water Development Appropriations Bill, 2006, approved May 18, 2005, which states:

*“Santa Ana River Mainstem, California...; and \$1,000,000 is available for the Seven Oaks Dam Water Quality Study.”*

Section 3036 of the Water Resources Development Act of 2007, 110<sup>th</sup> Congress, 2<sup>nd</sup> Session, Public Law 110-114, amended the original project authorization with the following language:

*“The project for flood control, Santa Ana Mainstem, authorized by section 401(a) of the Water Resources Development Act of 1986 (100 Stat. 4113) and modified by section 104 of the Energy and Water Development Appropriations Act, 1988 (101 Stat. 1329-11), section 102(e) of the Water Resources Development Act of 1990 (104 Stat 4611), and section 311 of the Water Resources Development Act of 1996 (110 Stat. 3713), is modified to direct the Secretary – (1) to include ecosystem restoration benefits in the calculations of benefits for the Seven Oaks Dam, California, portion of the project; and (2) to conduct a study of water conservation and water quality at the Seven Oaks Dam.”*

Further Congressional direction was provided in the Consolidated Appropriations Act, 2008 (H.R. 2764; Public Law 110-161), which states:

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*“Santa Ana River Mainstem, California. –Funding in addition to the budget request for this project is included to continue studies to ascertain the nature and extent of water quality degradation in the Santa Ana River resulting from the construction and operation of Seven Oaks Dam and to amend the Seven Oaks Dam water control plan in light of current conditions and requirements.”*

**Authorization for Updated Water Control Plan (to include Water Quality).** No additional authorization is required for the modification of Seven Oaks Dam’s Water Control Plan to include the operation for Water Quality. The original authorization for the Seven Oaks Dam project is contained in the Water Resources Development Act of 1986, 99<sup>th</sup> Congress, 2<sup>nd</sup> Session (P.L. 99-662). The modification to the 2003 Water Control Plan will not change the authorized purpose of the project.

The 2014 WCP is based on the proposed plan to eliminate the “fulltime” debris pool during flood season. As this proposal changes the operation of the debris pool during flood seasons, an update of the approved WCP, or this 2014 WCP/Manual for the Seven Oaks Dam and Reservoir, became necessary. The following operational modification will be followed during the implementation of the 2014 WCP. During flood seasons, the debris pool will only be built at the start of a runoff event, and then drained as quickly as possible during the recession or conclusion of the runoff event. The rate of release change, and general regulation/operation of the dam during the non-flood seasons, will not change from what was provided in the 2003 Water Control Manual. No other modifications will be necessary, or proposed, to the original Water Control Plan for the 2014 WCP document.

### 1.2. Project Features and Locations

Seven Oaks Dam is located at a narrowing of the of the Upper Santa Ana Canyon, about 1 mile upstream from the canyon mouth at the confluence of the SAR (Santa Ana River) and Government Canyon, and is 8 miles northeast of the city of Redlands in San Bernardino County, California. The steep-walled canyon is surrounded by the rugged foothills along the southern flank of the San Bernardino Mountains. When the pool elevation is near spillway crest (elevation 2580 ft, NGVD) , the reservoir would cover about 780 acres (315 ha), and would be about 500 feet (150 m) deep and 3 miles (5 km) long.

Approximately 23 percent of the SAR watershed is within the San Gabriel and San Bernardino Mountains; about nine percent is in the San Jacinto Mountains; and five percent is within the Santa Ana Mountains. Most of the remaining area is in the valleys formed by the broad alluvial fan along the base of these mountains, extending to the Pacific Ocean.

The SOD sub-watershed drains approximately 177 square miles, excluding the 32 square miles tributary to Baldwin Lake, located approximately 21 miles northeast of the SOD. The 27 miles of river upstream of the dam have an average gradient of 300 feet/mile, with one individual stream gradient of more than 600 feet/mile. Some small tributaries in the upper portion of the watershed have gradients exceeding 1,900 feet/mile. The steep slopes of the upper watershed are generally

## 1. INTRODUCTION

covered with dense growth of chaparral and sage scrub. Above elevations of 5,000 feet NGVD, coniferous forest predominates. Figure 1.2-1 shows the map of the project area.

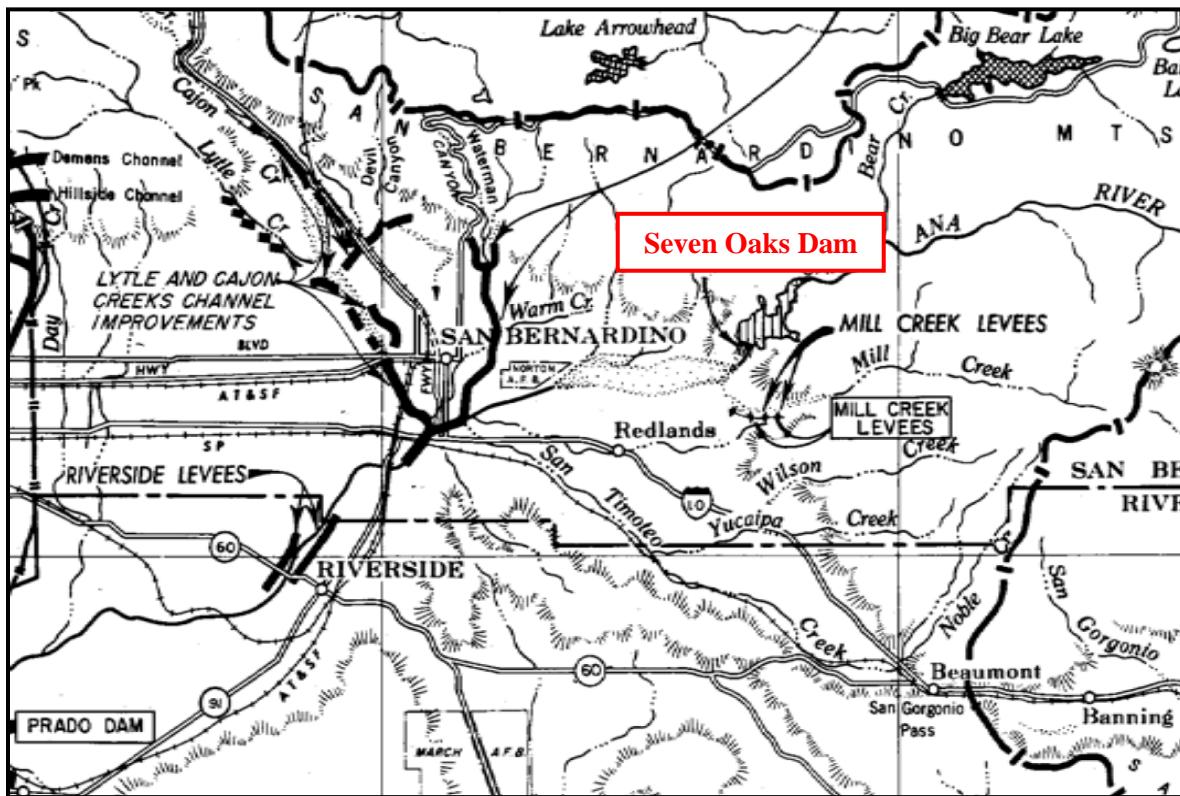


Figure 1.2-1. Project Area Map

The area of analysis for this DSEA/ND is located directly behind SOD on the upstream to include all lands up to the high water mark (2,200 feet) plus a 200-foot buffer, extending above the high water mark, as well as approximately 15 miles downstream from SOD to the Riverside Narrows where a federally-listed species, Santa Ana sucker (*Catostomus santaanae*) is located. Most of the environmental resources evaluated in this DSEA/ND, with the exception of water, geology, and biology, are expected to remain relatively unaffected by the Proposed Action. Therefore the areas of analysis for these other resources are limited to the areas immediately upstream and downstream of SOD.

### 1.3. Current Dam Operations

The primary purpose for Seven Oaks Dam is flood control, as is reflected in the current Water Control Plan (WCP) contained within the 2003 Water Control Manual (WCM). Following the current WCP, at the start of a runoff event, the dam operator builds a "debris pool" to prevent sediment and other larger debris from entering the outlet works. In order to build the debris pool, the outlet release from the dam is reduced down to something less than computed inflow to start impounding water within the reservoir. While the debris pool is being built or maintained, flows may be restricted to as little as 3 cfs. If the pool elevation should start to exceed the top of debris pool elevation, which is currently set at 2200 feet NGVD, the scheduled nominal releases

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as suggested in the WCP would be followed. Prior to making any changes to release, especially prior to making any flood control releases, coordination occurs with local agencies downstream to ensure safety within the downstream channels. Upon observing that the runoff has peaked, and inflow to the reservoir is declining, outflow is reduced. The Orange County Public Works (OCPW) water control managers would then continue regulating the release from the dam with the objective of completely draining the pool back down to the debris pool elevation, at or below 2200 feet NGVD. Bringing the pool back down to the top of the debris pool would prepare the reservoir for any subsequent forecast 2-storm/runoff event.

Flood season for this project is identified as the time period between Oct 1<sup>st</sup> to Mar 1<sup>st</sup> of each year. At the end of the flood season, the reservoir is continuously drained, in accordance with the 2014 WCP. Any remaining pool above the sediment pool elevations must be completely drained by September 1 to allow for annual maintenance. Within the debris pool elevations, the discharge may be coordinated with the local water districts to divert this water for conservation purposes. Currently, the most ideal rate of release for this diversion is about 175 cfs. Release rates naturally decrease in relationship to the decreasing pool elevation behind the dam.

The existing WCM also includes the potential for making higher flow releases if and when necessary to mitigate operational impacts of the dam (when hydrologic and ecological conditions warrant and all threat of any subsequent flood runoff has passes). The water available for such environmental releases from SOD would come from the “Intermediate”, “Main Trash Rack”, or “Flood Control” pools. (Water within or below the debris pool elevation could not be released at a high enough rate to provide the desired ecological benefits.) Decisions concerning potential mitigation releases would be made in coordination with the Corps, local sponsors (dam owners and operators), U.S. Fish and Wildlife Service, and other resource agencies and stakeholders, and would likely follow the mitigation “decision tree” strategy outlined in the Seven Oaks Dam Multi-Species Habitat Management Plan (USACE 2012).

### **1.4. Purpose and Need**

The purpose of the SEA/ND is to evaluate a detailed plan for the safe and effective operation of Seven Oaks Dam that would continue providing necessary flood control and flood control mitigation, while improving water quality. The primary water quality concerns downstream of the SOD that have been identified are related to occasional elevated turbidity and (to a lesser extent) organic carbon concentration. Under current operations, the pool impounded within the debris pool during and after storm runoff events are held throughout the flood season. This sometimes turbid runoff collected within the debris pool is then released in accordance with the WCP. With the proposed change in operations, it is anticipated that flows passing through the dam (in the absence of a debris pool) would be less turbid.

Secondary concerns related to occasional summer algae blooms have also been identified in limited areas. As the reservoir is drawn down in the late summer season to allow for maintenance and accommodate the next rainy season flows, excess organic material could potentially result in algae blooms and anaerobic conditions with increased hydrogen sulfide within the debris pool. This has the potential to impact downstream water quality and increase the level of required water treatment or impair the use of the water for aquifer recharge. The

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water quality study, however, did not find evidence of significant amounts of algal blooms behind the dam, although it was detected in the “forebay pool” (residual debris pool) and the plunge pool. The proposed revision to the 2014 WCP and this DSEA/ND only address the primary issue related to suspended sediment and turbidity, issues that can be improved through flood-season operational changes, although this could also result in a reduction of algal blooms.

Note that the purpose of this project is to mitigate water quality impacts caused by operation of SOD. The purpose is not to meet Regional Water Quality Control Board Basin Plan objectives, or National Pollution Discharge Elimination System (NPDES) requirements.

Returning the system to a pre-dam condition is not possible while flood damage reduction is in place. The recommended adjustments in the *Seven Oaks Dam Updated Water Control Plan To Include Regulation for Water Quality (May 2014)*, have been prepared to implement the recommendations provided in the ERDC’s *Water Quality in Seven Oaks Reservoir and Influences on Receiving Waters of the Santa Ana River Report (January 2014)*; to supplement the original approved water control document titled, *The Seven Oaks Dam Water Control Manual, September 2003* (WCM); and to operate Seven Oaks Dam for flood risk management, and for improved water quality. The 2003 WCM still contains detailed pertinent background information of the entire Seven Oaks Dam and Reservoir project that are not included in the 2014 WCP. Updates to the Water Control Plan to continue operating for flood control while improving (or decreasing impacts to) water quality are summarized in Chapter 2.

### **1.5. Previously Prepared Reports**

Numerous studies or reports have been conducted pertaining to water and related land resources within the project area. These studies have examined themes including development trends, environmental resources, environmental impacts, water supply, groundwater recharge, wastewater management, flooding and erosion, geology, cultural resources, history, and recreation. The following is not intended to be a comprehensive list of previous studies or reports, but to provide a sample of the types of studies that have been completed.

*Seven Oaks Dam Water Conservation Feasibility Report and Environmental Impact Statement/Report*, Los Angeles District, USACE 1997. (The Record of Decision was not signed for this document).

*Santa Ana River Mainstem including Santiago Creek, Phase II General Design Memorandum (GDM) and Supplemental Environmental Impact Statement*, Los Angeles District, USACE, 1988.

*Seven Oaks Dam Operation, Maintenance, Repair, Replacement & Rehabilitation Manual*, Los Angeles District, USACE, August 2002.

*Seven Oaks Dam Biological Opinion*, Section 7 Consultation for Operations of Seven Oaks Dam, San Bernardino County, California, December 2002.

*Water Control Manual, Seven Oaks Dam & Reservoir, Santa Ana River, California*. Los Angeles District, USACE, September 2003.

*Santa Ana River Draft Environmental Impact Report and Community Report, Santa Ana River Water Rights Applications for Supplemental Water Supply, Second Printing*, Western Municipal Water District,

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October 2004.

*Seven Oaks Dam Water Impacts Project, Upper Santa Ana Water Resource Association in Conjunction with East Valley Water District, December 8, 2005.*

*Water Quality in Seven Oaks Reservoir and Influences on Receiving Waters of the Santa Ana River, California, USACE ERDC, November 2011.*

*Seven Oaks Dam Multispecies Habitat Management Plan, Los Angeles District, USACE, May 2012.*

*Updated Water Control Plan to Include Regulation for Water Quality, Seven Oaks Dam and Reservoir, Santa Ana River, San Bernardino County, California, Los Angeles District, USACE, May 2014.*

## **2. PROJECT DESCRIPTION**

### **2. PROJECT DESCRIPTION**

One action alternative has been identified to address water quality issues associated with Seven Oaks Dam and its operation, and is described below. This alternative was developed as part of the ERDC's water quality analysis and recommendations to address water quality concerns raised by stakeholders in the area. A No-Action Alternative has also been identified for NEPA alternative comparison purposes and is described below.

#### **2.1. No Action Alternative**

The No Action Alternative would involve no modification to the 2003 Water Control Plan for water quality, and Seven Oaks Dam would continue to be operated per the 2003 Water Control Plan. The building of the debris pool would continue to be built at the start of the flood season beginning Oct 1<sup>st</sup>, by restricting the outflow to 3 cfs. If elevation 2,200 ft is exceeded, the pool is drained back down to the top of the debris pool elevation as outlined in the Water Control Manual. During the month of June, releases will equal inflow plus 10 cfs, and during the months of July and August, releases will equal inflow plus 20 cfs. The process of determining the proper release rate to drain the debris pool will involve trial and error, as the gates and valve settings will need to be constantly adjusted to release the calculated value. Also, these adjustments may be needed on a regular basis to accommodate varying inflow rates. By 1 September, the debris pool shall be completely drained, at release rates, greater than what's prescribed in the change of release schedule, if needed.

#### **2.2. Proposed Action Alternative**

The Proposed Action involves the modification of the existing 2003 Water Control Plan, which addresses the operation of Seven Oaks Dam. The proposed modification would eliminate the “full-time” debris pool during flood season (Oct 1<sup>st</sup> to Mar 1<sup>st</sup>). The following operation modification will be followed during the implementation of the Updated Water Control Plan:

During the flood season, the debris pool will only be built at the start of a runoff event, and then drained as quickly as possible during the recession or conclusion of the runoff event. At the start of an observed storm/runoff event, the release rate will be decreased to a rate that is lower than observed inflow to allow for water impoundment up to the top of the current debris pool elevation of 2,200 feet, NGVD. During the first major storm of the year, if the water surface is expected to exceed the top of debris pool elevation, preparation for releases through the main tunnel would be made. Once opened, the sluice gate may remain open through the remainder of the flood season.

Under this changed debris pool operation, it is anticipated that there would be little or no debris pool remaining to drain by the end of flood season. Any pool that may be remaining going into the non-flood season (starting March 1st) will still be drained on the same schedule which was established in cooperation with the downstream water agencies during the development of the Phase II GDM. The release range within the debris pool during flood season will no longer be limited to 3 cfs, but would more mimic the natural hydrograph release from the dam, while

## 2. PROJECT DESCRIPTION

adhering to the safe change in release schedule provided within the WCP thereby, mimicking more natural storm flows through the river.

With regard to the adjustment of the debris pool storage adjustments throughout project life, the same procedures as provided in the original Water Control Plan shall be followed. Water temporarily stored within the debris pool is not available for environmental mitigation and enhancement plans. The original Water Control Plan's requirement to restrict the flows to 3 cfs beginning 1 October to start the building of the seasonal debris pool will no longer apply.

No other modifications will be necessary, or proposed, to the original Water Control Plan. Flood control operations (dictating how water that exceeds the debris pool elevation is stored and released) would remain the same.

Table 2.2-1 below shows a comparison summary of the two operational plans.

**Table 2.2-1. Seven Oaks Dam - Comparison Table  
(Debris Pool Operation ONLY)**

Original Water Control Plan (Sep 2003)	Updated Water Control Plan (2012 Water Quality Plan)
<b>Flood Season</b>	
Oct 1-Mar 1 <ul style="list-style-type: none"> <li>Start building a debris pool (up to 2,200 ft) starting 1 Oct, by restricting the outflow to 3 cfs. This pool is maintained throughout the flood season.</li> <li>If 2,200 ft is exceeded, due to a runoff event, the release schedule as outlined on Plate 7-01 of the 2003 Water Control Manual (also on Table 2 below) is followed until the pool is drained back down to the debris pool elevation. Once water surface elevation recedes below the debris pool, release rates are adjusted to continue maintaining a debris pool until end of flood season. Releases within the debris pool can also be coordinated with the downstream water agencies for their use.</li> </ul>	Oct 1-Mar 1 <ul style="list-style-type: none"> <li>Start building debris pool <i>only</i> during a storm or runoff event. If runoff event results in exceeding the top of debris pool of 2,200 ft, follow the release schedule as identified in the 2014 WCP (also on Table 2 below).</li> <li>Drain debris pool, completely, upon passing of the runoff event. Within the debris pool, release rates can go up to 500 cfs.</li> <li>Once debris pool is drained, outflow would equal inflow, or as limited by what is seeping through the stoplogs within the sediment pool elevations.</li> </ul>
<b>Non Flood Season</b>	
Mar -May <ul style="list-style-type: none"> <li>Debris pool is drained in cooperation with downstream water agencies (generally 250 cfs or less, physical max=500 cfs).</li> </ul>	Mar – May <ul style="list-style-type: none"> <li>By end of Mar 1, little or no debris pool should remain, and outflow would equal inflow, or as limited by what is seeping through the stoplogs within the sediment pool elevations. Any debris pool remaining after Mar 1 (from a late season storm) will be drained on the same schedule which was established in cooperation with the</li> </ul>

## 2. PROJECT DESCRIPTION

		downstream water agencies (generally 250 cfs or less, physical max=500 cfs).
June	<ul style="list-style-type: none"> <li>Release: inflow + 10 cfs</li> </ul>	June <ul style="list-style-type: none"> <li>Release: inflow = outflow, or as limited by what is seeping through the stoplogs within the sediment pool elevations. If still draining a debris pool, release = inflow + 10 cfs</li> </ul>
Jul-Aug	<ul style="list-style-type: none"> <li>Release: inflow + 20 cfs</li> </ul>	Jul-Aug <ul style="list-style-type: none"> <li>Release: inflow = outflow, or as limited by what is seeping through the stoplogs within the sediment pool elevations. If still draining a debris pool, release = inflow + 20 cfs</li> </ul>
Sep 1	<ul style="list-style-type: none"> <li>Completely drain debris pool using higher release rates, if needed</li> </ul>	Sep <ul style="list-style-type: none"> <li>Release: inflow = outflow, or as limited by what is seeping through the stoplogs within the sediment pool elevations. If still draining a debris pool, higher release rates could be used, if capable, to ensure pool is completely drained ASAP.</li> </ul>

**Table 2.2-2. Pool Elevations and Rate of Release Change**  
(Similar for both operations unless otherwise specified)

Pools	Elevation	Discharge
Spillway Surcharge	2610 ft	
Main Flood Control Pool	2580 ft	Prado Rising Q=up to 500 cfs Prado Falling Q=up to 7000 cfs
Main Trash Rack Pool	2299 ft	7Oaks Rising Q=up to 50 cfs 7Oaks Falling Q=up to 2000 cfs
Intermediate Pool	2265 ft	* Q=up to 500 cfs
Debris Pool	2200 ft	Flood Season Q=up to 500 cfs (for 2013 updated plan only – minimal releases would be made to maintain debris pool under 2003 plan) Non Flood Q=inflow+10 to 20 cfs (or inflow = outflow if not draining a debris pool)
Sediment Pool	2150 ft	Q=inflow or seepage thru stop logs
Reservoir Bottom	2100 ft NGVD	

\* In the Intermediate pool, may delay releases and modify release rates if hydrologic conditions warrant to support mitigation and enhancement plans (same for Original and Updated Plans).

### **3. AFFECTED ENVIRONMENT**

#### **3. AFFECTED ENVIRONMENT**

The following is a discussion of the existing conditions and affected environment for each environmental resource. Essentially, the 2014 WCP is a modification to the original Water Control Plan *only* with respect to the “debris pool” operation, to provide mitigation for impacts to the Water Quality introduced by turbid runoff into the Seven Oaks Dam reservoir during the flood season months (October 1 through March 1). The original Water Control Plan’s requirement to restrict the flows to 3 cfs beginning 1 October to start the building of the seasonal debris pool will no longer apply.

Environmental resources will remain relatively unaffected by the modified operation as it would not involve any construction, and will not change how large flood events are managed. The description of existing conditions and affected environment for each resource is focused around the SOD Project Area (SOD Basin and areas immediately downstream) where applicable. Environmental resources (i.e., water, geology, and biology) that could potentially be affected by the 2014 WCP in areas outside of the Project Area are described in further detail as appropriate.

##### **3.1. Water Resources**

###### **3.1.1. General Setting**

The headwaters of the SOD watershed lie within the San Bernardino Mountains. Generally trending southwesterly, the 27 miles of river upstream of the dam has an average gradient of 300 feet per mile. Some smaller tributaries that begin high in the mountains have gradients that exceed 1,900 feet per mile. Bear Creek, the principal tributary within the Seven Oaks canyon area, drains 55 square miles and descends at an average gradient of approximately 460 feet per mile.

The drainage area upstream of the dam is protected as a National Forest and will likely remain mostly undeveloped during the project life. (USACE, 2003)

###### **3.1.2. Watershed Characteristics and Surface Water**

The State of California uses a hierarchical naming and numbering convention to define watershed areas for management purposes. Watershed boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. A general description of how watershed levels are defined is provided below in Table 3.3-1. The Natural Resources Conservation Service (NRCS), which is part of the U.S. Department of Agriculture (USDA), is responsible for maintaining the California Interagency Watershed Mapping Committee (IWMC), formerly the CalWater Committee. The IWMC has defined a set of naming and numbering conventions applicable to all watershed areas in California, for the purposes of interagency cooperation and management. Table 3.1.2-1 shows the primary watershed classification levels used by the State of California, as defined by the IWMC that are applicable to this analysis.

### 3. AFFECTED ENVIRONMENT

**Table 3.1.2-1 State of California Watershed Hierarchy Classifications**

Watershed Level	Approximate Square Miles	Description
Hydrologic Region (HR)	12,735	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage.
Hydrologic Area (HA)	244	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-area (HSA)	195	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

The SOD and reservoir are located within the northeast portion of the SAR Hydrologic Unit (HU). Within this HU, the dam and its drainage area occupy two Hydrologic Areas (HAs), the Upper SAR HA and the San Bernardino Mountain HA. The SOD and reservoir lie within the Santa Ana Canyon Hydrologic Sub-area (HSA), contained entirely by the Upper SAR HA. The drainage area that is captured by the SOD includes a portion of the Upper SAR HA, as well as all of the San Bernardino Mountain HA. Three HSAs fall within the San Bernardino Mountain HA: the Baldwin HSA, the Bear Valley HSA, and the Seven Oaks HSA.

The upper SAR drainage area above SOD is approximately 177 square miles, excluding the 32 square miles tributary to Baldwin Lake, and has its headwaters in the San Bernardino Mountains. At the headwaters, the river originates as an undisturbed mountain stream and flows through steep canyons until it reaches the SOD. Stream flow, which is perennial in the canyons of the SAR and in the headwaters of most of its tributaries, is generally ephemeral in most valley segments. Stream flow increases rapidly in response to precipitation. High-intensity precipitation, in combination with the effects of steep gradients and possible denudation by wildfire, may result in intense sediment laden floods with some heavier debris load including rocks, shrubs and trees. Deposition of sediment occurs behind the dam and in the stream channels as they flow onto the more gently-sloped valley floor. (USACE, 2003)

The headwaters of the SAR are located upstream of the SOD. Within this upstream drainage area, Bear Creek, which drains Big Bear Lake, is the principal tributary to the upper Santa Ana River. Because the area upstream of SOD lies within the San Bernardino National Forest, the watershed in this area is unmodified with no existing or expected urbanization. The SAR downstream of SOD is divided into two major divisions: (1) the reach that extends from SOD to Prado Dam, and (2) the lower SAR, which extends from Prado Dam to the Pacific Ocean. While the lower SAR has been modified, the reach between SOD and Prado Dam remains largely unmodified, with the exception of Lytle-Warm Creek confluence, the Riverside levees, and the Norco Bluffs bank protection. (USACE, 2003).

The river initially flows west through this broad and deep gorge, and about 18 miles (29 km) from its headwaters, receives its first major tributary from the right: Bear Creek, flowing southwest from well-known Big Bear Lake. The river turns south, passing through the Seven Oaks Dam, flowing out of its canyon into the arid interior basin of San Bernardino County and Riverside County, and receives Mill Creek from the left as it winds westwards towards the city

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of San Bernardino. As it passes through the urban area, it receives City Creek from the right and enters a flood control channel flanked by earthen levees on both sides.

Not long after the confluence with City Creek, Lytle Creek enters from the right. Lytle Creek is one of the largest tributaries of the Santa Ana river, rising in three forks in the San Gabriel Mountains and flowing southeast, becoming the Lytle Creek Wash before discharging into the main stem. From there, the Santa Ana flows southwest, and after passing through the city of Riverside, it discharges into the normally dry flood control reservoir formed by Prado Dam. Two major tributaries of the river join in the reservoir area: Chino Creek from the right, and Temescal Creek from the left. Temescal Creek drains the largest area of all the tributaries, because it provides the outflow from Lake Elsinore, into which the San Jacinto River flows. It is also one of the longest, at 32 miles (51 km) in length. Except during the wettest years, Temescal Creek contains little or no water because Lake Elsinore is not high enough to overflow.

After flowing out of the Prado Dam, the Santa Ana River cuts a second Santa Ana Canyon, a water gap, between the northern Santa Ana Mountains and the Puente Hills and Chino Hills, crossing into Orange County. The river roughly bisects the county as it flows southwest towards the ocean. The river is then entirely diverted into spreading grounds for groundwater recharge of the aquifer of north Orange County, providing about half of the entire county's municipal water. Downstream of there, the river serves only for flood control and waste drainage purposes, and typically has no more than a trickle of water. Passing the cities of Orange and Anaheim, it receives Santiago Creek from the east as it enters the city of Santa Ana. Here, the river is entirely confined to a concrete flood control channel between earthen levees. After crossing under Interstate 5 the riverbed again becomes earthen as it flows to its mouth between Huntington Beach and Costa Mesa. The river accretes in a small lagoon before flowing out to sea at the northern end of Santa Ana River County Beach.

The climate of the SAR watershed is Mediterranean with hot, dry summers and cooler, wetter winters. Average annual precipitation ranges from 12 inches per year in the coastal plain to 18 inches per year in the inland alluvial valleys, reaching 40 inches or more per year in the San Bernardino Mountains. Most of the precipitation occurs between November and March in the form of rain with variable amounts of snow in the higher elevations. The climatological cycle of the region results in high surface water flows in the spring and early summer, followed by low flows during the dry season. Winter and spring floods generated by storms are not uncommon in wet years. Similarly, during the dry season, infrequent summer storms can cause torrential floods in local streams. (SAWPA, 2011)

Flooding within the Project Area has historically occurred at fairly regular intervals. Historical references indicate that (from 1769 to 1850) medium-to-large floods occurred in 1825, 1833, 1840, and 1850. Some available quantitative data indicates that, from 1850 to 1897, medium-to-large winter floods occurred in 1859, 1862, 1867, 1876, 1884, 1886, 1889 and 1894. Recorded data from 1897 to the present indicate that medium-to-large winter floods occurred in 1903, 1920, 1914, 1916, 1921, 1922, 1927, 1938, 1943, 1965, 1966, 1969, 1978, 1980, 1983, 1993, 2005 and 2010. Following the historical floods of the 1800's and early 1900's, considerable changes have occurred in the lower elevations of the drainage basin. Runoff characteristics of the majority of the valley areas have been changed by urbanization and agriculture. However, the

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mountain areas (upstream of the SOD) have remained relatively unchanged. In the event that a large, historical storm occurred under present-day conditions, mountain runoff would be similar to that which occurred in the past. Excluding the runoff that would be captured by the SOD, valley runoff would be considerably higher in both peak and volume because of increased impervious cover due to development. In the lower watershed, this runoff would be conveyed via channelized stream segments. (USACE, 2003)

#### Surface Water Quality

Under the authority of the Porter-Cologne Water Quality Control Act, the SARWQCB has established beneficial uses for waters within Region 8. Beneficial uses are ways in which waters of the State can be used for the benefit of either people and/or wildlife. These beneficial uses apply to both surface water and groundwater. Surface water quality is tied to beneficial uses through the designation of water quality objectives that seek to maintain existing beneficial uses and improve water quality to achieve potential beneficial uses. The SARWQCB has identified beneficial uses for streams, lakes, and groundwater basins both upstream and downstream of the SOD.

The watershed above SOD is mostly unimproved, and supports numerous beneficial uses. Upstream of the SOD, the SARWQCB has identified beneficial uses for the SAR and its tributaries, Big Bear Lake, and two hydrologically isolated lakes (Erwin Lake and Jenks Lake). Beneficial Uses in the Project area are described below, in Table 3.1.2-1.

**Table 3.1.2-1 Designated Beneficial Uses for Surface Waters  
Within the Project Area**

Surface Water Feature	Beneficial Uses <sup>1</sup>											
	MUN	AGR	GWR	POW	REC1	REC2	WARM	COLD	WILD	RARE	SPWN	BIOL
Santa Ana River, Reach 6 (SOD to the headwaters)	X	X	X	X	X	X		X	X		X	
Bear Creek (principle tributary to Reach 6 of the SAR)	X	X		X	X	X		X	X	X	X	
Tributaries to Big Bear Lake <sup>2</sup>	X		X		X	X		X	X		X <sup>3</sup>	
Shay Creek (tributary to Baldwin Lake)	X		X		X	X		X	X	X		
Big Bear Lake (upstream of SOD)	X	X	X		X	X		X	X			
Erwin Lake (upstream of SOD)	X				X	X		X	X	X		X
Jenks Lake (upstream of SOD)	X	X	X		X	X		X	X			
Santa Ana River, Reach 5 <sup>4</sup> (SOD to San Jacinto Fault)	X	X	X		X	X	X		X	X		
Santa Ana River, Reach 4 (San Jacinto Fault to Mission Bl.)			X		X	X	X		X	X	X	
Santa Ana River, Reach 3 (Mission Bl. to Prado Dam)		X	X		X	X	X		X	X	X	

Source: SARWQCB, 2008

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<sup>1</sup> Only those beneficial uses relevant to the surface water features listed in this table are presented, including: municipal and domestic supply (MUN), agricultural supply (AGR), groundwater recharge (GWR), hydropower generation (POW), water contact recreation (REC 1), non-contact water recreation (REC 2), warm freshwater habitat (WARM), cold freshwater habitat (COLD), wildlife habitat (WILD), rare, threatened, or endangered species (RARE), spawning, reproduction and development (SPWN), and preservation of biological habitats of special significance (BIOL). Beneficial uses which are not associated with the listed surface water features and therefore not presented in this table include: industrial service supply (IND), industrial process supply (PROC), navigation (NAV), commercial and sportfishing (COMM), limited warm freshwater habitat (LWRM), marine habitat (MAR), shellfish harvesting (SHEL), and estuarine habitat (EST)

<sup>2</sup> North Creek, Metcalf Creek, Grout Creek, Rathbone Creek, Meadow Creek

<sup>3</sup> Only applicable to North Creek, Metcalf Creek, and Grout Creek

<sup>4</sup> Water purveyors along Reach 5 divert up to 280 cfs for water supply and depend on the identified beneficial uses of MUN and AGR.

In order to protect the existing beneficial uses listed in Table 3.1.2-1, and to achieve potential beneficial uses, the SARWQCB has set Water Quality Objectives for waters within its jurisdiction. Beneficial uses and the water quality objectives designed to protect or achieve those beneficial uses are together known as Water Quality Standards (WQS). These WQS are achieved through both point-source and non-point source pollution control. In cases where a water body does not meet the WQS as defined by the SARWQCB in the Basin Plan (SARWQCB, 2008), those water bodies are identified on a list of impaired water bodies not meeting the WQS, known as the 303(d) list.

Several of the water bodies described in Table 3.1.2-1 are identified on the 2006 Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments, as listed below.

- Big Bear Lake is listed as impaired by the following pollutants: copper, mercury, metals, noxious aquatic plants, nutrients, polychlorinated biphenyls PCBs, and sedimentation/siltation;
- Grout Creek is impaired by metals;
- Knickerbocker Creek is impaired by metals and pathogens;
- Rathbone Creek is impaired by nutrients and sedimentation/siltation; and
- Summit Creek is impaired by nutrients.

Downstream of the Seven Oaks Dam, Reach 4 and Reach 3 of the Santa Ana River are listed as impaired by pathogens. (SWRCB, 2006)

#### **3.1.3. Groundwater**

The Project Area is underlain by the Upper Santa Ana Valley Groundwater Basin and the Bunker Hill Sub-Basin, as shown on Figure 3.1.3-1 (Project Area Groundwater Basins). Other groundwater basins and sub-basins are also located upstream and downstream of the SOD; only the basins underlying the Project Area are shown on Figure 3.1.3-1, although all basins in the vicinity are discussed in this section. The Upper Santa Ana Valley Groundwater Basin underlies the SAR Valley between SOD and Prado Dam. This groundwater basin is roughly bounded by the San Gabriel and San Bernardino Mountains to the north and the Puente Hills to the southwest.

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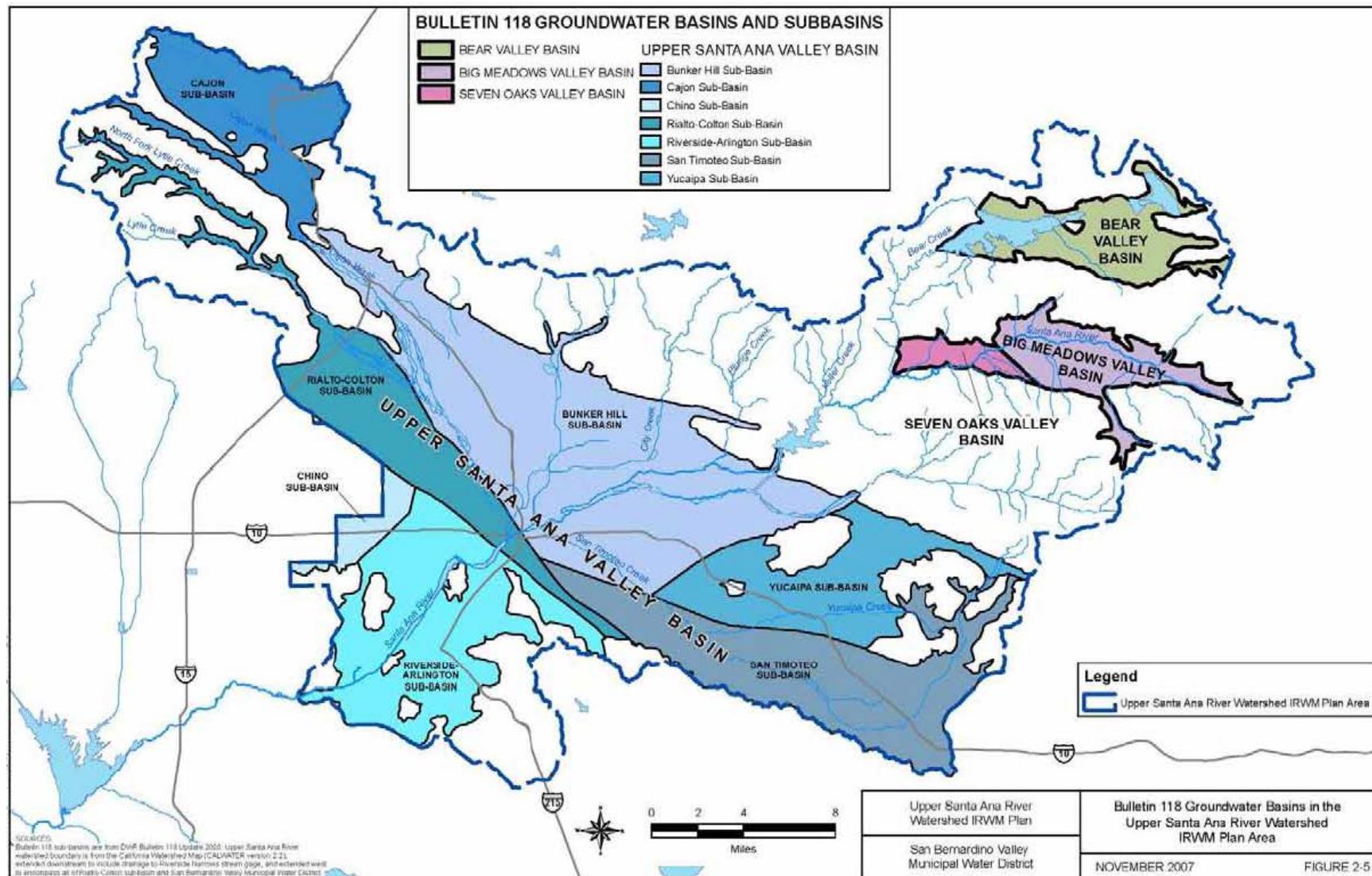
Numerous faults and other geologic barriers separate the basin into multiple sub-basins, including: Bunker Hill (shown on Figure 3.1.3-1), Rialto-Colton, Riverside-Arlington, Chino, and Temescal. The Bunker Hill Sub-basin is located directly downstream of the SOD, and underlies 89,600 acres of Holocene and Pleistocene age alluvial deposits of sand, gravel, and boulders interspersed with deposits of silt and clay. Recharge to the Upper Santa Ana Valley Groundwater Basin occurs mainly through percolation of runoff from the San Gabriel and San Bernardino Mountains, including stream flow from the SAR, Mill Creek, and Lytle Creek. (DWR, 2003)

The mountainous watershed upstream of the SOD is underlain by three small groundwater basins, including Bear Valley, Big Meadows Valley, and Seven Oaks Valley.

The Bear Valley Groundwater Basin underlies 19,600 acres in the San Bernardino Mountains north of SOD, in the headwaters of Bear Creek. Water in this basin is found primarily in unconsolidated alluvial deposits. The groundwater basin is separated into the upper, middle, and lower aquifers. The upper and middle aquifers are the primary sources of groundwater. A groundwater divide separates Big Bear Lake and Baldwin Lake. Recharge in the basin is primarily from percolation of rainfall and runoff. (DWR, 2003)

The Seven Oaks Valley and the Big Meadows Valley Groundwater Basins are adjacent groundwater basins that encompass 18,280 acres of a mountain valley in the headwaters of the SAR. These are bounded by impermeable crystalline rocks of the San Bernardino Mountains. Groundwater in these basins is found in thick alluvium that is composed of clay, silt, sand and gravel. Recharge within the valley is achieved through percolation of rainfall and stream flow in the SAR. (DWR, 2003)

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(source: [http://www.sbvwd.dst.ca.us/projects/pdfs/IRWM\\_Plan.pdf](http://www.sbvwd.dst.ca.us/projects/pdfs/IRWM_Plan.pdf))

**Figure 3.1.3-1, Project Area Groundwater Basins**

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#### **Depth to Groundwater**

Depth to groundwater varies throughout the Project Area, but in general is found near the surface in unconfined river-valley alluvial deposits. Along some reaches of the SAR, groundwater can surface to form base-flow. Above SOD, groundwater levels fluctuate in response to seasonal changes in precipitation, and are found in more shallow alluvial deposits following percolation of runoff from winter storms. Below the SOD, the Bunker Hill Sub-basin is encountered in shallow alluvial deposits, and generally converges towards the SAR. At Colton Narrows, in the southwest portion of the Sub-basin, the San Jacinto fault forms a strong barrier to groundwater that raises the water table nearly to the surface below the course of the SAR. (DWR, 2003)

#### **Groundwater Quality**

The SARWQCB has designated beneficial uses for several groundwater basins within the Project Area. The Bear Valley Groundwater Basin supports MUN and PROC. The Bunker Hill Sub-basin, directly downstream of the SOD, supports the following beneficial uses: MUN, AGR, IND and PROC. The SARWQCB has defined water quality objectives for several groundwater basins within the Project Area. The Bear Valley Groundwater Basin has numeric water quality objectives for the following constituents: total dissolved solids, hardness, sodium, chloride, nitrate, and sulfate. The Bunker Hill Sub-basin has numeric water quality objectives for total dissolved solids and nitrate. (SARWQCB, 2008)

In general, the groundwater basins upstream of SOD are of high quality, likely due to the fact that recharge is achieved through runoff from mostly undeveloped and undisturbed mountains. Water in the Bear Valley Groundwater Basin is impaired by elevated fluoride content. Several wells produced samples above the Maximum Contamination Level (MCL) for inorganics. No water quality impairments are listed for either the Seven Oaks Valley Groundwater Basin or the Big Meadows Valley Groundwater Basin. (DWR, 2003)

Below SOD, the Upper SAR Valley Groundwater Basin has been contaminated by industrial and military activities, and samples from wells often exceed MCLs. Directly downstream of the SOD, the Bunker Hill Sub-basin contains highly impaired groundwater, with several contamination plumes of Trichloroethylene (TCE), Tetrachloroethylene (PCE), and other petroleum contaminants. Some of the plumes are designated Superfund sites, or sites identified by the USEPA under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 as areas with uncontained or abandoned hazardous materials. Many of the wells within the sub-basin have produced samples that exceed MCLs for the following constituents: inorganics, radiological contaminants, nitrates, pesticides, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). (DWR, 2003)

#### **3.2. Biological Resources**

This section documents the existing environmental conditions for biological resources occurring or potentially occurring in the Project Area, as well as downstream areas of ecological importance and concern. It provides data and habitat assessments for sensitive plant and wildlife species known or expected to occur in the Project Area, with particular emphasis on federally-listed species including Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*) “woolly star”, slender-horned spineflower (*Dodecahema leptoceras*) “spineflower”, and San Bernardino

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kangaroo rat (*Dipodomys merriami parvus*) “SBKR”. This section also covers the existing conditions for the Santa Ana sucker (*Catostomus santaanae*) which is located approximately 15 miles downstream of the Project Area, and its critical habitat beginning downstream of the dam on the SAR.

Information presented in this section was derived from recent literature review and field studies conducted in 2006 and 2010. Information on SAR woolly star, Slender-horned spineflower, and SBRK is gathered from the recently finalized Multi-Species Habitat Management Plan “MSHMP” (2012), prepared by the Corps. The management area, also known as the Woolly Star Preserve Area (WSPA), in the MSHMP is located approximately 2 miles downstream and southwest of SOD. The WSPA consists of approximately 760 acres of interconnected and stand-alone parcels of lands on the SAR wash. One of the key constraints identified for the Water Quality Study is that the proposed alternative cannot adversely affect the WSPA or the local sponsors’ ability to manage this area for listed species.

#### *Background of the WSPA and MSHMP*

The 1988 SEIS for the SAR Mainstem project introduced an agreement between USFWS and the Corps that the anticipated impacts associated with the operation of SOD, in combination with anticipated cumulative impacts from local activities that are reasonably certain to occur, would be compensated through the acquisition and management of approximately 760 acres of habitat for the SAR woolly star. In compliance with the terms and conditions of this agreement, lands constituting 764 acres of the floodplain downstream from SOD were acquired and preserved as the WSPA to mitigate for potential impacts to Santa Ana River woolly star as a result of implementation of the long-term operation and maintenance of SOD. The lands for the WSPA were purchased and are cooperatively managed by San Bernardino, Riverside, and Orange County Flood Control Districts, with oversight by the Corps.

In 2002, a new BO was completed (1-6-02-F-1000.10) that addressed impacts from SOD operations on additional federally listed species (spineflower and SBKR). The Corps and local sponsors agreed to revise the WSPA management plan to focus on improving habitat conditions within the Preserve area for all three species. The resulting product, the MSHMP, included monitoring requirements to determine the effectiveness of habitat management efforts. The intent of the MSHMP is to manage and preserve large areas of the SAR wash and associated alluvial terraces for the three listed species.

Years of survey and monitoring data have been collected for the three listed species during preparation and initial implementation of the MSHMP. Additionally, field studies, including vegetation mapping, botanical surveys, and reconnaissance level surveys for special-status wildlife, were conducted throughout the Project Area by the Corps biologist and Environmental Contractor, Aspen Environmental Group, in June/July 2006 and April 2010. All of this material was reviewed for the purpose of this study and applicable information is summarized below.

#### **3.2.1. Vegetation Communities and Land Cover Types**

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Vegetation composition and density within the Project Area are primarily dictated by geography and soils. The following describes the vegetation communities that exist within and around the Project Area starting from upstream of the SOD, just above the flood inundation elevation and moving downstream to the SAS-occupied habitat.

Biological resources above SOD are primarily associated with chaparral intergrading to riparian habitats. Biological resources occurring below SOD are primarily associated with vegetation communities and habitats that are dominated by Riversidian alluvial fan sage scrub (RAFSS).

#### **HABITAT TYPES UPSTREAM AND IMMEDIATELY BELOW SOD**

##### ***Riparian Scrub***

Riparian scrub communities on the bars and banks of river channels generally require seasonal flooding and are dominated by trees and shrubs. It consists of newly emerging willows including sand bar and arroyo willow, mulefat, and cottonwood. In addition, Mexican elderberry (*Sambucus mexicanus*) and Fremont cottonwood are also known to occur in this habitat type. Along the Project Area, many riparian scrub communities intergrade with willow and mulefat scrub communities. Riparian scrub or the intergraded scrub communities is found in the areas about a half mile upstream of Warm Springs tributary and just below the Alder Creek confluence (see photos 1 to 4). These areas are just above the flood inundation elevation and therefore contain moderately dense riparian scrub vegetation capable of supporting a variety of riparian species including, but not limited to, the two-striped garter snake, vireo, and the flycatcher.



**Photos 1 and 2. Area above Warm Springs tributary dominated with pioneer riparian shrub species.**

### 3. AFFECTED ENVIRONMENT



**Photos 3 and 4. Riparian scrub habitat below the Alder Creek confluence. The area is mulefat and cattail dominated with juvenile willows. On the toe of the canyon are mature sycamore and cottonwood trees.**

#### *Southern Willow Scrub*

Willow scrub is plant community dominated by a mixture of willows and mulefat (*Baccharis salicifolia*), and includes shrub species such as poison oak (*Toxicodendron diversilobum*) and the invasive non-native Spanish broom (*Spartium junceum*) (Holland, 1986). In some areas almost pure stands of sandbar willow abut the stream with small populations of white alder and an occasional cottonwood. Southern willow scrub is also present along the historically dry braided channels of alluvial floodplains.

In the Project Area behind the dam, a population of juvenile sandbar willow (*Salix exigua*), arroyo willow (*Salix lasiolepis*), and mulefat (*Baccacharis salicifolia*) persist along the terraces adjacent to the dam reservoir. This area is often inundated and for a prolonged period of time. It lacks diversity and is generally dominated by the early successional native and non-native weedy species. Further upstream of the reservoir, the sandbar area supports little or no vegetation (see photos 5 and 6) and has no habitat value due to the flooding recurrence after each rainy season.

### 3. AFFECTED ENVIRONMENT



**Photo 5.** Area behind the dam supports dense stand of successional willow habitat. Note that with exception of a few stands woody shrubs, the native chaparral community is generally dead below the flood line.



**Photo 6.** Looking upstream of the dam, sandbar area supports little or no vegetation due to regular inundation.

#### ***Southern Cottonwood Willow Riparian Forest***

Mature cottonwoods and willows dominate southern cottonwood willow riparian forests (Faber and Keller, 1985), which can have an open or closed canopy that is generally greater than 20 feet

### **3. AFFECTED ENVIRONMENT**

in height and requires a persistent water source (Holland, 1986). The areas representative of this habitat can be found just downstream of the dam where there is a small forest of cottonwoods and willows; the canopy is over 20 feet in height and over 300 feet in length (see photo 7). A dense thicket of understory vegetation in this area includes juvenile willows, mulefat, mugwort (*Artemisia douglasiana*), western ragweed (*Ambrosia psilostachya* var. *californica*), and stinging nettle (*Urtica dioica* ssp. *holosericea*). White clover (*Melilotus alba*) and non-native brome grasses (*Bromus* spp.) are other common species. Although the forest is dense in appearance, this community lacks age structure with few if any juvenile cottonwoods. This is probably due to the lack of regular disturbance and the atypical persistent summer flows. Similarly, sustained summer water appears to have led to encroachment of riparian vegetation into the river channel and the recruitment of understory willows and plants.



**Photo 7. Small patch of riparian forest downstream of the dam that support juvenile to intermediate plant species.**

#### ***Upland Communities***

Upland plant communities include vegetation dominated by plant species that do not require a permanent source of water, as opposed to plant species that are adapted to areas that are either seasonally flooded or have saturated soils for at least a portion of the growing season. Generally, upland plant communities consist of plant species that are adapted to dryer conditions and typically require only seasonal precipitation to obtain adequate water resources for growth and reproduction. Several upland plant communities occur on elevated terraces in the floodplain or immediately adjacent to the river edge.

#### ***Coastal Sage Scrub***

Coastal sage scrub communities are characterized by low growing, drought-tolerant shrub species. The community occurs in various sections of the project area including the area

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immediately below the dam (see photos 8 and 9). These communities are dominated by stands of California buckwheat, California sagebrush, and California bush sunflower (*Encelia californica*). Other common species include California fuchsia (*Epilobium canum* ssp. *canum*), white sage, chaparral nightshade (*Solanum xantii* var. *xantii*), and yucca (*Yucca whipplei* ssp. *whipplei*). Purple sage, bush monkey flower (*Mimulus aurantiacus*), and non-native grasses are also present.



**Photos 8 and 9. Upstream (left) and downstream (right) views of the dam.  
The coastal sage scrub is buckwheat dominated.**

Scrub species form various canopy densities and occupy shallow or heavy soils on dry predominantly southern-facing slopes. Some larger evergreen shrubs, typically categorized as chaparral species, such as ceanothus (*Ceanothus* spp.) and sugar bush (*Rhus ovata*), are also observed as emergent shrubs within coastal sage scrub communities. Coastal sage scrub occurs in many areas adjacent to the project area and is prominent in alluvial scrub communities and on some of the dry stream terraces (see photo 9).

## HABITAT TYPES DOWNSTREAM OF SOD

### ***Riversidian Alluvial Fan Sage Scrub (RAFSS)***

RAFSS is the dominant vegetation community found downstream of SOD and contains four primary phases ranging in succession from pioneer to mature. The successional stages, characterized in the MSHMP, range from early pioneer and intermediate to California Juniper and Sclerophyll-dominated phases. Common species found in pioneer RAFSS phase include scale-broom (*Lepidospartum squamatum*), California buckwheat (*Eriogonum fasciculatum* var. *polifolium*), sweetbush (*Bebbia juncea*), brittlebush (*Encelia farinosa*), and golden-aster (*Heterotheca sessiliflora*). The intermediate phase community is found on slightly elevated accumulations of alluvium above the early pioneer phase include California buckwheat, scale-broom, brittlebush, sweetbush, and prickly pear (*Opuntia littoralis*). Associated shrub species include chaparral yucca (*Yucca whipplei*), yerba santa (*Eriodictyon trichocalyx*), white sage (*Salvia apiana*), valley cholla (*Opuntia parryi* var. *parryi*), and matchweed (*Gutierrezia californica*). Deerweed (*Lotus scoparius*) may be locally abundant in certain areas. California Juniper-dominated phase is found on the highest and oldest terraces mapped as alluvial deposits of modern washes by Bortugno and Spittler (1986), and is visually dominated by California

### **3. AFFECTED ENVIRONMENT**

juniper (*Juniperus californica*). (Still older surfaces on the alluvial fan are vegetated by sclerophyll communities, typically dominated by chamise). Dominant shrubs include yerba santa, California buckwheat, scale-broom, white sage, and matchweed. Associated native perennial species include brittlebush and valley cholla. Sclerophyllous scrub communities are dominated by woody, evergreen species typical of chaparral and are found on the highest terraces and oldest alluvial surfaces. Sclerophyll communities commonly abut the California juniper-dominated phase of RAFSS and in some cases sclerophyll species such as chamise are found in the juniper-dominated vegetation (and vice-versa). Three phases of this community are recognized.

#### ***Riparian Woodland***

This community type is characterized by large shrubs and trees associated with stream courses, such as Fremont cottonwood (*Populus fremontii*), various willows (*Salix gooddingii*, *Salix* spp.), western sycamore, and mulefat (*Baccharis salicifolia*). This community is very limited at the downstream of SOD and was mapped at an unnamed tributary to the Santa Ana River near the confluence with Mill Creek, isolated groups of riparian trees along the Santa Ana River, and small groups of riparian trees associated with percolation ponds in the northeastern part of the study area.

#### ***Mulefat Scrub***

Mulefat scrub occurs along creek banks outside of the active channel. Dominant perennial plant species are limited, but include mulefat. It typically occurs in areas subject to frequent flooding and with higher soil moisture due to proximity to alluvial groundwater in contrast to sites occupied by various RAFSS phases.

## **HABITAT TYPES OCCURRING UPSTREAM AND DOWNSTREAM OF SOD**

#### ***Disturbed Habitat***

Disturbed plant communities, also known as ruderal communities, are dominated by herbaceous, introduced, pioneering plant species that readily colonize open disturbed soil and thrive as a result of human impacts. Ruderal communities may provide a certain degree of erosion control for recently disturbed or graded areas, but such communities are also a threat to the natural biodiversity of an area. Invasive species continually distribute highly competitive propagules into otherwise native vegetation; however, if ruderal grassland stands remain undisturbed for more than five years they can undergo succession towards more stable and less weedy plant communities, such as coastal or riparian scrub (Zedler et al., 1997). More commonly, however, the non-native community persists and continues to spread over the long-term, without direct intervention (active restoration).

The described disturbed habitat is apparent in the reservoir behind the dam and spans upstream to the maximum inundation elevation, approximately about a mile upstream of Warm Springs tributary (see photo 10). Disturbed habitat also occurs along the access roads to the SCE Powerhouse 1 on the south side of the stream as well as downstream of the SOD. These areas are dominated by summer mustard, black mustard (*Brassica nigra*), tocalote, and Russian thistle. Some of the non-native and often invasive herbs scattered throughout these areas include

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tumbling pigweed (*Amaranthus albus*), scarlet pimpernel (*Anagallis arvensis*), mayweed (*Anthemis cotula*), pineapple weed (*Chamomilla suaveolens*), Italian thistle, Mexican tea (*Chenopodium ambrosioides* var. *ambrosioides*), red stem filaree (*Erodium cicutarium*), and sweet fennel (*Foeniculum vulgare*). Prickly lettuce (*Lactuca serriola*), horehound (*Marrubium vulgare*), bur-clover (*Medicago polymorpha*), wild radish (*Raphanus sativa*), red brome (*Bromus madritensis* ssp.*rubens*), ripgut brome (*Bromus diandrus*), wild oats (*Avena* sp.), filaree (*Erodium* sp.), Mediterranean mustard (*Hirschfeldia incana*), and various other mostly non-native forbs (herbaceous species that are not grasses) are other common weeds identified along the project area.



**Photo 10.** Approximately a half mile upstream from the dam reservoir, the area is highly disturbed due to regular periods of inundation. Many of the areas are colonized by ruderal species.

Non-native tree plantings typically occur as shade trees or windrows around facilities in the downstream areas. The most common ornamental trees are eucalyptus (*Eucalyptus* spp.) and Peruvian pepper (*Schinus molle*). This category was chiefly applied to occurrences of non-native trees within the native vegetation types, which is especially common along roads.

#### **Non-Vegetated Areas**

**Open Water.** Open water occurs within the flood pool of the dam when sufficient inflow occurs, and persists for a short distance downstream until the water is either diverted into recharge basins or naturally percolates into subsurface flow. During storm events, continuous flow could persist much further downstream, even as far as Prado Dam for a limited time, depending on the amount and duration of inflow. During the April 2010 surveys, the cover type defined as open water within the Project Area consisted of no emergent vegetation above the surface water level. It is likely that as the surface water level recedes, the vegetation below could be characterized as degraded habitat within the series of vegetation communities described above, depending on location.

### **3. AFFECTED ENVIRONMENT**

*Sandy Wash.* Sandy wash occurs adjacent to the active channel of the SAR at the upstream end of the Project Area. Due to channel morphology, these areas are subject to periodic and episodic flooding that eliminate annual plants and many seedling or juvenile perennials. These scouring floods may occasionally, yet rapidly, convert this cover type back to non-vegetated channel. The plants in this community are generally able to rapidly reestablish populations following scouring floods. Sandy wash in the Project Area consist of very low shrub cover and plant diversity. This habitat is dominated by open sand with some scattered individual plants such as golden aster (*Heterotheca sessiliflora*), California croton (*Croton californicus*), scalebroom (*Lepidospartum squamatum*), California buckwheat, and sweetbush (*Bebbia juncea*). This habitat does not match any vegetation types exactly, but if allowed to persist without flooding, would probably develop into scalebroom scrub as described by Sawyer et al. (2009). Scalebroom scrub is typically associated with intermittently or rarely flooded, low-gradient alluvial deposits along streams, washes, and alluvial fans. Stands establish after fluvial events and are highly variable in species composition.

*Disturbed/Developed.* This cover type is used to classify areas that have very little vegetative cover due to continued disturbance or existing development, such as the series of dirt roads that run adjacent to the southern boundary of the Project Area and also the dam surface itself, which is composed of large rocks. Vegetation in any of these areas is very limited and may best be referred to as ruderal, composed primarily of non-native annuals.

#### **Special-Status Plant Species**

Special-status plants considered in this DSEA/ND include those species listed as threatened or endangered under the FESA or CESA, species proposed for listing, candidate species, and species identified as List 1 or 2 by the California Native Plant Society (CNPS) rare plant rankings<sup>1</sup>, and that are either present or have the potential to occur within the Project Area or that could potentially be affected in downstream areas with implementation of the Proposed Action. An initial record search was conducted by reviewing the CNDB, the CNPS Online Rare Plant Inventory, the Consortium of California Herbaria database, and special-status species lists obtained from USFWS and CDFW. Botanical surveys were then performed by Aspen in April 2010 which includes the Project Area. Surveys were floristic in nature and were conducted during the optimal survey period for the majority of the special-status species that may occur in the region.

No Federal or state listed plant species were detected in the Project Area above the SOD during botanical surveys. The area above the SOD does not support suitable habitat for any listed plants known from the region; however, one species, woolly star, was collected from the SAR Canyon in 1985, approximately two miles upstream from the Project Area. No other Federal or state listed plant species are expected to occur above SOD. Conversely, below SOD, populations of SAR woolly star, including slender-horned spineflower, are found over the wash area and particularly in the WSPA.

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<sup>1</sup> The CNPS cooperates under a Memorandum of Understanding (MOU) with CDFG to identify plants that may be rare or threatened, evaluate threats to them, share occurrence data, and plan protective measures. All of the CNPS List 1B plants in the Project Area are also included in the CDFG Special Plants List and are tracked by CDFG's CNDB (CDFG, 2010b). By CNPS's standards, the plants on CNPS Lists 1A, 1B and 2 meet the definitions of Sections 2062 and 2067 (CESA) of the California Fish and Game Code, and are eligible for State listing (CNPS, 2001a)..

### **3. AFFECTED ENVIRONMENT**

Several habitat assessments, reconnaissance surveys, and focused surveys for sensitive plant and wildlife species have been conducted in the Project Area over the past several years, and even decades, for numerous projects. Information includes data collected from a number of these biological studies prepared by various resource agencies and organizations, including the U.S. Army USACE of Engineers (USACE), LSA Associates (LSA), ESA Environmental Services (ESA), Lilburn Corporation (Lilburn), and Science Applications International Corporation (SAIC). To reflect current biological conditions in the Project Area, this information has been updated accordingly through information obtained from recent habitat assessments and surveys conducted in 2008 and 2009.

One CDFW special plant, Robinson's peppergrass (*Lepidium virginicum* var. *robinsonii*), a CNPS List 1B.2 species, was detected within the Project Area along the western edge of the reservoir. The area above the SOD also supports suitable habitat for two additional CDFW special plant species, including Plummer's mariposa lily (*Calochortus plummerae*) and Parry's spineflower (*Chorizanthe parryi* var. *parryi*). Plummer's mariposa lily has been previously identified in 1997 and 2009 within the SAR Canyon, approximately three and ten miles upstream from the Project Area, respectively. The Project Area supports suitable habitat for Plummer's mariposa lily, particularly in areas characterized as chaparral communities. There are no known records for Parry's spineflower above SOD, and habitat in the Project Area for this species is limited to transitional interfaces between chaparral and surrounding areas.

Populations of federal and state listed plants are common below the SOD. A large number of Santa Ana River woolly star and slender-horned spineflower as documented in the MSHMP are known to occur in the historic overflow channel of the SAR downstream of the SOD and habitat is consistent with pioneer phase RAFSS. Populations of slender-horned spineflower are known to occur near the Project Area but are not known to occur within areas subject to inundation.

Plummer's Mariposa Lily is also known from the Project Area and has been documented near the southern and western most of the Water Conservation Districts' recharge basin (Aspen, 2006). Populations of Parry's spineflower are also known to be locally abundant in the Project Area near the recharge basins and can be found in many of the open patches of the alluvial fan scrub. In some areas near the border of the Project Area this plant occurred in extremely large numbers (1000+ plants) and with the exception of the basins occurs to some degree in most of the upland habitat that borders the project.

Table 3.2.1-1 provides a summary of the special-status plant species that were either identified during botanical surveys or that have potential to occur in the Project Area both above and below SOD. Potential for occurrence is based on the presence of suitable habitat and/or proximity to known occurrences. Species accounts for all special-status plant species with a potential to occur in the Project Area or in the upper SAR wash area are provided below.

Each of these species was assessed for its potential to occur based on the following criteria:

### 3. AFFECTED ENVIRONMENT

- Present: Species was observed within the Project Area during April 2010 botanical surveys, or, in the upper SAR wash area during surveys conducted within the past five years, or, population has been acknowledged by CDFW, USFWS, or local resource experts.
- High: Habitat (including soils) for the species occurs and a known record occurs within the Project Area or adjacent areas (within 5 miles) within the past 20 years; however, these species were not detected during the most recent surveys.
- Moderate: Habitat (including soils) for the species occurs and a known record occurs, but not within 5 miles or within the past 20 years; or a known record occurs within 5 miles and within the past 20 years and marginal or limited amounts of habitat is present; or the species' range includes the geographic area and suitable habitat exists.
- Low: Limited habitat for the species occurs and no known records were found within the literature search and the species' range includes the geographic area.
- Not likely to occur:  
Species was not observed during botanical surveys conducted at an appropriate time for identification of the species and species is restricted to environmental conditions (including soil and elevation factors) that do not occur.

**Table 3.2.1-1. Known and Potential of Special-Status Plant Species to Occur**

Scientific Name	Common Name	Status	Blooming Period	Habitat Association and Elevation Limits	Potential to Occur	
					Above SOD	Below SOD
FEDERAL AND STATE LISTED SPECIES						
<i>Dodecahema leptoceras</i>	Slender-horned spineflower	FE, SE, List 1B.1	Apr-Jun	Chaparral, coastal scrub (alluvial fan sage scrub); flood deposited terraces and washes; 656-2493 ft.	Not likely to occur	Present
<i>Eriastrum densifolium</i> ssp. <i>Sanctorum</i>	Santa Ana River woollystar	FE, SE, List 1B.1	May-Sep	Coastal scrub, chaparral; sandy soils on river floodplains or terraced fluvial deposits; 492-2001 ft	Low	Present
CDFW SPECIAL PLANTS						
<i>Calochortus plummerae</i>	Plummer's mariposa-lily	List 1B.2	May-Jul	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest; occurs on rocky and sandy sites, usually of granitic or alluvial material; common after fire; 295-5282 ft.	High	Present
<i>Chorizanthe parryi</i> var. <i>parryi</i>	Parry's spineflower	List 1B.1	Apr-Jun	Coastal scrub, chaparral; dry slopes and flats; sometimes at interface of two vegetation types; dry, sandy soils; 131-5594 ft.	Low	Present
<i>Chorizanthe xanti</i> var. <i>leucotheca</i>	White-bracted spineflower	List 1B.2	Apr-Jun	Sandy or gravelly sites, usually on alluvial fans or bajadas within desert shrubland, desert transition chaparral, or pinyon woodlands; 984-3937 ft.	Not likely to occur	Present
<i>Lepidium virginicum</i> var. <i>robinsonii</i>	Robinson's pepper-grass	List 1B.2	Jan-Jul	Chaparral, coastal scrub; dry soils, shrubland; 1-945 m (3-3100 ft)	Present	Present

### 3. AFFECTED ENVIRONMENT

Scientific Name	Common Name	Status	Blooming Period	Habitat Association and Elevation Limits	Potential to Occur	
					Above SOD	Below SOD
FE –Federally listed Endangered				CNPS 1A – Presumed extinct in California		
FT – Federally listed Threatened				CNPS 1B – Rare or endangered in California and elsewhere		
SE – California-listed Endangered				0.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)		
ST – California-listed Threatened				0.2 = Fairly endangered in California (20-80% occurrences threatened)		
				0.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)		

#### Species Accounts – Plants

##### Federal and State Listed Species

Slender-horned spineflower (*Dodecahema leptoceras*). Slender-horned spineflower was federally listed as endangered on September 28, 1987 (52 FR 36260). The State of California listed slender-horned spineflower as endangered in January 1982. The geographic range for slender-horned spineflower stretches across portions of Los Angeles, Riverside, and San Bernardino counties. Known locations include Soledad Canyon, Big Tujunga Canyon, the SAR Wash near Redlands, the San Jacinto River floodplain near Hemet, the Vail Lake area east of Temecula, and Temescal Canyon near Lake Elsinore. It occurs between approximately 700 and 2,500 feet in elevation. Slender-horned spineflower's usual habitat is open, slightly depressed sites within mature shrublands of broad alluvial systems (Allen, 1996; Wood and Wells, 1996). Occupied habitat described by Allen (1996) and Wood and Wells (1996) was on relatively flat surfaces ranging in age from about 100 years to several thousand years. Spineflower microsites were slightly lower than surrounding surfaces, had higher silt content, and lower mineral, organic, and plant nutrient content than surrounding areas. Occupied sites also had low weedy grass cover ( $\leq 11\%$ ). Ferguson et al. (1996) noted that spineflower plants were often immediately adjacent to rocks; this correlation could be due to seeds becoming captured at bases of rocks, or perhaps the plants are more successful there due to increased water runoff from the adjacent rock surface. About three-quarters of the historical locations for slender-horned spineflower have been extirpated by land use modifications, including flood control structures, development, vehicle and recreational uses, and aggregate mining. These land uses continue to threaten habitat for this species.

Slender-horned spineflower was not identified above SOD during April 2010 botanical surveys and there are no known occurrences above SOD. The area above SOD does not support mature, broad alluvial systems that are associated with this species. On the contrary, below SOD on the SAR wash, populations of this species have been found. The Corps has been monitoring population and distribution of the slender-horned spineflower under the MSHMP. The distribution of spineflower on the Wash is based on compilation of records from (1) 1997-1999 plus a few earlier records which were cited in USACE (1999), (2) historic records from the California Natural Diversity Data Base (CNDDDB), and (3) data collected during 2008 and 2010 distribution surveys (SAIC 2008, 2010).

The WSPA contains a relatively small percentage of the known slender-horned spineflower locations on the wash. There are a few locations in Area B, several locations in Area D (mostly concentrated near the MWD easement), and localized occurrence in Area E (near Cone Camp)

### **3. AFFECTED ENVIRONMENT**

(Figure 3.2.1-1). No records have been reported in Areas A, C, or F. Most occurrence records are outside the WSPA.

No critical habitat rules for slender-horned spineflower have been published.

### 3. AFFECTED ENVIRONMENT

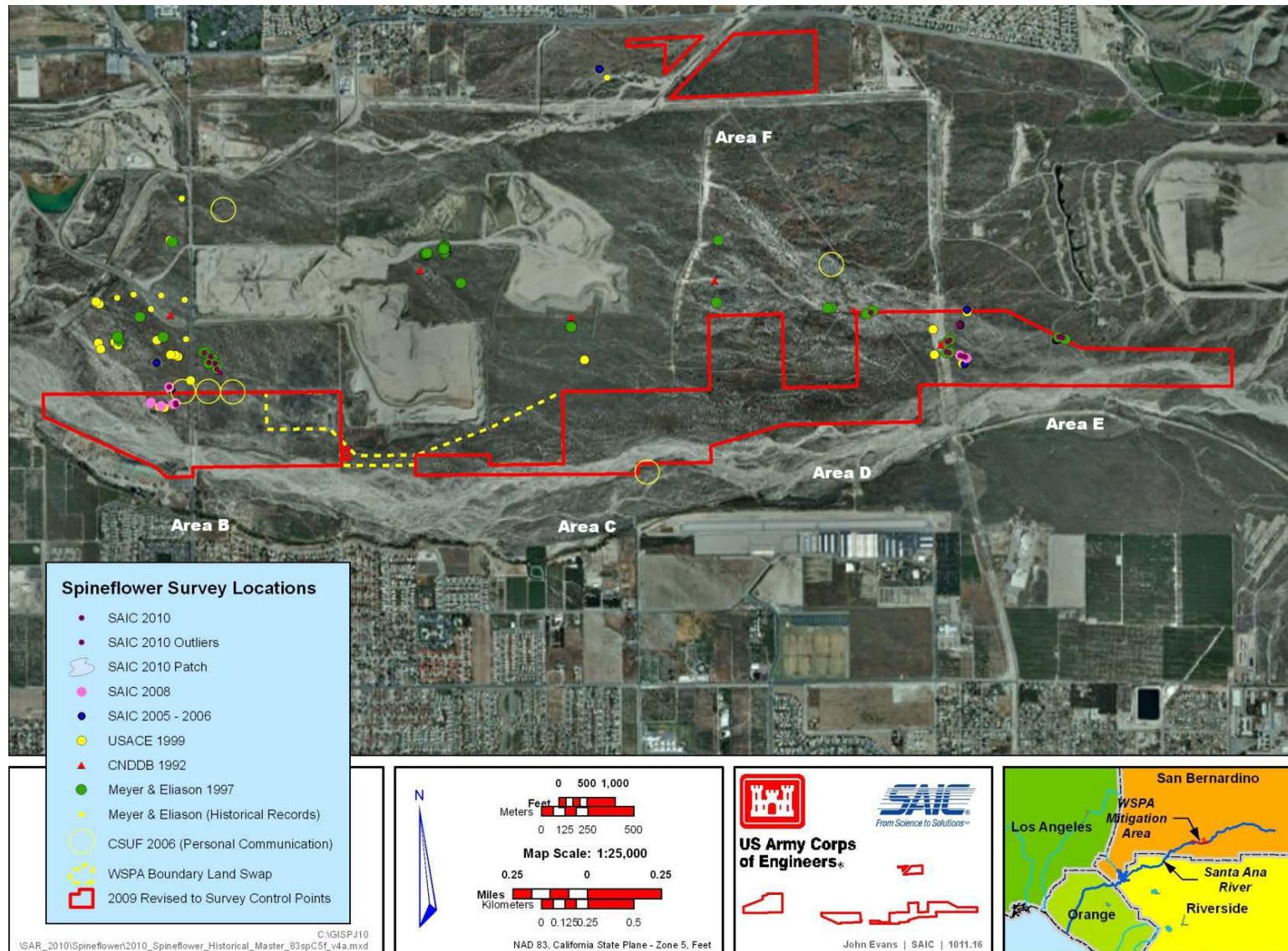


Figure 3.2.1-1. Known reported locations of slender-horned spineflower within the WSPA and on the Santa Ana River Wash as documented in the MSHMP (2012).

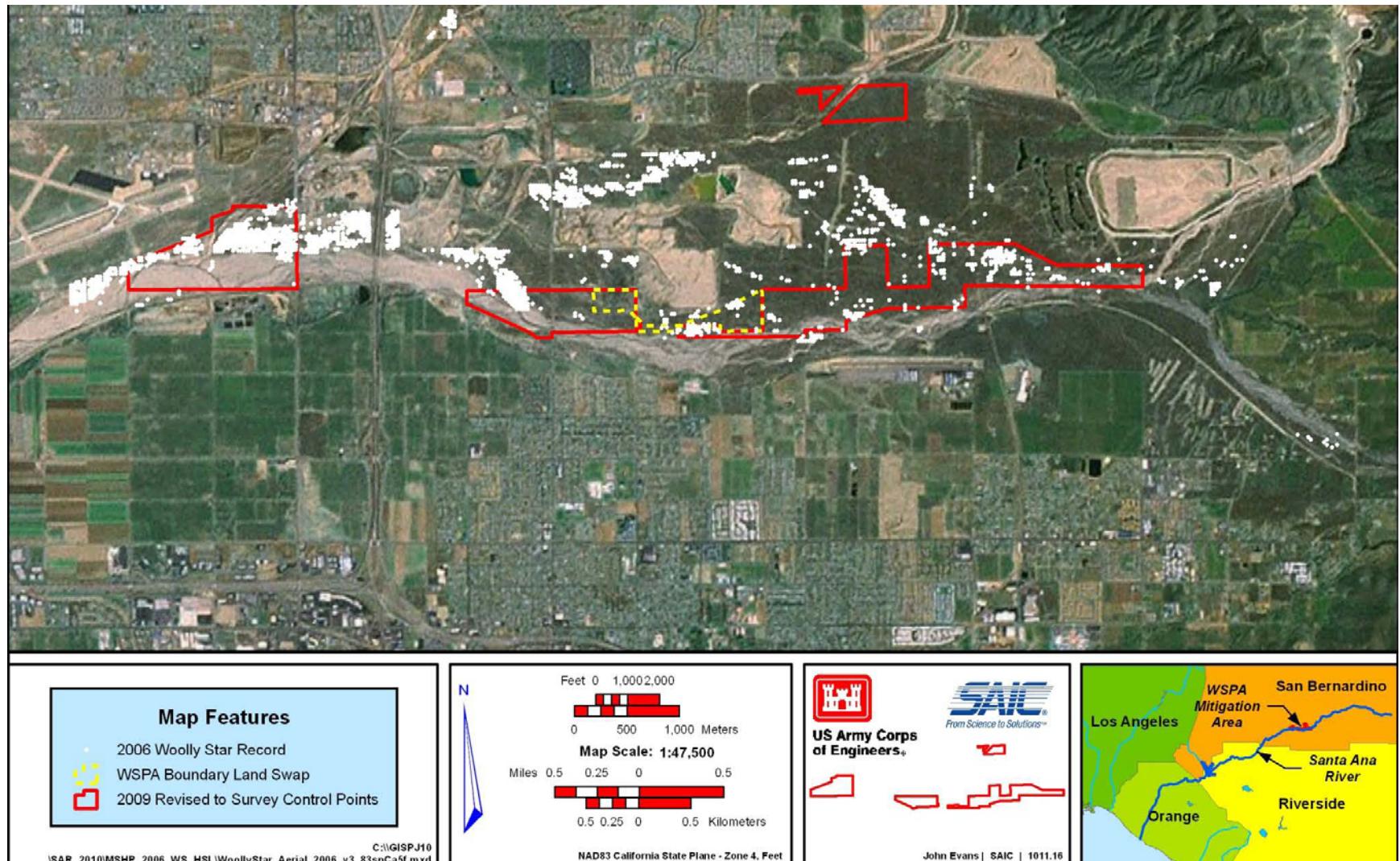
### **3. AFFECTED ENVIRONMENT**

Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*). Santa Ana River woolly star was listed as federally endangered on September 28, 1987 (52 FR 36260). The State of California also listed Santa Ana River woolly star as endangered in September 1987. This species primarily occurs along the Santa Ana River watershed in southwestern San Bernardino County and is generally associated with open washes and early succession alluvial shrublands in sandy or gravelly soils. It is also known from locations farther west, in the Lytle Creek and Cajon Wash floodplain (tributary to the SAR). On that floodplain, it occurs from about 2,000 feet elevation near Devore, south to about 1,200 feet elevation where Lytle Creek enters a flood control basin (CDFG, 2011). Burke et al. (1989) found that most vigorous populations of this subspecies occur along alluvial surfaces associated with the 1969 flood (a 25-year event) and found no occurrences on older surfaces (now covered by chaparral shrubs) dating to the 1938 flood (a 100-year event). These populations were in relatively open habitat, growing with other early-successional shrubs. Historically, habitat for this subspecies extended farther downstream, but land use conversions have rendered these areas unsuitable. There are still a few remnant occurrences but no substantial occurrences downstream from the populations described above (CDFG, 2009a).

This subspecies was not identified above the SOD during April 2010 botanical surveys and this area supports marginal habitat within the areas defined as sandy wash and chaparral interfaces. There is only one known occurrence for this subspecies from above SOD, collected in 1985 from the SAR Canyon approximately two miles northeast and upstream of the Project Area (CCH, 2011). According to this record, this subspecies was collected within an area that incorporated the broad floodplain of the SAR and adjacent chaparral and coastal sage scrub covered slopes (CCH, 2011). Santa Ana River woolly star is represented at several known locations within the upper SAR wash area downstream of SOD and a number of plants border the western most detention basin in the Project Area. Figure 3.2.1-2 below shows the distribution for this species.

No critical habitat rules for Santa Ana River woolly star have been published.

### 3. AFFECTED ENVIRONMENT



**Figure 3.2.1-2. Distribution of woolly star within the WSPA and on the Santa Ana River Wash, 2006, as documented in the MSHMP (2012).**

### **3. AFFECTED ENVIRONMENT**

#### **CDFW Special Plants**

Plummer's mariposa lily (*Calochortus plummerae*). Plummer's mariposa lily occurs in the mountains and foothills of Ventura, Los Angeles, Orange, Riverside, and San Bernardino counties (the San Gabriel, San Bernardino, San Jacinto, Santa Ana, and Santa Monica Mountains) at elevations up to approximately 5,600 feet, though it is uncommon at those higher elevations (CNPS, 2009; Consortium of California Herbaria, 2009). Habitats that are commonly associated with Plummer's mariposa lily include chaparral, coastal sage scrub, grassland, woodlands, and lower elevation yellow pine forests. It seems to be most common in coarse, sandy granitic soils in washes or on uplands, generally in chaparral.

Although this species was not identified in the above the SOD during April 2010 botanical surveys, it was recently collected from the Santa Ana River Canyon by Prince (2009) approximately ten miles to the northeast (CCH, 2011). According to this record, hundreds of individual plants were detected on a steep north-facing slope growing in gaps of the surrounding shrub layer (CCH, 2011). White (1997) also collected this species within the same canyon, approximately three miles upstream and northeast of the Project Area (White, 2011). Suitable habitat for this species primarily occurs in the Project Area both above and below the SOD within areas characterized as chaparral and degraded chaparral, which dominate most of the uplands surrounding the reservoir. Plummer's mariposa lily has also been collected or reported at numerous sites, particularly associated with chamise chaparral and disturbed areas, within the upper SAR wash (below the dam), as summarized by Dudek (2007). Aspen identified this species at several locations within Riversidian alluvial sage scrub habitat within the Project Area adjacent to the western most recharge basin that borders Cone Camp Road (Aspen, 2006). Therefore, there is a high potential for this species to occur in the Project Area and it is present in the upper SAR wash area below SOD.

Parry's spineflower (*Chorizanthe parryi* var. *parryi*). Parry's spineflower occurs in the Inland Empire region of southern California, throughout most of western Riverside County and adjacent southwestern San Bernardino County with a few records from adjacent San Diego and Los Angeles counties (CNPS, 2011). Parry's spineflower apparently does not occur in otherwise suitable places with high cover of alien grasses and mustards. Much of the coastal sage scrub vegetation throughout its range has been, or is being, converted to weedy grasslands and mustard fields. Even where native shrubs still dominate the shrub layer, the understory is often wholly dominated by weeds, eliminating potential habitat for Parry's spineflower.

Parry's spineflower was not identified in the above the SOD during April 2010 botanical surveys and there are no known occurrences above SOD. Habitat in the Project Area is marginal within areas characterized as chaparral communities as these areas do provide some suitable transitional zones with preferred coastal sage scrub habitat and support undisturbed habitat most associated with this species. Parry's spineflower was described as locally abundant during surveys within the upper SAR wash area (Aspen, 2006) and is known to occur in the Project Area below the SOD. It was most often associated with areas that support mature shrub lands and relatively undisturbed stable alluvial benches (Aspen, 2006). Therefore, this species has a low potential to occur above the SOD but is considered present below SOD.

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White-bracted spineflower (*Chorizanthe xanti* var. *leucotheca*). White-bracted spineflower is known from a few sites in sandy washes near the desert margins of the San Bernardino Mountain and San Jacinto Mountain foothills and a few reports farther east in the Colorado Desert mountain ranges (CCH, 2009). Most known occurrences are in or near the San Gorgonio Pass area near Banning with several other records to the west (e.g., Devore area) and south (Coyote Canyon, Anza Borrego Desert State Park) (CCH, 2009). A few reports from other areas, including Corona in Riverside County and Sleepy Valley in Los Angeles County, are doubtful and are unsupported by specimens (Roberts et al., 2004). White-bracted spineflower is typically associated with sandy or gravelly sites, usually on alluvial fans or bajadas, within desert shrub land, desert transition chaparral, or pinyon woodlands (CNPS, 2009).

This variety was not identified above the SOD during April 2010 botanical surveys and there are no known occurrences above SOD. The area above SOD does not support suitable arid habitats most commonly associated with this variety. White-bracted spineflower was collected in 2008 from the upper SAR wash area and from Mill Creek, approximately three miles upstream of the wash area (Bramlet, 2009; CCH, 2011). Therefore, this variety is not likely to occur above the SOD but should be considered present in the upper SAR wash area below SOD.

Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*). Robinson's pepper-grass is found in southwestern California on the Channel Islands, in central Los Angeles County south through western San Diego County, to northern Baja California, and inland to western Riverside and San Bernardino Counties. Robinson's pepper-grass is typically found in chaparral and coastal sage scrub habitats. Its primary habitat seems to be slightly sheltered, open soils in shrub lands, often on south-facing slopes, and often around rock crevices, cobble-sized rocks or at the margins of shrubs, which may provide some moisture runoff (CNPS, 2011). This variety is often found at relatively sterile sites, apparently characterized by low nutrient availability or poor soil productivity. Robinson's pepper-grass does not seem to compete well with other annual herbs, and generally is not found in annual grasslands, dense mustard stands, or north-facing slopes that tend to support denser herb cover.

Robinson's pepper-grass was identified above the SOD during April 2010 botanical surveys. The observation occurred along the western edge of the reservoir in an opening along south-facing slopes. Suitable habitat is present in the Project Area, particularly along the southern boundary where scrub oak chaparral characterizes the vegetation composition. This variety has also been reported from the upper SAR wash area below SOD by Prigge (1985) (CCH, 2011). This occurrence is reported from just below the mouth of SAR Canyon on an alluvial terrace south of Greenspot Road (CCH, 2011). Additionally, Aspen reports this variety as being identified within the upper SAR wash area during surveys conducted in 2006 (Aspen, 2006). Therefore, Robinson's pepper-grass is present in the Project Area and assumed to be present both above and below SOD.

#### **3.2.2. General Wildlife**

Historically, the upper SAR has supported a dynamic environment for an extensive variety of animals. Periodic, yet frequent, flooding due to both natural and anthropogenic causes has continuously altered the landscape, resulting in the conversion of habitat types and the

### **3. AFFECTED ENVIRONMENT**

fluctuation of species density and composition. Human activities, such as operation and maintenance of the dam, and recreational uses, have also contributed to the current shape and function of the system.

While much of the Project Area has been subjected to historic and ongoing disturbance, portions continue to support high-quality, native vegetation communities. The vegetation communities described in preceding sections of this document contribute to the diversity and abundance of wildlife in the area as they provide habitat for a variety of common and sensitive wildlife species that utilize these areas throughout various stages of their life cycles, including breeding, foraging, dispersal, and transient uses. Additionally, these patches of native vegetation represent some of the few remaining areas, region-wide, that function as wildlife movement corridors amidst the heavily urbanized landscape between the San Bernardino Mountains, to the north, and the San Bernardino Valley, below. Due to the overlapping project area with the proposed 2014 WCP, information from the WCS will be referenced in this DSEA/ND.

Several federally and state listed species are known or likely to occur within or in the vicinity of the Project Area and they include Least Bell's vireo (*Vireo bellii pusillus*), Southwestern willow flycatcher (*Empidonax traillii extimus*), Coastal California gnatcatcher (*Polioptila californica californica*), San Bernardino Kangaroo rat (*Dipodomys merriami parvus*), Arroyo southwestern toad (*Bufo californicus*), and Santa Ana sucker (*Castostomus sanatanna*). Many of these species were not detected at the time of the reconnaissance level surveys. However, through literature search, many of these species are known or have been historically known to exist within the Project Area. Appropriate focused surveys to document the occurrence of the target species and/or their habitat within the Project Area may be determined in coordination with the resource agencies.

#### **Fish**

Historically several threatened and endangered native freshwater fish species inhabited the Santa Ana drainage, including the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), speckled dace (*Rhinichthys osculus*), arroyo chub (*Gila orcutti*), and Santa Ana sucker "SAS" (*Castostomus santaanae*) (Swift et al., 1993).

Two non-native species of fish that commonly inhabit the drainage include brown and rainbow trout. Rainbow trout are known to inhabit several tributaries to the SAR, including Bear Creek where they are the dominant fish species (USACE 1985; EA Environmental Science and Technology 1995). Brown trout are also found in Hemlock Creek, a tributary to Alder Creek, which is a tributary to the SAR (USACE 1997).

SAS is federally threatened and a state Species of Special Concern. Critical habitat for SAS currently includes the Santa Ana River (SAR) and tributaries above Seven Oaks Dam. The SAS historically occurred in small, shallow, low-elevation streams in the Los Angeles, San Gabriel, and Santa Ana River systems (Swift et al., 1993). They also historically occurred in the upper Santa Ana River, on Cajon and City Creeks in the foothills of the San Bernardino Mountains, and in Santiago Creek in the foothills of the Santa Ana Mountains (Moyle et al., 1995). Currently, SAS is restricted to 3 noncontiguous populations: the lower Big Tujunga Creek, the East, West and North Forks of the San Gabriel River and the lower and middle Santa Ana River

### **3. AFFECTED ENVIRONMENT**

(USFWS, 2000). More specifically, SAS occupies the Santa Ana River in the reach downstream of the La Cadena drop structure to the Riverside Narrows (Van Buren Blvd). Individual fish are occasionally sighted further downstream.

SAS typically inhabit small, shallow streams and rivers less than 23 feet (7 meters) wide where water temperature is generally below 72 ° F (22 ° C), and where currents range from swift to sluggish (USFWS, 2000). SAS tolerate seasonally turbid water, although they prefer clear water and are often found in pools. SAS change diet with age. Detritus, algae, and diatoms constitute about 98 percent of the diet of young-of-the-year fish. Older fish feed on aquatic insects, fish scales, and fish eggs (RCIP, 2002). Sexual maturity of SAS occurs by the first year, and they continue to spawn to age 2. Neither males nor females show spawning coloration, and the sex ratio is typically 1:1. Spawning takes place in March through early July, peaking in late May through early June. Fecundity is very high (4,000–16,000 eggs depending on the size of the female). Along with a protracted spawning period, high fecundity enables fish to quickly repopulate a stream after a severe flood event. Their life history approach includes explosive breeding and prolonged spawning, conducive to repopulating disturbed habitats (RCIP, 2002). Natural upstream and downstream movement depends on habitat conditions. Flood events contribute to dispersal of the species (RCIP, 2002).

### **Amphibians**

A variety of amphibian species is known or expected to occur along the Project Area. The amphibians include arroyo southwestern toad (*Bufo californicus*), California red-legged frog (*Rana aurora draytoni*), mountain yellow-legged frog (*Rana muscosa*), western toad (*Bufo boreas*), bullfrog, and California treefrog (*Hyla cadaverina*). There are five (5) additional non-status species and one (1) California species of concern (CSC) known or reasonably expected to occur within the Project Area, which include the Western spadefoot toad (*Scaphiopus hammondii*), Pacific tree frog (*Hyla regilla*), California chorus frog (*Pseudacris cadaverina*), Pacific chorus frog *Pseudacris regilla*, and the Large-blotched ensantina (*Ensatina escholtzii*), a CSC species. Table 3.2.2-1 provides a list of amphibian species known or has the potential to occur within the Project Area.

### 3. AFFECTED ENVIRONMENT

**Table 3.2.2-1. Listing of amphibian species known, or reasonably expected to occur, within the Seven Oaks Dam Water Quality Project Area, San Bernardino County, California.**

Species Common Name	Scientific Name	Federal Status <sup>1</sup>	State Status <sup>1</sup>
Arroyo toad	<i>Bufo californicus</i>	E	CSC
Western toad	<i>Bufo boreas</i>	CSC	
Western spadefoot toad	<i>Scaphiopus hammondii</i>		
California tree frog	<i>Hyla cadaverina</i>		
Pacific tree frog	<i>Hyla regilla</i>		
California chorus frog	<i>Pseudacris cadaverina</i>		
Pacific chorus frog	<i>Pseudacris regilla</i>		
California red-legged frog	<i>Rana aurora draytonii</i>	E	CSC
Mountain yellow-legged frog	<i>Rana muscosa</i>	E	CSC
Large-blotched ensatina	<i>Ensatina escholtzii</i>		CSC
Pacific salamander	<i>Batrachoseps pacificus</i>		

<sup>1</sup>Status: (E) refers to species which are listed as endangered by the respective government agency; (FSS) refers to U. S. Forest Service Sensitive Species; (CSC) refers to California Species of Special Concern.

### Reptiles

Many reptiles are known to occur or reasonably expected to occur within the Project Area. These species include: western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarinata*), side-blotched lizard (*Uta stansburiana*), two-striped garter snake (*Thamnophis hammondii*), and gopher snake (*Pituophis melanoleucus*). During the 2010 field survey, a flat-tailed horned lizard (*phrynosoma mcallii*), a State species of concern, was observed in an alluvial sand scrub habitat just upstream of the Warms Springs confluence project area. Although not observed during surveys, king snake (*Lampropeltis getulus*) and western rattlesnake (*Crotalus viridis*) are expected to occur in many of the native natural communities along the project area. Table 3.2.2-2 lists the following species that are known, or reasonably expected to occur, within the Project Area.

### 3. AFFECTED ENVIRONMENT

**Table 3.2.2-2. Listing of reptile species known, or reasonably expected to occur, within the Seven Oaks Dam Water Quality Project Area, San Bernardino County, California.**

Species Common Name	Scientific Name	Federal Status <sup>1</sup>	State Status <sup>1</sup>
California lyre snake	<i>Trimorphodon biscutatus</i> ssp. <i>vandenburgi</i>		
California night snake	<i>Hypsiglena torquata</i>		
San Bernardino mountain kingsnake	<i>Lampropeltis zonata parvirostris</i>	FSS	CSC
Common kingsnake	<i>Lampropeltis getulus</i>		
Coast patch-nosed snake	<i>Salvadora hexalepis</i>		CSC
Two-striped garter snake	<i>Thamnophis hammondii</i>	FSS	
San Bernardino ringneck snake	<i>Diadophis punctatus modestus</i>	FSS	
Coastal rosy boa	<i>Lichanura trivirgata roseofusca</i>	FSS	
Southern rubber boa	<i>Charina bottae umbratica</i>	FSS	T
California lyre snake	<i>Trimorphodon biscutatus</i>		
Gopher snake	<i>Pituophis melanoleucus</i>		
California glossy snake	<i>Arizona elegans occidentalis</i>		
California whipsnake	<i>Masticophis lateralis</i>		
Red diamond rattlesnake	<i>Crotalus ruber</i>		CSC
Speckled rattlesnake	<i>Crotalus mitchellii</i>		
Southern pacific rattlesnake	<i>Crotalus viridis helleri</i>		
Great Basin fence lizard	<i>Sceloporus occidentalis biseriatus</i>		
Sagebrush lizard	<i>Sceloporus graciosus</i>		
Side-blotched lizard	<i>Uta stansburiana</i>		
San Diego horned lizard	<i>Phrynosoma coronatum blainvillii</i>	FSS	CSC
Orange-throated whiptail	<i>Cnemidophorus hyperythrus</i>		CSC
Coastal western whiptail	<i>Cnemidophorus tigris multicarinatus</i>		CSC
San Diego alligator lizard	<i>Gerrhonotus multicarinatus webbi</i>		
Silvery legless lizard	<i>Anniella pulchra pulchra</i>	FSS	CSC
Gilbert's skink	<i>Eumeces gilberti rubricaudatus</i>		
Coastal banded gecko	<i>Coleonyx variegatus</i>		
Southwestern pond turtle	<i>Clemmys marmorata pallida</i>	FSS	CSC

<sup>1</sup>Status: (T) refers to a species that has been designated threatened by state of California; (FSS) refers to U. S. Forest Service Sensitive Species; and (CSC) refers to California Species of Special Concern

### Birds

Bird species common to the project area include American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), western scrub jay (*Aphelocoma coerulescens*), and California towhee (*Pipilo crissalis*). Mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), and killdeer (*Charadrius vociferous*) were observed in the stream. Other species known to occur within the project area include red-tailed hawk (*Buteo jamaicensis*), California quail (*Callipepla californica*), warbling vireo (*Vireo gilvus*), and phainopepla (*Phainopepla nitens*).

### **3. AFFECTED ENVIRONMENT**

Several sensitive birds may have the potential to occur in the project area and include California condor (*Gymnogyps californianus*), southwestern willow flycatcher (*Empidonax trailli extimus*), least Bell's vireo (*Vireo belli pusillus*), and the coastal California gnatcatcher (*Polioptila californica californica*). However, at the time of the surveys, none of these species were detected. Table 3.2.2-3 lists the following species that are known, or reasonably expected to occur, within the Project Area.

**Table 3.2.2-3 provides a list of bird species known, or reasonably expected to occur, within the Project Area.**

### 3. AFFECTED ENVIRONMENT

Species Common Name	Scientific Name	Federal Status <sup>1</sup>	State Status <sup>1</sup>
Mallard	<i>Anas platyrhynchos</i>		
Lesser scaup	<i>Aythya affinis</i>		
Ring-necked duck	<i>Aythya collaris</i>		
Green-winged teal	<i>Anas crecca</i>		
Redhead	<i>Aythya americana</i>		
Ruddy duck	<i>Oxyura jamaicensis</i>		
Turkey vulture	<i>Cathartes aura</i>		
Cooper's hawk	<i>Accipiter cooperii</i>	CSC	
Sharp-shinned hawk	<i>Accipiter striatus</i>	CSC	
Merlin	<i>Falco columbarius</i>	CSC	
Red-tailed hawk	<i>Buteo jamaicensis</i>		
Red-shouldered hawk	<i>Buteo lineatus</i>		
Northern harrier	<i>Circus cyaneus</i>	CSC	
White-tailed kite	<i>Elanus caeruleus</i>	SP	
Golden eagle	<i>Aquila chrysaetos canadensis</i>	SP, CSC	
Bald eagle	<i>Haliaeetus leucocephalus</i>	E	E, SP
American kestrel	<i>Falco sparverius</i>		
Prairie falcon	<i>Falco mexicanus</i>	CSC	
Peregrine falcon	<i>Falco peregrinus</i>	E, SP	
California quail	<i>Callipepla californica</i>		
Mountain quail	<i>Oreotyx pictus</i>		
Killdeer	<i>Charadrius vociferous</i>		
Common snipe	<i>Gallinago gallinago</i>		
Mourning dove	<i>Zenaida macroura</i>		
Band-tailed pigeon	<i>Columba fasciata</i>		
Greater roadrunner	<i>Geococcyx californianus</i>		
Burrowing owl	<i>Athene cunicularia</i>	CSC	
California spotted owl	<i>Strix occidentalis occidentalis</i>	FSS	CSC
Long-eared owl	<i>Asio otus</i>		CSC
Great horned owl	<i>Bubo virginianus</i>		
Barn owl	<i>Tyto alba</i>		
Western screech owl	<i>Otus kennicottii</i>		
Common poorwill	<i>Phalaenoptilus nuttallii</i>		
Lesser nighthawk	<i>Chordeiles acutipennis</i>		
White-throated swift	<i>Aeronautes saxatalis</i>		
Vaux's swift	<i>Chaetura vauxi</i>	CSC	
Anna's hummingbird	<i>Calypte anna</i>		
Costa's hummingbird	<i>Calypte costae</i>		
Black-chinned hummingbird	<i>Archilochus alexandri</i>		
Belted kingfisher	<i>Ceryle alcyon</i>		

### 3. AFFECTED ENVIRONMENT

Downy woodpecker	<i>Picoides pubescens</i>		
Nuttall's woodpecker	<i>Picoides nuttallii</i>		
Acorn woodpecker	<i>Melanerpes formicivorus</i>		
Hairy woodpecker	<i>Picoides villosus</i>		
Northern flicker	<i>Colaptes auratus</i>		
Western wood-peewee	<i>Contopus sordidulus</i>		
Olive-sided flycatcher	<i>Contopus cooperi</i>		
Pacific-sloped flycatcher	<i>Empidonax difficilis</i>		
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E	E
Black phoebe	<i>Sayornis nigricans</i>		
Say's phoebe	<i>Sayornis saya</i>		
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>		
Western kingbird	<i>Tyrannus verticalis</i>		
Loggerhead shrike	<i>Lanius ludovicianus</i>		
Warbling vireo	<i>Vireo gilvus</i>		
Least Bell's vireo	<i>Vireo bellii pusillus</i>	E	E
Hutton's vireo	<i>Vireo huttoni</i>		
Steller's jay	<i>Cyanocitta stelleri</i>		
Western scrub jay	<i>Aphelocoma californica</i>		
Common raven	<i>Corvus corax</i>		
American crow	<i>Corvus brachyrhynchos</i>		
Horned lark	<i>Eremophila alpestris</i>		
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>		
Violet-green swallow	<i>Tachycineta thalassina</i>		
Tree swallow	<i>Tachycineta bicolor</i>		
Cliff swallow	<i>Petrochelidon pyrrhonota</i>		
Barn swallow	<i>Hirundo rustica</i>		
Oak titmouse	<i>Baeolophus inornatus</i>		
Mountain chickadee	<i>Poecile gambeli</i>		
White-breasted nuthatch	<i>Sitta carolinensis</i>		
Bushtit	<i>Psaltriparus minimus</i>		
Bewick's wren	<i>Thryomanes bewickii</i>		
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	FSS	CSC
Rock wren	<i>Salpinctes obsoletus</i>		
Canyon wren	<i>Catherpes mexicanus</i>		
House wren	<i>Troglodytes aedon</i>		
Wrentit	<i>Chamaea fasciata</i>		
Golden-crowned kinglet	<i>Regulus satrapa</i>		
Ruby-crowned kinglet	<i>Regulus calendula</i>		
Coastal California gnatcatcher	<i>Polioptila californica californica</i>	T	CSC
Blue-grey gnatcatcher	<i>Polioptila caerulea</i>		
American robin	<i>Turdus migratorius</i>		
Western bluebird	<i>Sialia mexicana</i>		
Mountain bluebird	<i>Sialia currucoides</i>		
Townsend's solitaire	<i>Myadestes townsendi</i>		

### 3. AFFECTED ENVIRONMENT

Swainson's thrush	<i>Catharus ustulatus</i>	
Hermit thrush	<i>Catharus guttatus</i>	
Northern mockingbird	<i>Mimus polyglottos</i>	
California thrasher	<i>Toxostoma redimivum</i>	
European starling	<i>Sturnus vulgaris</i>	
Phainopepla	<i>Phainopepla nitens</i>	
Yellow warbler	<i>Dendroica petechia</i>	CSC
MacGillivray's warbler	<i>Oporornis tolmieei</i>	
Black-throated gray warbler	<i>Dendroica nigrescens</i>	
Wilson's warbler	<i>Wilsonia pusilla</i>	
Yellow-rumped warbler	<i>Dendroica coronata</i>	
Orange-crowned warbler	<i>Vermivora celata</i>	
Common yellowthroat	<i>Geothlypis trichas</i>	
Yellow-breasted chat	<i>Icteria virens</i>	CSC
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	
Blue grosbeak	<i>Guiraca caerulea</i>	
Lazuli bunting	<i>Passerina amoena</i>	
Spotted towhee	<i>Pipilo maculatus</i>	
California towhee	<i>Pipilo crissalis</i>	
Black-chinned sparrow	<i>Spizella atrogularis</i>	
Fox sparrow	<i>Passerella iliaca</i>	
Golden-crowned sparrow	<i>Zonotrichia atricapilla</i>	
Song sparrow	<i>Melospiza melodia</i>	
Southern California rufous-crowned sparrow	<i>Aimophila ruficepscanescens</i>	CSC
Sage sparrow	<i>Amphispiza belli</i>	
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	
Lincoln's sparrow	<i>Melospiza lincolni</i>	
Savannah sparrow	<i>Passerculus sandwichensis</i>	
Dark-eyed junco	<i>Junco hyemalis</i>	
Brown-headed cowbird	<i>Molothrus ater</i>	
Red-winged blackbird	<i>Agelaius phoeniceus</i>	
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	
Bullock's oriole	<i>Icterus bullockii</i>	
Pine siskin	<i>Carduelis pinus</i>	
House finch	<i>Carpodacus mexicanus</i>	
Lesser goldfinch	<i>Carduelis psaltria</i>	
American goldfinch	<i>Carduelis tristis</i>	
House sparrow	<i>Passer domesticus</i>	

<sup>1</sup>Status: (E) refers to species which are listed as endangered by the respective government agency; (T) refers to species which are listed as threatened by the respective government agency; (SP) refers to species that are listed as fully protected by the state of California; (FSS) refers to U. S. Forest Service Sensitive species; and (CSC) refers to California Species of Special Concern.

### 3. AFFECTED ENVIRONMENT

#### Sensitive Wildlife

Below is a table identifying the list of special status species, listed as threatened or endangered under the federal or California Endangered Species Acts, species proposed for listing, species of special concern, and other species which have been identified by the USFWS, USFS, or CDFW as unique or rare and which have the potential to occur within the project area. There are currently 40 sensitive species (Table 3.2.2-4) that either occur or have the potential to occur within the project area.

**Table 3.2.2-4. Known or Potentially Occurring Sensitive Wildlife to Occur in the Vicinity of the Project Area.**

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Project area
<b>Fish</b>				
Unarmored three-spine stickleback	<i>Gasterosteus aculeatus williamsoni</i>	FE	Aquatic-Riverine, slow moving or standing water.	Potential to occur - known from the headwaters of the Santa Clara River and low gradient sections of the Los Angeles, San Gabriel, and SAR. Only recognized populations within San Bernardino County are in Shay Creek which drains into Baldwin Lake located just east of Big Bear Lake (Swift et al., 1993).
Santa Ana sucker	<i>Castostomus sanatannae</i>	FT, CSC	Aquatic-Riverine, small to medium sized (< 20 ft wide) shallow streams with cool and clear water	Potential to occur-known from the Santa Ana and the San Gabriel Rivers.
Santa Ana speckled dace	<i>Rhinichthys osculus</i>	FSC, FSS CSC	Aquatic-Riverine	Potential habitat is present. Abundant in the lower parts of the San Gabriel River. Smaller populations have been found in tributaries to the SAR, including Cajon Wash. Historic records indicate populations of this species also occurred in the SAR immediately downstream of the project area (USACE 1997).
Arroyo chub	<i>Gila orcutti</i>	FSS, CSC	Slow-moving warm streams in Southern California	Recorded in SAR, between Seven Oaks and Prado Dams, and in several tributaries to the SAR in Riverside and San Bernardino Counties (Swift et al., 1993).
<b>Amphibians</b>				
Arroyo southwestern toad	<i>Bufo californicus</i>	FE, CSC	Semi-arid regions, riparian habitats and intermittent steams, desert washes, with sandy streambeds with cottonwood, sycamore, and willow trees.	Known to occur within the both upstream and downstream of the Seven Oaks dam.
California red-legged frog	<i>Rana aurora draytonii</i>	FT, CSC	Aquatic-riverine, ponds, lakes, ephemeral drainages	Suitable habitat occurs within the project area primarily along tributaries to the SAR. A small amount of habitat also occurs in the SAR mainstem at the uppermost reaches of the project area. During surveys for the Southern California Edison in 1996, no species were detected in the mainstem

### 3. AFFECTED ENVIRONMENT

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Project area
			(USACE 1997).	
Foothill yellow-legged frog	<i>Rana boylii</i>	FSC, FSS, CSC	Aquatic-riverine, foothill yellow-legged frogs live in small, sometimes seasonal pools and slow-moving creeks, preferring regions with rocky cover. Commonly found in streams with rocky beds	No species has been reported from the project area. Suitable habitat does exist in the foothills and lower mountain slopes of the SAR canyon.
Mountain yellow-legged frog	<i>Rana muscosa</i>	FE, CSC	Restricted to southern California commonly inhabit streams at elevations ranging from 1,200- 7,000 feet	Suitable habitat occurs. Not observed during the field surveys.
Western spadefoot toad	<i>Spea hammondii</i>	FSS, CSC	Sandy or gravelly soil found in valley, grasslands, chaparral, and sage scrub	No known occurrences in the project area above the SOD. This species was found in the percolation ponds on the alluvial floodplain below the SOD (USACE 1997).
Reptiles				
Flat-tailed horned lizard	<i>phrynosoma mcallii</i>	CSC	sparsely vegetated gravelly habitats and mud hills	Suitable habitat occurs for this species within the project area. Species was observed within the alluvial sand scrub nearby Warms Springs tributary to the SAR during the field survey in 2006.
San Diego horned lizard	<i>Phrynosoma coronatum blainvillii</i>	FSS, CSC	Inhabits coastal sage scrub, chaparral in arid and semi-arid climates. Prefers friable, rocky, shallow, sandy soils.	Suitable habitat for the species exists within the project area. This species was observed upstream of the Dam in 1994 (SCE 1994), and both upstream and downstream of the SOD in 1995 (SCE 1995).
Orange-throated whiptail Lizard	<i>Cnemidophorus hyperythrus beldingi</i>	FSS CSC	Prefers coastal scrub, chamise-redbank chapparal, mixed chaparral, and valley foothill hardwood habitats	Suitable habitat exists throughout the project area, but not observed during several survey efforts (USFWS 1988).
Southwestern pond turtle	<i>Clemmys marmorata pallid</i>	FSC, FSS, CSC, BLMS	Aquatic-riverine, ponds, lakes with suitable basking areas	Suitable habitat occurs throughout project area, but species was not observed during field surveys. Within Riverside County, the southwestern pond turtle generally ranges from the Santa Ana River, to Chino Creek, along the eastern slopes of the Santa Ana Mountains and Elsinore Mountains, south to the Temecula River at I-15 (Brattstrom and Messer, 1988).
Two-striped garter snake	<i>Thamnophis hammondi</i>	FSS, CSC, BLMS	Occur in perennial and intermittent streams that have rocky beds and are bordered by willow thickets or other dense vegetation.	Suitable habitat exists throughout project area. Several individuals of this species were observed in the project area upstream of the dam during 1992 (SCE 1995), 1993 (CNDDDB), and 1996 (Dr. R. Fisher, pers. Comm.).—(USACE 1997).
San Bernardino ring-neck snake	<i>Diadophis punctatus modestus</i>	FSS	Prefers moist habitats including forests, grasslands, rocky wooded hillsides, chaparral, into upland desert along streams;	Suitable habitat may occur in the upper extent of the project area. A few individuals were observed in the project area in 1992 (SCE 1995).

### 3. AFFECTED ENVIRONMENT

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Project area
			sea level to ca. 7,000 feet	
Southern rubber boa	<i>Charina bottae umbratica</i>	ST	Occurs in conifer forests near streams and meadows	Suitable habitat may occur in the project area. Known from several localities in the San Bernardino Mountains in San Bernardino County, near Idyllwild in Riverside County, and on Mount Pinos in Kern County.
Silvery legless lizard	<i>Aniella pulchra pulchra</i>	FSC CSC	Prefers soft sandy substrate associated with sandbar, beach, or dune habitat	Suitable habitat may occur in the project area but species not detected at time of field survey.
Coastal rosy boa	<i>Lichanura trivirgata roseofusca</i>	FSS	Prefers a variety of desert and semi-desert habitats, rocky substrates, chaparral, hillsides, and canyons	Suitable habitat may occur in the project area but species not detected at time of field survey.
San Bernardino Mountain king-snake	<i>Lampropeltis zonata parvirostris</i>	FSS CSC	The known elevations for this species extends from ca. 1,200 feet) to ca. 8,000 feet)	Suitable habitat occurs in the project area. Endemic to the San Gabriel, San Bernardino, and San Jacinto mountains of southern California. This species was not detected during field surveys.
Birds				
California condor	<i>Gymnogyps californianus</i>	FE, SE, DFGFP	Requires vast expanses of open savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Nests in cliffs. May forage up to 100 miles from nest and roost sites	Potential foraging habitat occurs in the project area. No occurrences were observed in the project area.
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT, SE, DFGFP	Winters at lakes, reservoirs, river systems, and some rangelands and coastal wetlands. Breeding habitats include mountainous regions near reservoirs, lakes and rivers.	Potential foraging habitat occurs in the project area. No occurrences were observed in the project area.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	FE	Obligate riparian species that breeds along rivers, streams, wetlands, and other aquatic-associated habitats such as extensive riparian woodlands with water-filled creeks, or channels and scattered overgrown clearings	Suitable habitat occurs in the project area. No occurrences were observed in the project area.
Least Bell's vireo	<i>Vireo bellii pusillus</i>	FE, SE	For breeding, least Bell's vireos prefer riparian woodlands that combine a dense understory with a tall canopy. Their small cup-shaped nests are made from plant material and are typically placed on slender	Potentially suitable habitat occurs in the project area. No least Bell's vireos were detected at the time of survey.

### 3. AFFECTED ENVIRONMENT

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Project area
			branches approximately two or three feet above the ground.	
Coastal California gnatcatcher	<i>Polioptila californica californica</i>	FT, CSC	Coastal sage scrub plant community, occasionally chaparral	Potentially suitable habitat occurs in the project area. This species was not detected at the time of survey.
American peregrine falcon	<i>Falco peregrinus anatum</i>	SE, FSS, CDFS, DFGFP	Wetlands, coastal areas, bays	Potential foraging habitat occurs in the project area. No occurrences were observed in the project area.
Yellow warbler	<i>Dendroica petechia brewsteri</i>	CSC, FWSMC	Riparian habitats	Suitable habitat occurs in the project area. No occurrences were observed in the project area at time of surveys.
Tricolored blackbird	<i>Agelaius tricolor</i>	FSC, CSC	Emergent wetland, marsh, riparian habitat	Suitable habitat occurs in the project area. No occurrences were observed in the project area.
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	SE, FWSMC	Floodplain riparian forests below 1,500 ft. Prefers nesting habitat consisting of cottonwood willow riparian forest.	Suitable habitat occurs in the project area but species is not likely to occur within the project area.
Great blue heron	<i>Ardea herodias</i>	CDFS	Aquatic, riverine, lakes, ponds. Roosts and nests colonially in large trees	Potential habitat occurs in the project area. No occurrences were observed in the project area at time of surveys.
Great egret	<i>Ardea alba</i>	CDFS	Aquatic, riverine, lakes, ponds. Roosts and nests colonially in large trees	Potential habitat occurs in the project area. No occurrences were observed in the project area at time of surveys.
White-faced ibis	<i>Plegadis chihi</i>	FSC, CSC	Nests in dense emergent wetland, forages in wet meadows, shallow lacustrine waters, irrigated pasture, and cropland	Suitable habitat does not occur within the project areas. No occurrences were observed in the project area at time of surveys.
Loggerhead shrike	<i>Lanius ludovicianus</i>	FSC, CSC	Prefers open habitats with scattered shrubs, trees, fences and other perches	Potential habitat occurs within the general project area. No occurrences were observed in the project area at time of surveys.
Purple martin (nesting colony)	<i>Progne subis</i>	CSC	Colonial species that requires tree cavities for nesting. Prefers riparian habitats in mountainous regions and lowlands.	Potential habitat occurs within the general project area. No occurrences were observed in the project area at time of surveys.
Bank swallow (nesting colony)	<i>Riparia riparia</i>	ST, CSC	Prefers sandy, vertical bluffs or riverbanks available for the birds to dig their burrows and nest in colonies	Potential habitat occurs within the general project area. No occurrences were observed in the project area at time of surveys.
Mammals				
San Bernardino Kangaroo rat	<i>Dipodomys merriami parvus</i>	FE, CSC	Prefers, sandy soil in alluvial scrub habitat with open vegetation	Potential habitat occurs within the general project area; however, this species was not observed at the time of the surveys.
Townsend's	<i>Corynorhinus</i>	FSC,	Occurs in a variety of	Potential habitat occurs within the general project

### 3. AFFECTED ENVIRONMENT

Species Common Name	Species Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Project area
big-eared bat	<i>townsendii</i>	FSS, CSC	habitats ranging from desert shrub to deciduous and coniferous forests at a wide range of elevations. Will use caves, mines, tree and rock cavities for roosting	area. No occurrences were observed in the project area at time of surveys.
Pallid bat	<i>Antrozous pallidus</i>	CSC, FSS,	This species occurs in low elevation areas in scrubland, woodland, and grassland habitats. Roosting and maternal colonies are typically found in caves, rock crevices, mines, and buildings that provide cool daytime temperatures	Potential habitat occurs within the general project area. No occurrences were observed in the project area at time of surveys.
Western mastiff bat	<i>Eumops perotis californicus</i>	CSC	Roosts in crevices in cliff faces. Known in closed canopy forests, scrub and chaparral communities.	Potential habitat occurs within the general project area. No occurrences were observed in the project area at time of surveys.
Yuma bat	<i>Yuma myotis</i>	CSC	Roosts in crevices in cliff faces, bridges, and tunnels Known in closed canopy forests, scrub and chaparral communities.	Potential habitat occurs within the general project area. No occurrences were observed in the project area at time of surveys.

Sources: CDFG 2003; USWF Animal Species List (2005).

FT = Federally Threatened Species

BLMS = BLM Sensitive Species

FE = Federally Endangered Species

SE = State Endangered Species

FSC = Federal Species of Special Concern

ST = State Threatened species

FSS = USFS Sensitive Species

CSC = California Species of Special Concern

PT= Federally Proposed Threatened Species

DFGFP = CDFG Fully Protected Species

FWSMC = USFWS-protected migratory species

CDFS = California Dept. of Forestry Service

### 3.3. Air Resources

This section presents information on ambient air quality conditions in the vicinity of the project area and identifies potential impacts to air quality as a result of the implementation of the Proposed Action. Sections 3.3.1 and 3.3.2 describe the existing setting as it relates to applicable regulations and air quality, respectively.

#### 3.3.1. General Setting

##### Meteorological Conditions

The climate of South Coast Air Basin is characterized as Mediterranean climate with warm, dry summers and cool winters with seasonally heavy precipitation that occurs primarily during the winter months. Summer typically has clear skies, warm temperatures, and low humidity. A monthly climate summary for the city of Redlands was selected to characterize the climate of the project area. As described in Table 3.3.1-1, average summer (June-September) high and low temperatures in the project area range from 95°F to 57°F, respectively. Average winter

### 3. AFFECTED ENVIRONMENT

(December-March) high and low temperatures in the project area range from 69°F to 40°F. The average annual precipitation range is 13.62 inches with over 74 percent occurring between December and March. Little precipitation occurs during summer because a high-pressure cell blocks migrating storm systems over the eastern Pacific.

**Table 3.3.1-1 Redlands-Dearborn Monthly Average Temperatures and Precipitation**

Month	Temperature		Precipitation Inches
	Maximum	Minimum	
January	65	40	2.98
February	67	43	3.04
March	69	45	2.58
April	75	48	0.81
May	79	52	0.42
June	88	57	0.13
July	94	61	0.10
August	95	62	0.22
September	90	59	0.42
October	81	52	0.50
November	73	44	0.91
December	66	40	1.51

Source: The Weather Channel 2010.

Winds across the Project Area are an important meteorological parameter as they control both the initial rate of dilution and direction of pollutants. The prevailing winds during summer daytimes blow from the southwest; however, winds during summer nighttimes reverse direction, coming from north. During wintertime, dominant winds are ocean winds from the southwest. During the fall season, Santa Ana's hot and dry easterly winds occur. Santa Ana winds last an average of 2 to 3 days for 5 to 10 times every year.

#### Air Quality Standards and Attainment Status

The United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and the local air districts classify an area as attainment, unclassified, or nonattainment, depending on whether or not the monitored ambient air quality data shows compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the project are provided in Table 3.3.1-2.

**Table 3.3.1-2 National and California Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards	National Standards
Ozone (O <sub>3</sub> )	1-hour	0.09 ppm	—
	8-hour	0.070 ppm	0.075 ppm <sup>a</sup>
Respirable particulate matter (PM10)	24-hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>
	Annual mean	20 µg/m <sup>3</sup>	—
Fine particulate matter (PM2.5)	24-hour	—	35 µg/m <sup>3</sup>
	Annual mean	12 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>

### 3. AFFECTED ENVIRONMENT

Carbon monoxide (CO)	1-hour	20 ppm	35 pm
	8-hour	9.0 ppm	9.0 ppm
Nitrogen dioxide (NO <sub>2</sub> )	1-hour	0.18 ppm	0.100 ppm <sup>b</sup>
	Annual mean	0.030 ppm	0.053 ppm
	24-hour	0.04 ppm	0.14 ppm
Sulfur dioxide (SO <sub>2</sub> )	Annual mean	—	0.03 ppm

Source: CARB 2010a.

ppm=parts per million; µg/m<sup>3</sup>= micrograms per cubic meter; “—” = no standard

Notes:

a – The 2008 standard is shown above, but as of September 16, 2009 this standard is being reconsidered. The 1997 8-hour standard is 0.08 ppm.

b – The U.S. EPA is in the process of implementing this new standard, which became effective April 12, 2010. This standard is based on the 3-year average of the 98<sup>th</sup> percentile of the yearly distribution of 1-hour daily maximum concentrations.

c – The 3-year average of the 99th percentile of the daily maximum 1-hour average concentrations.

The Project Area is within the South Coast Air Basin (SoCAB) and within the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Table 3.3.1-3 summarizes the Federal and state attainment status of criteria pollutants for the Project Area based on the NAAQS and CAAQS, respectively.

#### Existing Air Quality

The nearest ambient air quality monitoring stations to the site of the Proposed Action are Redlands-Dearborn for ozone and PM10, and San Bernardino-4<sup>th</sup> Street for PM2.5, carbon monoxide, and nitrogen dioxide. The nearest monitoring stations that monitor sulfur dioxide is the Fontana-Arrow Highway station. The last three years of maximum ambient monitored concentrations from these monitoring stations are provided in Table 3.3.1-4.

**Table 3.3.1-3 Attainment Status for the South Coast Air Basin**

Pollutant	State	Federal
Ozone – 1 Hour	Extreme Nonattainment	N/A
Ozone – 8 Hour		Severe Nonattainment <sup>a</sup>
PM10	Nonattainment	Serious Nonattainment
PM2.5	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO <sub>2</sub>	Nonattainment	Attainment <sup>b</sup>
SO <sub>2</sub>	Attainment	Attainment

Source: CARB 2010b. USEPA 2010a.

N/A – Not Applicable

a – The SCAQMD and CARB in the State Implementation Plan (SIP) revision submitted for USEPA approval in 2008 have requested that the 8-hour ozone nonattainment classification for the SoCAB be revised to extreme; however, USEPA has not yet approved the SIP revision and revised the nonattainment classification.

b – This shows the attainment status for the Federal annual NO<sub>2</sub> standard. The attainment status of the new Federal 1-hour NO<sub>2</sub> standard has not been determined and will not be determined until at least sometime in 2012.

**Table 3.3.1-4 Air Quality Monitoring Summary 2007-2009**

Pollutant	Averaging Time	2007	2008	2009
Ozone (O <sub>3</sub> )	1-hour	0.149 ppm	0.154 ppm	0.145 ppm
	8-hour	0.124 ppm	0.120 ppm	0.122 ppm

### 3. AFFECTED ENVIRONMENT

Respirable particulate matter (PM10)	24-hour	97 µg/m³*	58.0 µg/m³	52 µg/m³
	Annual Average	37.5 µg/m³	27.4 µg/m³	29.0 µg/m³
Fine particulate matter (PM2.5)	24-hour	72.1 µg/m³	43.5 µg/m³	37.8 µg/m³
	Annual Average	18.3 µg/m³	13.5 µg/m³	12.9 µg/m³
Carbon monoxide (CO)	1-hour	3.7 ppm	2.4 ppm	2.5 ppm
	8-hour	2.3 ppm	1.7 ppm	1.9 ppm
Nitrogen dioxide (NO₂)	1-hour	0.08 ppm	0.09 ppm	0.08 ppm
	Annual Average	0.024 ppm	0.022 ppm	0.020 ppm
Sulfur dioxide (SO₂)	1-hour	0.01 ppm	0.009 ppm	0.005 ppm
	24-hour	0.004 ppm	0.003 ppm	0.002 ppm
	Annual Average	0.001 ppm	0.001 ppm	0.000 ppm

Source: SCAQMD 2010, ARB 2010c, USEPA 2010b

This table shows, by comparison with Table 3.3.1-2, that exceedances of the Federal and/or state ozone, PM10, and PM2.5 standards are occurring near the project site. This table also shows that carbon monoxide, nitrogen dioxide, and sulfur dioxide concentrations near the project site are all well below both Federal and state standards.

#### 3.3.2. Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill and the chronically ill, especially those with cardio-respiratory diseases. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

Because of the isolated location of the Dam, there are no human sensitive receptors located in close proximity to the project site. The closest residential neighborhood is located approximately 2 miles west-southwest of the Project Area.

### 3.4. Earth Resources

The following discussion of geology and soils in the Project Area appears in Volume 1, SOD, of the Phase II General Design Memorandum (GDM) on the SAR Mainstem including Santiago Creek, as prepared by the Corps, Los Angeles District, in August of 1988 (USACE, 1988) and is still applicable and relevant with regards to the Proposed Action.

#### 3.4.1. Geology

The Project Area is located in upper SAR canyon, within the southern frontal margin of the San Bernardino Mountains. These mountains are in the eastern part of the Transverse Ranges

### **3. AFFECTED ENVIRONMENT**

physiographic province in southern California, so named because they lie across the grain of adjacent physiographic provinces that are strongly influenced by the northwest-southeast-trending San Andreas fault system. The San Andreas fault system forms a tectonic divide between the Pacific plate, the west, and the North American plate, to the east. The cumulative right-lateral offset movement along this system over the past few million years is estimated to be from 100 to 180 miles.

*Faulting.* In the vicinity of the project, the San Andreas Fault splits into two branches. The Project Area is located in the Wilson Creek block, a wedge of basement rock bounded by the North and South Branches. The Project Area is approximately one mile upstream of the South Branch, which in the recent past has been more active than the North Branch, approximately one-half mile upstream of the Project Area.

*Seismicity and Strong Ground Motion.* The region surrounding the Project Area is seismically active due to the tectonic interaction of the North American plate and the Pacific plate. Relative movement along the boundary between the plates has formed the San Andreas Fault, with the action of the movement being primarily right-lateral strike-slip. The relative movement between the crustal plates as well as the movements within the plates causes release of energy in the form of earthquakes, the magnitude and recurrence interval of which are dependent on various factors relating to fault length and type of movement. It is anticipated that a maximum credible event of Richter magnitude greater than 8 could occur along the San Andreas Fault. Other major faults in the general southern California region can potentially rupture with maximum credible events of magnitude 6.5 to 7.5.

*Surface Fault Rupture.* Although no active fault trace has been discovered at the Project Area, a major earthquake on the San Andreas Fault can be expected to produce sympathetic movement on random shear planes within bedrock under the dam. Assessment of the fault rupture hazard by a recognized technical expert indicates that lateral displacement along the fault plane itself may be on the order of 20 feet, and a conservative design displacement of as much as four feet in any direct at the Project Area from a magnitude 8+ earthquake on the South Branch of the San Andreas fault should be assumed.

*Landsliding and Slope Stability.* Literature search, aerial photo interpretation, and geologic field mapping did not identify widespread or significant land-sliding in the Project Area. However, rock falls and debris flows from the higher and steeper slopes are common. Several slip-surface slope failures were identified and mapped, especially in proximity to the North Branch fault zone and associated Tertiary sediments. Soils in the Project Area have a potential for some mass movements, most of which would consist of the down slope movement of saturated surficial residual soil and loose rock.

#### **3.4.2. Soils**

*Setting.* The surface geology of the Project Area consists mainly of units of terrace deposits (Qt), colluvium (Qc), landslide debris, stream terrace (Qst), and recent alluvium (Qal).

### **3. AFFECTED ENVIRONMENT**

*Terrace Deposits (Qt):* Dissected remnants of at least three generations of Quaternary-age stream terrace deposits (Qt) were identified in SAR Canyon during the field mapping. In the Project Area, the terrace deposits occur as patches of sand, gravel, cobbles, and boulders “hanging” on the walls of the steep-sided SAR canyon. On Government Canyon Ridge, the terraces are more extensive in area. Each generation was identified based upon the elevation of the base of the deposit. No published data was found describing these deposits in detail. According to Shaefer Dixon Associates (1985), these terraces have probably formed in a similar manner to those terrace deposits in the adjacent San Gabriel Mountains that are the result of both tectonic base-level changes and climatic perturbations. The terraces probably developed during the late Quaternary time when conditions were much wetter, and both the San Gabriel and San Bernardino Mountains were being uplifted.

*Colluvium (Qc):* Colluvium (Qc) consists of materials deposited by soil creep, slope-wash, and gravity (talus). Generally, the larger of these deposits are estimated to range from five to ten feet in thickness on the upper slopes to approximately 40 to 50 feet in thickness on the lower slopes. A localized deposit of colluvium at the left abutment is at least 116 feet thick.

*Landslide Debris:* Landslide debris in the Project Area is identified mainly on the basis of topographic expression. Suspect areas were delineated during the detailed aerial photo analysis and later field checked where possible. In the rock terrain north of the North Branch, the areas designated as landslides are predominately rock falls. South of the fault, in the Project Area, the landslide deposits are more characteristically debris flows. In Warm Springs Canyon, landslide masses are typically associated with the thick sections of Tertiary sedimentary rocks (Tmc) that outcrop between the splays of the North Branch of the San Andreas Faults (Shaefer Dixon Associates, 1985).

*Stream Terrace (Qst):* Stream terrace material is composed of streambed alluvium deposited during high flood activity. These materials consist of sand, gravel, cobbles and boulders, similar to Qal, but shows sand stability by surficial cover of fine-grained sediments and vegetation. These interfinger with colluvium (Qc) along edges of the canyons, which occurs when two different types of sediments change laterally from one type to another in the form of interpenetrating wedges.

*Recent Alluvium (Qal):* SAR Canyon is floored by clastic materials eroded from the adjacent highlands and transported down the canyon during various stages of flooding. These materials consist of unconsolidated sand, gravel, cobble, and boulder-size clasts randomly deposited within the 500- to 1,000-foot wide main channel of the canyon.

#### **3.5. Land Use**

SOD is located within the southwest portion of San Bernardino County, east of the City of Highland, north of the City of Mentone, and northeast of the City of Redlands. The reservoir area formed by the SOD is surrounded by the San Bernardino National Forest. Offsite land use surrounding the Project Area includes NFS service roads; SCE facilities including powerhouses (Numbers 1, 2, and 3), a flume system, and transmission lines; and a groundwater well that has been acquired by the non-Federal Sponsors and is currently operated by the Bear Valley Mutual

### **3. AFFECTED ENVIRONMENT**

Water Company. There are also several gauging stations with small structures and powerhouses along the SAR and operated under a Federal Energy Regulatory Commission License. The Bear Valley Aqueduct, which joins the Redlands Aqueduct south of Greenspot Road, conveys water northward towards Big Bear. Additional land use in the general area consists of dispersed recreational activities including hunting, fishing and hiking. There are residential developments approximately 2 miles west of the SOD as well as mixed residential and agricultural uses to the south. The SAR floodplain is a dominating feature that runs south and southwest of SOD.

SOD is operated and maintained by the project sponsors: San Bernardino County Flood Control District, Orange County Flood Control District, and Riverside County Flood Control and Water Conservation District. The Project Area is not within the boundaries of the San Bernardino National Forest; however, the land surrounding the Proposed Action is within the National Forest Service's (NFS) San Bernardino National Forest Strategy Land Management Plan.

#### **3.6. Noise**

This following section discusses the various sources of noise that may be present in the Project Area.

##### **3.6.1. General Setting**

###### **Noise Environment in the Project Area**

Seven Oaks Dam is not visible from any public roads and is relatively isolated and surrounded mostly by National Forest Service Lands. The nearest residences to the dam as part of a larger high density residential development are approximately 2 miles to the west and southwest of the SOD. Noise sources in the area include operation and maintenance vehicle trips, as well as overhead passing aircraft noise. Currently, with respect to operational vehicle noise, operations staff make approximately 30 trips a day up and down Santa Ana Canyon Road on average. SCE staff make approximately 50 trips a day up and down Santa Ana Canyon Road, and other users such as the water districts and CDFW make approximately 20 trips a day up and down the same road.

###### **Sensitive Receptors in the Project Area**

Some land uses are considered more sensitive to elevated noise levels because of the purpose and intent of the use. Places where people are meant to sleep, or places where a quiet environment is necessary for the function of the land use, are normally considered sensitive. For instance, residential areas, schools, places of worship, and hospitals are more sensitive to noise than are commercial and industrial land uses.

Urban development in the area primarily consists of roads, commercial areas, residential homes and Santa Ana River floodplain. The nearest residential development is approximately 2 miles from the Project Area. The Woolly Star Preserve Area (WSPA) is a project mitigation site located on the SAR wash below the dam, north of the river, and could be considered (along with other natural areas) an ecological sensitive receptor.

### **3. AFFECTED ENVIRONMENT**

#### **3.7. Transportation**

Roadways in the Project Area are generally rural in character, although the western portion of the Project Area is subject to continued growth and urbanization pressures. The Project Area includes several different agencies that have control over traffic improvements and general circulation. The City of Highland is on the western side of the Project Area. The City of Redlands is to the south, which includes I-10 and is controlled by the California Department of Transportation (Caltrans). The County of San Bernardino and the NFS control roads in the central and northeastern portions of the Project Area, respectively.

Santa Ana Canyon Road intersects with Greenspot Road within the unincorporated area of San Bernardino County. Santa Ana Canyon Road is an access road that accesses the facilities within Santa Ana Canyon such as the SCE powerhouses and the SOD.

The National Forest Management Plan identifies two roads in the Project Area. One is designated as 1N13 and corresponds to Santa Ana Canyon Road: 1N13 travels up the Santa Ana River channel. According to the Management Plan, this collector road is currently used but is not proposed for long-time preservation. 1N16 intersects with Greenspot Road to the west of Santa Ana Canyon Road and is designated as a current and preferred collector road. These roads primarily provide access to the National Forest for recreation, forest service needs and fire suppression.

Other modes of transportation include the Atchison, Topeka and Santa Fe (AT&SF) Railroad, which owns a railroad line approximately 10 miles to the south west of the SOD. The line travels in a north/south direction generally parallel to I-15. One loop of this line passes through the City of Highland, crosses the Santa Ana River floodplain, and continues to Mentone. The AT&SF railroad sold this line to Metrolink, which provides commuter rail service to the region. It is anticipated that in the future this line will experience increased usage because of commuter rail use.

There are several airports in the region, including the San Bernardino International Airport approximately 6.5 miles to the west and the City of Redlands Municipal Airport located south of the Santa Ana Wash, between Judson Street and Wabash Avenue. The Redlands Municipal Airport is projected to handle approximately 186 daily aircraft.

#### **3.8. Cultural Resources**

##### **3.8.1. Regulatory Setting**

There are two principal methods of locating cultural resources. Before starting a project, a records and literature search is conducted at any number of repositories of archeological site records. The search may show that an archeological, or historical survey had been conducted and some cultural resources were identified. That information may be enough to proceed with the significance evaluation stage of the project. If a conclusion is reached that (1) no previous survey had been done, or (2) a previous survey was either out of date or inadequate, the project

### **3. AFFECTED ENVIRONMENT**

cultural resources expert, an archeologist, will need to carry out a pedestrian surface survey to determine if any cultural resources are within the proposed project boundaries.

After a cultural resource(s) has been identified during a survey or record and literature search the Federal Agency overseeing the undertaking embarks on a process that involves determining if the cultural resource is eligible for listing in the National Register of Historic Places (National Register). Section 106 of the National Historic Preservation Act mandates this process. The Federal Regulation that guides the process is called 36 CFR 800. For a cultural resource to be determined eligible for listing in the National Register it has to meet certain criteria. The resource has to be either minimally 50 years old or exhibit exceptional importance. After meeting the age requirement, cultural resources are evaluated according to four criteria; a, b, c, and d. The National Register criteria for evaluation as defined in 36 CFR 60.4 are:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history.

After a cultural resource has been determined eligible for inclusion in the National Register it is accorded the same level of protection as a property that is included. It then becomes formally known as a “historic property” regardless of age. Historic property status may be applied to individual cultural resources or to a group of cultural resources that are united by a theme or context. The combined historic properties are then designated as either a historic or archeological “district” and the individual elements are called contributors.

#### **3.8.2. Area of Potential Effects**

Since the Area of Potential Effects (APE) for the Seven Oaks Dam Water Quality project is contained within the APE for the Seven Oaks Dam construction project, all cultural resources have been identified and treated for that project.

#### **3.8.3. Cultural Context**

Cultural context was provided in the previous Seven Oaks Dam construction project environmental documentation and will not be repeated here.

#### **3.8.4. Records and Literature Search**

The records and literature search was accomplished as an element of the Seven Oaks Dam construction project. The APE contained the National Register of Historic Places (NRHP) eligible Santa Ana River Hydroelectric System which under a Memorandum of Agreement

### **3. AFFECTED ENVIRONMENT**

among the Corps, the California State Historic Preservation Officer, the Advisory Council on Historic Preservation, Southern California Edison Company and the San Bernardino National Forest an Historic Properties Treatment Plan was developed to mitigate certain impacts to features of the Santa Ana River Hydroelectric System. This included the Historic American Engineering Record (HAER) recordation of the Santa Ana River Powerhouse number 2 which is the only NRHP eligible resource (i.e., historic property) in the APE of the Seven Oaks Dam Water Quality project. Native American coordination was also conducted to achieve compliance for the Dam construction project.

#### **3.8.5. Field Survey**

The entire APE for the proposed Seven Oaks Dam Water Quality project has been previously surveyed in the 1980s by archaeologists who met, at a minimum, the Standards of the Secretary of the Interior.

### **3.9. Socioeconomics**

The Project Area is in the San Bernardino National Forest located within the boundaries of San Bernardino County and is less than 0.5 miles northeast of the City of Highland and eight miles northeast of the City of Redlands. The National Forest area immediately surrounding the Project Area is open space and forest. As a result, the socioeconomic analysis will focus on San Bernardino County and the Cities of Highlands and Redlands. While there are scattered residences within the San Bernardino National Forest, none are in the vicinity of the Project Area.

#### **Population**

As shown below in Table 3.9-1, according to the 2006 American Community Survey (ACS) of the U.S. Census, San Bernardino County had an overall estimated population of 1,999,753, while the Cities of Highland and Redlands had populations of 55,923 and 72,612, respectively. While the City of Redlands has a median age of 33.8, slightly above the County's median age of 30.3, the City of Highland had a median age of 28.6, below the County's median age.

**Table 3.9-1 Population and Median Age  
in Jurisdictions around the Proposed Action**

Jurisdiction	Population	Median Age
San Bernardino County	1,999,753	30.3
Highland	55,923	28.6
Redlands	72,612	33.8

Source: U.S. Census Bureau, 2010a; U.S. Census Bureau, 2010b; U.S. Census Bureau, 2010c

#### **Employment**

According to the California Employment Development Department's March 2010 estimates, the unemployment rate for San Bernardino County was 14.8 percent. Highland and Redlands had unemployment rates of 18.5 and 10.9 percent respectively (CAEDD, 2010).

### **3. AFFECTED ENVIRONMENT**

#### **Housing and Income**

Current housing trends in the Project Area are summarized in Table 3.9.2. As shown in the table, while San Bernardino County as a whole and the City of Highland have vacancy rates well above the California average of 5.89 percent, the City of Redlands has a vacancy rate below the California Average. According to the 2006 ACS, the City of Redlands has a substantially higher 2006 median family income than either San Bernardino County or the City of Highland.

**Table 3.9-2 Housing Profile of Jurisdictions around the Proposed Action**

Jurisdiction	Total Housing Units	Vacancy Rate	Family Income
San Bernardino County	690,234	11.57	\$62,790
Highland	16,695	9.28	\$66,034
Redlands	26,807	4.83	\$79,947

Source: DOF, 2010; U.S. Census Bureau, 2010a; U.S. Census Bureau, 2010b; U.S. Census Bureau, 2010c

#### **Ethnicity**

According to the 2006 ACS, San Bernardino County has a minority population comprising 39.6 percent of the total population. The Cities of Redlands and Highland have minority populations comprising 28 percent and 45.3 percent respectively (U.S. Census Bureau, 2010a; U.S. Census Bureau, 2010b; U.S. Census Bureau, 2010c).

### **3.10. Hazardous and Toxic Materials**

Hazardous materials and the generation of hazardous waste generally raise an environmental concern when altering, changing, or developing land (e.g. industrial or commercial uses such as automotive establishments). Hazardous materials can take the form of petroleum products (including oil and gasoline), automotive fluids (antifreeze, hydraulic fluid), paint, cleaners (dry cleaning solvents, cleaning fluids), and pesticides from agricultural uses, if in significant concentrations. Byproducts generated as a result of activities (industrial, manufacturing, etc.) using hazardous materials such as dry cleaning solvents, oils, and gasoline are considered to be hazardous waste.

To determine the presence of and potential for hazardous materials and/or waste contamination within the Project Area from existing, onsite and surrounding uses, a hazardous materials and waste analysis was conducted. This analysis included a cursory review of existing onsite and surrounding land uses and their associated activities. The analysis also included a review of Federal, state, and local agencies' databases for reported hazardous materials and waste contamination sites within a 1/2-mile radius of the Project Area.

A computerized search of these lists was completed in May 2010 by Environmental Data Resources, Inc. (EDR) for all sites within a 1/2 mile radius of the Project Area. Based on a review of these lists, no potential and/or known hazardous materials, and/or waste sites (including generators, transporters, or sites with registered underground storage tanks), that have the potential to contribute to hazardous contamination within a 1/2-mile radius of the Project Area were identified.

### **3.11. Esthetics**

### **3. AFFECTED ENVIRONMENT**

#### **3.11.1. General Setting**

The Project Area is primarily surrounded by San Bernardino National Forest and some residential urban development approximately two miles away to the south and west of the SOD. The SAR and associated floodplain run to the west and southwest of the dam as well. Urban development in the area primarily consists of roads, commercial areas, residential homes. There are agricultural fields adjacent to the floodplain to the south of the river. SOD is visible from Greenspot Road. As such, the dam was painted to blend with its natural surroundings.

The overall visual character of a site is defined by landforms, water, vegetative patterns and existing man-made modifications that give the site its distinguishing visual qualities. When viewing the dam going north on Santa Ana Canyon Road, in the main visual foreground is the large, tall, rock and earthen dam which is a dominant feature in the steep walled canyon where the dam is located. The tan/brown colored rock dam with the asphalt road which runs back and forth along the face of the dam horizontally as it ascends the top of the dam is in stark contrast to the natural surroundings of the NFS lands that surround it. The landscape behind the dam contains natural landforms including rock outcrops, mountains in the distance as well as vegetated areas and some of the upstream portion of the SAR. Downstream of the dam in the SAR wash is the WSPA, owned by the County Flood Control Districts (San Bernardino, Orange, and Riverside), which is composed of mostly of RAFSS and chaparral communities. Where the SAR crosses Greenspot Road, it is surrounded by agricultural fields, residential and to a lesser extent commercial development. Overall, the Project Area as a whole has a high scenic quality as viewed from public vantage points.

The visual sensitivity of an area is based on the public's expectation of the area and the number of people viewing the area, as well as the duration and dominance of views. The dam is visible from Greenspot Road when looking north from the north-south portion of the road, but is not visible from any other public vantage points. Therefore, the majority of the Project Area is of low visual sensitivity.

#### **3.12. Public Safety**

The main safety issues that would need to be considered for any proposed activity involving SOD would include the potential for dam failure and resultant flooding or other uncontrolled release of water, as well as hazards to operating personnel and the public, particularly during pool rise. Access roads to the pool area are closed to the public and operating personnel must comply with the SOD Safety Plan. The SOD Operations Manager and technical staff make routine inspections of the dam to assure safety and operating reliability. Staff utilizes a checklist used to aid in discovering and correcting problems that could lead to dam failure or uncontrolled release of water.

#### **3.13. Recreation**

Recreational uses are an integral component of the National Forest, with an emphasis on passive recreation such as hiking, exploration, and equestrian uses. Portions of the forest are designated

### **3. AFFECTED ENVIRONMENT**

in the Forest Management Plan as being closed to motor vehicles year-round. As previously noted, NFS Roads 1N13 and IN16 lead from Greenspot Road into the forest and provide access for a variety of recreational uses. Access into the canyon has been closed upstream of the SOD since its construction. The closest developed recreational uses within the forest are camp sites within Mill Creek and upstream of the SOD within Barton Flats. The Santa Ana Divide Trail to the north and the Morton Ridge Trail to the south are also near SOD.

Recreational uses are prevalent downstream of the SOD. The General Plans for the cities of Highland and Redlands both identify the SAR Wash as area for recreational uses such as hiking and equestrian uses. In particular, the City of Highland's General Plan includes the Planned Development, Open Space, and Agriculture/Equestrian designations. The Planned Development designations allows for all residential land uses, as are support uses which includes open space and recreation; the purpose of the Open Space designation is to preserve natural open space, utility corridors, water conservation facilities, sensitive habitat areas, and passive recreation areas for the protection of environmental values, natural resources, views, recreation, aesthetics and public safety; and the Agriculture/Equestrian designation is appropriate for rural and equestrian-oriented development with light agricultural uses permitted. (City of Highland, 2006)

The WSPA consists of mitigation lands set aside for protection, preservation, and enhancement of habitat that support the SAR woolly star, slender-horned spineflower, and SBKR. Therefore, public access and recreational uses in the WSPA are prohibited.

## **4. ENVIRONMENTAL CONSEQUENCES**

### **4. ENVIRONMENTAL CONSEQUENCES**

The Proposed Action involves an operational modification of the existing Water Control Plan. Specifically, during flood season, the debris pool will only be built at the start of a runoff event, and then drained as quickly as possible during the recession or conclusion of the runoff event. The dam's flood damage reduction capability would not be reduced. Moreover, this proposed modification does not change the existing plan's ability to allow for higher flow releases as necessary to mitigate operational impacts (to benefit the WSPA and/or SAS when hydrologic and ecological conditions warrant and all threat of any subsequent flood runoff has passes). The water available for such environmental releases from SOD would still need to come from the "Intermediate", the "Main Trash Rack", and the "Flood Control" pools. (Water within or below the debris pool elevation could not be released at a high enough rate to provide the desired ecological benefits.) No other modifications to the original Water Control Plan are currently proposed. The 2014 WCP will be a "non-structural" plan and therefore most environmental resources are expected to remain unaffected, or impacts would be less than significant. Some improvements to water quality are anticipated.

The following subsections analyze potential changes or impacts to the environmental resources under the Proposed Action.

#### **4.1. Water Resources**

##### **4.1.1. Significance Criteria**

An impact to water resources and hydrology would be considered significant if it meets one or more of the following significance criteria:

- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality
- 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 that would not support existing land uses or planned uses for which permits have been granted)
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion, siltation, or flooding, on- or off-site
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, or place within a 100-year flood hazard area structures that would impede or redirect flood flows
- 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
- Inundation by seiche<sup>2</sup>, tsunami, or mudflow

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<sup>2</sup> A seiche is a large wave generated in an enclosed body of water in response to ground shaking.

#### **4. ENVIRONMENTAL CONSEQUENCES**

Impacts related to water resources and hydrology that would be expected to occur under the Proposed Action and the No Action Alternative are discussed below.

##### **4.1.2. No Action Alternative**

Under the No Action Alternative, SOD would continue to be operated according to the current WCP in the Water Control Manual. Water quality would be degraded due to occasional elevated turbidity and organic carbon concentration during the flood season and by extended impoundment in deep storage pools, where anaerobic conditions could develop due to higher temperatures in the reservoir during the non-flood season, as described in ERDC's Water Quality Report (2011).

##### **4.1.3. Proposed Action Alternative**

The Proposed Action includes no construction activities and is limited to changes in the operation of the SOD during the flood season. The purpose of the Proposed Action is to improve water quality conditions in SOD.

Under this changed debris pool operation, it is anticipated that there would be little or no debris pool remaining to drain by the end of flood season (Mar 1<sup>st</sup>). Any pool that may be remaining going into the non-flood season would still be drained on the same schedule which was established under the original plan. Water quality would be improved to some extent due to the decreased timing of water impoundment behind the dam. Furthermore, the ERDC water quality analysis report stated that during the 2010 and 2011 high flow outlet works tests, the extreme high turbidity observed in the immediate downstream reaches below SOD was not generated within the pool, but was due largely to re-suspension of scour of bed and bank material in the SAR channel.

The Proposed Action would not result in impacts to any of the significance criteria described above. The Proposed Action would improve water quality and would not violate any water quality standards or waste discharge requirements. Similarly, the Proposed Action would provide benefits to groundwater supplies and recharge with improved water quality conditions. The Proposed Action involves an operational change in that the maximum release rate within the debris pool is up to 500 cfs and releases would only be made only after passing of the runoff event. The Proposed Action, therefore, would not result in impacts to the remaining criteria: altering 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 substantial erosion, siltation, or flooding, on- or off-site, create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, place housing within a 100-year flood hazard area, or 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, increase inundation by seiche, tsunami, or mudflow.

#### **4.2. Biological Resources**

## **4. ENVIRONMENTAL CONSEQUENCES**

### **4.2.1. Significance Criteria**

An evaluation of whether an impact on biological resources would be substantial must consider the resource and how that resource fits into a regional or ecological context. Impacts are sometimes locally important but not significant because, although they would result in an adverse alteration of existing conditions, they would not substantially diminish nor result in the permanent loss of an important resource on a population-wide or region-wide basis.

Direct impacts occur when sensitive biological resources are altered, disturbed, destroyed or removed during the course of project activities. Indirect impacts occur when project activities affect biological resources without direct physical disturbance or occur at a later point in time as a result of project activities. Both direct and indirect impacts can be classified as either temporary or permanent, depending on the duration of the impact. Temporary impacts may be considered to have reversible effects on biological resources. Permanent impacts are those impacts resulting in the irreversible removal of biological resources, such as the permanent removal of habitat.

Impacts associated with the current operations at SOD were previously analyzed in the 1988 SEIS. As such, this section strictly focuses on impacts that could potentially occur as a result of implementation of the Proposed Action. The Proposed Action would be limited to modifications to the current water release schedule in the “debris pool” during the flood season for the purpose of improving water quality. During the flood season, the “debris pool” will only be built at the start of a runoff event, and then drained as quickly as possible during the recession or conclusion of the runoff event. Within the debris pool, the rate of release change can go up to a maximum of 500 cfs. In addition, there’s also a minor change to the “sediment pool” operation, as the original Water Control Plan’s requirement to restrict flows to 3 cfs beginning 1 October to start the building of the seasonal debris pool will no longer apply. The rate of releases during a flood event, and general regulation/operation of the dam during the non-flood season, will not change from what was described in the 1988 SEIS and provided in the 2003 Water Control Manual. As stated in the Introduction to this chapter, the modified WCP still retains the ability to make “environmental releases” as necessary to benefit downstream resources.

An impact to biological resources would be considered significant if it met any of the following significance criteria:

- An adverse effect on a population of a threatened, endangered or candidate species or the loss or disturbance of important habitat for a listed or candidate species.
- A net loss in the habitat value of a sensitive biological habitat or area of special biological significance.
- Substantial impedance to the movement or migration of fish or wildlife.
- Substantial loss to the population of any native fish, wildlife or vegetation. For the purpose of this analysis, substantial is defined as a change in a population or habitat that is detectable over natural variability for a period of 5 years or more.
- Substantial loss in overall diversity of the ecosystem.

## **4. ENVIRONMENTAL CONSEQUENCES**

### **4.2.2. No Action Alternative**

Under the No Action Alternative, SOD would continue to be operated according to the original Water Control Manual. The mitigation strategy that was presented as part of the 1988 SEIS and updated in the 2002 BO, including the purchase and management of preservation lands, would continue to provide compensation for impacts to biological resources.

### **4.2.3. Proposed Action Alternative**

This section provides an analysis of impacts to biological resources that would be expected with implementation of the Proposed Action. Impacts are discussed based on consideration of the significance criteria listed above.

#### **4.2.3.1. Vegetation and Habitat**

##### ***Upstream of Dam***

The 1988 SEIS provided mitigation for the loss of all vegetation within the 50-year flood pool elevation of 2,425 feet. Impacts associated with the loss of vegetation would not exceed those that were analyzed in the 1988 SEIS. Furthermore, it is anticipated that all vegetation that would be subject to impacts resulting from inundation would be subject to mortality, regardless of the temporal degree to which water is impounded above SOD. Therefore, implementation of the Proposed Action and associated modifications to the scheduled impoundment and release of waters above SOD would result in no additional impacts and no new mitigation would be required.

##### ***Downstream of Dam***

“Debris pool” operational releases during the flood season as part of the Proposed Action are not expected to have any impacts to the vegetative communities downstream. The rate of release is expected to be up 500 cfs, of which some or all of the flows may be diverted or infiltrated into the riverbed as the flow travels downstream. Little change in the water surface elevation and velocity of flow from the releases is expected, which would inundate or uproot vegetation. Therefore, substantial impacts to the vegetative communities downstream of SOD would not be expected and no new mitigation would be required.

##### **Special-Status Plant Species**

Federally/State Listed Plant Species. Implementation of the Proposed Action would not result in adverse effects to the federal or state listed plant species both upstream and downstream of the dam, including woolly star and slender-horned spineflower. Most of the floodplain that supports this sensitive vegetation occurs on mid to upper level alluvial benches well above the water surface elevations. Therefore, populations of these species are not expected to be affected and no mitigation would be required.

#### **4. ENVIRONMENTAL CONSEQUENCES**

CDFW Special Plants. The Proposed Action (elimination of a full-time debris pool) would not adversely impact any CDFW special plant species. Most of the floodplain that supports this sensitive vegetation occurs on mid to upper level alluvial benches well above the water surface elevations therefore would not be subjected to extended periods of inundation. The 1988 SEIS included the preservation and management of approximately 764 acres of lands in the upper SAR wash area, designated as the WSPA. Preservation and management of these lands would incidentally benefit the State special status species (Plummer's mariposa lily and Robinson's pepper-grass). Implementation of the Proposed Action is not expected to result in additional impacts to these species compared to those that would occur under the current Water Control Manual and no new mitigation would be required.

The 2002 BO for SOD operations included a requirement to enable large releases from the dam when and if necessary to sustain endangered species habitat within the WSPA. This requirement was incorporated into the 2003 WCM, and the proposed modification retains that capability. The Final MSHMP, which was prepared in coordination with USFWS and other resource agencies and stakeholders, identifies a detailed strategy and plan of action for monitoring habitat conditions and implementing management measures as needed, which may include “environmental releases” from SOD.

Evaluations of, and adjustments to, the environmental regulation plan will be made, as necessary, during the implementation of the 2014 WCP for any impacts to listed species and/or habitat.

##### **4.2.3.2. Wildlife**

Habitats associated with the Project Area both above and below the SOD and adjacent areas support a variety of both common and special-status wildlife species. Inundation elevations and the rates of release flows would be consistent with those analyzed in the 1988 SEIS and specified in the Water Control Manual. The primary differences would be elimination of the “full time” debris pool during the flood season. The 1988 SEIS addressed and provided mitigation to compensate for all impacts to wildlife associated with construction and operation of SOD. Impacts to wildlife associated with the Proposed Action are discussed in greater detail below.

##### **Wildlife Movement**

The region surrounding the Project Area, particularly the SAR corridor and associated tributaries has historically provided important seasonal migration routes for mule deer and fish, among other species. It is recognized that construction of SOD introduced a substantial barrier for wildlife movement for species restricted to the stream corridor between the mountainous San Bernardino National Forest and the lower valley below. Operational activities associated with SOD have also limited the ability of some species to move through the area as adjacent uplands are exposed and become degraded due to inundation from water impoundment. However, with implementation of the Proposed Action, by not holding a “full time” debris pool during the flood season, the adjacent upland habitat conditions may improve due to shorter inundation periods of water impoundment, thereby allowing greater wildlife movement. Suitable open space is still expansively available in areas surrounding SOD, which would support the passage of most terrestrial wildlife species, including mule deer. Water releases below the SOD are not likely to result in substantial barriers to wildlife movement. Continued water releases after each major runoff event as part of the Proposed Action, would not hinder movement for species with limited

#### **4. ENVIRONMENTAL CONSEQUENCES**

dispersal ability as the releases would not substantially change water surface elevation and flow velocity along the SAR. As such, implementation of the Proposed Action would not result in impacts to terrestrial wildlife movement and no additional mitigation would be required.

Trout are also known to spawn throughout the SAR immediately surrounding SOD (Corps, 1988). The 1988 SEIS states that construction and operation of SOD would permanently restrict the self-sustaining capacity and limit the adult range of the productive brown trout fishery located along this stretch of the SAR due to increases in water temperature, sedimentation, and nutrients, and decreases in dissolved oxygen and flow rates. The Proposed Action would reduce the period of inundation in the dam reservoir and would improve overall water quality and habitat conditions for the trout. Therefore, impacts to the trout are not expected as a result of the Proposed Action and no additional mitigation would be required.

#### **Federally/State Listed and California Fully Protected Wildlife Species**

No Federal or State listed or fully protected wildlife species were detected in the Project Area above the SOD during the April 2010 reconnaissance surveys. Santa Ana sucker, white-tailed kite, coastal California gnatcatcher, and San Bernardino kangaroo rat, are either not expected or have a low potential to occur in Project Area. As discussed above, hydrologic and habitat conditions in the areas below the dam would remain similar to existing flood control operations. The only change from implementation of the Proposed Action is that during the flood season, flows from the “debris pool” would be released downstream during the recession or conclusion of runoff events. And because the releases are made during the flood season, when wildlife species are already exposed to wetted conditions, no additional adverse effects are anticipated. Additional analysis is provided below more specifically for each species.

#### **Santa Ana Sucker (SAS) and Critical Habitat**

Direct and indirect effects to SAS are not known to occur in areas above SOD. This species would likely not be present within close proximity of the Project Area but its critical habitat begins downstream of the dam. The closest occupied habitat known to support existing populations of SAS is the area immediately below the Rapid Infiltration and Extraction Treatment Facility, located approximately 15 miles downstream from SOD.

This analysis focuses on determining whether the hydrologic effects from implementation of the Proposed Action would deviate significantly from the original water control plan (WCP) and whether it would adversely impact the SAS and its critical habitat downstream of the dam. The three elements for consideration are change in water surface elevation, and quantity and velocity of flows. Occasional moderate and high velocity flows from SOD and/or other tributaries or sources are deemed critical for enhancing habitat conditions for the SAS. Some of the benefits include flushing fines downstream and exposing or relocating coarse sediment substrates (i.e., sand, gravels, cobbles) for spawning and foraging.

In comparing the two different operational plans (existing and proposed), little hydrologic change is expected to take place which would directly or indirectly affect SAS and critical habitat (see Table 2.2-1). The original plan includes building and maintaining a debris pool during the flood season by restricting the outflow to 3 cfs. If the pool exceeds elevation 2,200 ft due to a runoff event, the release schedule as outlined in the WCP is followed until the pool is drained back down to the debris pool elevation. At that point, any additional inflow would be

#### **4. ENVIRONMENTAL CONSEQUENCES**

passed through (or a minimum 3 cfs release would be made). In the Proposed water quality plan, the debris pool would only be built during a runoff event and drained completely upon passing of the runoff event. Similar to existing conditions, if the debris pool exceeds elevation 2,200 ft due to a runoff event the currently identified release schedule is followed until the debris pool elevation is reached. Then, under the proposed plan, water would continue to be drained, at rates that can maximize up to 500 cfs until the debris pool is emptied, assuming that no other storm events are on the horizon. All inflow would be passed through the dam. Non-flood season operation would be essentially the same under both plans, following the release rates as identified in the WCP.

During the flood season, operation of both plans in either a normal, wet, or an above average wet year, is not expected to produce any measurable effects on the change in water surface elevation and flow velocity in the river. Continuing releases of up to 500 cfs for a few days or weeks at the end of each storm event would not result in a significant change in water surface elevation or flow velocity in the river downstream. Moreover, the updated water control plan (Proposed Action) would not deviate significantly from the original plan (or current operation) during a normal, wet, or above average wet year, in terms of water availability or presence downstream of the dam during the flood season. Although 500 cfs is the maximum rate of release within the debris pool elevation, some or all of the flows would likely be diverted or infiltrated into the ground within 0.75 mile of SOD, allowing little or no flow to continue further downstream (as is currently the case in-between storm events). Given the scenario, effects on water surface elevation, quantity and velocity in the river would be minimal. The river dynamics would not shift dramatically. Therefore, impacts to the SAS and its critical habitat are not expected to occur due to implementation of the Proposed Action.

##### **Coastal California gnatcatcher**

Direct and indirect effects to this species are not expected to occur. This species is known to be a year round resident below the SOD and has been documented adjacent to the Project Area. Water releases associated with the Proposed Action would not alter baseline conditions for this species nor disrupt breeding in adjacent upland habitat. Therefore, the proposed project would have no affect on this species.

##### **White-tailed kite**

Direct and indirect effects to this species are not expected to occur. This species is known to be a year round resident below the SOD and has been documented adjacent to the Project Area near Cone Camp Road. Water deliveries associated with the Proposed Action would not alter baseline conditions for this species nor habitat utilized by this species. Therefore, the proposed project would have no affect on this species.

##### **Golden eagle**

Direct and indirect effects to this species are not expected to occur. Golden eagle may utilize the Project Area for foraging activities and the steep canyon walls above the Project Area support suitable nesting habitat for this species. Implementation of the Proposed Action would provide more availability of upland habitats that support prey resources for this species when shorter pool inundation occurs. Upstream areas that support potential nesting habitat would not be affected by operational activities associated with the Proposed Action. Implementation of the Proposed

#### **4. ENVIRONMENTAL CONSEQUENCES**

Action would not affect foraging for eagles below the SOD. Access to foraging lands would not be lost and no new disturbance would occur. Adverse impacts to golden eagle and its foraging habitat are not expected to occur and no new mitigation would be required.

##### **Least Bell's vireo**

No direct or indirect impact is expected on least Bell's vireos because the Proposed Action would take place outside the breeding and nesting season. Suitable breeding habitat in the Project Area is patchy and isolated, and no breeding has been detected above SOD. Where inundation does occur, these effects are consistent with those described and mitigated for in the previously described 1988 SEIS. Therefore, there would be no additional impacts to least Bell's vireo associated with the Proposed Action and no new mitigation would be required.

##### **San Bernardino Kangaroo Rat (SBKR)**

No additional direct or indirect effects to this species are expected to occur in areas above or below SOD. This species is known to be a year round resident below the SOD and has been documented in upland habitat across much of the SAR alluvial floodplain. Water releases associated with the Proposed Action would not alter baseline conditions for this species nor habitat utilized by this species.

##### **Other Special-Status Wildlife Species**

Three CDFW species of special concern were detected in the Project Area during April 2010 reconnaissance surveys, including two-striped garter snake, northern harrier, and yellow-breasted chat. Furthermore, the Project Area supports suitable habitat for a variety of other CDFW species of special concern with a moderate to high potential to occur as identified in Tables 3.2.2-1, 3.2.2-2, and 3.2.2-3.

**Fish.** Santa Ana speckled dace is known from the headwaters of the SAR. Arroyo chub is common to portions of the SAR that support permanent water. Although these species were not detected during April 2010 reconnaissance surveys, there is a moderate potential for them to occur in the Project Area. The current impoundment of water behind SOD compromises suitable habitat for this species due to increases in water temperature, sedimentation, and nutrients, and decreases in dissolved oxygen and flow rates. However, implementation of the Proposed Action could help improve water quality condition for the fish and therefore no new mitigation is required.

**Amphibians.** Only one special-status amphibian, western spadefoot, has the potential to occur in the Project Area and may use the area for overwintering, foraging, and breeding. Inundation levels associated with implementation of the Proposed Action would be similar to those under the current Water Control Manual. Although impacts to western spadefoot were not specifically analyzed in the 1988 SEIS, water quality improvement activities included in the Proposed Action would be conducted at inundation levels within the authorized flood pool. The 1988 SEIS addressed and provided mitigation to compensate for all impacts to wildlife associated with construction and operation of SOD.

In portions of the Project Area that occur below the SOD, this species is likely associated with the margins of the various percolation basins, shallow depressions where rainwater collects, and small streams and drainages. Implementation of the Proposed Action during the flood season

#### **4. ENVIRONMENTAL CONSEQUENCES**

would reduce the time water is present in the existing canals and percolation basins. However, overall habitat conditions would remain similar to what they normally experience during the winter months under wet and rainy conditions. Therefore the Proposed Action would not likely affect this species and no new mitigation is required.

**Reptiles.** A total of six special-status reptile species, including silvery legless lizard, orangethroat whiptail, red-diamond rattlesnake, California mountain kingsnake, coast horned lizard, and two-striped garter snake, are known to occur or have a moderate to high potential to occur in the Project Area. The 1988 SEIS recognized two of these species, orangethroat whiptail and coast horned lizard (referred to as San Diego coast horned lizard in that document) as residents in habitat above SOD. The 1988 SEIS also identified impacts to these species, as well as other herpetofauna, that include the potential drowning of adult and juvenile individuals associated with seasonal flooding behind the dam and post-flood changes in habitat from sedimentation. Implementation of the Proposed Action is not expected to result in additional impacts to special-status reptile species or habitat that was not disclosed in the 1988 SEIS. Any impacts would be considered less than significant and no additional mitigation is required.

**Birds.** Two special-status bird species were detected in the Project Area during April 2010 surveys, including northern harrier and yellow-breasted chat. The Project Area also supports suitable habitat for loggerhead shrike, and there is a moderate potential for that species to occur. Table 3.2.3 Known and Potential Occurrence of Special-Status Wildlife Species also contains a list of the sensitive bird species that have a moderate to high potential to occur in the Project Area. The 1988 SEIS indicated that construction and operation of SOD would result in permanent losses to bird habitat and provided mitigation to compensate for all impacts to wildlife, including avian species. Furthermore, all Proposed Action activities would be subject to the Migratory Bird Treaty Act and would not substantially reduce habitat values, restrict home ranges, or cause regional populations to drop below self-sustaining levels for avian species. The Proposed Action would take place during the flood season (October 1 to March 1), outside of the breeding and nesting season. Therefore impacts would be less than significant and no additional mitigation is required.

**Mammals.** Several special-status mammals, including San Diego black-tailed jackrabbit, San Diego desert woodrat, Northwestern San Diego pocket mouse, Los Angeles pocket mouse, and American badger, are known to occur or have a moderate to high potential to occur in the Project Area. Sensitive bats that may occur include pallid bat and western mastiff bat. The 1988 SEIS states that impacts to small mammals would be less than significant because rodent and small mammal populations utilizing habitat associated with SOD are comparatively small. The Proposed Action would only include modifications to the current water capture and release regime during the flood season and would not increase the amount of habitat lost to these species. The species and habitat would have already been subject to the winter rains. The water quality improvement activities included in the Proposed Action would be conducted at inundation levels below those that were previously discussed in the 1988 SEIS. Therefore, implementation of the Proposed Action would result in less than significant impacts to special-status mammals or habitat and no additional mitigation is required.

##### **4.3. Air Resources**

## 4. ENVIRONMENTAL CONSEQUENCES

The Proposed Action does not include any construction or major changes to the current operational activities, generating no direct air pollutant emissions. Therefore, this air quality assessment is a qualitative analysis of indirect air quality impacts that may result as a consequence of implementation of the Proposed Action. This would primarily be related to occasional increased operational requirements, and possible benefits associated with reducing the potential for anaerobic conditions in the dam reservoir to develop.

### 4.3.1. Significance Criteria

Air Quality impacts could be significant if the alternatives:

- 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 non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)
- Expose sensitive receptors to substantial pollutant concentrations
- Create objectionable odors affecting a substantial number of people

### 4.3.2. No Action Alternative

Under the No Action Alternative, SOD would continue to be operated according to the existing Water Control Manual. Air quality impacts associated with the Water Control Manual were evaluated in the 1988 SEIS.

### 4.3.3. Proposed Action Alternative

The Proposed Action does not require any construction and therefore is not expected to generate any air pollutant emissions. Incidentally, air quality may improve with implementation of the Proposed Action. During the flood season, the debris pool will only be built at the start of a runoff event, and then drained as quickly as possible during the recession or conclusion of the runoff event. Water impoundment for an extended timeframe (during non-flood season) will not occur, thereby reducing the potential for odor impacts surrounding the Project Area due to anaerobic decomposition during the non-flood season.

**Air Quality Emission Impacts.** The SCAQMD has regional and localized thresholds of significance for daily construction and operation emissions. The Proposed Action does not require any construction. The Proposed Action may require one additional part-time employee and this additional employee's vehicle commute would result in a minor increase in air emissions. Therefore, the project would not have any major direct or indirect air pollutant emissions except for one additional employee vehicle and would not exceed the SCAQMD's significance thresholds.

#### **4. ENVIRONMENTAL CONSEQUENCES**

**Toxic Air Contaminants.** There are no established ambient air quality standards for toxic air contaminants and the Proposed Action would not emit any toxic air contaminants since there are no activities requiring combustion of fuels and oils, or any other industrial activities that could emit toxic air contaminants. Therefore, no impacts associated with toxic air contaminants would occur.

**Odors.** Since the Proposed Action involves letting water through the reservoir and draining the debris pool after runoff events during the flood season, the chance for anaerobic decomposition and odor-emitting gases would be reduced.

**Federal General Conformity Rule.** In addition to regional and local significance criteria, the Federal General Conformity Rule applies to those areas in nonattainment of the NAAQS or with an attainment maintenance plan per Section 176(c) of the Clean Air Act Amendments (CAAA) of 1990. A full determination is not required if the Proposed Action causes less than the General Conformity *de minimis* thresholds, and the Proposed Action is not regionally significant. No emissions would exceed the General Conformity *de minimis* thresholds since there are no direct emission sources associated with the Proposed Action as discussed above. A complete conformity analysis is not required for the Proposed Action.

#### **4.4. Earth Resources**

##### **4.4.1. Significance Criteria**

Protection of unique geologic features and minimization of soil erosion are considered when evaluating potential impacts to earth resources and geology, as well as limitations due to potential geologic hazards. An impact to earth resources and geology would be significant if it would meet the following significance criterion:

- Project activities occur on a geologic unit or soil that is unstable or that would become unstable as a result of the project and would potentially result in a landslide, lateral spreading, subsidence, liquefaction, or collapse.

Impacts that would be expected to occur with regards to earth resources and geology under both the Proposed Action and the No Action Alternative are discussed below.

##### **4.4.2. No Action Alternative**

Under the No Action Alternative, the dam would be operated per the 2003 Water Control Plan. The debris pool is held until the end of the flood season, when it is drained on a schedule established in cooperation with the downstream water agencies during the development of the Phase II GDM. There is no affect to earth resources other than what was analyzed in the original EIS/EIR.

##### **4.4.3. Proposed Action Alternative**

The Project Area has high potential for strong ground motion due to its proximity to the San Andreas Fault. Rockslides and debris flows on steeper slopes in the Project Area are common,

#### **4. ENVIRONMENTAL CONSEQUENCES**

but no construction would be required for the Proposed Action. Consequently, no grading or excavation would occur under the Proposed Action to change the stability of the Project Area. Operational activities associated with the Proposed Action would be limited to modifications of water releases from the debris pool during the flood season as dictated by the 2014 WCP. The deviation from the Water Control Manual would not alter the stability of the Project Area and would not result in landslide, lateral spreading, subsidence, liquefaction, or collapse. The Proposed Action would result in no additional impacts to earth resources and geology.

##### **4.5. Land Use**

###### **4.5.1. Significance Criteria**

Land use impacts could be significant if they:

- Are inconsistent or in noncompliance with applicable land use plans or policies,
- Preclude the viability of existing land use,
- Preclude continued use or occupation of an area, or
- Are incompatible with land uses adjacent to or in the vicinity of the proposed project site to the extent that public health or safety is threatened.

###### **4.5.2. No Action Alternative**

Under the No Action Alternative, the proposed changes to dam operations would not be implemented. The No Action Alternative would not preclude or occupy existing land uses, and would not be incompatible with adjacent land use. In addition, the No Action Alternative would not include development; therefore, coordination between agencies would not be required as stated in San Bernardino's, Orange, and Riverside County's General Plan. No impact would occur with the No Action Alternative because there would be no change in Land Use.

###### **4.5.3. Proposed Action Alternative**

###### *Consistency with Applicable Plans and Policies*

Table 4.5.3-1 below lists the applicable plans and policies, and details how the Proposed Action would be consistent with these policies.

**Table 4.5.3-1 Consistency with Applicable Land Use Plans and Policies**

Agency Regulating Land Use	Regulation or Policy	Action Consistent?	Method of Consistency
County of San Bernardino General Plan – Section IV Circulation and Infrastructure	GOAL CI 11. The County will coordinate and cooperate with governmental agencies at all levels to ensure safe, reliable, and high quality water supply for all residents and ensure prevention of surface and	Yes	Implementation of the Proposed Action would be coordinated with the Counties of San Bernardino, Orange, and Riverside, as well as with local jurisdictions.

#### 4. ENVIRONMENTAL CONSEQUENCES

Agency Regulating Land Use	Regulation or Policy	Action Consistent?	Method of Consistency
Element	ground water pollution. CI 11.11 Coordinate with all agencies providing water service and protection to achieve effective local and regional planning.		In addition, the Proposed Action continues to allow for the adjustment of releases above the debris pool to support downstream environmental mitigation and enhancement plans when conditions are warranted. Therefore, the Proposed Action would be consistent with these goals and policies.
County of San Bernardino General Plan – Section V Conservation Element	GOAL CO 5. The County will protect and preserve water resources for the maintenance, enhancement, and restoration of environmental resources. CO 5.1 Because the San Bernardino County Flood Control District is responsible for debris basin construction and maintenance at the base of the mountains, development in these areas will be coordinated with that agency.		
Orange County General Plan – Chapter V. Public Services and Facilities Element	Goal 1 – Provide effective and efficient flood protection throughout Orange County. Objectives 1.1 To implement the improvements for the Santa Ana River Mainstem Project (including Santiago Creek). 1.2 To develop and enhance intergovernmental relations for flood protection programs in Orange County. Policies 1. Santa Ana River Mainstem Project To continue to pursue approval of the Plan and the construction of proposed facilities.	Yes	Implementation of the Proposed Action would be coordinated with the Counties of San Bernardino, Orange, and Riverside, as well as with local jurisdictions. In addition, operation of the Proposed Action would continue to be consistent with the SAR Mainstem Project. Therefore, the Proposed Action would be consistent with these goals and policies.
Orange County General Plan – Chapter IX. Safety Element	Goal 1 – Provide effective and efficient flood protection throughout Orange County. Objective 1.1 To implement the improvements for the Santa Ana River Mainstem Project. Policies 2. To encourage and promote coordination between regional/local flood control agencies and the State/Federal agencies for optimum flood prevention programs and protection devices.		

#### 4. ENVIRONMENTAL CONSEQUENCES

Agency Regulating Land Use	Regulation or Policy	Action Consistent?	Method of Consistency
Riverside County General Plan	<p>Water Supply - Policies            OS 1.1 Balance consideration of water supply requirements between urban, agricultural, and environmental needs so that sufficient supply is available to meet each of these different demands. (AI 3)</p> <p>Floodplain and Riparian Area Management – Policies            OS 5.1 Substantially alter floodways or implement other channelization only as a last resort, and limit the alteration to:</p> <ul style="list-style-type: none"> <li>a. that necessary for the protection of public health and safety only after all other options are exhausted;</li> <li>b. essential public service projects where no other feasible construction method or alternative project location exists; or</li> <li>c. projects where the primary function is improvement of fish and wildlife habitat.</li> </ul> <p>OS 5.2 If substantial modification to a floodway is proposed, design it to reduce adverse environmental effects to the maximum extent feasible, considering the following factors:</p> <ul style="list-style-type: none"> <li>a. stream scour;</li> <li>b. erosion protection and sedimentation;</li> <li>c. wildlife habitat and linkages;</li> <li>d. groundwater recharge capability;</li> <li>e. adjacent property; and</li> <li>f. design (a natural effect, examples could include soft riparian bottoms and gentle bank slopes, wide and shallow floodways, minimization of visible use of concrete, and landscaping with native plants to the maximum extent possible).</li> </ul>	Yes	<p>Implementation of the Proposed Action would be coordinated with the Counties of San Bernardino, Orange, and Riverside, as well as with local jurisdictions.</p> <p>In addition, operation of the Proposed Action would continue to be consistent with the SAR Mainstem Project.</p> <p>There is continued coordination with the resource agencies to avoid impacts to habitats and protected species.</p> <p>Therefore, the Proposed Action would be consistent with these goals and policies.</p>

#### **4. ENVIRONMENTAL CONSEQUENCES**

##### *Preclude the Viability of Existing Land Use*

The Proposed Action involves impounding and releasing water at different intervals than under current dam operations, and does not include construction. As such, implementation of the Proposed Action would not result in the displacement of people, nor the demolition, conversion, or removal of structures. As a result, impacts related to the Proposed Action would be less than significant since they would not alter the land use within the Project Area.

##### *Preclude Continued Use or Occupation of an Area*

The Proposed Action would not preclude access to infrastructure or recreation facilities surrounding the dam. Therefore, no impacts would occur since the Proposed Action would not preclude continued use or occupy an area.

##### *Compatibility with Adjacent Land Uses*

The Proposed Action would be compatible with adjacent land uses from the perspective of both existing uses as well as future uses. Construction of SOD was completed in 1999 and adjacent uses were planned to be compatible with these flood control facilities. As the Proposed Action would change the regulation of water without changing its function, it would be compatible with existing adjacent uses. Implementation of the Proposed Action will contribute to the clean supply of water to local utility providers.

Areas north of the project are within the boundaries of the San Bernardino National Forest and managed by the Forest Service. This project does not involve deviations from the water control manual that would result in submersion of additional Forest Service lands that have not been accounted for in the 1988 EIS. The Corps is not required to obtain any permits from the Forest Service.

#### **4.6. Noise**

##### **4.6.1. Significance Criteria**

An impact to Noise would be significant if it meets one or more of the following significance criteria:

- 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
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

##### **4.6.2. No Action Alternative**

#### **4. ENVIRONMENTAL CONSEQUENCES**

Under the No Action Alternative, the proposed changes to the operation plan would not occur. Dam operation would continue as under current conditions and no changes to the existing noise environment would occur either upstream or downstream of the dam. The No Action Alternative would have no impacts to the existing noise environment in the Project Area.

##### **4.6.3. Proposed Action Alternative**

The Proposed Action does not involve any construction activities or alterations to the existing SOD. It is only limited to changes in the SOD operation for drainage of the debris pool during the flood season. No adverse affect would take place by exposing the public to excessive ground-borne vibration or noise levels. Furthermore, the debris pool releases would be made during the flooding season when the SAR is likely expected to already contain flows and would not result in an increase in ambient noise levels. As a result, the Proposed Action will not result in any significant impacts to the existing noise environment in the Project Area.

#### **4.7. Transportation**

##### **4.7.1. Significance Criteria**

An impact to Transportation would be significant if it would meet one or more of the following significance criteria:

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities

##### **4.7.2. No Action Alternative**

Under the No Action Alternative, the proposed changes to the operation plan would not occur. Dam operation would continue as under current conditions and no changes to the existing Transportation environment would occur either upstream or downstream of the dam. The No Action Alternative would have no impacts on transportation in the Project Area.

##### **4.7.3. Proposed Action Alternative**

Currently on average, Operations staff make approximately 30 trips a day up and down Santa Ana Canyon Road. Southern California Edison staff make approximately 50 trips a day up and down Santa Ana Canyon Road and other users such as the water districts and California Department of Fish and Wildlife make approximately 20 trips a day up and down the same road. (personal com. Lovell, 2010). This activity is not expected to change with the implementation of the Proposed Action and no significant increases in daily traffic are expected to be generated from implementation of the Proposed Action since no construction is involved. Operations and maintenance activities will not result in any conflicts to any plans, ordinances, programs or

#### **4. ENVIRONMENTAL CONSEQUENCES**

congestion management plans. The Proposed Action will not result in inadequate emergency access or increase traffic hazards. Additionally, these activities were fully analyzed in the 1988 SEIS for dam construction. The Proposed Action will therefore not result in any impacts to transportation.

##### **4.8. Cultural Resources**

###### **4.8.1. Significance Criteria**

The current study was completed under the provisions of the National Historic Preservation Act (NHPA) of 1966, as amended (NHPA; 16 United States Code [U.S.C.] 470f). Cultural resources are considered during federal undertakings chiefly under Section 106 of the NHPA through one of its implementing regulations, 36 CFR 800 (Protection of Historic Properties), as well as the National Environmental Policy Act (NEPA). Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of the NHPA. Other relevant federal laws include the Archaeological Data Preservation Act of 1974, the American Indian Religious Freedom Act (AIRFA) of 1978, the Archaeological Resources Protection Act (ARPA) of 1979, and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1989.

Section 106 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, cultural resources must be identified and evaluated; effects to historic properties are reduced to acceptable levels through mitigation measures or agreements among consulting and interested parties. Historic properties are those resources that are listed in or are eligible for the NRHP per the criteria paraphrased below (36 CFR 60.4; Advisory Council on Historic Preservation 2000).

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:

- are associated with events that have made a significant contribution to the broad patterns of our history; or
- are associated with the lives of persons significant in our past; or
- 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
- have yielded, or may be likely to yield, information important in prehistory or history.

Impacts of a project to significant cultural resources that affect the characteristics of any resource that qualify it for the NRHP are considered a significant effect on the environment. Under 36 CFR 800.5(a)(2), adverse effects on historic properties include, but are not limited to:

#### **4. ENVIRONMENTAL CONSEQUENCES**

- physical destruction of or damage to all or part of the property;
- alteration of a property;
- removal of the property from its historic location;
- change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- neglect of a property, which causes its deterioration; or
- transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

##### **4.8.2. No Action Alternative**

Under the No Action Alternative, the proposed Project would not be conducted. No impact would occur.

##### **4.8.3. Proposed Action**

Since the proposed project APE does not contain any historic properties, there would be no impacts.

#### **4.9. Socioeconomics**

##### **4.9.1. Significance Criteria**

The significance of population and expenditure impacts are assessed in terms of their direct effect on the local economy and related effect on other socioeconomic resources (e.g., housing). Socioeconomic impacts would be considered significant if implementation of the Proposed Action would result in:

- Substantial shifts in population trends
- Adverse effects to regional spending and earning patterns
- Overwhelming demand for public services or utilities

The following discussion identifies the potential socioeconomic effects of the Proposed Action on the communities within the vicinity of SOD.

##### **4.9.2. No Action Alternative**

Under the No Action Alternative, SOD would continue to be operated according to the existing Water Control Manual. The No Action Alternative would neither induce population growth nor result in a direct population increase through the need for new employees or construction workers. As such, this alternative would cause no potential socioeconomic impacts.

## **4. ENVIRONMENTAL CONSEQUENCES**

### **4.9.3. Proposed Action Alternative**

No construction would be required for the Proposed Action. Existing workers' duties may be expanded but no substantial change to the region's population would occur as a result of the Proposed Action. Implementation of the Proposed Action would neither place a demand on employment opportunities, housing, or public facilities, nor would it create substantial new employment opportunities, housing, or public facilities in the region. Consequently, the Proposed Action activities would not create socioeconomic impacts within the adjacent communities and no impacts or opportunities would occur.

### **4.10. Hazardous and Toxic Materials**

#### **4.10.1. Significance Criteria**

This section discusses potential safety concerns associated with the Proposed Action and No Action Alternatives. Impacts are assessed according to the potential for increased safety risks to construction personnel, the public, and property. Impacts would be significant if implementation of the Proposed Action:

- Substantially increased risks from hazardous materials and waste handling to the public or the environment.

Impacts that would be expected to occur with regards to hazardous materials and waste handling and disposal under both the Proposed Action and the No Action Alternative are discussed below.

#### **4.10.2. No Action Alternative**

Under the No Action Alternative, proposed changes to debris pool operation to improve water quality would not be implemented. No changes would be made to the quantities and use of hazardous materials on site and no activities under the current operation plan would expose workers to hazardous materials or waste. The No Action Alternative would result in no hazardous materials or waste handling impacts.

#### **4.10.3. Proposed Action Alternative**

Implementation of the Proposed Action would not involve any excavation or grading of soils (beyond existing maintenance practices) and so would not expose personnel to any hazardous materials or waste.

The Proposed Action would not require long-term storage, treatment, disposal, or transport of substantial quantities of hazardous materials. As under the current operation of the Seven Oaks Dam, small quantities of hazardous materials would be stored, used, and handled during Proposed Action activities, including petroleum hydrocarbons and their derivatives (e.g., diesel, gasoline, oils, lubricants, and solvents) to operate personnel vehicles. These materials would be contained within vessels engineered for safe storage. Storage of substantial quantities of these materials along the dam is not anticipated. Furthermore, vehicles may require on-site fueling, or

#### **4. ENVIRONMENTAL CONSEQUENCES**

routine or emergency maintenance that could result in the release of oil, diesel fuel, transmission fluid or other materials; however, the materials would not be used in quantities or stored in a manner that would pose a significant hazard to the public or the workers themselves. Implementation of the Proposed Action would not increase the amounts of hazardous materials stored or used in the vicinity of the dam. Consequently, the Proposed Action would result in no hazardous materials or waste handling impacts.

##### **4.11. Esthetics**

###### **4.11.1. Significance Criteria**

An impact to esthetics would be significant if it meets one or more of the following significance criteria:

- Has a substantial adverse effect on a scenic vista
- Substantially degrades the existing visual character or quality of the site and its surroundings
- Creates a new source of substantial light or glare which would adversely affect day or nighttime views in the area

###### **4.11.2. No Action Alternative**

The No Action Alternative will not result in any impacts to esthetics since no construction or visual changes to the dam or Project Area will occur.

###### **4.11.3. Proposed Action Alternative**

The Proposed Action does not require any construction activities and is limited to changes in the operation of the debris pool for water quality improvement. Therefore, no changes to the existing visual environment will occur. On the contrary, the Proposed Action may improve esthetics in the reservoir by draining the pool during the flood season in order to reduce the chance for algal formation.

The Proposed Action does not result in any alterations to the existing dam, and thus would not have an adverse effect on scenic vistas, damage scenic resources or degrade the visual character of the site and it will not create any new sources of light or glare. As a result, the Proposed Action will not result in any significant impacts to esthetics or visual resources in the Project Area.

##### **4.12. Public Safety**

###### **4.12.1. Significance Criteria**

Public safety impacts would be considered significant if the Proposed Action:

- Results in increased hazards risks to operational personnel or residents downstream of Seven Oaks Dam as a result of dam failure or uncontrolled water release.

## **4. ENVIRONMENTAL CONSEQUENCES**

### **4.12.2. No Action Alternative**

Under the No Action Alternative, the Proposed Action would not be implemented and the dam would continue to operate in its current flood control capacity, and as mentioned above, as long as the structure is licensed and regulated by the DSOD, the risk of dam failure is minimal.

### **4.12.3. Proposed Action Alternative**

Implementation of the Proposed Action would modify the debris pool operation at SOD during the flood season. Building of the debris pool begins at the start of a runoff event and then it would be drained as quickly as possible during the recession or conclusion of the runoff event. The maximum debris pool elevation is at 2,200 feet. Existing access roads leading to the upper canyon would not be inundated during the filling or emptying of the debris pool and therefore safety risks on operational personnel would be minimized. In addition, the Proposed Action would not result in an increase in flows on the SAR because the river would have been saturated or already contains flows during the flood season. The water purveyors may also intercept flows from the dam depending on the quality of water being released and if it's within their diversion capacity.

In addition, in the spring of 2011, gate testing with high flow releases indicated that pool elevation was 2,322 feet, and found no safety risks associated with infrastructure or the rate of release. The Proposed Action is compatible with dam and public safety as the debris pool is drained after every flood event, always allowing for additional reservoir storage at the start of every storm/runoff events during the flood season.

While flooding as a result of a breach in the dam or an uncontrolled water release could potentially result in the loss of life of individuals residing within the city of Highland, the risks of flooding to the local community would be the same as under current conditions. Implementation of the Proposed Action would result in no additional impacts to public safety.

Finally, the structure is licensed and regulated by the Division of Safety of Dams (DSOD). Therefore, the consequence of the dam's failure has low hazard rating potential.

## **4.13. Recreation**

### **4.13.1. Significance Criteria**

Recreation impacts would be considered significant if:

- They would result in an increase in 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.
- The project includes recreational facilities or requires the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

## **4. ENVIRONMENTAL CONSEQUENCES**

### **4.13.2. No Action Alternative**

Under the No Action Alternative, the proposed changes to the operation plan would not occur. Dam operation would continue as under current conditions and no changes to the conditions or use of recreation areas either upstream or downstream of the dam would occur. The No Action Alternative would not result in any population growth that would increase the use of recreational facilities. The No Action Alternative would have no impacts on recreational facilities.

### **4.13.3. Proposed Action Alternative**

The Proposed Action would primarily affect conditions in the debris pool area behind the dam and flows downstream during the flood season. While the Proposed Action would result in changes to downstream flows by letting water pass through, the changes to the SAR is relatively insignificant as the river would have already been saturated or contained flowing waters during the flood season. The water purveyors may also capture some of the flows downstream depending on quality of water, which may in turn decrease the amount of flows in the SAR. As access behind the dam has been closed to the public since the dam's construction, no recreational uses behind the dam would be affected by the Proposed Action. As noted in Section 3.13, the City of Highland's General Plan designations (Planned Development, Open Space, and Agriculture/Equestrian) all allow for and encourage recreation activities. Nonetheless, while the operation plan under the Proposed Action would alter downstream flows from during the flood season (1 October through 1 March) of each year, these changes would not be enough to substantially change conditions for hikers, equestrians, or other downstream recreational users.

The Proposed Action would neither induce population growth nor result in a direct population increase. One new part-time position may be created by the Proposed Action. However, this addition is minor and the Proposed Action would cause no increase in the use of existing neighborhood and regional parks or other recreational facilities.

The Proposed Action would not include the construction of or induce expansion of any recreational facilities. The Proposed Action would not include construction occurring on or directly adjacent to any recreational facilities. Therefore, the Proposed Action would have no impacts on recreational facilities.

## **4.14. Greenhouse Gas (GHG) Emissions**

The state of California has adopted laws and policies directed at regulating and reducing GHG emissions. However, there is no current federal plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Furthermore, the Corps is not subject to California State laws and policies directed at regulating and reducing GHG emissions. Therefore, discussions of GHG are included so that non-federal agencies may use this DSEA/ND to comply with CEQA for agency actions subject to CEQA.

The Proposed Action involves eliminating the "full time" debris pool during the flood season for the purpose of water quality improvements. The Proposed Action does not include any

#### **4. ENVIRONMENTAL CONSEQUENCES**

construction activities. This greenhouse gas assessment is a qualitative analysis of indirect GHG emissions resulting as a consequence of the Proposed Action. The emissions baseline includes existing O&M activities required at the reservoir, and the GHG impacts from the Proposed Action are determined based on the potential increase or decrease from those baseline GHG emission levels. Due to the uncertain and extremely limited nature of indirect GHG emissions, project GHG emissions are not quantitatively evaluated.

##### **4.14.1. No Action Alternative**

The greenhouse gas emissions of the approved project were not discussed in the 1988 SEIS.

**Direct GHG Emissions.** The existing operation and maintenance activities would continue to occur, resulting in the same level of GHG emissions. Therefore, there would be no direct GHG emissions associated with the No Action Alternative. Under CEQA, there would be no impacts to GHG emissions.

##### **4.14.2. Proposed Action Alternative**

**Direct GHG Emissions.** The only direct GHG emissions source for the Proposed Action may be require the use of one additional employee vehicle, and there would be no other direct GHG emissions associated with the Proposed Action. Under CEQA, there would be no impacts to GHG emissions.

**Indirect GHG Emissions.** The overall indirect GHG emissions if any would be *de minimis* and well below the published CARB and SCAQMD draft thresholds of 7,000 or 10,000 metric tonnes per year, respectively. Under CEQA, there would be less than significant impacts to GHG emissions.

## **5. CUMULATIVE AND GROWTH-INDUCING IMPACTS**

### **5. CUMULATIVE AND GROWTH-INDUCING IMPACTS**

A cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time in the proposed activity area. Those actions could be undertaken by various agencies (Federal, state, or local) or private entities. In accordance with NEPA regulations, a discussion of cumulative impacts resulting from actions and projects that are proposed, under implementation, or reasonably anticipated to be implemented in the near future is required.

Cumulative environmental impacts are most likely to arise when a relationship exists between a proposed activity and other projects expected to occur in a similar location, time period, and/or involving similar actions. Projects in proximity to the proposed project activities would be expected to have more potential for a relationship that could result in potential cumulative impacts than those more geographically separated.

Commercial and residential projects located in close proximity to the proposed project site considered to have the potential for creating cumulative impacts in association with the Proposed Action are identified in Table 5-1.

**Table 5-1. Cumulative Projects in the Project Area**

Project Name	General Location	Description
U.S ARMY CORPS OF ENGINEERS		
Multi Species Habitat Management Plan (MSHMP)	The Woolly Star Preserve Area (WSPA) constitutes approximately 764-acres of floodplains downstream of the Seven Oaks Dam near the San Bernardino International Airport and the City of Redlands in San Bernardino County	The MSHMP is developed to include management planning for the WSPA to sustain the Slender-horned spineflower, San Bernardino kangaroo rat, and the Santa Ana River woolly star. The purpose of the document is to support implementation of an effective and science-based adaptive management plan for the three listed species in a manner that is consistent with the conservation measures specified in the 1989 and 2002 BOs.
Multi Species Habitat Management Plan (MSHMP) EA/MND	WSPA	The MSHMP EA/MND is being prepared to analyze potential impacts for implementation of any short and long term species and habitat management measures to sustain the three federally and state-listed species.
COUNTIES OF SAN BERNARDINO, ORANGE, AND RIVERSIDE FLOOD CONTROL AND WATERSHED CONSERVATION DISTRICTS		
Seven Oaks Dam Operations and Maintenance	Dam vicinity	The three project sponsors are the owners and operators of the dam and are required to perform routine maintenance on the dam as per the Water Control and Operations and Maintenance Manual, respectively.

## 5. CUMULATIVE AND GROWTH-INDUCING IMPACTS

Project Name	General Location	Description
CITY OF REDLANDS		
No relevant projects were identified upon review of the City of Redlands Projects List.		
CITY OF HIGHLAND		
Upper Santa Ana River Wash Land Management Plan and Habitat Conservation Plan and Surface Mining Expansion	Boundary begins 1 mile downstream of SOD	The project involves approximately 4,400 acres of wash basin south and west of Greenspot Road. The Upper Santa Ana River Wash Land Management Plan and Habitat Conservation Plan EIR was certified by the San Bernardino Valley Water Conservation District (lead agency) in 2008. The City approved related CUP for the surface mining activity and also certified the related EIR in June of 2009. San Bernardino Valley Water Conservation District is still attempting to obtain approval of the EIS and Take Permit for the required land exchange with BLM.

Source: USACE, 2010

San Bernardino County, 2010, 2011

City of Highland, December 2010

City of Redlands, 2010

### Cumulative Impacts Analysis

#### 5.1. Water Resources

The cumulative impacts for operation/maintenance activities related to water resources and hydrology were determined not to be significant in the 1988 SEIS. The cumulative impacts of the Proposed Action would still remain less than significant because the Proposed Action would not lead to any significant water quality impacts, nor would it combine with any other activities such that water quality would be significantly degraded. On the contrary, implementation of the Proposed Action would lead to improved water quality (i.e., reduced turbidity) in the river where the debris pool would be drained during recession or conclusion of each runoff event.

#### 5.2. Biological Resources

The impacts associated with operation and maintenance activities related to biological resources were determined to be significant in the 1988 SEIS considering implementation of such activities combined with anticipated cumulative impacts that are reasonably certain to occur. Mitigation was provided in the 1988 SEIS to compensate for cumulative impacts to biological resources. This mitigation included preserving and managing specific areas totaling more than 700 acres of suitable habitat for special-status species, including Santa Ana River woolly star, Slender-horned spineflower, and San Bernardino kangaroo rat. According to the 1988 SEIS, these areas were specifically selected based on complementing existing protected lands either already in federal ownership or under federal permit jurisdiction and meeting the criteria of remaining subject to periodic flooding with the project in place. In addition, the mitigation called for preparation of the MSHMP to include species and habitat management planning for the three listed species in the WSPA in a manner that is consistent with the conservation measures specified in the 1989 and 2002 BOs.

## **5. CUMULATIVE AND GROWTH-INDUCING IMPACTS**

The cumulative impacts of the Proposed Action would not introduce additional impacts aside from those analyzed in the 1988 SEIS. As such, implementation of the Proposed Action would not alter the conclusion of the cumulative impacts analysis provided in the 1988 SEIS.

### **5.3. Air Resources**

The cumulative operation/maintenance emissions impacts were determined not to be substantial in the 1988 SEIS, considering the lifetime of the approved project and the minimal maintenance vehicles required. The cumulative impacts of the Proposed Action would still remain less than significant since the Proposed Action would not emit any direct air emissions and because no construction activities are involved. The Proposed Action, on the contrary, may improve air quality by preventing algal formation in the reservoir during the non-flood season as a result of increased temperature, which in turn causes noxious odor in the air. The Proposed Action's contribution to cumulative impacts would be negligible; therefore, the Proposed Action would not alter the conclusion of the cumulative impacts discussed in the 1988 SEIS. The Proposed Action would not contribute to any cumulative impacts to air quality because water quality improvement activities at SOD would not result in any additional air quality emissions than current operations.

### **5.4. Earth Resources**

As described in Section 4.4, no impacts to geological resources would occur from implementation of the Proposed Action. As the Proposed Action would require no grading or excavation, no impacts to soils and geology would occur, and no contribution to cumulative impacts in the region would occur. Therefore, impact of the Proposed Action would be less than significant and would not result in cumulative effects to earth resources.

### **5.5. Land Use**

As discussed in Section 4.5, the Proposed Action would not significantly affect existing land uses. Implementation of the Proposed Action would not result in the inundation of the existing access road leading to the upper canyon and would not contribute to any significant cumulative land use impacts above those associated with current operations.

### **5.6. Noise**

Implementation of the Proposed Action would not increase or change the on-site noise related to existing operations and maintenance activities. As discussed in Section 4.6, impacts due to the Proposed Action were considered to be less than significant. Therefore, the Proposed Action would not make a significant contribution to any cumulative impact to recreation because the proposed debris pool operation would not result in any noise impacts above those associated with current operations.

### **5.7. Transportation**

## **5. CUMULATIVE AND GROWTH-INDUCING IMPACTS**

The Proposed Action involves modification of dam operation at the debris pool level. No construction is required; therefore additional construction-related vehicle trips are not anticipated. The Proposed Action would not result in any increased inundation of the existing access road leading to the upper canyon. Cumulative transportation impacts as a result of the Proposed Action would not be significant and would not result in any transportation impacts above those associated with current operations.

### **5.8. Cultural Resources**

Since the proposed project does not impact any historic properties, there would be no cumulative impacts on cultural resources.

### **5.9. Socioeconomics**

As described in Section 4.9, the Proposed Action would not result in any adverse socioeconomic impacts to adjacent communities or the region. The Proposed Action would not contribute to any cumulative impacts to socioeconomics because the modified dam operations at SOD would not result in any socioeconomic impacts above those associated with current operations.

### **5.10. Hazardous and Toxic Materials**

As discussed in Section 4.10, the Proposed Action would not result in any additional impacts associated with hazardous materials or waste handling and disposal. Therefore, the Proposed Action would not contribute to any cumulative impacts to hazardous materials and waste handling and disposal.

### **5.11. Esthetics**

The Proposed Action would not significantly impact or conflict with visual resources since there are no physical alterations proposed to SOD. The Proposed Action would not contribute to a degradation or alteration of the scenic viewscape. The chance for odor impacts due to anaerobic decomposition will be reduced during the non-flood season as a result of the releases made in the debris pool during the flooding season. The Proposed Action would not contribute to any cumulative impacts to esthetics because there is no modification of structures under the Proposed Action and the existing visual conditions would not be altered.

### **5.12. Public Safety**

As discussed in Section 4.12, the maximum debris pool elevation is 2,200 feet. At this level, the discharge rate could be up to 500 cfs and at least a portion of that discharge could potentially be captured by the downstream water purveyors depending on the turbidity level. The discharge rate is small compared to flow rates of up to 7,000 cfs associated with flooding events. Therefore, the Proposed Action would not contribute to any cumulative impacts to safety and would not result in any impacts above those associated with current operations.

### **5.13. Recreation**

## **5. CUMULATIVE AND GROWTH-INDUCING IMPACTS**

According to the 1988 SEIS, construction of Seven Oaks Dam was not anticipated to impede existing recreation facilities in the vicinity of the dam or include any recreational uses. Similarly, as discussed in Section 4.13, implementation of the Proposed Action would not affect existing recreational uses because there would be no change in use at SOD that would preclude recreational activities in the area. Therefore, the Proposed Action would not contribute to any cumulative impacts to recreation and would not result in any recreation impacts above those associated with current operations.

### **5.14. Greenhouse Gas (GHG) Emissions**

As discussed in Section 4.14, implementation of the Proposed Action would not increase GHG emissions as it would not involve any construction activities and may require the use on one additional employee vehicle. Therefore, the Proposed Action would not contribute to any cumulative impacts to GHG emissions.

## **6. ENVIRONMENTAL COMMITMENTS**

### **6. ENVIRONMENTAL COMMITMENTS/MITIGATION MEASURES**

As discussed in the Section 4 analysis, the Proposed Action would not result in any significant impacts to water resources, biological resources, air resources, earth resources, land use, noise, transportation, cultural resources, socioeconomics, esthetics, hazardous and toxic materials, public safety, public services and utilities, and recreation. Although no significant adverse impacts are expected to water quality (and in fact beneficial effects are anticipated), the Corps and local sponsors (dam operators) will continue to monitor conditions as follows:

#### **6.1. Water Resources**

##### **W-1: Implementation of Water Quality Monitoring Program**

A Water Quality Monitoring Program will be implemented in order to verify that the Proposed Action does not degrade water quality, and to allow for adaptive management of the SOD should water quality problems arise. The Water Quality Monitoring Program will sample chemical, limnological, and bacteriological parameters during each of the months of March through August when water is present in the reservoir pool. The results of the Water Quality Monitoring Program will be analyzed each year in order to determine necessary changes to the monitoring program and/or operation of the Seven Oaks Dam.

## **7. COMPLIANCE AND COORDINATION**

### **7. COMPLIANCE AND COORDINATION**

The Proposed Action has been developed in accordance with the requirements of the environmental statutes and regulations outlined below. Conclusions concerning compliance or responsibility for compliance are identified in italics for each requirement.

#### **Federal Laws and Regulations**

##### *National Environmental Policy Act of 1969 and Implementing Regulations*

This Draft Environmental Assessment has been prepared in accordance with the requirements of NEPA of 1969 (42 USC 4321, as amended) and the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), dated 1 July 1988. NEPA requires that agencies of the Federal Government shall implement an environmental impact analysis program in order to evaluate “major federal actions significantly affecting the quality of the human environment.” A “major federal action” may include projects financed, assisted, conducted, regulated, or approved by a federal agency. NEPA regulations are followed in the preparation of this Draft EA/ND. Federal agencies consider potential environmental consequences of proposed actions in their decision-making process. Under the Regulations for Implementing the Procedural Provisions of the NEPA, Federal agencies are required to prepare an EA or Environmental Impact Statement, which is dependent upon the impacts, resulted from the implementation of a Proposed Action.

Department of Army, U.S. Army Corps of Engineers Regulations (USACE). ER-200-2-2, 33 CFR 230, March 1988. This regulation provides guidance for implementation of the procedural provisions of the NEPA for the Civil Works Program of the USACE. It supplements Council on Environmental Quality (CEQ) regulations 40 CFR 1500-1508, November 29, 1978, in accordance with the CEQ regulations. Wherever the guidance in this regulation is unclear or not specific, the reader is referred to the CEQ regulations. This regulation is applicable to all USACE responsibility for preparing and processing environmental documents in support of civil works functions.

ER-1105-2-100, April 2000, as amended, the Planning Guidance Notebook, provides guidance for conducting Civil Works planning studies and related programs by USACE.

##### *Clean Water Act of 1977 (33 USC § 1251 et seq.)*

The Clean Water Act (CWA) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The definition of waters of the United States includes wetland areas “that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3 7b). Section 401 of the CWA requires Federal agencies to obtain state water quality certification from the state in which the proposed action would take place if impacts to these resources would occur. The proposed activities would not violate state and Federal water quality standards and would be consistent with the CWA. Construction and

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operation of SOD was coordinated with the State Water Resources Board (SWRCB) and the Regional Water Quality Control Board (RWQCB, Santa Ana Region), and the project received an exemption from Section 401 Certification in the 1980s. The proposed change in operations does not result in additional adverse affects to water quality, and would not result in discharge of dredged or fill material, and therefore 401 Certification is not required.

Section 402 establishes conditions and permitting for point-source discharges of pollutants under the National Pollution Discharge Elimination System (NPDES). In California, NPDES permitting authority is delegated to, and administered by, the State Water Resources Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs). No point-source discharges of pollutants would occur under the proposed Action.

Section 404 of the CWA regulates the discharge of dredged or fill materials into the waters of the United States, including rivers, streams, and wetlands, except as permitted under separate regulations by the USACE and the USEPA. The USACE administers the Section 404 permit program. The Proposed Action would not include excavation or construction activities; therefore, dredged or fill materials would not be discharged and Section 404 of the CWA would not apply.

### *Endangered Species Act of 1973, 1988 Amendments (16 USC § 1531 et seq.)*

The ESA protects federally-listed threatened and endangered plant and wildlife species by prohibiting actions that would jeopardize the continued existence of such species, or by minimizing actions that would result in the destruction or adverse modification of any critical habitat of such species. Proposed Action activities would result in no additional impact to Federally-listed species or designated critical habitat, and therefore formal or informal ESA consultation with the U.S. Fish and Wildlife Service is not required. However, the project has been fully coordinated with that agency.

### *Fish and Wildlife Coordination Act, as amended*

This Project is in compliance with the Fish and Wildlife Coordination Act. The proposed project has been fully coordinated with the USFWS, and the Draft EA will be sent to that agency and the California Department of Fish and Wildlife for review. A Coordination Act Report was provided by the USFWS for the original construction and operation of the dam.

### *Migratory Bird Treaty Act of 1972*

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, hunt, capture, kill, or possess or attempt such an action towards any bird listed in wildlife protection treaties between the United States and several countries including Great Britain, Mexico, Japan, and countries that are part of the former Soviet Union. A “migratory bird” includes the living bird, any part of the bird, its nests or eggs. Disturbance of the nest of a migratory bird requires a permit issued by the USFWS pursuant to CFR Title 50. Almost all birds, except for a few nonnative species, are covered by the Act. The administering agency is the USFWS. Numerous waterfowl and other common birds have the potential to occur within or adjacent to the Project. Some of these include yellow-breasted chat, tricolored blackbird and waterfowl such as mallard, American coot, and

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double-crested cormorant. However, the Proposed Action is not expected to result in the loss of these species. The Proposed Action activities would be in conformance with this Act.

### *Clean Air Act*

The USEPA establishes the NAAQS for “criteria pollutants” that are considered harmful to public health and the environment. The limits set by the NAAQS protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly, and they protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Pollutants regulated under these standards include ozone, NO<sub>2</sub>, CO, PM10, PM2.5, and SO<sub>2</sub>. Additional information regarding the NAAQS that are relevant to the Project is provided in Table 3.3.1-2 under Section 3.3.1.

The SCAQMD and the CARB are the responsible agencies for providing attainment plans and meeting attainment with these standards; and the USEPA reviews and approves these plans and regulations that are designed to ensure that the area attains and maintains attainment with the NAAQS.

The Federal project sponsor is responsible for ensuring compliance with the USEPA’s General Conformity regulations that require a determination of conformity with State Implementation Plan for Projects requiring federal approvals if the Project’s annual emissions for nonattainment pollutants are above specified levels.

USEPA has a number of other regulations under the authority of the federal Clean Air Act (such as New Source Review (NSR), Prevention of Significant Deterioration (PSD), Title V permitting program, etc.); however, these regulations for new sources do not directly apply to the Proposed Action because the Action would have no permanent operating stationary emission sources. The USEPA does have on-road and off-road engine emission reduction programs, but these programs do not apply to the project that does not use any on-road or off-road engines.

### *Noise Control Act of 1972 (42 USC § 4901-4918)*

The Noise Control Act directs all Federal agencies to carry out, “to the fullest extent within their authority,” programs within their jurisdictions in a manner that furthers a national policy of promoting an environment free from noise that jeopardizes health and welfare. The USEPA identifies a 24-hour exposure level of 70 dB as the level of environmental noise which will prevent any measurable hearing loss over a lifetime (USEPA, 1974). Levels of 55 dBA (Ldn) outdoors and 45 dBA (Ldn) indoors were identified as preventing activity interference and annoyance. These levels are not standards, criteria, regulations, or goals, and should be viewed as levels, below which there is no reason to suspect that the general population will be at risk from any of the identified effects of noise. The proposed Action’s activities would be consistent with this Act since there will be no new noise sources from implementation of the Proposed Action. Noise impacts due to the Proposed Action are considered to be a less than significant impact.

*U.S. Department of Labor Occupation Safety & Health Administration (29 CFR 1910.95)*

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The U.S. Department of Labor Occupation Safety & Health Administration (OSHA) (29 CFR 1910.95) requires protection against the effects of noise exposure when sound levels exceed those shown in Table 7-1 (OSHA, 2004). Feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table 7-1, personal protective equipment shall be provided to reduce sound levels within the levels of the table. In order to minimize noise impacts, feasible administrative or engineering controls shall be utilized and personal protective equipment shall be provided if necessary to reduce sound levels to comply with the levels listed in Table 7-1. The proposed Action's activities would not conflict with OSHA standards since there are no new noise sources expected to result from implementation of the Proposed Action.

**Table 7-1 Permissible Noise Exposures**

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Source: OSHA, 2004

*National Historic Preservation Act of 1966 (16 USC § 470)*

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on cultural resources eligible for the National Register of Historic Places (National Register). The action must demonstrate compliance with the NHPA, Public Law 89-665; 16 U.S.C. 470-470m, as amended, 16 U.S.C. 460b, 470l-470n, and 36 CFR 800, as amended (August 5, 2004). The proposed project is in compliance.

*Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.*

Executive Order 12898 identifies and addresses disproportionately high and adverse human health or environmental effects resulting from the programs, policies, or activities of Federal agencies on minority populations and low-income populations within the United States. The Order is further intended to provide information access and public participation relating to potential impacts to these populations. The Proposed Action activities would not create socioeconomic impacts within the adjacent communities. There would be no conflict with Executive Order 12898.

*Resource Conservation and Recovery Act of 1976 (42 USC § 6901)*

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Resource Conservation and Recovery Act (RCRA) was enacted to ensure the safe and environmentally responsible management of hazardous and nonhazardous solid waste, and to promote resource recovery techniques to minimize waste volumes. The Proposed Action does not involve the use, handling or disposal of any new hazardous materials not already analyzed in the 1988 EIS/EIR for dam construction. Therefore, the Proposed Action would be consistent with this Act.

### *Hazardous Waste and Solid Waste Amendments Act of 1984 (42 USC § 6901)*

The Hazardous Waste and Solid Waste Amendments Act of 1984 are amendments to the RCRA and the Solid Waste Disposal Act that authorize regulations or require that regulations be promulgated on waste minimization, land disposal of hazardous wastes, and underground storage tanks. There would be no conflict with this Act since the Proposed Action does not involve the use, handling or disposal of any new hazardous materials not already analyzed in the 1988 EIS/EIR for dam construction.

### *Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 USC § 9601)*

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provides a statutory framework for the cleanup of waste sites containing hazardous substances and, as amended by the Superfund Amendments in 1986 and Reauthorization Act, provides an emergency response program in the event of a release (or threat of a release) of a hazardous substance to the environment. CERCLA's goal is to provide for response and remediation of environmental problems that are not adequately covered by permit programs of other environmental laws, such as the CAA, the CWA, the RCRA, and the Atomic Energy Act. There would be no conflict with this Act since the Proposed Action does not involve the use, handling or disposal of any new hazardous materials not already analyzed in the 1988 EIS/EIR for dam construction.

### *Emergency Planning and Community Right-to-Know Act of 1986 (42 USC § 11001)*

This act was included as Title III of the Superfund Amendments and Reauthorization Act. Under Subtitle A of this Act, Federal facilities provide information regarding inventories of specific chemicals used or stored, and releases that occur from these sites, to the State Emergency Response Commission and to the Local Emergency Planning Committee to ensure that emergency plans are sufficient to respond to unplanned releases of hazardous substances. In addition, under Subtitle B of the Act, material safety data sheet reports, emergency and hazardous chemical inventory reports, and toxic chemical release inventory reports must be provided to appropriate state, local, national, and federal authorities. There would be no conflict with this Act since the Proposed Action does not involve the use, handling or disposal of any new hazardous materials not already analyzed in the 1988 EIS/EIR for dam construction.

### *Toxic Substances Control Act of 1976 (15 USC § 2601, et seq.)*

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The Toxic Substances Control Act (TSCA) provides the USEPA with the authority to require testing of both new and old chemical substances entering the environment and to regulate them where necessary. There would be no conflict with this Act since the Proposed Action does not involve the use, handling or disposal of any new hazardous materials not already analyzed in the 1988 EIS/EIR for dam construction.

### *40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule.*

This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tonnes of CO<sub>2</sub> equivalent (CO<sub>2</sub>E) emissions per year. The Proposed Action would not trigger greenhouse gas reporting as required by this regulation.

### *40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule.*

U.S. Environmental Protection Agency proposed on September 30, 2009 to apply Prevention of Significant Deterioration (PSD) requirements to facilities whose stationary source CO<sub>2</sub>E emissions exceed 25,000 tons per year (USEPA, 2009). The Proposed Action would not trigger PSD permitting as required by this regulation.

## **State Regulations**

### *California Environmental Quality Act (CEQA) (California Public Resources Code section 21000 et seq.)*

The California Environmental Quality Act (CEQA) requires state and local agencies to disclose and consider the environmental implications of their actions. It further requires that agencies, when feasible, avoid or reduce the significant environmental impacts of their decisions. This document meets the goals, policies, and requirements of CEQA. Information and analysis to meet CEQA requirements are included within this Draft EA/ND for each resource.

CEQA establishes requirements and procedures for State and local agency review of the environmental effects of projects proposed within their jurisdictions. It further requires that agencies, when feasible, avoid or reduce the significant environmental impacts of their decisions. As per CEQA Guidelines [CCR Title 14, Chapter 3, Section 15225] “the Lead Agency under CEQA may use the federal document in the place of an EIR or Negative Declaration without recirculating the federal document for public review. One review and comment period is enough. Prior to using the federal document in this situation, the Lead Agency shall give notice that it will use the federal document in the place of an EIR or Negative Declaration and that it believes that the federal document meets the requirements of CEQA”

CEQA requires the preparation of an Initial Study (IS) to determine whether a Negative Declaration or Environmental Impact Report should be prepared by a State or local agency for projects that may significantly impact the environment. With respect to this proposed Project, the CEQA Guidelines of 2005 state that “the lead agency may use an environmental assessment or a similar analysis prepared pursuant to the National Environmental Policy Act” to satisfy the

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requirements of the Initial Study [CCR Title 14, Chapter 3, Section 15063]. Nonetheless, an Initial Study Checklist has been prepared to aid and facilitate evaluation of the Proposed Action. The Initial Study (see Appendix A) found that all potential Project impacts could be mitigated to levels that are less than significant and that a Mitigated Negative Declaration is the appropriate environmental document to comply with the CEQA.

### *Air Quality*

CARB also sets the CAAQS for criteria pollutants. These standards include pollutants not covered under the NAAQS, and these are more stringent standards than provided under the NAAQS. Pollutants regulated under these standards include ozone, NO<sub>2</sub>, CO, PM10, PM2.5, SO<sub>2</sub>, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. Additional information regarding the CAAQS that are relevant to the Project is provided in Section 3.1.1. CARB, like USEPA, also has on-road and off-road engine emission reduction programs and a Portable Equipment Registration Program; however, these are not applicable to the project.

### *Water Resources and Hydrology*

### *Porter Cologne Water Quality Control Act*

The Porter Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect State waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The Project Area is located within the jurisdiction of the Santa Ana RWQCB, and is subject to the management direction of the Water Quality Control Plan (Basin Plan) for the Santa Ana Region. In accordance with Porter Cologne, the Basin Plan lists the various beneficial uses of water within the region; describes the water quality which must be maintained to allow those uses; describes the programs, projects, and other actions which are necessary to achieve the standards established in this plan; and summarizes plans and policies to protect water quality. The Proposed Action would be expected to not disrupt current or designated beneficial uses of surface waters.

### *Noise*

The California Office of Safety and Health Administration (Cal/OSHA) regulates employee noise exposure, as mandated by Title 8 of the California Code of Regulations, Group 15, Article 105 §§ 5095-5100. Cal/OSHA stipulates the same requirements as Federal OSHA (above). Additionally, a Hearing Conservation Program must be instituted when employees are exposed to noise levels of an 8-hour time weighted average at or greater than 85 dBA. California Government Code (§65030 *et seq.*) requires each local government entity to implement a noise element as part of their general plan. The California Office of Planning and Research has developed guidelines (OPR, 1990) for evaluating the compatibility of various land uses surrounding a project area as a function of community noise exposure. The proposed Action's activities would not conflict with Cal/OSHA standards.

*California Global Warming Solutions Act of 2006 (AB32).*

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The California Air Resources Board (CARB) has promulgated regulations for mandatory GHG emission reporting to comply with the California Global Warming Solutions Act of 2006 (AB 32 Núñez, Statutes of 2006, Chapter 488, Health and Safety Code sections 38500 et seq.) (CARB, 2008a). The Proposed Action does not include any direct GHG emission sources that would be subject to the requirement of AB32.

**Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under CEQA:** The California Air Resources Board (CARB) published a preliminary draft staff proposal that contains interim significance thresholds for GHG in 2008. The threshold consists of the performance standards and a quantitative threshold of 7,000 metric tonnes CO<sub>2</sub>E/year from non-transportation related GHG sources which include combustion-related components/equipment, process losses, purchase electricity, and water usage and wastewater discharge (CARB, 2008b).

### **Local Regulations**

#### *Air Quality*

The Proposed Action is within SCAQMD's jurisdiction. The SCAQMD is responsible for planning, implementing, and enforcing federal and State ambient standards within this portion of the South Coast Air Basin. The regulations of this agency are primarily focused on stationary sources; therefore, most of the local agency regulations are not relevant to the Proposed Action.

#### *Esthetics*

The San Bernardino County General Plan contains the Land Use Element which dictates policies and goals related land use including ensuring compatibility within San Bernardino County's jurisdiction of new development from a land use perspective which also encompasses visual compatibility. The Proposed Action is consistent with the goals and policies contained in the Land Use Element of San Bernardino County's General Plan because there would be no change in land use from implementation of the Proposed Action.

#### *Noise*

The San Bernardino County General Plan contains the Noise Element which dictates policies and goals related to Noise within San Bernardino County's jurisdiction. The Proposed Action is consistent with the goals and policies contained in the Noise Element of San Bernardino County's General Plan because no new noise sources would be introduced and the noise environment with implementation of the Proposed Action would be the same as existing dam related operations and maintenance which were analyzed and found to be consistent with local policies in the 1988 Supplemental EIR/EIS and the 1997 EIR/EIS.

#### *Transportation*

The San Bernardino County General Plan contains the Circulation and Infrastructure Element which dictates policies and goals related Traffic and Transportation within San Bernardino

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County's jurisdiction. The Proposed Action is consistent with the goals and policies contained in the Circulation and Infrastructure Element of San Bernardino County's General Plan because no new traffic sources would be introduced and the transportation environment with implementation of the Proposed Action would be the same as existing dam related operations and maintenance which were analyzed and found to be consistent with local policies in the 1988 Supplemental EIR/EIS and the 1997 EIR/EIS.

### *Greenhouse Gas Emissions*

On December 5, 2008, the SCAQMD Governing Board adopted the proposal for draft interim GHG significance threshold for projects where the SCAQMD is lead agency. SCAQMD's interim GHG significance threshold is set as 10,000 metric tonnes CO<sub>2</sub>E/year for industrial project with a project's construction emissions added after being amortized over 30 years or the project life (SCAQMD, 2008).

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## COUNTY OF ORANGE INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

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This form and the descriptive information in the application package constitute the contents of Initial Study pursuant to County Guidelines under Ordinance 3040 and Section 15063 of the State CEQA Guidelines.

### **PROJECT CONTACT INFORMATION:**

**Lead agency:** Orange County Flood Control District  
300 North Flower Street  
Santa Ana, CA 92703

**Contact person:** Jeff Ernst  
**Phone No:** (714) 647-3963  
**E-mail:** jeff.ernst@ocpw.ocgov.com

**Project Sponsors:** Orange County Flood Control District, San Bernardino Flood Control District, and Riverside County Flood Control and Water Conservation District

### **PROJECT OVERVIEW:**

The Proposed Action involves updates to the existing 2003 Water Control Plan, which addresses the operation of Seven Oaks Dam. The proposed updates would eliminate the “full-time” debris pool during flood season (Oct 1<sup>st</sup> to Mar 1<sup>st</sup>). The following operation will be followed during the implementation of the Updated Water Control Plan to Include Regulation for Water Quality (May 2014) “2014 WCP”:

During the flood season, the debris pool will only be built at the start of the storm or runoff event, and then drained as quickly as possible during the recession or conclusion of the runoff event. At the start of an observed storm/runoff event, the release rate will be decreased to a rate that is lower than the observed inflow to allow for water impoundment up to the top of the current debris pool elevation of 2,200 feet, NGVD. During the first major storm of the year, if the water surface is expected to exceed the top of debris pool elevation, preparation for releases through the main tunnel would be made. Once opened, the sluice gate may remain open through the remainder of the flood season.

Under this changed debris pool operation, it is anticipated that there would be little or no debris pool remaining to drain by the end of flood season. Any pool that may be remaining going into the non-flood season (after Mar 1st) will still be drained on the same schedule which was established in cooperation with the downstream water agencies during the development of the Phase II GDM. The release range within the debris pool during flood season will no longer be limited to 3 cfs, but would follow flows from the storm events that occur, thereby, mimicking more natural storm flows through the river.

With regard to the adjustment of the debris pool storage adjustments throughout project life, the same procedures as provided in the original Water Control Plan shall be followed. Water temporarily stored within the debris pool is not available for environmental mitigation and enhancement plans.

The original Water Control Plan's requirement to restrict the flows to 3 cfs beginning October 1<sup>st</sup> to start the building of the seasonal debris pool will no longer apply.

No other updates will be necessary, or proposed, to the original Water Control Plan. Flood control operations (dictating how water that exceeds the debris pool elevation is stored and released) would remain the same.

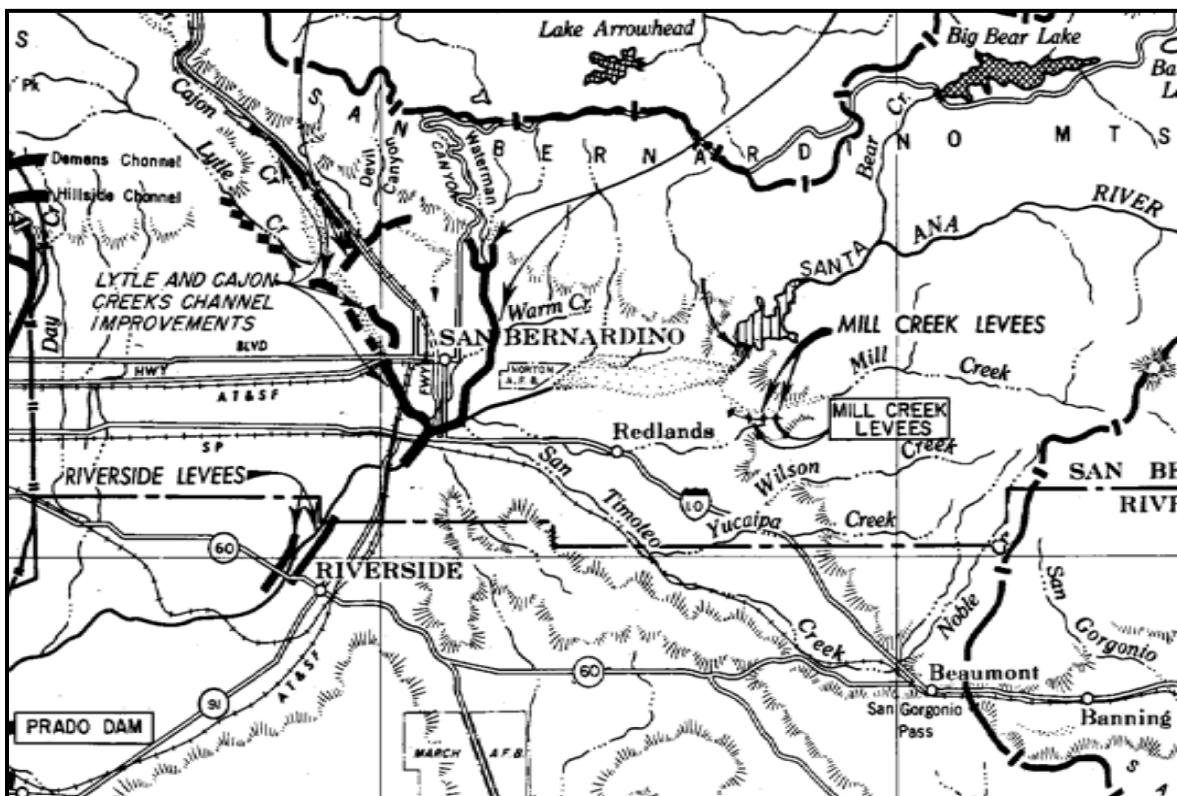
### **Project Site Location**

Seven Oaks Dam is located at a narrowing of the Upper Santa Ana Canyon, about 1 mile upstream from the canyon mouth at the confluence of the SAR (Santa Ana River) and Government Canyon, and is 8 miles northeast of the city of Redlands in San Bernardino County, California. The steep-walled canyon is surrounded by the rugged foothills along the southern flank of the San Bernardino Mountains. When the pool elevation is near spillway crest (elevation 2580 ft, NGVD), the reservoir would cover about 780 acres (315 ha), and would be about 500 feet (150 m) deep and 3 miles (5 km) long.

Approximately 23 percent of the SAR watershed is within the San Gabriel and San Bernardino Mountains; about nine percent is in the San Jacinto Mountains; and five percent is within the Santa Ana Mountains. Most of the remaining area is in the valleys formed by the broad alluvial fan along the base of these mountains, extending to the Pacific Ocean.

The SOD sub-watershed drains approximately 177 square miles, excluding the 32 square miles tributary to Baldwin Lake, located approximately 21 miles northeast of the SOD. The 27 miles of river upstream of the dam have an average gradient of 300 feet/mile, with one individual stream gradient of more than 600 feet/mile. Some small tributaries in the upper portion of the watershed have gradients exceeding 1,900 feet/mile. The steep slopes of the upper watershed are generally covered with dense growth of chaparral and sage scrub. Above elevations of 5,000 feet NGVD, coniferous forest predominates. Figure 1 shows the map of the project area.

**Figure 1 – Project Area Map**



The area of analysis for this DSEA/ND is located directly behind SOD on the upstream to include all lands up to the high water mark (2,200 feet) plus a 200-foot buffer, extending above the high water mark, as well as approximately 15 miles downstream from SOD to the Riverside Narrows where a federally-listed species, Santa Ana sucker (*Catostomus santaanae*) is located. Most of the environmental resources evaluated in this DSEA/ND, with the exception of water, geology, and biology, are expected to remain relatively unaffected by the Proposed Action. Therefore the areas of analysis for these other resources are limited to the areas immediately upstream and downstream of SOD.

## **EVALUATION FORMAT**

This initial study is prepared in compliance with the California Environmental Quality Act (CEQA) pursuant to Public Resources Code Section 21000, et seq. and the State CEQA Guidelines (California Code of Regulations Section 15000, et seq.). Specifically, the preparation of an Initial Study is guided by Section 15063 of the State CEQA Guidelines. This format of the study is presented as follows. The Proposed Project is evaluated based upon its effect on seventeen (17) major categories of environmental factors. Each factor is reviewed by responding to a series of questions regarding the impact of the Proposed Project on each element of the overall factor. The Initial Study Checklist provides a formatted analysis that provides a determination of the effect of the Proposed Project on the factor and its elements. The effect of the Proposed Project is categorized into one of the following four categories of possible determinations:

Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
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Substantiation is then provided to justify each determination. One of the four following conclusions is then provided as a summary of the analysis for each of the major environmental factors.

1. **No Impact:** Therefore, no impacts are identified or anticipated and no mitigation measures are required.
2. **Less than Significant Impact:** Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.
3. **Less than Significant Impact with Mitigation Incorporated:** Possible significant adverse impacts have been identified or anticipated and the following mitigation measures are required as a condition of Project approval to reduce these impacts to a level below significant. The required mitigation measures are: (List mitigation measures)
4. **Potentially Significant Impact:** Significant adverse impacts have been identified or anticipated. An Environmental Impact Report (EIR) is required to evaluate these impacts, which are (Listing the impacts requiring analysis within the EIR).

At the end of the analysis the required mitigation measures are restated for the Mitigation Monitoring and Reporting Program.

## ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this Proposed Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Aesthetics               | <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Air Quality                        |
| <input type="checkbox"/> Biological Resources     | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology / Soils                    |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials      | <input type="checkbox"/> Hydrology / Water Quality          |
| <input type="checkbox"/> Land Use / Planning      | <input type="checkbox"/> Mineral Resources                  | <input type="checkbox"/> Noise                              |
| <input type="checkbox"/> Population / Housing     | <input type="checkbox"/> Public Services                    | <input type="checkbox"/> Recreation                         |
| <input type="checkbox"/> Transportation / Traffic | <input type="checkbox"/> Utilities / Service Systems        | <input type="checkbox"/> Mandatory Findings of Significance |

## DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation, the following finding is made:

- The Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- 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.
- The Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- 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.
- 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: (prepared by Megan Wong, Environmental Manager,  
USACE)

Signature: Jeff Ernst, P.E, G.E. (Sr. Civil Engineer,  
OC Public Works)

5/8/14

5/8/14

I. AESTHETICS - Would the project	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**SUBSTANTIATION:** (Check  if project is located within the view-shed of any Scenic Route listed in the General Plan):

- a) **No Impact.** The Proposed Action does not involve any construction and is limited to changes in the operation of the debris pool for water quality improvement. Therefore, no changes to the existing visual environment will occur. Refer to the impacts analysis completed in Section 4.11 of the NEPA document.
- b-d) **No Impact.** The Proposed Action does not result in any alterations to the existing dam, and thus would not have an adverse effect on scenic vistas, damage scenic resources or degrade the visual character of the site and it will not create any new sources of light or glare. As a result, the Proposed Action will not result in any impacts to esthetics or visual resources in the Project Area and therefore no mitigation is proposed.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

II.	<b>AGRICULTURE AND FORESTRY RESOURCES</b> - In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**SUBSTANTIATION:** (Check  if project is located in the Important Farmlands Overlay):

- a-e) **No Impact.** No construction would be required for the Proposed Action. Operational activities associated with the Proposed Action would be limited to modifications of water releases from the debris pool during the flood seasons as dictated by the Updated Water Control Plan to Include Regulation for Water Quality (2014 WCP). The Proposed Action would not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use; conflict with existing zoning for agricultural use; conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production; result in the loss of forest land or conversion of forest land to non-forest use; involve other changes in the existing environment in the conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

**No significant adverse impacts are identified or anticipated and no mitigation measures would be required.**

III. AIR QUALITY - Where available, the significance criteria established by the applicable air quality management or air pollution control district might be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**SUBSTANTIATION:** (Discuss conformity with the South Coast Air Quality Management Plan, if applicable):

- a) **No Impact.** The Proposed Action does not conflict with or obstruct implementation of the applicable air quality plan as it only involves operational changes to the debris pool during the flood seasons. Therefore, no mitigation is proposed. Refer to Section 4.3 of the NEPA document on impacts analysis.
- b) **No Impact.** The Proposed Action does not require any construction activities and therefore would not generate any air quality emissions and would not result in the generation of criteria pollutant emissions. Therefore, no mitigation is proposed.
- c) **No Impact.** The Proposed Action does not require any construction activities and therefore would not result in cumulatively considerable net increase of any criteria pollutant. No impacts to cumulative air quality impacts are expected and therefore no mitigation measures would be required.
- d) **No Impact.** The Proposed Action would not expose sensitive receptors to substantial pollutant concentrations as no construction activities are involved. No impacts are identified or anticipated and therefore no mitigation measures are required.
- e) **No Impact.** The modified operation of the Proposed Action would not generate unusual or objectionable odors because the Proposed Action would not require any physical modification of the dam. Therefore, no odor impacts are anticipated, and no mitigation measures would be required.

**No significant impacts are identified or anticipated and no mitigation measures would be required.**

**IV. BIOLOGICAL RESOURCES - Would the project:**

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- a) Have substantial adverse effects, either directly or through habitat modifications, 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?
- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US 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?

**SUBSTANTIATION:** (Check if project is located in the Biological Resources Overlay or contains habitat for any species listed in the California Natural Diversity Database ):  
Category N/A

- a) **No Impact.** Impacts directly or through habitat modifications on any species identified as a candidate, sensitive or special status species are not anticipated. The Proposed Action, modified debris pool operation without physical modifications of the dam or construction, would take place during the flood seasons and the “debris pool” operational releases would be made only after the major runoff events have passed. Refer to Section 4.2 of the NEPA document for more detailed analysis. Impacts to habitat or candidate, sensitive or special status species are not anticipated and therefore no mitigation is proposed.
- b) **No Impact.** No construction activity is required as part of the Proposed Action. The Proposed Action involves an operational change in that the maximum release rate within the debris pool is up to 500 cfs, of which some or all of the flows may be diverted or infiltrated into the riverbed as the flow travels downstream. Little change in the water surface elevation and velocity of flow from the releases is expected, which could inundate or uproot vegetation. Therefore impacts to any riparian habitat or other sensitive natural community in the vicinity of the Seven Oaks Dam are not anticipated, and no mitigation is proposed. Refer to Section 4.2 of the NEPA document for more detailed analysis.
- c) **No Impact.** The Proposed Project involves an operational change within the debris pool and would not require any construction activities. No impacts are anticipated on jurisdictional wetlands and therefore no mitigation is required. Refer to Section 4.2 of the NEPA document for more detailed analysis.

- d) **No Impact.** The modified operational releases as part of the Proposed Action would take place within the riverbed and would not inundate the upper terraces where wildlife corridors are located. Furthermore, with infiltration and diversion by local water users, the releases are not expected to travel greater than 0.75 miles downstream of the dam resulting in impacts fish migration. As such, impacts associated with interference with a migratory wildlife corridor would not be significant, and no mitigation measures would be required. Refer to Section 4.2 of the NEPA document for more detailed analysis.
- e) **No Impact.** The Proposed Action would not involve the removal of any regulated desert or riparian trees and mitigation is therefore not required.
- f) **No Impact.** The Multispecies Habitat Management Plan is a plan developed in coordination with the California Department of Fish and Wildlife, US Fish and Wildlife, and Regional Water Quality Control Board, to manage and preserve a designated area of the SAR wash (also known as the Woolly Star Preserve Area "WSPA") and associated alluvial terraces for the three listed species, Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*) "woolly star", slender-horned spineflower (*Dodecahema leptoceras*) "spineflower", and San Bernardino kangaroo rat (*Dipodomys merriami parvus*) "SBKR". The WSPA is located approximately 2 miles downstream of the dam adjacent to the SAR. Implementation of the Proposed Action would not impact the WSPA as the modified releases would not reach that far downstream as a result of infiltration and diversion by local water users. Therefore, impacts associated with an adopted Habitat Plan would not be significant, and no mitigation measures would be required.

**No significant impacts are identified or anticipated and no mitigation measures would be required.**

V. **CULTURAL RESOURCES** - Would the project

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**SUBSTANTIATION:** (Check if the project is located in the Cultural  or Paleontologic )

Resources overlays or cite results of cultural resource review):

a-d) **No Impact.** The Proposed Action area or the Area of Potential Effect does not contain any historic properties and there would be no cultural resources impacts are anticipated. No mitigation is required.

**No significant impacts are identified or anticipated and no mitigation measures would be required.**

**VI. GEOLOGY AND SOILS** - Would the project:

Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- 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 on or off site landslide, lateral spreading, subsidence, liquefaction or collapse?
- d) Be located on expansive soil, as defined in Table 18-1-B of the California Building Code (2001) creating substantial risks to life or property?
- e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal

systems where sewers are not available for the disposal of wastewater?

**SUBSTANTIATION:** (Check  if project is located in the Geologic Hazards Overlay District):

a-e) **No Impact.** The Project Area has high potential for strong ground motion due to its proximity to the San Andreas Fault. Rockslides and debris flows on steeper slopes in the Project Area are common, but no construction would be required for the Proposed Action. Consequently, no grading or excavation would occur under the Proposed Action to change the stability of the Project Area. Operational activities associated with the Proposed Action would be limited to modifications of water releases from the debris pool during the flood seasons as dictated by the 2014 WCP. The deviation from the Water Control Manual would not alter the stability of the Project Area and would not result in landslide, lateral spreading, subsidence, liquefaction, or collapse. The Proposed Action would result in additional impacts to earth resources and geology and therefore mitigation is not proposed.

**No significant impacts are identified or anticipated and no mitigation measures would be required.**

**VII. GREENHOUSE GAG EMISSIONS** - Would the project:

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- 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?

**SUBSTANTIATION:**

a-b) **No Impact.** No construction would be required for the Proposed Action. Operational activities associated with the Proposed Action would be limited to modifications of water releases from the debris pool during the flood seasons as dictated by the 2014 WCP. The Proposed Action would not result in generation of GHG and would not conflict with GHG plans, policies, or regulations. Therefore, mitigation is not required.

**No significant impacts are identified or anticipated and no mitigation measures would be required.**

**VIII. HAZARDS AND HAZARDOUS MATERIALS** - Would the project:

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- 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 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?
- 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?

**SUBSTANTIATION:**

- a) **No Impact.** The Proposed Action would not require any construction activities, excavation or grading of soils (beyond existing maintenance practices) and so would not expose the public or environment through the routine transport, use, or disposal of hazardous materials.

- b-d) **No Impact.** This question is not applicable to the Proposed Action as construction would not be required.
- e-g) **No Impact.** The proposed operational releases made from the debris pool as part of the Proposed Action would not result in a safety hazard for people residing or working within the vicinity of a private airstrip or within an airport land use plan as no construction would be required.
- h) **No Impact.** This question is not applicable to the Proposed Action as construction would not be required.

**No significant impacts are identified or anticipated and no mitigation measures would be required.**

IX. HYDROLOGY AND WATER QUALITY - Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 that would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| f) Otherwise substantially degrade water quality?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| j) Inundation by seiche, tsunami, or mudflow?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

#### **SUBSTANTIATION:**

Under this changed debris pool operation, it is anticipated that there would be little or no debris pool remaining to drain by the end of flood season (Mar 1<sup>st</sup>). Any pool that may be remaining going into the non-flood season would still be drained on the same schedule which was established under the original plan. Water quality would be improved to some extent due to the decreased timing of water impoundment behind the dam.

The Proposed Action would improve water quality and would not violate any water quality standards or waste discharge requirements. Similarly, the Proposed Action would provide benefits to groundwater supplies and recharge with improved water quality conditions. The Proposed Action involves an operational change in that the maximum release rate within the debris pool is up to 500 cfs and releases would only be made only after passing of the runoff event. The Proposed Action, therefore, would not result in impacts to the following: altering 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 substantial erosion, siltation, or flooding, on- or off-site; create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; place housing within a 100-year flood hazard area, or 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, increase inundation by seiche, tsunami, or mudflow.

- a) No Impact. Refer to the analysis described above or in Section 4.1 of the SEA.
- b) No Impact. The Proposed Action would provide benefits to groundwater supplies and recharge with improved water quality conditions.
- c-f) No Impact. Refer to the analysis described above or in Section 4.1 of the SEA.
- g) No Impact. The purpose of the Proposed Action is to improve water quality.

- h) No Impact. Refer to the analysis described above or in Section 4.1 of the SEA.
- i) No Impact. The rate of release change within the debris pools would not be significant to result in exposing 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) No Impact. The rate of release change within the debris pools would not be significant to result in or encourage inundation by seiche, tsunami, or mudflow.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

**X. LAND USE AND PLANNING** - Would the project:

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- 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?

**SUBSTANTIATION:**

- a) **No Impact.** The Proposed Action involves only an operational change of the SOD within the debris pool level and therefore would not divide an established community.
- b) **No Impact.** Refer to Section 4.5.3 of the SEA for impacts analysis.
- c) **No Impact.** Implementation of the Proposed Action would not conflict with any habitat or natural community conservation plans as the proposed modified debris pool operational releases would not likely result in impacts to the habitat or species identified within the plans.

**No significant adverse impacts are identified or anticipated; and no mitigation measures would be required**

**XI. MINERAL RESOURCES** - Would the project:

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- 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?

**SUBSTANTIATION:** (Check  if project is located within the Mineral Resource Zone Overlay):  
MRZ-3a

- a) **No Impact.** The Proposed Action involves only an operational change of the SOD within the debris pool level and therefore would not result in the loss of availability of a known mineral resource valuable to the region and residents of the state.
- b) **No Impact.** The Proposed Action involves only an operational change of the SOD within the debris pool level and therefore would not result in the loss of availability of a locally important mineral resource delineated recovery site.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

**XII. NOISE** - Would the project result in:

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- 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?

**SUBSTANTIATION:** (Check if the project is located in the Noise Hazard Overlay District  or is subject to severe noise levels according to the General Plan Noise Element ):

The Proposed Action does not involve any construction activities or alterations to the existing SOD. It is only limited to changes in the SOD operation for drainage of the debris pool during the flood season. No adverse affect would take place by exposing the public to excessive ground-borne vibration or noise levels. Furthermore, the debris pool releases would be made during the flooding season when the SAR is likely expected to already contain flows and would not result in an increase in ambient noise levels. As a result, the Proposed Action will not result in any significant impacts to the existing noise environment in the Project Area.

- a-f) **No Impact.** Refer to paragraph above.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

**XIII. POPULATION AND HOUSING** - Would the project:

Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?
- 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?

**SUBSTANTIATION:**

No construction would be required for the Proposed Action. Existing workers' duties may be expanded but no substantial change to the region's population would occur as a result of the Proposed Action. Implementation of the Proposed Action would neither place a demand on employment opportunities, housing, or public facilities, nor would it create substantial new employment opportunities, housing, or public facilities in the region. Consequently, the Proposed Action activities would not create socioeconomic impacts within the adjacent communities and no impacts or opportunities would occur.

- a-c) **No Impact.** Refer to the above paragraph for impacts analysis.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

#### XIV. PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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- a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire Protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police Protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other Public Facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### SUBSTANTIATION:

- a) **No Impact.** Implementation of the Proposed Action would modify the debris pool operation at SOD during the flood seasons and would not result in the need for new or physically altered governmental facilities, need for new or physically altered governmental 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.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

## XV. RECREATION

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## SUBSTANTIATION:

- a-b) **No Impact.** The Proposed Action would primarily affect conditions in the debris pool area behind the dam and flows downstream during the flood season. While the Proposed Action would result in changes to downstream flows by letting water pass through, the changes to the SAR is relatively insignificant as the river would have already been saturated or contained flowing waters during the flood season. The water purveyors may also capture some of the flows downstream depending on quality of water, which may in turn decrease the amount of flows in the SAR. As access behind the dam has been closed to the public since the dam's construction, no recreational uses behind the dam would be affected by the Proposed Action. As noted in Section 3.13 of the SEA, the City of Highland's General Plan designations (Planned Development, Open Space, and Agriculture/Equestrian) all allow for and encourage recreation activities. Nonetheless, while the operation plan under the Proposed Action would alter downstream flows from during the flood season (1 October through 1 March) of each year, these changes would not be enough to substantially change conditions for hikers, equestrians, or other downstream recreational users.

The Proposed Action would neither induce population growth nor result in a direct population increase. The Proposed Action would not include the construction of or induce expansion of any recreational facilities. The Proposed Action would not include construction occurring on or directly adjacent to any recreational facilities. Therefore, the Proposed

Action would have no impacts on recreational facilities.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

**XVI. TRANSPORTATION/TRAFFIC - Would the project:**

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**SUBSTANTIATION:**

As part of SOD operations and maintenance, Operations staff make approximately 30 trips a day up and down Santa Ana Canyon Road. Southern California Edison staff make

approximately 50 trips a day up and down Santa Ana Canyon Road and other users such as the water districts and California Department of Fish and Wildlife make approximately 20 trips a day up and down the same road. (personal com. Lovell, 2010). This activity is not expected to change with the implementation of the Proposed Action and no significant increases in daily traffic are expected to be generated from implementation of the Proposed Action since no construction is involved. Operations and maintenance activities will not result in any conflicts to any plans, ordinances, programs or congestion management plans. The Proposed Action will not result in inadequate emergency access or increase traffic hazards. Additionally, these activities were fully analyzed in the 1988 SEIS for dam construction. The Proposed Action will therefore not result in any impacts to transportation.

- a-f) **No Impact.** Refer to the above paragraph for impacts analysis.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

XVI. UTILITIES AND SERVICE SYSTEMS - Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded, entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill(s) with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- g) Comply with federal, state, and local statutes and regulations related to solid waste?

**SUBSTANTIATION:**

- a-g) **No Impact.** As the Proposed Action would require no construction, no additional demands on water supplies, wastewater facilities, and solid waste facilities would be made. The Proposed Action would not generate wastewater or solid waste, would not alter service at wastewater or solid waste facilities and would ultimately improve regional water supplies. The Proposed Action would neither constrain nor disrupt existing utilities and utility providers and therefore would not result in any impacts to utilities and service systems.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**

**XVII. MANDATORY FINDINGS OF SIGNIFICANCE:**

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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 a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**SUBSTANTIATION:**

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a-c) **No Impact.** The Proposed Action would require no construction. Consequently, implementation of the Proposed Action would not impact or degrade the overall quality of the environment, including habitat of a fish or wildlife species, reduction in fish or wildlife population below self-sustaining levels, and threats to eliminate a plant or animal community. The Proposed Action would not have a cumulatively considerable effect in connection with past, current, or future projects. The Proposed Action would not have environmental effects that would adversely affect human beings directly or indirectly.

**No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.**