C. Affected Environment and Environmental Consequences

C.1 Introduction

Section C includes analyses of the 12 technical issue areas listed below:

- Air Quality and Climate Change
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Public Safety
- Hydrology
- Noise
- Recreation and Land Use
- Transportation and Traffic
- Visual Resources
- Water Quality and Resources
- Wildfire Prevention and Suppression

Within each of the technical issue areas listed above, discussion of Project impacts is organized according to the following major subheadings:

- Affected Environment
- Regulatory Framework
- Issues Identified During Scoping
- Environmental Consequences, including direct and indirect impact analyses, CEQA Conclusions, and mitigation for the proposed Project and alternatives, including the No Action Alternative.
- Impact Summary

C.1.1 Affected Environment

The affected environment has been described in each issue area to encompass the proposed action and alternatives, including site preparation; construction activities; sediment removal, transport, and disposal; and operation and maintenance. The extent of the affected environment evaluated, or study area, can differ between issue areas. Study areas were determined by geographic extent of anticipated project-related impacts.

NEPA requires that the EIS shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration (40 CFR 1502.15). However, NEPA has no direct guidance regarding when the establishment of a baseline for determining the significance of an impact when preparing an EIS should occur. For the purpose of this EIS/EIR document, and pursuant to CEQA Guidelines (Section 15125[a]), the environmental setting, or affected environment, used to determine the impacts associated with the proposed action and alternatives is based on the environmental conditions that existed in the project area in March 2014, at the time the Notice of Preparation (NOP) was distributed and the Notice of Intent (NOI) was published (see Section A.4).

As part of Section C (Affected Environment), the regulatory framework applicable to the proposed action is presented within each issue area section. Project activities predominantly would occur on National Forest System lands, with sediment transport routes traversing public rights-of-way in unincorporated Los Angeles County and the City of Palmdale. Consideration to the zoning ordinances of the County of Los Angeles and the City of Palmdale is given in the impact analyses provided in Section C. However, the Forest Service and PWD have pre-emptive jurisdiction over the proposed action and no local discretionary permits or local plan consistency evaluations are required for the proposed action or alternatives. As the action involves construction related to a water storage facility, under California

Government Code Section 53091(e), "Zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water…" However, the sites identified to receive the sediment removed from the Reservoir would be required to obtain any necessary permits from local jurisdictions (refer to Standard Project Commitments in Appendix A). Additionally, the Forest Service and PWD, in accordance with NEPA and CEQA (respectively), have included evaluation of local land use plans in this document in cases where these local plans and policies would help reduce or eliminate an environmental impact. The issue area discussions in Section C (Regulatory Framework) present applicable federal, State, and local plans and policies, as well as a discussion of the proposed action's consistency with each applicable plan or policy described.

C.1.2 Environmental Consequences

Section C examines the environmental consequences associated with the proposed action and alternatives to the proposed action, including the No Project/No Action alternative. Analysis within each issue area includes consideration of the proposed action and alternatives, which are described fully in Section B of this EIS/EIR.

The purpose of identifying the potential environmental impacts and the associated mitigation is to provide information about the proposed action's environmental effects to decision makers and the public that can be used in deliberations about whether or not to approve the proposed action or one of the alternatives. The information contained in this EIS/EIR will also be used by regulatory agencies that would need to issue permits for the construction of the proposed action if approved by the Lead Agencies.

Pursuant to NEPA, the intent of the environmental impact analysis is to provide a scientific and analytic basis for comparing the alternatives. The analysis also identifies any adverse environmental effects that cannot be avoided should the Project be implemented and presents mitigation measures to minimize adverse environmental impacts (40 CFR 1502.16). Environmental effects will include direct, indirect, as well as residual or unavoidable impacts that would remain after mitigation measures have been applied.

A significant impact is defined by CEQA as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (State CEQA Guidelines Section 15382). In comparison, NEPA states that "'Significantly' as used in NEPA requires considerations of both context and intensity…" (40 CFR 1508.27). Significance criteria, or thresholds, serve as a benchmark for determining if a project action will result in a significant adverse environmental impact when evaluated against the baseline.

For the CEQA analysis, impact significance is discussed for each issue area under the subheading "CEQA Significance Conclusion," and is identified according to the following classification:

- Class I: Significant impact that cannot be mitigated to a level that is not significant. Class I impacts are significant adverse effects that cannot be mitigated below a level of significance through the application of feasible mitigation measures. Class I impacts are significant and unavoidable.
- Class II: Significant impact that can be mitigated to a level that is not significant. A Class II impact is a significant adverse effect that can be reduced to a less-than-significant level through the application of feasible mitigation measures.
- Class III: Adverse, but not significant. A Class III impact is a minor change or effect on the environment that does not meet or exceed the criteria established to gauge significance.
- Class IV: Beneficial impact. Class IV impacts represent beneficial effects that would result from project implementation.

Although guidance provided by CEQA and NEPA are used to help determine the level of severity of impacts, the determination of impact significance is based on the independent judgment of the Lead Agencies. The establishment of any criteria used to evaluate the level of severity of impacts is also the responsibility of the Lead Agencies. Some impact categories in this document lend themselves to scientific or mathematical analysis and, therefore, to quantification, while others are more qualitative, and issue areas such as Air Quality have significance criteria that are established by regulatory agencies.

Each environmental impact identified is associated with a specific threshold, which is used to evaluate the level of severity of the impact. Potential mitigation measures are proposed for adverse impacts, where feasible. The PWD has incorporated mechanisms into the description of its proposed project to avoid or reduce impacts from project construction and operation. These mechanisms are referred to as standard project commitments (SPCs) in this EIS/EIR, and are considered in the analysis of impacts and the determinations of impacts. In the assessment of identified impacts, SPCs have been assumed to be part of the proposed project and, therefore, are not included as mitigation measures. The SPCs are considered a commitment by the PWD and implementation of each SPC will be monitored by the PWD if the proposed project or an alternative is approved. The SPCs that are considered necessary to reduce potential impacts are listed in Appendix A (Standard Project Commitments).

C.2 Air Quality and Climate Change

This section presents information on ambient air quality conditions in the vicinity of the Project site and identifies potential impacts to air quality as a result of the construction and operation of the Project. As discussed in Section B (Description of Proposed Action/Project and Alternatives), construction activities restoring the Reservoir storage capacity are estimate to last 7 to 12 years for the proposed Project and a minimum of 13 years for Alternative 1. To ensure worst-case impacts are evaluated, the emission estimates utilized within this section assumed a 7-year construction scenario for the proposed Project and a 13-year construction scenario for Alternative 1. While construction activities may last longer, these durations represent worst-case daily and total emissions. The air quality and greenhouse gas (GHG) emission calculations assumptions and methodologies are provided in Appendix B.

C.2.1 Affected Environment

C.2.1.1 Air Quality

The Project is located in the southwestern part of the Antelope Valley Air Quality Management District (AVAQMD). Additionally, a portion of the Project is located on National Forest Service (NFS) lands within the Angeles National Forest (ANF).

Greenhouse gases cause global climate change impacts, and GHG emissions impacts are not localized near the area of emissions but rather are a long-term globally cumulative impact phenomenon.

C.2.1.2 Meteorological Conditions

The climate of northern Los Angeles County is characterized by hot, dry summers and mild to cold winters with seasonally heavy precipitation that occurs primarily during the winter months. Summer typically has clear skies, high temperatures, and low humidity. The prevailing strong winds in the Project area are generally out of the west and southwest (AVAQMD, 2011). A monthly climate summary for Littlerock, California, was selected to characterize the climate of the project area. As described in Table C.2-1, average summer (June-September) high and low temperatures in the study area range from 97°F to 60°F, respectively. Average winter (December-March) high and low temperatures in the study area range from 67°F to 37°F. The average annual precipitation is 6.77 inches with over 70 percent occurring between December and March.

Table C.2-1. Littlerock Monthly Average Temperatures and Precipitation

Month	Temperature		Precipitation Inches
	Maximum	Minimum	
January	58°F	37°F	1.24
February	61°F	39°F	1.60
March	67°F	42°F	0.92
April	73°F	46°F	0.34
May	82°F	53°F	0.09
June	91°F	60°F	0.04
July	97°F	67°F	0.18
August	96°F	67°F	0.19
September	89°F	62°F	0.17
October	78°F	53°F	0.36
November	65°F	43°F	0.45
December	57°F	37°F	1.19

Source: The Weather Channel, 2014.

C.2.1.3 Existing Air Quality

The United States Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) 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 federal and State ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the Project are provided in Table C.2-2.

Table C.2-2. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
Ozone (O_3)	1-hour	0.09 ppm	—
	8-hour	0.070 ppm	0.075 ppm
Respirable particulate matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3
	Annual mean	20 µg/m^3	—
Fine particulate matter ($PM_{2.5}$)	24-hour	—	35 µg/m^3
	Annual mean	12 µg/m^3	12.0 µg/m^3
Carbon monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9.0 ppm	9 ppm
Nitrogen dioxide (NO_2)	1-hour	0.18 ppm	0.10 ppm
	Annual mean	0.030 ppm	0.053 ppm
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	0.075 ppm
	24-hour	0.04 ppm	—

Notes: ppm=parts per million; µg/m^3= micrograms per cubic meter; "—" = no standard
Source: CARB, 2013, Ambient Air Quality Standards Table.

The project area is located within the Mojave Desert Air Basin (MDAB), under the jurisdiction of the Antelope Valley Air Quality Management District (AVAQMD). Table C.2-3 summarizes the federal and State attainment status of criteria pollutants for the Project area based on the NAAQS and CAAQS, respectively.

Table C.2-3. Attainment Status for Antelope Valley Portion of the MDAB

Pollutant	Federal	State
Ozone	Severe Nonattainment	Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified/Attainment	Attainment
PM10	Unclassified/Attainment	Nonattainment
PM2.5	Unclassified/Attainment	Unclassified

Source: CARB, 2014a; USEPA, 2014a

Ozone, NO_2, CO, PM10, and PM2.5 concentrations are currently recorded at the Lancaster Division Street monitoring station located approximately 15 miles north northwest of the Littlerock Reservoir. This monitoring station also used to monitor CO concentrations. The current nearest operating monitoring station for SO_2 is in the City of Burbank about 30 miles southwest of Littlerock Reservoir, and the closest within the MDAB is Victorville about 40 miles east of the Project site.

Ozone

In the presence of ultraviolet radiation, both nitrogen oxides (NO_x) and volatile organic compounds (VOCs) go through a number of complex chemical reactions to form ozone. Table C.2-4 summarizes the ambient ozone data for the project area collected since 2002 from the Lancaster Division Street monitoring station. The table includes the maximum hourly and 8-hour average concentration and the number of days above the National and State standards. The Los Angeles County portion of the MDAB is classified as a serious nonattainment area for the 8-hour ozone NAAQS and nonattainment of the ozone CAAQS.

Table C.2-4. Ozone Air Quality Summary, 2002-2013

	1-Hr Ozone Summary			8-Hr Ozone Summary			
Year	Maximum 1-Hr Avg. (ppm)	Days Above CAAQS	Days Above NAAQS	Max. State 8-Hr Avg. (ppm)	Days Above CAAQS	Max.Fed. 8-Hr Avg. (ppm)	Days Above NAAQS
2002	0.157	46	5	0.107	87	0.107	70
2003	0.156	50	4	0.120	92	0.120	67
2004	0.121	37	0	0.101	85	0.101	61
2005	0.127	42	1	0.103	73	0.103	60
2006	0.132	22	2	0.106	66	0.105	39
2007	0.118	16	0	0.101	63	0.101	43
2008	0.116	18	0	0.103	59	0.102	35
2009	0.122	22	0	0.102	70	0.102	45
2010	0.107	11	0	0.096	78	0.096	45
2011	0.115	19	0	0.100	76	0.100	53
2012	0.112	13	0	0.096	72	0.095	39
2013	0.108	9	0	0.094	53	0.093	34

Source: CARB, 2014b; USEPA, 2014b
CAAQS: 1-hr, 0.070 ppm; 8-hr, 0.09 ppm
NAAQS: 8-hr, 0.075 ppm

The long-term trends for ozone concentrations and number of days exceeding the standards each year have shown reduction since the mid-1980s; however, ozone continues to be above the State 1-hour and State and federal 8-hour ozone standards. The western MDAB is primarily impacted by ozone and ozone precursor pollutants transported from the SCAB (i.e. Metropolitan Los Angeles) and the San Joaquin Valley Air Basin (SJVAB). The long-term trends in ozone pollutant levels in the western MDAB are inexorably tied to the reduction in ozone precursor pollutant levels in these two upwind air basins.

Carbon Monoxide (CO)

CO is generally found in high concentrations only near a significant source of emissions (i.e., freeway, busy intersection, etc.). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main cause of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. Carbon monoxide concentrations in the State have declined significantly due to two statewide programs: (1) the 1992 wintertime oxygenated gasoline program, and (2) Phases I and II of the reformulated gasoline program. Additionally, overall vehicle fleet turnover from higher-emitting older engines to lower-emitting new engines is a significant factor in the declining CO levels.

Table C.2-5 summarizes the ambient carbon monoxide data for the Project area collected over the past 10 years from the Lancaster Division Street monitoring station. The table includes the available maximum 8-hour concentrations.

Most of the project site route area, and proposed sediment removal route and storage areas, would be expected to have even lower CO levels than those presented in Table C.2-5, as they are not located near dense population centers and would experience comparatively vehicle traffic, which is the major contributor to CO emissions. As indicated in the table, there have been no exceedances of CAAQS or NAAQS since at least 2002 for the 8-hour CO standard in Lancaster.

Most of the project site route area, and proposed sediment removal route and storage areas, would be expected to have even lower CO levels than those presented in Table C.2-5, as they are not located near dense population centers and would experience comparatively vehicle traffic, which is the major contributor to CO emissions. As indicated in the table, there have been no exceedances of CAAQS or NAAQS since at least 2002 for the 8-hour CO standard in Lancaster.

Table C.2-5. Carbon Monoxide Air Quality Summary, 2002-2011

Year	Maximum 8-Hr Avg. (ppm)	Month of Max. 8-Hr Avg.
2002	2.24	Sep
2003	1.88	Dec
2004	1.72	Jan
2005	1.54	Dec
2006	1.60	Dec
2007	1.25	Jan
2008	1.04	Nov
2009	1.2	—
2010	1.23	Jan
2011	1.33	Nov
2012	1.4	—
2013	1.2	—

Source: CARB, 2014b; USEPA, 2014b
Note: "—" indicates data not reported by the source.
CAAQS: 1-hr, 9.0 ppm; 8-hr, 20 ppm
NAAQS: 1-hr, 9 ppm; 8-hr, 35 ppm

Nitrogen Dioxide (NO_2)

The majority of the NO_x emitted from combustion sources is in the form of nitric oxide (NO), while the balance is mainly NO_2. NO is oxidized by O_2 (oxygen) in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 often occur during the fall and not in the winter. While winter atmospheric conditions favor the trapping of ground level releases of NO there is a lack of significant radiation intensity (less sunlight) to oxidize NO to NO_2. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard. NO is also oxidized by O_3 to form NO_2. The formation of NO_2 in the summer with the help of the ozone occurs according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in downwind rural areas (without sources of fresh NO_x emissions) ozone concentrations can remain relatively high.

Table C.2-6 summarizes the ambient nitrogen dioxide data for the Project area collected over the past 12 years from the Lancaster Division Street monitoring station. The table includes the maximum 1-hour and annual concentrations. This table shows that both the short-term and long-term average NO_2 concentrations have been dropping fairly significantly since 2002. The MDAB is either unclassified or in attainment for nitrogen dioxide.

Inhalable Particulate Matter (PM10)

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_x, sulfur oxides (SO_x), VOC, and ammonia, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

Table C.2-6. Nitrogen Dioxide Air Quality Summary, 2002-2013

Year	Maximum 1-Hr Avg. (ppm)	Maximum Annual Avg. (ppm)
2002	0.101	0.016
2003	0.067	0.015
2004	0.103	0.015
2005	0.074	0.015
2006	0.066	0.015
2007	0.064	0.014
2008	0.062	0.013
2009	0.065	—
2010	0.056	0.012
2011	0.058	0.012
2012	0.049	0.009
2013	0.048	0.008

Source: CARB 2014b.
Note: "—" is for a year with less than representative monitoring data coverage for the year or data not reported by the source.
CAAQS: 1-hr, 0.18 ppm; annual, 0.030 ppm
NAAQS: 1-hr, 0.10 ppm; annual, 0.053 ppm

Table C.2-7 summarizes the ambient particulate matter data collected from the Lancaster Division Street monitoring station. The table includes the maximum 24-hour and annual arithmetic average concentrations. As shown in Table C.2-7, the project area experiences exceedances of the State 24-hour PM10 standards and the State annual arithmetic mean PM10 standards. The western MDAB in the Project area is unclassified for the federal PM10 standard and is nonattainment of the State PM10 standard.

Table C.2-7. PM10 Air Quality Summary, 2002-2013

Year	State Maximum Daily Average (µg/m³)	Days Above Daily CAAQS*	Federal Maximum Daily Average (µg/m³)	Days Above Daily NAAQS*	State Annual Average (µg/m³)
2002	73	6	210	1	29.7
2003	54	6	98	—	23.2
2004	33	—	83	—	—
2005	47	—	55	—	—
2006	58	26	65	—	25.1
2007	181	18	86	—	28.2
2008	70	—	143	—	—
2009	56	—	199	1	—
2010	—	—	43	—	—
2011	49	—	81	—	—
2012	43	—	85	—	18.5
2013	173	—	185	6	—

Source: CARB, 2014b; USEPA, 2014b.
CAAQS: 24-hr, 50 µg/m³; annual arithmetic, 20 µg/m³
NAAQS: 24-hr, 150 µg/m³;
*Days above the State and national standard (calculated): Because PM10 is monitored approximately once every six days; the potential number of exceedance days is typically calculated by multiplying the actual number of days of exceedance by six.
Note: "—" is for a year with less than representative monitoring data coverage for the year or data not reported by the source.

Fine Particulate Matter (PM2.5)

PM2.5, similar to PM10, can be emitted directly or it can be in the form of secondary particulate. Most combustion particulate, including diesel particulate matter, is emitted as fine PM2.5 and most secondary particulate formation is also formed as fine PM2.5. Fugitive dust on the other hand is typically

emitted in high proportions of larger PM fraction sizes, so that ambient PM10 concentrations have a much higher fraction of contribution from fugitive dust than ambient PM2.5 concentrations.

Table C.2-8 summarizes the ambient fine particulate matter data collected over the past 12 years from the Lancaster Division Street monitoring station. The MDAB is unclassified for both the federal and State PM2.5 standards.

Table C.2-8. PM2.5 Air Quality Summary, 2002-2013*

Year	State Maximum Daily Average (µg/m³)	Federal 98th Percentile of Maximum Daily Average (µg/m³)	Days Above 98th Percentile Daily NAAQS	State Annual Average (µg/m³)	Federal Annual Average (µg/m³)
2002	24	23	—	—	10.4
2003	25	21	—	9.4	9.3
2004	18	18	—	—	8.5
2005	28	17	—	8.9	8.9
2006	18	13	—	7.4	7.4
2007	25	16	—	8.0	7.7
2008	24	24	—	—	7.2
2009	20	16	—	7.8	7.7
2010	15	14	—	—	5.9
2011	50	50	—	—	7.1
2012	14	14	—	—	5.4
2013	12	11	—	—	5.8

Source: CARB, 2014b; USEPA, 2014b.
CAAQS: Annual Mean Standard, 12 µg/m³
NAAQS: 24-Hr, 35 µg/m³., Annual Arithmetic Mean, 12 µg/m³;
*Days above the State and national standard (calculated): Because PM10 is monitored approximately once every six days; the potential number of exceedance days is typically calculated by multiplying the actual number of days of exceedance by six.
Note: "—" is for a year with less than representative monitoring data coverage for the year or data not reported by the source.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content such as coal or heavy fuel oils can emit very large amounts of SO_2 when combusted. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels, gaseous, liquid, and solid.

The MDAB is designated attainment or unclassified for all SO_2 State and federal ambient air quality standards. There are no SO_2 monitoring stations near the Project site or within the MDAB west of Victorville and Trona; therefore, no representative SO_2 ambient air quality data exists.

C.2.1.4 Summary

As discussed above and presented in Table C.2-3, the Project area is in nonattainment of the State and federal ozone standards and the State PM10 standard. The Project area is designated as attainment and/or unclassified for all other criteria pollutant standards. The Project area's attainment status is significantly influenced by pollutant transport from both the south (South Coast Air Basin, i.e. Los Angeles area) and the west (San Joaquin Valley Air Basin). The long-term trends in pollutant levels in the western MDAB are inexorably tied to the reduction in pollutant levels in these two upwind air basins.

C.2.1.5 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. Impacts from the Project would be localized at the areas of material removal, material hauling, and material storage or disposal. The localized short-term impacts would be greatest to those located adjacent or very close to these areas. Sensitive receptors located more than 0.25 mile from these construction sites would have limited exposure times and concentrations, so only the sensitive receptors located within 0.25 mile of Littlerock Reservoir, the main sediment haul route and sediment storage area are considered those with potentially significant pollutant exposure.

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 for industrial/commercial areas 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.

A land use survey was conducted to identify sensitive receptors (e.g., local residences, schools, hospitals, recreational facilities) in the general vicinity of the Project. There are no residences or other sensitive receptors located within a mile of the main project site at Littlerock Reservoir and recreational activities at the site would be suspended during the Project. There are several dozen residences located within 0.25 mile of the haul routes and there are residences that may be located within 0.25 miles of the primary sediment storage site depending on its exact location within the existing aggregate mines, and residences located within 0.25 miles of the secondary sediment storage site. There are no known public schools, hospitals, or active recreational facilities known to exist within one-half mile of the Project site, the haul routes or sediment storage sites. The air quality analysis will consider the Project impacts to the residential receptors located along the haul route and near the sediment storage site.

C.2.1.6 Climate Change

While climate change has been a concern since at least 1998, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), efforts devoted to greenhouse gas (GHG) emissions reduction, and climate change research and policy have increased dramatically in recent years.

Global climate change (GCC) is expressed as changes in the average weather of the Earth, as measured by change in wind patterns, storms, precipitation, and temperature. Much scientific research has indicated that the human-related emissions of GHGs above natural levels are likely a significant contributor to GCC.

Because the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans, the area of influence for GHG impacts associated with the Project would be global. However, those cumulative global impacts would be manifested as impacts on resources and ecosystems in California. Additionally, as this analysis concerns cumulative global impacts, there is no separate cumulative impacts analysis for Global Climate Change.

Setting

The Project site is located in Northern Los Angeles County in the MDAB. In California, ARB is designated as the responsible agency for traditional air quality regulations. In addition, Assembly Bill (AB) 32 vested ARB with regulatory authority for GHGs.

Greenhouse Gases

Greenhouse gases are gases that trap heat in the atmosphere and are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and industry include CO_2, Methane (CH_4), and Nitrous Oxide (N_2O). The accumulation of GHGs in the atmosphere regulates the earth's temperature. GHGs have varying amounts of global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. By convention, CO_2 is assigned a GWP of 1. In comparison, CH_4 has a GWP of 25, which means that it has a global warming effect 25 times greater than CO_2 on an equal-mass basis. To account for their GWP, GHG emissions are often reported as CO2e (CO_2 equivalent). The CO2e for a source is calculated by multiplying each GHG emission by its GWP, and then adding the results together to produce a single, combined emission rate representing all GHGs.

C.2.2 Regulatory Framework

The Project includes construction and ongoing operations and maintenance activities but does not include any long-term stationary emission sources, so there are very few direct air quality regulations that specifically regulate the Project's air quality emission sources. The regulations that do apply, such as fugitive dust regulations, tend to be general and allow multiple means of achieving compliance. Similarly, regulations related to climate change and greenhouse gas emissions reductions generally relate to stationary source emissions or development construction standards, so there are very few regulations that directly apply to this project's greenhouse gas emissions sources. A description of the specific and general regulations that apply to the Project is provided below.

Table C.2-9 provides a list of plans and policies that are applicable to air quality and climate change, and includes a discussion of the Project's consistency with each plan or policy.

C.2.2.1 Air Quality

- **United States Environmental Project Agency (USEPA).** USEPA has issued a number of National Ambient Air Quality Standards (NAAQS) (see Section C.2.1.2). The AVAQMD and the California Air Resources Board (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 attain and maintain attainment with the NAAQS. 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, none of these regulations apply to this project because the Project would have no long-term operating stationary emission sources. Therefore, a PSD air quality impact analysis of the Project's impacts to the nearest mandatory Class I areas is not required. The USEPA does have on-road and off-road engine emission reduction programs that indirectly affect the Project's Emissions through the phasing in of cleaner on-road and off-road equipment engines.

- **USDA Forest Service Land Management Plan.** The USDA Forest Service regulates the portion of the Project that is located within the National Forest System lands, and the Angeles National Forest Plan Strategy does not include any air quality strategies that would be significantly impacted by the construction or operation of the Project (USFS, 2005). The Angeles National Forest air quality

strategies are limited to the following: (1) AIR 1: Minimize Smoke and Dust; and (2) AIR 2: Forest Air Quality Emissions. The Angeles National Forest strategy AIR 1 is very general and is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." The only action item of this of this strategy is to "Incorporate visibility requirements into project plans." The Angeles National Forest air quality strategy AIR 2 relates to providing an air quality inventory for prescribed burns and wildfires and therefore does not directly relate to the Project's emissions.

- **California Air Resources Board (CARB).** CARB has issued a number of California Ambient Air Quality Standards (CAAQS) (see Section C.2.1.2). CARB, like USEPA, also has on-road and off-road engine emission reduction programs that indirectly affect the Project's emissions through the phasing in of cleaner on-road and off-road equipment engines. Additionally, CARB has a Portable Equipment Registration Program that allows owners or operators of portable engines and portable equipment driven by portable engines, such as a portable concrete batch plant or screening plant, to register their units under a Statewide portable program to operate their equipment, which must meet specified program emission requirements, throughout California without having to obtain individual permits from local air districts.
- **Antelope Valley Air Quality Management District (AVAQMD).** The Project is located within the local jurisdiction of the AVAQMD. The local jurisdiction is responsible for planning, implementing, and enforcing federal and State ambient standards within its jurisdiction. The regulations of this agency are focused on stationary sources; therefore, most of the local agency regulations are not relevant to this Project. However, portable engines and portable equipment used during construction that are larger than 50 hp and that are not registered under the CARB Portable Equipment Registration Program would need to be obtain permits from the AVAQMD. The Project's construction and later maintenance activities will also have to comply with AVAQMD visible emissions, nuisance, and fugitive dust regulations, as follows:
  - AVAQMD Rule 401 – Visible Emissions
  - AVAQMD Rule 402 – Nuisance
  - AVAQMD Rule 403 – Fugitive Dust
- These rules limit the visible dust emissions from the Project construction sites, prohibit emissions that can cause a public nuisance, and require the prevention and reduction of fugitive dust emissions. One or more measures are required by the Fugitive Dust rules reduce fugitive dust emissions from specific dust-causing activities. These measures may include, adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities (such as during periods of high winds). Additionally, any state or locally permitted portable stationary equipment that may be associated with the Project and that would also cause fugitive dust emissions would also have to comply with the following AVAQMD fugitive dust and emission limit rules:
  - AVAQMD Rule 401 – Visible Emissions
  - AVAQMD Rule 402 – Nuisance
  - AVAQMD Rule 403 – Fugitive Dust
  - AVAQMD Rule 404 – Particulate Matter – Concentration
  - AVAQMD Rule 405 – Solid Particulate Matter – Weight

- Any locally permitted portable stationary equipment with internal combustion engines associated with the Project would also have to comply with the following AVAQMD rule:
  - AVAQMD Rule 1110.2 – Emissions From Stationary, Non-road & Portable Internal Combustion Engines
- **County of Los Angeles General Plan.** The County's General Plan includes a long list of air quality related goal and policies. These goals and policies generally relate to future development and transportation improvements to reduce air quality impacts from future growth. There are no air quality policies in the General Plan that directly relate to the actions of the Project.
- Antelope Valley Areawide General Plan. This General Plan does not include an air quality element.
- **County of Los Angeles Draft General Plan 2035.** The draft General Plan includes an air quality element that has several goals and policies; however, none of the air quality measures are applicable to the Project.
- **City of Palmdale General Plan.** This General Plan does not include an air quality element.

C.2.2.2 General Conformity

- **Section 176(c), Clean Air Act Amendments (CAAA).** Per Section 176(c) of the CAAA of 1990, the Forest Service must make a determination of whether the Project (i.e., proposed action) and project alternatives "conforms" with the State Implementation Plan (SIP). However, if the total direct and indirect emissions from the Project and project alternatives are below the General Conformity Rule (40 CFR §93.153) de minimis emission levels, the Project would be exempt from performing a comprehensive Air Quality Conformity Analysis and Determination, and would be considered to be in conformity with the SIP. If an Air Quality Conformity Analysis is necessary it must be certified prior to the Project's Record of Decision (ROD).

C.2.2.3 Climate Change

- **United States Environmental Project Agency.** Under the provisions of the Clean Air Act (CAA) to protect public health and welfare, the USEPA has the authority to regulate GHGs, should a finding be made that GHGs have the potential for adverse impacts. In response to the Supreme Court decision on December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:
  - Endangerment Finding: That the current and projected concentrations of the GHGs in the atmosphere threaten the public health and welfare of current and future generations, and
  - Cause or Contribute Finding: That the combined emissions of GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

  USEPA has enacted a number of GHG regulations and other environmental regulations that will impact GHG emissions, including: (1) Mandatory GHG Reporting, (2) GHG Tailoring Rule for PSD Permits, (3) GHG Vehicle Emissions Standards, (4) Corporate Average Fuel Economy Standards, and (5) Renewables Fuel Standard. None of these federal regulations are specifically relevant to the Project. However, the vehicles/fuels used for project activities will have reduced GHG emissions due to the implementation of some of these regulations.
- **California Air Resources Board (CARB).** California is one of several states that have set GHG emission targets. Executive Order S-3-05 and Assembly Bill 32 (AB 32), the California Global Warming Solutions

Act of 2006, promulgated targets to achieve reductions in GHG to 1990 GHG levels by the year 2020. This target-setting approach allows progress to be made in addressing climate change, and is a forerunner to setting emission limits. CARB is the agency in charge of promulgating and enforcing most of the statewide climate change/GHG emissions limit regulations. CARB, and other state agencies, have enacted a number of GHG regulations and other environmental regulations that will impact California GHG emissions, including: (1) Mandatory GHG Reporting, (2) Cap and Trade, (3) Advanced Clean Cars Program, (4) Electricity Renewable Portfolio Standard (RPS), and (5) Power Plant Emissions Performance Standard (EPS). None of these State regulations are specifically relevant to the Project. However, the vehicles/fuels used for project activities will have reduced GHG emissions due to the implementation of some of these regulations.

- **Office of the California Attorney General.** The Office of the California Attorney General maintains a website that addresses mitigation for greenhouse gases (OAG, 2014). This website provides links to documents that list potential CEQA mitigations for global climate change impacts (OPR, 2008; CAPCOA, 2009). These documents tend to focus on the discussion of measures that are recommended to be added to planning documents, rather than the identification of measures that would be applicable to specific types of development projects. From these documents, specific mitigation measures that could be relevant to the Project have been identified and listed below in Table C.2-14.
- **City of Palmdale Energy Action Plan.** The City of Palmdale's Energy Action Plan includes a large number of GHG emission reduction goals and measures meant to achieve a citywide GHG emission reduction of 15 percent from 2005 year levels by the year 2020. However, most of these goals and measures do not apply to the Project. The one specific goal that indirectly applies is the municipal and community goal to reduce GHG emissions related to water consumption.

Table C.2-9. Consistency with Applicable Air Quality and Climate Change Plans and Policies

Plan/Policy	Consistency	Explanation
State of California GHG Reduction Strategies		
Vehicle Climate Change Standards	Consistent	These are ARB enforced standards; vehicles that access the Project that are required to comply with the standards would comply with these strategies.
Limit Idling Time for Commercial Vehicles	Consistent	Project vehicles would be required to comply with ARB idling restriction regulations.
Construction and Demolition Waste Reduction	Consistent	The Project's primary waste stream, sand/aggregate, would be stored in existing aggregate mining pits or on a City of Palmdale owned property for later re-use. Lesser waste streams, including waste asphalt or concrete would be recycled. (See Appendix A)
Increase Water Use Efficiency	Consistent	The Project would allow PWD operations to be more efficient by increasing the use of local surface water and reducing the amount of needed imported water.
County of Los Angeles Draft General Plan 2035		
Climate Change Policy AQ 3.5: Encourage maximum amount of energy conservation in new development and municipal operations.	Consistent	The Project would allow PWD operations to be more efficient by increasing the use of local surface water and reducing the amount of needed imported water.
County of Los Angeles Unincorporated Los Angeles County Community Climate Action Plan 2020		
CCAP Measure LUT-9: Encourage idling limits of 3 minutes for heavy-duty construction equipment, as feasible within manufacturer's specifications.	Consistent	This idling restriction is a stated project commitment (See Appendix A).

Table C.2-9. Consistency with Applicable Air Quality and Climate Change Plans and Policies

Plan/Policy	Consistency	Explanation
CCAP Measure LUT-11: Reduce energy consumption and waste generation associated with pavement maintenance and rehabilitation.	Consistent	Pavement will be replaced/resurfaced only as necessary and asphalt waste will be recycled (See Appendix A)
CCAP Measure LUT-12: Utilize electric equipment wherever feasible for construction projects.	Consistent	Measure requires use of electric equipment were feasible. The use of electric equipment is generally not feasible in the remote project site location due to the lack of electrical infrastructure at the project site and the size/energy requirements of the heavy construction equipment needed to complete the Project.
CCAP Measure WAW-2: Promote the use of wastewater and gray water to be used for agricultural, industrial, and irrigation purposes. Manage stormwater, reduce potential treatment, and protect local groundwater supplies.	Consistent	Imported water use and related energy based GHG emissions would be reduced by the increased use in local surface water resources.
CCAP Measure SW-1: For the County's unincorporated areas, adopt a waste diversion goal to comply with all state mandates to divert at least 75% of waste from landfill disposal by 2020.	Consistent	The Project's primary waste stream, sand/aggregate, would be stored in existing aggregate mining pits or on a City of Palmdale owned property for later re-use. Lesser waste streams, including waste asphalt or concrete would be recycled to the extent feasible. (See Appendix A).
City of Palmdale Energy Action Plan		
Municipal and Community Goal 2: Reduce Water Consumption for Energy Conservation	Consistent	The measures specified under these goals do not specifically apply to the Project; however, imported water use and related energy based GHG emissions would be reduced by the increased use in local water resources. Additionally water used for fugitive dust control would be obtained from the local surface water available at the reservoir.

Source: USFS, 2005: OPR, 2008: CAPCOA, 2009: LAC, 2014a: LAC, 2014b; City of Palmdale, 2011.

C.2.3 Issues Identified During Scoping

There were no air quality or climate change issues identified during the public scoping period. See Appendix E (Summary of Scoping Process) for a summary of issues relevant to the entire Project that were raised during the scoping process.

C.2.4 Environmental Consequences

C.2.4.1 Air Quality

Significance Criteria. The following significance criteria for Air Quality were derived from the AVAQMD CEQA Guidelines (AVAQMD, 2011), the Angeles National Forest Strategy (USFS, 2005) and from Federal air quality regulations (40 CFR Part 93 Subpart B). Impacts of the proposed action/project or alternatives would be considered significant and would require mitigation if:

- Criterion AIR1: The Project would be inconsistent with the current approved Air Quality Management Plan.
- Criterion AIR2: The Project would generate emissions of air pollutants that would exceed any AVAQMD regional air quality standard as defined in Table C.2-10.

Table C.2-10. AVAQMD Significance Thresholds

	Daily Emissions (lbs/day)						Annual Emissions (Tons)					
	VOC	CO	NOx	SOx	PM10	PM2.5	VOC	CO	NOx	SOx	PM10	PM2.5
AVAQMD Significance Thresholds	137	548	137	137	82	82	25	100	25	25	15	15

Source: AVAQMD, 2011.

Per direct guidance from MDAQMD staff, where MDAQMD and AVAQMD share staff and have the same significance thresholds and nearly identical CEQA guidance, emissions from very short-term projects that exceed daily MDAQMD emissions thresholds would not be considered significant under the following circumstances or conditions: (MDAQMD, 2014)

- The Project does not create any localized pollutant hot spots (required).
- The Project does not exceed the annual emissions thresholds (required).
- The Project is applying reasonably feasible control measure for the pollutants exceeding the daily emissions thresholds (required depending on project circumstances).
- The Project's construction schedule is altered, in a manner that increases air quality emissions, in order to reduce other project impacts (consideration for review).
- The Project's emissions are included in attainment plans (if true then only this item is needed to identify impacts as less than significant).
  - Criterion AIR3: The Project would expose sensitive receptors to substantial pollutant concentrations.
  - Criterion AIR4: The Project would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements.
  - Criterion AIR5: The Project would expose a substantial number of people to objectionable odors.
  - Criterion AIR6: The Project would conflict with air quality provisions of the Angeles National Forest Strategy.

Significance conclusions for individual impacts are not required for compliance with NEPA. Therefore, conclusions presented in the following analysis regarding the significance of identified impacts are provided for the purposes of CEQA only.

Emissions Calculations Methodology. The air quality emissions resulting from Project and project action alternative activities were calculated using the most recent available emission factors from CARB for on-road and off-road vehicles/equipment and the most recent fugitive dust emission calculation methodologies from the United States Environmental Protection Agency (USEPA, 2014c). Detailed Project schedules, equipment use, and material transport quantities were used to develop the activity estimates used in the emission calculations. Due to the scope and complexity of this Project, simplified construction project emission calculation programs (such as the California Emissions Estimator Model software CalEEMod) were not used.

As discussed earlier, the emission estimates utilized within this section assumed a 7-year construction scenario for the proposed Project and a 13-year construction scenario for Alternative 1. While construction activities may last longer, these durations represent worst-case daily and total emissions. The detailed construction schedule, equipment use, and vehicle trip assumptions used within the emission calculations are provided in Appendix B (Air Quality Calculations).

C.2.4.2 Climate Change

Significance Criteria. Appendix G of the CEQA Guidelines allows the lead agency discretion in how to address and evaluate significance based on these criteria. According to these Guidelines the following criteria may be considered to establish the significance of GCC emissions (AEP, 2011).

Would the Project:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The AVAQMD CEQA Guidelines provide an annual GHG emissions threshold of 100,000 tons per year (AVAQMD, 2001). This guideline also provides for a short-term threshold that is proportional to the annual threshold; however, the annual threshold is more appropriate both for this long-term project and for the evaluation of GHG emissions impacts in general. Construction GHG emissions are included, amortized over the Project's life, in the Project's annual GHG emissions totals.

Considering these guidelines, the following criteria are used in this EIR to determine the significance of Project GCC impacts:

- Criterion GHG1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold.
- Criterion GHG2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Emissions Calculations Methodology. Direct GHG emissions would result from fuel use from proposed construction and operation activities. Indirect emissions could occur from an increase in on-site electricity use during construction or operation or from the increased use of water. However, for this Project there is not assumed to be an incremental increase in on-site electricity consumption from construction and operation activities; and this Project would allow the increased use of local water supplies that would cause a reduction in GHG emissions from water management. Therefore, indirectly the Project would reduce GHG emissions; however, the potential magnitude of this GHG emissions reduction was not estimated.

GHG emissions were calculated based on methodologies provided in The Climate Registry – General Reporting Protocol (TCR, 2013) (TCR Protocol), and emissions factors for the TCR Protocol updated in 2014 (TCR, 2014). The TCR Protocol is the guidance document that TCR members, which includes the State of California, use to prepare annual GHG inventories for the Registry.

The assumptions used to create the air pollutant emissions and vehicle and equipment use were used to create diesel and gasoline fuel use estimates during Project construction and operation. These fuel use estimates along with the TCR GHG emissions factors for diesel and gasoline were used to determine the GHG emissions estimates.

C.2.4.3 Proposed Action/Project

Direct and Indirect Effects Analysis

The Project would include the following separate construction and operation activities:

Construction

- Site preparation, equipment, and material receipt and storage at the lay down area;
- Grade control structure excavation and refilling construction, including temporary screening plant and concrete batch plant;
- Sediment stockpiling and removal (1,165,000 cubic yards total, as much as 172,800 cubic yards/year for seven years, as much as 2,880 cubic yards per day using 16 dump trucks that haul 12 cubic yards/trip);
- Sediment hauling to the storage area in the existing sand and gravel pit area, or the alternative storage site on PWD owned land;
- Sediment storage area sediment pushing;
- Maintenance of unpaved and paved access roads; and
- Cleanup and demobilization.

Operation

- Site preparation, equipment and material receipt and storage at the lay down area;
- Sediment stockpiling and removal (38,000 cubic yards total per year, as much as 1,080 cubic yards per day using 6 dump trucks that haul 12 cubic yards/trip);
- Sediment hauling to the storage area in the existing sand and gravel pit area, or the alternative storage site on PWD owned land;
- Sediment storage area sediment pushing;
- Maintenance of unpaved and paved access roads; and
- Cleanup and demobilization.

The removed sediment would be placed into the storage area and a stabilized surface would be created at the end of each year's construction or operation excavation period. The detailed construction activity assumptions, including the construction equipment use, on-road traffic, and construction schedule are provided in Appendix B (Air Quality Calculations).

Air Quality

The Project would be inconsistent with the current approved Air Quality Management Plan (Criterion AIR1)

Impact AQ-1: Project Construction and Operation would conflict with the approved AVAQMD Air Quality Management Plans

The Project is located in the MDAB under the jurisdiction of the AVAQMD. The Antelope Valley portion of the MDAB is in non-attainment of the federal and State ozone standards and the State PM10 standard. The AVAQMD has developed a 2004 Ozone Attainment Plan (State and federal attainment) and a 2014 update to the Reasonably Available Control Technology State Implementation Plan (RACT SIP) analysis, and has prepared a list of measures to reduce PM emissions to meet State planning requirements.

Ozone

The AVAQMD 2004 Ozone Attainment Plan (AVAQMD, 2004) does not propose any new control measures beyond those in their current rules and regulations. The Project commitments for off-road equipment (See Appendix A) would meet or exceed the requirements of the only potentially project applicable ozone precursor reduction related rule (Rule 1110.2), and the construction contractor would have to ensure that permitted portable equipment also comply with this rule. The 2014 RACT SIP Analysis (AVAQMD, 2014) does not include any actions that are relevant to project emissions sources. Therefore, the Project would be consistent with the Ozone Air Quality Management Plan for Antelope Valley.

PM10

The AVAQMD prepared a list of measures to reduce PM emissions in 2005 (AVAQMD, 2005). Of the new control measures listed, the only applicable measures are fugitive dust control measures that would be integrated into Rule 403 – Fugitive Dust. The construction contractor would be required to comply with all AVAQMD rules and regulations; therefore, the Project would comply with the AVAQMD State PM attainment control measures.

Summary

The Project would have to comply with all rules and regulations applicable at the time of the Project's construction and operation and would implement the air quality project commitments (see Appendix A) that would reduce air pollutant emissions during Project construction and operation. Therefore, the Project would not conflict with the approved AVAQMD Air Quality Management Plans.

CEQA Significance Conclusion

Project construction, operations, and maintenance would be required to comply with AVAQMD rule and regulations. Therefore, the Project would have less than significant impacts in regards to applicable air quality plan conformance (Class III).

The Project would generate emissions of air pollutants that would exceed any AVAQMD regional air pollutant emissions threshold as defined in Table C.2-10. (Criterion AIR2)

Impact AQ-2: The Project's Construction Emissions Would Exceed AVAQMD Significance Criteria

Using vehicle and equipment assumptions developed for the Project, the air pollutant emissions were estimated for the two construction phases of the Project, grade control structure construction and excavation. The grade control structure construction will occur during a 3-month period in the first year of the Project life, and the excavation phase will occur for approximately 2.5 months each year for 7 years of the Project life starting the year after the grade control structure is constructed. As discussed earlier, a 7-year construction scenario for the proposed Project represents worst-case daily and total emissions. Tables C.2-11 and C.2-12 provide the average daily and annual air pollutant emissions estimates for the grade control structure construction.

Table C.2-11. Project Grade Control Structure – Average Daily Construction Emissions (lbs/day)						
	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.64	5.46	3.20	0.01	0.21	0.13
Off-road equipment	9.58	33.64	114.83	0.11	5.42	4.99
Fugitive dust	—	—	—	—	27.71	6.28
Total	10.21	39.10	118.03	0.12	33.34	11.41
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011.

Table C.2-12. Project Grade Control Structure – Average Construction Emissions (tons/yr)						
	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.02	0.20	0.12	0.00	0.01	0.00
Off-road equipment	0.35	1.24	4.25	0.00	0.20	0.18
Fugitive dust	—	—	—	—	1.03	0.23
Total	0.38	1.45	4.37	0.00	1.23	0.42
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Tables C.2-11 and C.2-12 show that the GCS construction emissions are estimated to be below all AVAQMD daily and annual emissions thresholds.

Tables C.2-13 and C.2-14 provide the average daily air pollutant emissions estimates for the excavation phase construction, with Table C.2-13 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-14 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-13. Project Excavation Phase – Average Daily Construction Emissions (lbs/day)						
	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	5.82	28.44	40.26	0.13	2.30	1.68
Off-road equipment	12.90	25.26	84.77	7.89	10.76	9.90
Fugitive dust	—	—	—	—	129.26	37.14
Total	18.72	53.70	125.03	8.02	142.32	48.72
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	Yes	No

Source: Appendix B; AVAQMD, 2011

Table C.2-14. Project Excavation Phase Alternate Sediment Storage Site – Average Daily Construction Emissions (lbs/day)						
	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	4.19	22.06	28.13	0.09	1.63	1.17
Off-road equipment	12.90	25.26	84.77	7.89	10.76	9.90
Fugitive dust	—	—	—	—	106.34	22.11
Total	17.09	47.32	112.90	7.98	118.73	33.19
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	Yes	No

Source: Appendix B; AVAQMD, 2011

As these two tables show, the PM10 emissions exceed the AVAQMD daily emissions thresholds. All other air pollutant emissions estimates are below the AVAQMD daily emissions thresholds.

Tables C.2-15 and C.2-16 provide the annual air pollutant emissions estimates for the excavation phase construction, with Table C.2-15 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-16 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-15. Project Excavation Phase – Annual Construction Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.19	0.91	1.29	0.00	0.07	0.05
Off-road equipment	0.41	0.81	2.71	0.25	0.34	0.32
Fugitive dust	—	—	—	—	4.14	1.19
Total	0.60	1.72	4.00	0.26	4.55	1.56
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-16. Project Excavation Phase Alternate Sediment Storage Site – Annual Construction Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.13	0.71	0.90	0.00	0.05	0.04
Off-road equipment	0.41	0.81	2.71	0.25	0.34	0.32
Fugitive dust	—	—	—	—	3.40	0.71
Total	0.55	1.51	3.61	0.26	3.80	1.06
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

As these two tables show, the air pollutant emissions estimates for the excavation phase of construction are well below the AVAQMD annual emissions thresholds.

SPCs Applicable to Impact AQ-2

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

All of the average daily and annual emissions are estimated to be below the AVAQMD emissions thresholds, except for average daily PM10 emissions during the excavation phase of construction.

While the Project's average daily PM10 emissions exceed the AVAQMD threshold during the excavation phase of the Project, per guidance from AQMD staff, emissions from very short-term projects that exceed daily AVAQMD emissions thresholds would not be considered significant under the following circumstances or conditions: (MDAQMD, 2014)

- The Project does not create any localized pollutant hot spots (required).
- The Project does not exceed the annual emissions thresholds (required).
- The Project is applying reasonably feasible control measure for the pollutants exceeding the daily emissions thresholds (required depending on project circumstances).
- The Project's construction schedule is altered, in a manner that increases air quality emissions, in order to reduce other project impacts (consideration for review).
- The Project's emissions are included in attainment plans (if true then only this item is needed to identify impacts as less than significant).

The Project would not create any localized pollutant hotspots that would impact any sensitive receptors (see the discussion below under Impact AQ-4), the Project's excavation phase construction PM10 emissions do not exceed the AVAQMD annual emissions thresholds, and the Project's schedule is altered to reduce impacts on biology (bird breading season) and to recreation that would occur if the reservoir was closed and drained to dead pool level for greater periods of the year. The Project meets the two required considerations noted above, which might be enough for AVAQMD to agree that the Project's emissions are less than significant. However, to ensure that these cumulative emissions impacts are less than significant, feasible mitigation of PM10 emissions will also be implemented during the excavation phase of the Project (please see SPCs AQ-1 through AQ-5 provided in Appendix A).

Therefore, all construction period pollutant emissions impacts are less than significant (Class III).

Impact AQ-3: The Project's Operation Emissions Would Exceed AVAQMD Significance Criteria

Tables C.2-17 and C.2-18 provide the average daily air pollutant emissions estimates for the ongoing annual excavation, with Table C.2-17 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-18 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-17. Project Ongoing Annual Sediment Removal – Average Daily Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	2.34	13.15	15.27	0.05	0.89	0.64
Off-road equipment	8.99	16.18	49.02	5.94	7.65	7.04
Fugitive dust	—	—	—	—	49.05	13.15
Total	11.33	29.34	64.29	5.99	57.60	20.82
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-18. Project Ongoing Annual Sediment Removal Alternate Sediment Storage Site – Average Daily Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	1.75	10.86	10.90	0.04	0.65	0.46
Off-road equipment	8.99	16.18	49.02	5.94	7.65	7.04
Fugitive dust	—	—	—	—	40.32	7.94
Total	10.74	27.04	59.92	5.98	48.62	15.44
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Tables C.2-17 and C.2-18 show that the ongoing annual excavation emissions are estimated to be below all AVAQMD daily emissions thresholds.

Tables C.2-19 and C.2-20 provide the annual air pollutant emissions estimates for the ongoing annual excavation, with Table C.2-19 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-20 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-19. Project Ongoing Annual Sediment Removal – Annual Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.05	0.26	0.31	0.00	0.02	0.01
Off-road equipment	0.18	0.32	0.98	0.12	0.15	0.14
Fugitive dust	—	—	—	—	0.98	0.26
Total	0.23	0.59	1.29	0.12	1.15	0.42
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-20. Project Ongoing Annual Sediment Removal Alternate Sediment Storage Site – Annual Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.03	0.22	0.22	0.00	0.01	0.01
Off-road equipment	0.18	0.32	0.98	0.12	0.15	0.14
Fugitive dust	—	—	—	—	0.81	0.16
Total	0.21	0.54	1.20	0.12	0.97	0.31
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

As these two tables show, the air pollutant emissions estimates for the ongoing annual excavation are well below the AVAQMD annual emissions thresholds.

SPCs Applicable to Impact AQ-3

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

All operation air pollutant emissions impacts are well below AVAQMD emissions thresholds, resulting in a less than significant impact (Class III).

The Project would expose sensitive receptors to substantial pollutant concentrations. (Criterion AIR3)

Impact AQ-4: The Project's Construction or Operations Emissions Would Create Health Risks

The Project's emissions would not include a large amount of toxic air pollutant emissions. The primary toxic air pollutant emitted is diesel particulate matter (DPM) from the Project's trucks and off-road equipment; however, even those emissions would be limited and the on-road DPM emissions would be spread along the primary sediment hauling route. Additionally, the majority of the off-road equipment DPM emissions from the Project and initial construction or maintenance, would occur at Littlerock reservoir, which is located more than a mile from any residences or other sensitive receptors. Due to the lack of schools or other significantly sensitive receptors near active project areas, the distance from residences to the main construction areas, the DPM emissions from on-road vehicles being spread out over several miles, and considering SPCs AQ-1 through AQ-5 (See Appendix A) would reduce diesel particulate matter (DPM) emissions, it is concluded that no adverse impacts to sensitive receptors would occur from toxic air pollutant emissions.

Please also see Section C.6 (Hazards and Public Safety) for a discussion of the potential for the Project to cause Valley Fever related health effects.

SPCs Applicable to Impact AQ-4

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Toxic air pollutant emissions are located far from sensitive receptors or spread out over a large area and so Project emissions of toxic air pollutants would not create substantial concentrations at sensitive receptor locations. Therefore, the impacts to sensitive receptors would be less than significant (Class III).

The Project would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements. (Criterion AIR4)

Impact AQ-5: The Project's Construction or Operations Emissions within the Angeles National Forest would exceed Applicable General Conformity Thresholds

The Project would potentially result in adverse impacts if the Project were to cause annual emissions that exceed the General Conformity *de minimis* thresholds. The current general conformity thresholds for the Antelope Valley portion of the MDAB, which is in severe nonattainment of the federal ozone standard, are as follows:

- NOx – 25 tons/year
- VOC – 25 tons/year

As the annual emissions estimates for construction (Tables C.2-12, C.2-15, and C.2-16) and operation (Tables C.2-19 and C.2-20) show the Project's estimated annual NOx and VOC emissions are well below the General Conformity applicability thresholds. A General Conformity analysis is not required for this project.

SPCs Applicable to Impact AQ-5

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

General Conformity would not be triggered; therefore, impacts are less than significant (Class III).

The Project would expose a substantial number of people to objectionable odors. (Criterion AIR5)

Impact AQ-6: The Project's Construction or Operations would create odors

Construction equipment and construction activities may create mildly objectionable odors. Additionally, biological decomposition odors may occur as the result of removing potentially wet sediments from the reservoir. These odors would be temporary, would occur far from populations, and would not affect a substantial number of people.

SPCs Applicable to Impact AQ-6

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Odor impacts would be less than significant (Class III).

The Project would conflict with air quality provisions of the Angeles National Forest Strategy. (Criterion AIR6)

Impact AQ-7: The Project would conflict with Angeles National Forest Air Quality Strategies

The Angeles National Forest Strategy does not include any air quality strategies that would be adversely impacted by the construction or operation of the Project. The Angeles National Forest air quality strategies are limited to the following:

- AIR 1: Minimize Smoke and Dust
- AIR 2: Forest Air Quality Emissions

The Angeles National Forest strategy AIR 1 is very general and is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." The only action item of this of this strategy is to "Incorporate visibility requirements into project plans." The Project construction smoke and dust would be reduced through conformance with AVAQMD fugitive dust rules and additionally mitigated to the extent feasible by SPCs AQ-1 through AQ-5 (see Appendix A). Therefore, this ANF air quality strategy would be complied with and no adverse impacts would occur.

The Angeles National Forest air quality strategy AIR 2 relates to providing an air quality inventory for prescribed burns and wildfires and therefore does not directly relate to the Project's construction and operation emissions. The Project's fire safety requirements are addressed separately.

Table C.2-21. Project – Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO2e (tons)
Construction Emissions	
On-Road Emissions	3,086
Off-Road Emissions	2,943
Subtotal Emissions	6,029
Amortized Construction Emissions (50-year life)	121
Operation Emissions	
On-Road Emissions	4,593
Off-Road Emissions	3,968
Subtotal Emissions	8,561
Amortized Operation Emissions (50 year-life)	171
Total Annualized Emissions	292
AVAQMD Significance Threshold	100,000
Exceeds Threshold?	NO

Source: Appendix B; AVAQMD, 2011.

SPCs Applicable to Impact AQ-7

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

There would be no conflict with Angeles National Forest Air Quality Strategies; therefore, impacts are less than significant (Class III).

Greenhouse Gases

The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold. (Criterion GHG1)

Impact GHG-1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold.

Using the same vehicle and equipment assumptions used to calculate the Project's air pollutant emissions, the fuel use was estimated for the on-road vehicle traffic and the off-road equipment to determine the direct GHG emissions from the Project. The Project has limited indirect emissions, and as noted previously may cause reductions in indirect emissions, and those secondary emissions were not calculated. Table C.2-21 provides the annualized direct CO2e emissions estimate for the Project.

Table C.2-21 shows the emissions totals for one year of GCS construction, 7 years of excavation (worst-case/maximum construction scenario), and 42 years of operation maintenance excavation. The amortized annual emissions divide these Project-life emissions by the 50-year Project life to obtain the Project's annualized emissions. The amortized Project life annual emissions are orders of magnitude below the AVAQMD significance threshold

Table C.2-22 provides the annualized direct CO2e emissions estimate for the Project assuming exclusive use of the alternate sediment storage site. The Project may use both storage locations, so these two tables represent the range of expected GHG emissions.

The shorter haul distance to the alternate sediment disposal location results is slightly lower GHG emissions than shown for the primary sediment disposal location as shown in Table C.2-21.

Table C.2-22. Project – Alternate Sediment Storage Site – Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO2e (tons)
Construction Emissions	
On-Road Emissions	2,236
Off-Road Emissions	2,943
Total Emissions	5,179
Amortized Emissions (50-year life)	104
Operation Emissions	
On-Road Emissions	3,445
Off-Road Emissions	3,968
Subtotal Emissions	7,413
Amortized Operation Emissions (50 year-life)	148
Total Annualized Emissions	252
AVAQMD Significance Threshold	100,000
Exceeds Threshold?	NO

Source: Appendix B; AVAQMD, 2011.

SPCs Applicable to Impact GHG-1

SPC GHG-1 (Recycle Construction Wastes)

CEQA Significance Conclusion

GHG emissions for the Project are estimated to be well below AVAQMD GHG emissions thresholds and are less than significant (Class III).

The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (Criterion GHG2)

Impact GHG-2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

As shown above in Table C.2-9, the Project would not conflict with applicable GHG emission reduction plans, policies, and regulations. The Project would use, re-use, or recycle all project waste streams, including the sediment, to the extent feasible (see Appendix A). Additionally, the Project would create the potential for increased beneficial use of a local potable water source.

SPCs Applicable to Impact GHG-2

SPC GHG-1 (Recycle Construction Wastes)

CEQA Significance Conclusion

The Project would conform to GHG emissions reductions policies, goals, and regulations, so impacts are less than significant (Class III).

C.2.4.4 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Alternative 1, which would differ from the Project only during the construction excavation phase, includes the following construction and operation activities:

Construction

- Sediment stockpiling and removal (1,400,000 cubic yards total, as much as 109,080 cubic yards/year for 13 years, as much as 1,080 cubic yards per day using 6 dump trucks that haul 12 cubic yards/trip)
- All other aspects of the Project construction, such as the grade control structure construction and the mobilization/demobilization/cleanup requirements would be identical or similar in nature to that noted for the Project.

Operation

- Identical to the Project, except that it would start 6 years later due to the longer construction excavation phase.

The detailed construction activity assumptions for Alternative 1, including the construction equipment use, on-road traffic, and construction schedule are provided in Appendix B (Air Quality Calculations).

Air Quality

The Project would be inconsistent with the current approved Air Quality Management Plan (Criterion AIR1)

Impact AQ-1: Project Construction and Operation would conflict with the approved AVAQMD Air Quality Management Plans

Alternative 1 would have the same types of emissions sources and so would be identical to the Project in relation to conformance with air quality management plans as described previously.

Summary

Alternative 1 would have to comply with all rules and regulations applicable at the time of the Project's construction and operation. Therefore, the Alternative 1 would not conflict with the approved AVAQMD Air Quality Management Plans.

CEQA Significance Conclusion

Project construction and operations and maintenance would be required to comply with AVAQMD rule and regulations and would implement the air quality project commitments that would reduce air pollutant emissions during Project construction and operation. Therefore, Alternative 1 would have less than significant impacts in regards to applicable air quality plan conformance (Class III).

The Project would generate emissions of air pollutants that would exceed any AVAQMD regional air pollutant emissions threshold as defined in Table C.2-10. (Criterion AIR2)

Impact AQ-2: The Project's Construction Emissions Would Exceed AVAQMD Significance Criteria

Using vehicle and equipment assumptions developed for the Project and Alternative 1, the air pollutant emissions were estimated for the two construction phases of the Project, grade control structure construction and excavation. The grade control structure construction would be the same for both alternatives and would occur during a 3-month period in the first year of the Project life, and the excavation phase for Alternative 1 would occur, at a much lower daily excavation rate compared to the Project, for approximately 5 months for 13 years of the Project life starting the year after the grade control structure is constructed. As discussed earlier, a 13-year construction scenario for Alternative 1 represents

worst-case daily and total emissions. Tables C.2-11 and C.2-12, provided previously, provide the average daily and annual air pollutant emissions estimates for the grade control structure construction.

Tables C.2-11 and C.2-12 show that the GCS construction emissions are estimated to be below all AVAQMD daily and annual emissions thresholds.

Tables C.2-23 and C.2-24 provide the average daily air pollutant emissions estimates for the excavation phase construction for Alternative 1, with Table C.2-23 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-24 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-23. Alternative 1 Excavation Phase – Average Daily Construction Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	2.45	13.76	16.04	0.05	0.94	0.67
Off-road equipment	8.95	15.85	49.78	6.00	7.73	7.11
Fugitive dust	—	—	—	—	50.65	13.55
Total	11.40	29.61	65.81	6.06	59.32	21.33
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-24. Alternative 1 Excavation Phase Alternate Sediment Storage Site – Average Daily Construction Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	1.82	11.30	11.37	0.04	0.68	0.48
Off-road equipment	8.95	15.85	49.78	6.00	7.73	7.11
Fugitive dust	—	—	—	—	42.30	8.31
Total	10.77	27.15	61.14	6.04	50.71	15.90
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

As these two tables show none of the excavation-phase construction emissions for Alternative 1 exceed the AVAQMD daily emissions thresholds.

Tables C.2-25 and C.2-26 provide the annual air pollutant emissions estimates for the excavation phase construction for Alternative 1, with Table C.2-25 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-26 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-25. Alternative 1 Excavation Phase – Annual Construction Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.13	0.72	0.84	0.00	0.05	0.04
Off-road equipment	0.47	0.83	2.61	0.32	0.41	0.37
Fugitive dust	—	—	—	—	2.66	0.71
Total	0.60	1.55	3.46	0.32	3.11	1.12
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-26. Alternative 1 Excavation Phase Alternate Sediment Storage Site – Annual Construction Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.10	0.59	0.60	0.00	0.04	0.02
Off-road equipment	0.47	0.83	2.61	0.32	0.41	0.37
Fugitive dust	—	—	—	—	2.22	0.44
Total	0.57	1.43	3.21	0.32	2.66	0.83
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

As these two tables show, the air pollutant emissions estimates for the excavation phase of construction for Alternative 1 are well below the AVAQMD annual emissions thresholds.

SPCs Applicable to Impact AQ-2

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

All construction air pollutant emissions impacts for Alternative 1 are well below AVAQMD emissions thresholds and are less than significant (Class III).

Impact AQ-3: The Project's Operation Emissions Would Exceed AVAQMD Significance Criteria

The Project goes into its operation and maintenance phase once the excavation phase is over. The operation and maintenance phase for Alternative 1 and the Project are identical, namely the removal of annual sediment accumulations. Therefore, Tables C.2-17 and C.2-18 also provide the average daily air pollutant emissions estimates for the ongoing annual excavation for Alternative 1, with Table C.2-17 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-18 assuming that the sediment transport will be to the alternate sediment storage site.

As these two tables show, the air pollutant emissions estimates for the ongoing annual excavation are well below the AVAQMD annual emissions thresholds.

SPCs Applicable to Impact AQ-3

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

All operation air pollutant emissions impacts for Alternative 1 are well below AVAQMD emissions thresholds and are less than significant (Class III).

The Project would expose sensitive receptors to substantial pollutant concentrations. (Criterion AIR3)

Impact AQ-4: The Project's Construction or Operations Emissions Would Create Health Risks

Alternative 1 would have the same types of toxic air emissions from the same types of emissions sources as the Project, although Alternative 1 would have lower maximum daily and annual emissions. The same analysis factors as noted for the Project apply to the Alternative 1. Therefore, due to the lack of schools or other significantly sensitive receptors near active Project areas, the distance from residences to the main construction areas, the DPM emissions from on-road vehicles being spread out over several miles, and considering the Project commitments (See Appendix A) that would reduce diesel particulate matter (DPM) emissions, it is concluded that no adverse impacts to sensitive receptors would occur from Alternative 1's toxic air pollutant emissions.

Please also see Section C.6 (Hazards and Public Safety) for a discussion of the potential for the Project to cause Valley Fever–related health effects.

SPCs Applicable to Impact AQ-4

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Toxic air pollutant emissions are located far from sensitive receptors or spread out over a large area and so project emissions of toxic air pollutants would not create substantial concentrations at sensitive receptor locations. Therefore, the impacts to sensitive receptors would be less than significant (Class III).

The Project would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements. (Criterion AIR4)

Impact AQ-5: The Project's Construction or Operations Emissions within the Angeles National Forest would exceed Applicable General Conformity Thresholds

Alternative 1 would potentially result in adverse impacts if the Project were to cause annual emissions that exceed the General Conformity *de minimis* thresholds. The current general conformity thresholds for the Antelope Valley portion of the MDAB, which is in severe nonattainment of the federal ozone standard, are as follows:

- NOx – 25 tons/year
- VOC – 25 tons/year

As the annual emissions estimates for Alternative 1 construction (Tables C.2-12, C.2-23, and C.2-24) and operation (Tables C.2-19 and C.2-20) show Alternative 1's estimated NOx and VOC emissions are well below the General Conformity applicability thresholds. A General Conformity analysis is not required for this Project.

SPCs Applicable to Impact AQ-5

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

General Conformity would not be triggered; therefore impacts are less than significant (Class III).

The Project would expose a substantial number of people to objectionable odors. (Criterion AIR5)

Impact AQ-6: The Project's Construction or Operations would create odors

Alternative 1 construction equipment and construction activities may create mildly objectionable odors. Additionally, biological decomposition odors may occur as the result of removing potentially wet sediments from the reservoir. These odors would be temporary, would occur far from populations, and would not affect a substantial number of people.

SPCs Applicable to Impact AQ-6

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Odor impacts would be less than significant (Class III).

The Project would conflict with air quality provisions of the Angeles National Forest Strategy. (Criterion AIR6)

Impact AQ-7: The Project would conflict with Angeles National Forest Air Quality Strategies

The Angeles National Forest Strategy does not include any air quality strategies that would be adversely impacted by the construction or operation of Alternative 1. The Angeles National Forest air quality strategies are limited to the following:

- AIR 1: Minimize Smoke and Dust
- AIR 2: Forest Air Quality Emissions

The Angeles National Forest strategy AIR 1 is very general and is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." The only action item of this of this strategy is to "Incorporate visibility requirements into project plans." The construction smoke and dust from Alternative 1 would be reduced through conformance with AVAQMD fugitive dust rules and additionally mitigated to the extent feasible by the Project commitments (see Appendix A). Therefore, this ANF air quality strategy would be complied with and no adverse impacts would occur.

The Angeles National Forest air quality strategy AIR 2 relates to providing an air quality inventory for prescribed burns and wildfires and therefore does not directly relate to the Alternative 1's construction and operation emissions. Fire safety requirements for Alternative 1 are addressed separately.

SPCs Applicable to Impact AQ-7

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

There would be no conflict with Angeles National Forest Air Quality Strategies; therefore, impacts are less than significant (Class III).

The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold. (Criterion GHG1)

Greenhouse Gases

Impact GHG-1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold.

Table C.2-27 provides the annualized direct CO2e emissions estimate for Alternative 1.

Table C.2-27 shows the emissions totals for one year of GCS construction, 13 years of excavation (worst-case/maximum construction scenario), and 36 years of operation maintenance excavation. The amortized annual emissions divide these project life emissions by the 50-year project life to obtain the Alternative 1 annualized emissions. The amortized project life annual emissions are orders of magnitude below the AVAQMD significance threshold, but are somewhat higher than those for the Project.

Table C.2-27. Alternative 1 – Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO2e (tons)
Construction Emissions	
On-Road Emissions	3,969
Off-Road Emissions	3,733
Subtotal Emissions	7,702
Amortized Emissions (50 year-life)	154
Operation Emissions	
On-Road Emissions	3,937
Off-Road Emissions	3,401
Subtotal Emissions	7,338
Amortized Operation Emissions (50 year-life)	147
Total Annualized Emissions	301
AVAQMD Significance Threshold	100,000
Exceeds Threshold?	NO

Source: Appendix B; AVAQMD, 2011.

Table C.2-28 provides the annualized direct CO2e emissions estimate for Alternative 1 assuming exclusive use of the alternate sediment storage site. The Project may use both storage locations, so these two tables represent the range of expected GHG emissions.

The shorter haul distance to the alternate sediment disposal location results is slightly lower GHG emissions than shown for the primary sediment disposal location as shown in Table C.2-27. However, the GHG emissions from Alternative 1 have been estimated to be slightly higher than those for the Project. The higher project-life GHG emissions for Alternative 1 are due to the expected higher efficiencies that can occur for the Project's higher daily volume sediment hauling.

Table C.2-28. Alternative 1 – Alternate Sediment Storage Site – Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO2e (tons)
Construction Emissions	
On-Road Emissions	2,972
Off-Road Emissions	3,733
Total Emissions	6,705
Amortized Emissions (50 year-life)	134
Operation Emissions	
On-Road Emissions	2,953
Off-Road Emissions	3,401
Subtotal Emissions	6,354
Amortized Operation Emissions (50 year-life)	127
Total Annualized Emissions	261
AVAQMD Significance Threshold	100,000
Exceeds Threshold?	NO

Source: Appendix B; AVAQMD, 2011.

SPCs Applicable to Impact GHG-1

SPC GHG-1 (Recycle Construction Wastes)

CEQA Significance Conclusion

GHG emissions for Alternative 1 are estimated to be well below AVAQMD GHG emissions thresholds and are less than significant (Class III).

The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (Criterion GHG2)

Impact GHG-2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Alternative 1 is essentially identical to the Project in terms of conformance with GHG emissions reduction plans, policies, and regulations. Therefore, Alternative 1 would not conflict with applicable GHG emissions reduction plans, policies, and regulations.

SPCs Applicable to Impact GHG-2

SPC GHG-1 (Recycle Construction Wastes)

CEQA Significance Conclusion

Alternative 1 would conform to GHG emissions reductions policies, goals, and regulations, so impacts are less than significant (Class III).

C.2.4.5 Alternative 2: No Action/No Project Alternative

Air Quality

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at an annual average rate of 38,000 cubic yards per year. Palmdale Water District (PWD) would not undertake any activities to remove sediment. Therefore, no air pollutant emissions would be generated.

At full capacity, sediment accumulated behind the dam would be approximately 7.4 million cubic yards. In the event sediment buildup led to safety issues and required demolition/removal of the Dam, construction activities (and related air pollutant emissions) are expected to be greater than that of the Project or Alternative 1. Demolition of the dam and restoration of the waterway would require the removal of 2.8 million cubic yards of sediment and dam concrete be removed. Such activities would result in a project similar to, but larger than, the Project, with the location(s) that could handle all of the material storage and disposal being uncertain and likely more distant that proposed for the Project or Alternative 1. Additionally, demolition and removal of the concrete dam would require extensive construction. While many activities would occur within the Reservoir and not proximate to sensitive receptors, the hauling and disposal of up to 2.8 million cubic yards of sediment and dam debris would generate air pollutant emissions similar to, but likely greater in quantity, than that of the Project or Alternative 1.

In the event the Reservoir became filled with sediment and the Dam was left, it is likely some sort of downstream flood-control channeling would need to be constructed. Air pollutant emissions from such construction activities would be temporary and are expected to be similar in quantity to that occurring during grade control construction. However, depending on the location of such flood control facilities, the air quality emissions may be emitted proximate to downstream residential receptors.

CEQA Significance Conclusion

Air pollutant emissions generated from the potential eventual dam removal construction activities may exceed AVAQMD emissions thresholds. While such a determination is speculative, the possibility exists. Therefore, air quality impacts related to Impact AQ-2 for the No Action/No Project Alternative are considered significant and unavoidable (Class I). All other air quality impacts would be less than significant (Class III).

Greenhouse Gases

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at an annual average rate of 38,000 cubic yards per year. PWD would not undertake any activities to remove sediment. Therefore, no greenhouse gas emissions would be directly generated.

At full capacity, sediment accumulated behind the dam would be approximately 7.4 million cubic yards. In the event sediment buildup led to safety issues and required demolition/removal of the Dam, demolition of the dam and restoration of the waterway would require the removal of 2.8 million cubic yards of sediment and dam concrete be removed. Therefore, construction activities (and related greenhouse gas emissions) are expected to be greater than that of the Project or Alternative 1. Such activities would result

in a project similar to, but larger than, the Project, with the location(s) that could handle all of the material storage and disposal being uncertain and likely more distant that proposed for the Project or Alternative 1. While many activities would occur within the Reservoir and not proximate to sensitive receptors, the hauling and disposal of up to 2.8 million cubic yards of sediment and dam debris would generate greenhouse gas emissions similar to, but likely greater in quantity, than that of the Project or Alternative 1.

In the event the Reservoir became filled with sediment and the Dam was left, it is likely some sort of downstream flood-control channeling would need to be constructed. Greenhouse gas emissions from such construction activities would be temporary and are expected to be similar in quantity to that occurring during grade control construction.

While the greenhouse gas emissions from dam removal activities may not exceed the AVAQMD thresholds, the loss of this water resource would not comply with GHG emissions reductions policies and goals that seek to maximize local water resources and reduce the GHG emissions associated with long distance water importing. It is assumed that construction wastes, including the sediment removed, would be recycled or re-used to the extent feasible.

CEQA Significance Conclusion

The direct greenhouse gas emissions generated from the potential eventual dam removal construction are not expected to exceed AVAQMD emissions thresholds. However, the No Action/No Project Alternative would cause the loss of the local water resource which would not comply with all applicable GHG emissions reduction policies and goals. Therefore, the GHG emissions impacts related to Impacts GHG-1 and GHG-2 for the No Action/No Project Alternative are considered significant and unavoidable (Class I).

C.2.5 Impact Summary

C.2.5.1 Air Quality

The air quality impacts associated with the Project and Alternative 1 would be less than significant. While such a determination is speculative for the No Action/No Project Alternative, the possibility exists that significant and unavoidable air quality impacts may occur from construction from removal of Littlerock Dam if the Reservoir were allowed to fill up with sediment and Dam safety became compromised.

Table C.2-29 summarizes the direct and indirect environmental impacts of the proposed action and the alternatives on air quality. Refer to Appendix A for the air quality project commitments.

Table C.2-29. Summary of Impacts and Mitigation Measures – Air Quality

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1, 2]	
AQ-1: Project Construction and Operation would conflict with the approved AVAQMD Air Quality Management Plans	Class III	Class III	Class III	Yes	None
AQ-2: The Project's Construction Emissions Would Exceed AVAQMD Significance Criteria	Class III	Class III	Class I	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
AQ-3: The Project's Operation Emissions Would Exceed AVAQMD Significance Criteria	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
AQ-4: The Project's Construction or Operations Emissions Would Create Health Risks	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
AQ-5: The Project's Construction or Operations Emissions within the Angeles National Forest would exceed Applicable General Conformity Thresholds	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
AQ-6: The Project's Construction or Operations would create odors	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.2-29. Summary of Impacts and Mitigation Measures – Air Quality					
	Impact Significance				
Impact	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1, 2]	Mitigation Measures/SPC
AQ-7: The Project would conflict with Angeles National Forest Air Quality Strategies	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
2 – Determination based on non-biological resource sensitive receptors.

C.2.5.2 Greenhouse Gases

The greenhouse gas emissions impacts associated with the Project and Alternative 1 would be less than significant. While such a determination is speculative for the No Action/No Project Alternative, the possibility exists that significant and unavoidable greenhouse gas impacts may occur from the loss of the water resource, from a GHG emission reduction policy perspective, if the Reservoir were allowed to fill up with sediment and the water resource was lost.

Table C.2-30 summarizes the direct and indirect environmental impacts of the proposed action and the alternatives on greenhouse gases. Refer to Appendix A for the greenhouse gas Project commitments.

Table C.2-30. Summary of Impacts and Mitigation Measures – Greenhouse Gases					
	Impact Significance				
Impact	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1, 2]	Mitigation Measures/SPC
GHG-1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold	Class III	Class III	Class I	Yes	SPC GHG-1 (Recycle Construction Wastes)
GHG-2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	Class III	Class III	Class I	Yes	SPC GHG-1 (Recycle Construction Wastes)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
2 – Determination based on non-biological resource sensitive receptors.

C.3 Biological Resources

This section describes effects to biological resources from the implementation of the proposed Littlerock Reservoir Sediment Removal Project (Project). The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for a range of Project alternatives, and recommends measures to reduce or avoid adverse impacts anticipated from the construction of the proposed grade control structure, the removal of accumulated sediment, and from the ongoing operational effects from annual sediment removal. Existing laws and regulations relevant to biological resources are described and how the Project would comply with these regulations.

A Biological Assessment evaluates impacts to federally listed threatened, endangered, proposed, petitioned, and candidate species, and is written according to guidelines of the U.S. Fish and Wildlife Service (USFWS). A Biological Evaluation evaluates impacts to USDA Forest Service (Forest Service) Sensitive species. Because the Project has the potential to affect listed species, a Biological Opinion for the Project will also be completed by the USFWS and provided in the Final EIS/EIR.

C.3.1 Affected Environment

The Affected Environment for biological resources includes the baseline biological conditions of the Project area. Vegetation types within the Project area are described to characterize botanical resources and wildlife habitat values. Biotic habitats suitable for the occurrence of special-status plant and wildlife species are also described.

For the purposes of describing, assessing, and analyzing Biological Resources the Project area is defined as the Littlerock Reservoir and all day use areas, including roads and recreational areas (Figure C.3-1). This includes Rocky Point (the location of the proposed grade control structure) and a portion of Little Rock Creek extending approximately 1,000 feet upstream from Rocky Point.

C.3.1.1 Baseline Data Collection Methodology

This section provides a description of the methodology used to assess biological resources in the Project area. Biological information was collected through field investigations (i.e., reconnaissance, protocol, and focused surveys); review of existing online and published literature; consultation with local biologists and regional experts; and coordination with regulatory staff including the United States Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW; formerly the California Department of Fish and Game [CDFG]), and the Forest Service. Field surveys were conducted between 2007 and 2014.

Information from a review of the literature, combined with observations from Aspen's field surveys, were used to generate a list of sensitive vegetation communities and special-status plant and animal taxa that either observed or may have the potential to occur within the Study Area and adjacent habitat. For the purposes of this report, special-status taxa are defined as plants or animals that:

- Have been designated as either rare, threatened, or endangered by CDFW or USFWS and are protected under the Federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA);
- Are candidate species being considered or proposed for listing under these acts;
- Are considered Species of Special Concern by the CDFW;
- Are designated as California Rare Plant Rank (CRPR) 1, 2, 3, or 4 plant species;

- Are listed as Forest Sensitive Species by Angeles National Forest;
- Are fully protected by the California Fish and Game Code, Sections 3511, 4700, 5050, or 5515; or
- Are of expressed concern to resource or regulatory agencies, or local jurisdictions.

Literature Search

Sensitive biological resources known to occur in the region or potentially present were identified through a review of existing literature sources including USGS topographic maps, aerial photography, and the CDFW California Natural Diversity Data Base (CNDDB) (CDFW, 2014). The Project site is located within the U.S. Geological Survey (USGS) Pacifico Mountain, California 7.5-foot topographic quadrangle. The following eight adjacent quadrangles were also included in the database search due to their proximity to the Study Area: Chilao Flat, Condor Peak, Acton, Ritter Ridge, Palmdale, Littlerock, Juniper Hills, and Waterman Mountain.

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

- Special Animals List (CDFW, 2016a);
- State and federally listed endangered and threatened animals of California (CDFW, 2016b);
- California Wildlife Habitat Relationships (CDFG, 2008);
- Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2015);
- Angeles National Forest Land Management Plan (USFS, 2005);
- Pacific Southwest Region Regional Forester's Sensitive Species List (USFS, 2014);
- Consortium of California Herbaria (CCH, 2011);
- Biological Assessment for the Littlerock Dam and Reservoir Sediment Control Plan (PCR, 2001);
- Antelope Valley Area Plan (LADRP, 2015);
- County of Los Angeles Significant Ecological Areas (LADRP, 2014); and
- Aerial photographs of Littlerock Reservoir and surrounding areas (from October 2012, December 2011, July 2011, June 2009, July 2008, March 2006, February 2006, December 2005, November 2005, July 2003, June 2002, May 2002, June 1994, and May 1994).

Consultation with Agencies and Local Experts

Agency coordination has been ongoing and includes biological resource staff from the ANF, CDFW, and the USFWS. Biological resource data including the use and distribution of sensitive wildlife, including arroyo toads have also been obtained from interviews and site visits with experts on arroyo toad ecology including Ruben Ramirez, Larry Hunt, and William Haas.

Surveys

Aspen conducted biological resource assessments within and adjacent to the Project site between 2007 and 2015. Surveys were conducted by experienced biologists familiar with the resources in the region and under appropriate conditions to detect and identify plant and wildlife species. Surveys of the Project site were conducted year round in order to evaluate seasonal use of the site and to note wintering bird use. Field personnel included Chris Huntley, Jared Varonin, Brady Daniels, Cindy Hitchcock, Justin Wood, Tracy Popiel, Jennifer Lancaster, Lynn Stafford, Larry Hunt, Jason Berkeley, and William Haas.

Surveys were conducted across a broad geographic range to better characterize the biological resources that occur or have the potential to be present in the vicinity of the Project area. This area is defined as the Study Area and includes all portions of the Project area and a buffer that extends 0.25 miles upstream from Rocky Point (including a portion of Santiago Creek), and approximately one mile downstream of Littlerock Dam. Most wildlife surveys included the entire Study Area. Vegetation mapping was limited to a subset of the Study Area extending approximately 500 feet from the Project area. This area is identified as the Vegetation Study Area. Figure C.3-1 shows the limits of the Project area, Study Area, and Vegetation Study Area. Table C.3-1 includes a list of the surveys conducted and a brief summary of their results. Survey methodologies are described in Appendix C-1.

Table C.3-1. Summary of Surveys Conducted at the Littlerock Reservoir and Sediment Disposal Sites

Target Species	Survey Type	Survey Dates	Results
Rare Plants and Vegetation	Focused Pedestrian Survey	16 May 2007 23 May 2010 7 Jul 2011 20 and 30 May 2012 6 Jun 2012	Three special-status plants, Johnston's monkeyflower (*Mimulus johnstoni*), short-joint beavertail (*Opuntia basilaris var. brachyclada*), and Lemmon's syntrichopappus (*Syntrichopappus lemmonii*) were detected within the Vegetation Study Area. These occurrences were outside of the Project area and would not be subject to disturbance. All vegetation types were mapped in the Vegetation Study Area (which included the proposed haul routes and sediment disposal site at 47th Street East).
Gastropods and Fish	Focused Pedestrian Survey of Micro-Habitats, Hand Raking Seining/Dip Netting/Visual Observations	1 - 3 Jun 2011 13 Jan 2012 4-5 Aug 2014	Sensitive gastropods were not detected in the Study Area. Several species of non-native fish were detected. Sensitive fish were not observed in the Study Area.
Amphibians and Reptiles	Acoustic, Focused Pedestrian, Inspections of Microhabitats	16 May 2007 24 Sep 2007 5, 14,18 May 2010 1 - 3 Jun 2011 12 Jul 2012 13,21 May 2014 Ongoing May 2015	One federally listed amphibian, the arroyo toad, was commonly detected within the Study Area above Rocky Point. The species has not been observed below the dam or within the Reservoir below Rocky Point. The species was not observed in the small tributary drainages that feed the Reservoir. Common amphibians were routinely observed at the Reservoir and along the stream terraces. Western toad was observed on access roads and in upland areas. Several sensitive reptiles were observed in the Study Area, including California legless lizard, coastal whiptail, coast horned lizard, and southwestern pond turtle.
Desert Tortoise and Burrowing Owl	Protocol Surveys	26 April 2014	The 47th Street sediment disposal site provides suitable habitat for burrowing owl and there is a moderate potential that this species would be present. Very few suitable burrows (i.e., ground squirrel only) were observed. No desert tortoise or their sign was found on or adjacent to the site.
Terrestrial Mammals	Reconnaissance-Level Surveys; Visual Surveys; Review of Scat, Tracks, Sign, Middens, and Burrows Habitat Assessment for Mohave Ground Squirrel	16 May 2007 5 and 14 May 2010 1–3 Jun 2011 13 Jan 2012 12 Jul 2012 22 Aug 2014 April 2015	Sensitive mammals (with the exception of bats, see below) were not detected in the Study Area. However, the area is expected to support a number of rare or protected species including bighorn sheep, American badgers, and ringtail.

Table C.3-1. Summary of Surveys Conducted at the Littlerock Reservoir and Sediment Disposal Sites			
Target Species	Survey Type	Survey Dates	Results
Bats	Visual and Acoustic (SongMeter™ SM2 and Wildlife Acoustics EM3)	17–18 May 2012 17–18 Jul 2012	Several species of bats were detected at the Reservoir including pallid bat and western small-footed myotis.
Least Bell's Vireo	Focused (Non-Protocol) and Protocol Surveys	22–23 Jul 2010 29 Apr 2011 10 and 19 May 2011 1,10, 21 Jun 2011 1 and 12 Jul 2011 16 Feb 2012 18 Apr 2012 18 May 2012	Least Bell's vireo was detected on Little Rock Creek downstream of the dam. The birds fledged young in 2011 but did not appear to do so in 2012.
Birds	Focused Pedestrian and Acoustic	14 May 2010 22–23 Jul 2010 1–3 Jun 2011 12–13 Jul 2012 15 Dec 2011 18 Jan 2012 16 Feb 2012 18 Apr 2012 18 May 2012 12 Jul 2012 18 Jul 2012 30 Aug 2011 13 Jan 2012	Eighty-five species of birds were detected in the Study Area including a variety of special status species. Bald eagle is known as an occasional winter visitor.
State and Federal Waters	Formal Delineation	4–5 Aug 2014	Littlerock Reservoir was determined to support State and federal jurisdictional waters. Wetlands are not present at the Reservoir.

C.3.1.2 Environmental Setting

Regional Setting and Background

The Littlerock Reservoir (Reservoir) is located approximately 3 miles southwest of the community of Littlerock, within the boundaries of the Santa Clara Mojave Rivers Ranger District in the Angeles National Forest (ANF) (Figure C.3-2). Inflow into the Reservoir is seasonal and varies widely depending on annual precipitation and snowmelt. Littlerock Dam, constructed in 1924, was originally built to provide a source of irrigation for downstream agricultural activities. With the construction of the California Aqueduct, which started in 1960, the Reservoir became a back-up water source for the communities it served. Historically, the watershed supported cattle grazing and mining.

The primary sediment disposal site would be exhausted sand and gravel mines located in the community of Littlerock, approximately 6 miles north of the Dam (as shown in Figures B-1 and C.3-2). Currently, six individual quarries operate within this area. The quarries abut Little Rock Creek, residential areas, and isolated rural lands adjacent to Highway 138. Sediment would also be stockpiled on property owned by Palmdale Water District (PWD) located in semi natural lands immediately west of 47th Street East, just north of the California Aqueduct (see Figures B-11 and C.3-2). Though varied floristic influences exist in the Antelope Valley and surrounding foothills, this region has been subject to historic land uses such as farming, grazing, recreation, water diversion (i.e., the Littlerock Reservoir and the California Aqueduct), and infrastructure development (i.e., the construction of residential and commercial properties, military land uses including Edwards Air Force Base, Interstate 14, and Highway 138).

The Reservoir is located in the Antelope Valley at the transition of the southern border of the Mojave Desert and the northeastern foothills of the San Gabriel Mountains. The Reservoir and proposed access roads are surrounded by National Forest System lands with portions bordered by small private in-holdings, rural residences, and privately held natural lands. This Project is located in a broad transition zone between the Mojave Desert and the Transverse Ranges which supports a variety of native and introduced plants and wildlife. The 2005 Forest Service Land Management Plan indicates the ANF is home to approximately nine native species of fish, 18 amphibians, 61 reptiles, 299 birds, 104 mammals, 2,900 vascular plants, and an unknown number of species of invertebrate animals and non-vascular plants. Some of these species are endemic to the ANF, and some have special status as federally listed threatened, endangered, proposed, candidate, or Forest Sensitive Species. Little Rock Creek is home to several sensitive biological resources including the arroyo toad, two-striped garter snake, southwestern pond turtle, and a variety of rare birds including least Bell's vireo and bald eagle.

Local Setting

The Project area includes the Reservoir where sediment would be removed and the grade control structure installed at Rocky Point; staging areas located within or immediately adjacent to the Reservoir; and sediment disposal areas located off NFS lands. Sediment disposal areas are located up to 6 miles north of the Reservoir and include disturbed quarries and semi natural lands (See Figures C.3-3, C.3-4, and C.3-5).

Littlerock Reservoir and Rocky Point

The Reservoir is located in a narrow mountainous valley on NFS lands and is approximately one mile in length. Access to the Reservoir is from Cheseboro Road, named after a popular cowboy actor from the early twentieth century. The road is located on the west side of the reservoir where recreational facilities are located. These include a boat ramp, restrooms, parking areas, a small café, cabins, and picnic facilities.

The shoreline is composed of eroded slopes, sand, small rock, and fines. In a few locations the banks have been reinforced with rock gabions and riprap. In addition to providing drinking water, the Reservoir supports recreational opportunities including boating, fishing, and swimming. When the reservoir is drained at the end of summer, dry portions of the Reservoir have been open to recreational off-highway vehicle (OHV) travel.

The upstream portion of the Project area and the southern extent of the Study Area are located in the northern limit of the Lower Little Rock Creek Critical Biological Zone of the ANF. Little Rock Creek is closed to the public above Rocky Point to protect the federally endangered arroyo toad (*Anaxyrus californicus*) and its designated critical habitat. A barrier of orange snow fencing delineates this area. During the course of surveys Aspen routinely observed vehicle tracks beyond the barrier, indicating that some OHV users are entering designated critical habitat for arroyo toad.

Vegetation at the Reservoir varies and includes species associated with the Mojave Desert and San Gabriel Mountains. California buckwheat scrub, California juniper woodland, and singleleaf pinyon woodland dominate the foothills surrounding the Reservoir. This habitat is relatively intact although small trails from OHVs occur in a few locations. Vegetation along the margins of the Reservoir is affected by seasonal fluctuations in water surface elevations that occur from the operation of the facility. The lack of soil development, steep slopes, and variable water surface elevations limit vegetation to patchy isolated areas in most locations. These factors contribute to the lack of vegetation in most of the reservoir; however, a Fremont cottonwood (*Populus fremontii*) forest with western sycamore (*Platanus*

racemosa) and willows (*Salix sp.*) is present in the Reservoir near Rocky Point. During surveys conducted in 2012, Aspen observed that many of the mature cottonwoods and willows were dead or dying and many have been removed from the Reservoir. This community is also present north of Rocky Point and to some degrees in other upstream areas.

The proposed grade control structure would be located at Rocky Point, where the creek is confined between a steep natural slope to the east and a reinforced man-made slope on the west. This location supports a picnic area and is often used for fishing or water play. During periods of low water recreationists construct small dams to trap water in this area. Vegetation in the developed area includes scattered cottonwoods, Joshua trees, juniper, and upland shrubs while riparian areas support emerging riparian vegetation. Depending on the time of year, emerging riparian vegetation including juvenile willows colonize portions of the reservoir and stream channel but are removed from scour or lost through inundation during the winter.

Little Rock Creek Downstream of the Dam

North of the Dam, the channel supports relatively undisturbed Southern cottonwood-willow riparian forest and Mojave riparian forest. The riparian vegetation and associated transitional habitat located in this area is more characteristic of unconfined river channels; however, much of the fine sediments are trapped behind the Littlerock Dam. Thick stands of riparian vegetation border the active stream channel in many locations and form broad canopies over the stream. Understory species include mulefat and herbaceous wetland species such as bulrushes (*Scirpus spp*.), cattails (*Typha spp.*) and nutsedges (*Cyperus spp*.). Non-native grasses, stinging nettle (*Urtica dioica ssp. holosericea*), and mugwort (*Artemisia douglasiana*) are also common in mesic areas. In a few locations, dense thickets of poison oak (*Toxicodendron diversilobum*) also occur.

As the creek flows north, the channel becomes more characteristic of an alluvial fan where riparian vegetation becomes patchy and routinely intergrades with more upland species. Vegetation on the mid- to upper-stream terraces is largely characterized by California buckwheat scrub. Big sagebrush scrub is present to limited areas and confined to mature alluvial benches and roadsides. Juniper woodland, non-native pines, and cleared areas supporting bee-keeping are also present.

Sediment Disposal Sites and Access Roads

The PWD–owned property on 47th Street East consists of a 21-acre site dominated by California junipers (*Juniperus californica*). Additional shrubs include desert tea (*Ephedra nevadensis*), narrowleaf goldenbush (*Ericameria linearifolia*), California buckwheat, antelope brush (*Purshia glandulosa* var. *glandulosa*), Chaparral yucca (*Hesperoyucca whipplei*), and Joshua tree. A moderate cover of annual and perennial wildflowers including Xantu's chaenactis (*Chaenactis xantiana*), desert dandelion (*Malacothrix glabrata*), checker fiddleneck (*Amsinckia tessellata*), common phacelia (*Phacelia distans*), chia (*Salvia columbariae*), small-flowered poppy (*Eschscholzia minutiflora*), Kennedy's mariposa lily (*Calochortus kennedyi*), and wild hyacinth (*Dichelostemma capitata*) were detected on the site. The vegetation is best classified as California juniper woodland (Alliance; Sawyer et al., 2009) and also best matches descriptions of Mojavean juniper woodland and scrub in Holland (1986). Approximately 2 acres of the site is barren and a small trail system supporting OHV and equestrian uses crosses the site. Illegal dumping and scattered trash litter is common. A braided ephemeral drainage carries storm flows off the site.

The exhausted mining pits are located adjacent to Highway 136 and are primarily devoid of vegetation. Excluding the active quarries, vegetation in the surrounding area is dominated by Joshua tree woodland, creosote bush scrub, brittle bush-ephedra scrub, and ruderal communities (RCA, 2005; PCR, 2005).

PWD Facilities at Littlerock Dam

For the continued safe operation of the Dam and to support water deliveries, PWD maintains an access road, staging area, and various diversion facilities at the base of the Dam. Crews periodically inspect this area and conduct routine maintenance and monitoring activities. The access road crosses a small channel with a corrugated pipe to convey flows below the Dam. Near the toe of the Dam, riparian areas support a mixture of arroyo willow thickets, open water, and sandy wash habitats (See Figures C.3-3, C.3-4 and C.3-5). The composition of these communities varies to some degree based on scour and seasonal flooding. During large storm events, scouring flows pass over the spillway and remove most of the vegetation immediately below the Dam. During these events, the access road is washed out and must be replaced to maintain access to the Dam.

Small ranches, horse properties, a dog kennel, and a small network of dirt roads are present along portions of Cheseboro Road. Creosote bush scrub, Joshua tree woodland, rabbitbrush scrub, and ruderal vegetation border Cheseboro Road north of Mount Emma Road. South of Mount Emma Road, the vegetation transitions from more intact scrub communities dominated by California buckwheat scrub, Mormon tea scrub, and big sagebrush scrub (See Figure C.3-4).

C.3.1.3 Special Habitat Management Areas Overview

Riparian Conservation Areas

Riparian Conservation Areas (RCAs) are defined as "an area delineated next to water features requiring special management practices to maintain and/or improve watershed and riparian-dependent resource conditions" (USDA, 2005). They are managed for habitat conservation according to Standard S47 in Part 3 of the Forest Service Land Management Plan. This standard requires that RCAs within the Project area must be identified using USDA Five-Step Project Screening Process for Riparian Conservation Areas. RCAs include areas containing aquatic and terrestrial components and serve as the interface between land and water. Specifically, RCAs can include lands adjacent to perennial, intermittent, or ephemeral streams as well as in and around meadows, lakes, reservoirs, ponds, wetlands, vernal pools, seeps, springs, and other water bodies. RCAs are unique areas that support a high diversity of plant and animal species and typically have a high degree of endemism including threatened and endangered species. The variety of wildlife species associated with RCAs on the ANF is high and these species use these areas for breeding, aestivation, foraging, refugia, and as movement corridors (USDA, 2005).

To provide for the management of species that use riparian areas, each RCA has a buffer area of associated upland habitat which corresponds to the unique life history of the species. The size of an RCA is determined primarily by the type of water (perennial or intermittent), but can be adjusted for other characteristics such as topography, species present, and connectivity to other RCAs. Within the Project area several RCAs support threatened and endangered species including the arroyo toad.

Antelope Valley Significant Ecological Area

The Reservoir is located adjacent to the proposed Antelope Valley Significant Ecological Area (SEA) and portions of the haul route are within the SEA. The SEA designation is given to land that supports irreplaceable biological resources, and SEAs are mapped as a zoning overlay in the Los Angeles County General Plan (LADRP, 2014). Development within the SEAs is regulated by Los Angeles County Ordinance (Hillside Management and Significant Ecological Areas Ordinance) intended to preserve the biological resources and sustainability of the SEAs (LADRP, 2014).

United States Fish and Wildlife Service Critical Habitat

The Reservoir is located immediately downstream and adjacent to designated critical habitat for the arroyo toad (USFWS, 2011). The most recent critical habitat was designated on February 9, 2011 and is part of the Little Rock Creek Basin, which is designated as Unit 21 (50 CFR Part 17) (See Figure C.3-6).

C.3.1.4 Vegetation Communities and Landforms

Surveys resulted in the documentation of 266 species of native and non-native vascular plants within the Study Area. Non-vascular plants, including lichens and bryophytes, were not identified during the surveys. A list of all plants observed within the Vegetation Study Area is provided in Appendix C-2.

Eleven types of vegetation were mapped within the Vegetation Study Area (See Table C.3-2, Figures C.3-3, C.3-4, and C.3-5). Vegetation was classified using names and descriptions in Sawyer et al. (2009). Vegetation classification according to Holland (1986) is also included. Non-native woodland and ruderal vegetation were mapped, but do not match any vegetation descriptions in Sawyer et al. (2009). Four additional non-vegetated land cover types were mapped including developed, unvegetated lake bottom, sandy wash, and open water.

At the time of vegetation mapping, the Reservoir was at the dead pool elevation (i.e., was "dry"). It is important to note that the acreages of vegetation types mapped in within the Reservoir are representative of the vegetation present, but acreages vary seasonally and depend on level of inundation at any given time. Further, vegetation within the Reservoir inundation zone is dynamic and the extent and distribution vary with rainfall amounts, inundation times and extent, amount of scour experienced, and other factors.

Table C.3-2. Summary of Vegetation and Cover Types and Acreages

Vegetation Community[1]		Type	Location		
Sawyer et al. (2009) Vegetation Classification	Holland (1986) Vegetation Classification		Reservoir[2]	Haul Roads[3]	Sediment Disposal Site
Arroyo willow thickets	Southern willow scrub	Riparian	5.26	2.02	0.00
Big sagebrush scrub	Big sagebrush scrub	Upland	2.88	17.05	0.00
Black willow scrub	Riparian scrub	Riparian	5.76	0.00	0.00
California buckwheat scrub	Mojave mixed woody scrub	Upland	79.60	21.09	0.00
California juniper woodland	Mojavean juniper woodland and scrub	Upland	32.01	47.44	28.2
Cattail marsh	Freshwater marsh	Riparian	0.00	0.27	0.00
Creosote bush scrub	Mojave creosote bush scrub	Upland	0.00	4.23	0.00
Fremont cottonwood forest	Southern cottonwood willow riparian forest	Riparian	3.59	4.41	0.00
	Mojave riparian forest				
Herbaceous wetland	Freshwater marsh	Riparian	3.56	0.00	0.00
Joshua tree woodland	Joshua tree woodland	Upland	0.00	4.41	0.00
Mormon tea scrub	Mojave mixed woody scrub	Upland	4.53	17.47	0.00
	Great Basin mixed scrub				
Rubber rabbitbrush scrub	Rabbitbrush scrub	Upland	0.00	22.86	0.00
Singleleaf pinyon woodland	Mojavean pinyon woodland	Upland	67.24	0.00	0.00

Table C.3-2. Summary of Vegetation and Cover Types and Acreages

Vegetation Community[1]		Type	Location		
Sawyer et al. (2009) Vegetation Classification	Holland (1986) Vegetation Classification		Reservoir[2]	Haul Roads[3]	Sediment Disposal Site
Other Cover Types and Landforms[4]					
Developed		Upland	21.91	71.17	5.5
Non-native woodland		Upland	0.00	4.68	0.00
Open water		Riparian	9.65	0.00	0.00
Ruderal		Riparian	0.00	21.00	0.00
Sandy wash		Riparian	32.02	2.30	0.00
Unvegetated lake bottom		Riparian	54.69	0.00	0.00
Total			322.68	240.39	33.7

1 – Communities in **bold** type are considered sensitive by the CDFW.

2 – Vegetation was mapped within the Reservoir and surrounding 500-foot buffer; see Figure C.3-3. The Reservoir was dry when vegetation mapping was conducted. When full, the Reservoir comprises approximately 95 acres of open water.

3 – Vegetation was mapped within a 300-foot wide corridor centered on the centerline of the proposed haul roads; see Figure C.3-4.

4 – These cover types and landforms are not vegetation types defined in Sawyer et al. (2009) and Holland (1986).

Riparian Vegetation

Much of the natural riparian vegetation in California has been lost or degraded due to a variety of factors, including land use conversions to agricultural, urban, and recreational uses; channelization for flood control; sand and gravel mining; groundwater pumping; water impoundments; and various other alterations. Faber et al. (1989) estimated that as much as 95 to 97 percent of riparian habitats have been lost in southwestern California. Riparian communities are considered high priority for inventory by CDFW (CDFG, 2010).

Riparian habitats are biologically productive and diverse, and are the exclusive habitat for several threatened or endangered wildlife species and many other special-status species. Many of these species are wholly dependent on riparian habitats throughout the entirety of their life cycles, while others may utilize these habitats during certain seasons or life history phases. For example, numerous amphibian species breed in aquatic habitats, but spend most of their lives in upland areas.

In an otherwise arid landscape, primary productivity in riparian habitats is high due to year-round soil moisture. High plant productivity leads to increased habitat structural diversity and increased food availability for herbivorous animals, and in turn, predatory animals (reviewed by Faber et al., 1989). Insect productivity is also at relatively higher levels in riparian systems. During the warmer months, large numbers of insects provide a prey base for a diverse breeding bird fauna, including several special-status birds. Structural diversity, including standing dead trees and fallen logs is also much more evident in riparian systems than those of most regional uplands. Riparian woodlands tend to have multi-layered herb, shrub, and tree canopies, whereas most upland communities have a simpler structure. More complex habitat structure creates a greater diversity of nesting and foraging sites for birds. Similarly, mammal diversity is greater due to higher biological productivity, denning site availability, thermal cover, and water availability.

Fremont cottonwood forest (*Populus fremontii* Forest Alliance). Fremont cottonwood forest is the most mature riparian vegetation in the Vegetation Study Area. It is found at the margin of the reservoir and along Little Rock Creek above and below the reservoir. In the Project area, it is dominated by

Fremont cottonwood (*Populus fremontii*) with western sycamore (*Platanus racemosa*), black willow (*Salix goodingii*), and arroyo willow (*S. lasiolepis*). In higher elevations, this vegetation best matches southern cottonwood-willow riparian forest as described by Holland (1986). In the lower elevations of below the Reservoir this community best matches the description of Mojave riparian forest (Holland, 1986). Southern cottonwood-willow riparian forest and Mojave riparian forest are both recognized as sensitive communities by the CDFW (CDFG, 2010).

During surveys conducted in 2012, it was noted that many of the mature cottonwoods and willows that occur along the margins of the reservoir, mapped within Fremont cottonwood forest, were dead or dying (See Figure C.3-7). An unknown number of the dead trees have been felled and left in place. While the exact cause of the tree mortality is unknown, it can probably be attributed to extended periods of inundation.

Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance). Arroyo willow thickets are lower in stature and typically less mature than cottonwood forests. Arroyo willow thickets tend to establish in recently scoured portions of the floodplain that have available ground water and open soil. Given enough time between disturbances, this vegetation may develop into Fremont cottonwood forest. In the Project area, arroyo willow thickets are dominated by arroyo willow, black willow, and red willow (*S. laevigata*), with an understory of riparian shrubs and herbaceous perennials. This vegetation type matches descriptions of southern willow scrub in Holland (1986). Arroyo willow thickets also match the description of Southern Riparian Scrub, which is recognized as a sensitive community by CDFW (CDFG, 2010).

Cattail marshes [*Typha* (*angustofolia, domingensis, latifolia*) Herbaceous Alliance]. Cattail marsh is abundant at the upstream margin of the reservoir above Rocky Point. This community also periodically becomes established at Rocky Point after the Reservoir has been drawn down. Broad leaved cattail (*Typha latifolia*) is present along with many other native and non-native wetland plants, including rabbits foot grass (*Polypogon monspeliensis*), rushes (*Juncus* spp.), monkey flowers (*Mimulus* spp.), young willows, young saltcedar (*Tamarix ramosissima*), and sweet clovers (*Melilotus* spp.). Given enough time between scouring floods and changes in the water level of the reservoir, this vegetation will quickly develop into arroyo willow thickets. This vegetation best matches freshwater marsh as described by Holland (1986). This alliance is not recognized by CDFW as sensitive (CDFG, 2010).

Herbaceous wetland. This area is unvegetated due to seasonal inundation; however, riparian vegetation, weeds, and herbaceous plants quickly become established along some areas of the Reservoir. Herbaceous vegetation observed near Rocky Point includes native and non-native species such as rabbits foot grass, willow herb (*Epilobium ciliatum*), salt heliotrope (*Heliotropium curassavicum*), bracted verbena (*Verbena bracteata*), and pineapple weed.

Upland Vegetation

In contrast to riparian and wetland plant species that are adapted to seasonally flooded or periodically saturated soils, upland plant communities consist of plant species that are adapted to drier conditions and typically require only seasonal precipitation to obtain adequate water resources for growth and reproduction. In the Vegetation Study Area, most of the upland plant communities are located in the foothills to the east and west of the Reservoir and adjacent to the haul road.

Juniper and Joshua tree woodland habitats support unique assemblages of plant and wildlife species and vast acreages of these habitats have been lost over the last several decades due to urbanization and agricultural activities in the Antelope Valley. In general, other desert plant communities lack

vertical structure and shade. However, these habitats provide the important structural characteristics for mammals and avian species. Additionally, unlike herbaceous or shrub-dominated habitats, arid woodlands are extremely slow developing, with mature juniper and pinyon woodlands requiring as much as 150 years to reach full maturity. Due to the unique floristic composition and structure of these communities, and due to historic and ongoing losses, several local plans, ordinances, and policies have designated juniper and Joshua tree woodland habitats as sensitive.

Big sagebrush (*Artemisia tridentata* Shrubland Alliance). Big sagebrush is uncommon and confined to mature alluvial benches and roadsides in the Vegetation Study Area. It is dominated by big sagebrush (*Artemisia tridentata*), with other plants such as rubber rabbitbrush (*Ericameria nauseosa*), desert bitterbrush (*Purshia glandulosa*), and hairy yerba santa (*Eriodictyon trichocalyx*) are present. This community best matches big sagebrush scrub as described by Holland (1986). In the Vegetation Study Area, big sagebrush intergrades with other types of vegetation, such as California juniper woodland, Mormon tea scrub, and rubber rabbitbrush scrub. This alliance is not recognized by CDFW as sensitive (CDFG, 2010).

California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance). California buckwheat scrub is common within the Vegetation Study Area, primarily on south-facing slopes adjacent to the reservoir and haul road. It is dominated by Mojave Desert California buckwheat (*Eriogonum fasciculatum* var. *polifolium*) with other species such as Acton's encelia (*Encelia actoni*), narrowleaf goldenbush (*E. linearifolia*), and Mormon tea (*Ephedra viridis*). California buckwheat scrub partially matches the description of Mojave mixed woody scrub as described by Holland (1986). This vegetation community is not recognized by CDFW as sensitive (CDFG, 2010).

California juniper woodland (*Juniperus californica* Woodland Alliance). California juniper woodland is found at several locations within the Vegetation Study Area. It is characterized by California juniper, which typically grows with an understory of species similar to those listed in California buckwheat scrub (described above) and Mormon tea scrub (described below). It best matches descriptions of Mojavean juniper woodland and scrub in Holland (1986). California juniper woodland tends to intergrade with singleleaf pinyon woodland (described below) in the Vegetation Study Area. California juniper woodland is not recognized by CDFW as sensitive (CDFG, 2010).

Creosote bush scrub (*Larrea tridentata* Shrubland Alliance). Creosote bush scrub is the most characteristic vegetation of the California deserts and is dominated by creosote bush (*Larrea tridentata*). Other shrub species present in smaller numbers include desert box thorn (*Lycium* spp.), Acton's encelia, and beavertail cactus. Ground cover among the shrubs is fairly open in most of the Project area, largely dominated by native bunchgrasses and other herbs. This community occurs near the proposed sediment disposal sites. This vegetation matches descriptions of Mojave creosote bush scrub in Holland (1986). Creosote bush scrub is not recognized by CDFW as sensitive (CDFG, 2010).

Joshua tree woodland (*Yucca brevifolia* Woodland Alliance). Joshua trees (*Yucca brevifolia*) are found at scattered locations throughout the Vegetation Study Area, but only the larger, intact patches are mapped separately. With the exception of the Joshua trees, these woodlands match the description of California juniper woodland (described above). This vegetation matches Joshua tree woodland as described by Holland (1986) and is recognized by CDFW as sensitive (CDFG, 2010).

Mormon tea scrub (*Ephedra viridis* Shrubland Alliance). This vegetation is similar in composition to California buckwheat scrub, but the dominant species are Mormon tea and desert bitterbrush. Within the Vegetation Study Area, it is isolated to a few steep north-facing slopes on the west side of the reservoir. It partially matches the description of Mojave mixed woody scrub and Great

Basin mixed scrub by Holland (1986). Mormon tea scrub is not recognized by CDFW as sensitive (CDFG, 2010).

Non-native woodland. This vegetation is composed primarily of non-native trees that have been planted for ornamental value and does not match any named vegetation in Sawyer et al. (2009) or Holland (1986). Non-native woodlands are present at several areas within the Vegetation Study Area, primarily along the haul routes. The largest non-native woodland in the Vegetation Study Area is near the reservoir entrance station where planted trees are persisting and in some cases reproducing. Non-native trees observed in this area include black locust (*Robinia pseudoacacia*), silk tree (*Albizia julibrissin*), cypresses (*Cupressus* spp.), saltcedar, and various pines (*Pinus* spp.). Non-native shrubs such as rosemary (*Rosmarinus officinali*) and oleander (*Nerium oleander*) were also observed. Non-native woodlands are not recognized by CDFW as sensitive (CDFG, 2010).

Rubber rabbitbrush scrub (*Ericameria nauseosa* Shrubland Alliance). This vegetation is characterized by the presence of rubber rabbitbrush. In the Vegetation Study Area, this vegetation was observed in a few isolated canyon bottoms and roadsides near the Reservoir and at several locations along the haul road. It is similar in species composition to big sagebrush (described above) but is dominated by rubber rabbitbrush. This vegetation matches descriptions of rabbitbrush scrub in Holland (1986) and is not recognized by CDFW as a sensitive community (CDFG, 2010).

Singleleaf pinyon woodland (*Pinus monophylla* Woodland Alliance). Singleleaf pinyon woodland is common within the Vegetation Study Area on slopes surrounding the Reservoir. Singleleaf pinyon pine (*Pinus monophylla*) is the dominant species, with California juniper, desert bitterbrush, and Joshua tree also present. Understory species are similar to those described in California buckwheat scrub (described above). This vegetation best matches Mojavean pinyon woodland described in Holland (1986). Singleleaf pinyon woodland is not recognized by CDFW as sensitive (CDFG, 2010).

Ruderal. Ruderal vegetation is characteristic of heavily disturbed sites such as roadsides, graded areas, and former agricultural lands. Ruderal areas typically have little overall vegetation cover, and what vegetation is present is dominated by non-native weeds, "weedy" native species, and escaped ornamental species. Ruderal species identified in the Vegetation Study Area include summer mustard (*Hirshfeldia incana*), cheat grass (*Bromus tectorum*), Mediterranean grass (*Schismus barbatus*), and pineapple weed (*Chamomilla suaveolens*). This vegetation is not recognized by CDFW as sensitive (CDFG, 2010).

Other Land Covers

Developed. There are numerous developed areas in the Project area including roads, parking lots, residential areas, and adjacent cleared lands. These areas are typically devoid of vegetation or support scattered ornamental species or low densities of weeds.

Sandy wash. This cover type is found in dry stream channels that have recently been scoured by floods. This cover type typically supports low densities of plant cover; however, in the absence of scouring flows or inundation these areas may develop more complex vegetation communities.

Open water. The operation of the Reservoir includes seasonal fluctuations in the water surface elevation. Typically, the Reservoir is at capacity after winter precipitation. Water levels are maintained through the summer and gradually lowered to the dead pool elevation after Labor Day. The change in the water surface elevations greatly affects the type and composition of vegetation at the Reservoir. When water recedes, large areas of barren sand and mud are exposed. When full, the Reservoir comprises approximately 95 acres of open water.

Unvegetated lake bottom. This cover type is found when the Reservoir is drained. Similar to sandy wash communities this cover type typically supports low densities of plant cover if any. However, in the absence of scouring flows or extreme heat these areas may support a variety of native and non-native vegetation.

Weeds

Executive Order 13112 defines criteria for certain plant species to be considered invasive. These species can effectively displace native species and modify the fire ecology of the forest. The term "noxious weeds" includes all plants formally designated by the Secretary of Agriculture or other responsible State officials. These are plants that have been determined to be undesirable or injurious in some capacity. (FSM 2900; USFS, 2011). Several noxious weeds already exist within the Vegetation Study Area, including the haul route. Some of these species occur in well-established populations and appear to be associated with historic disturbance.

Noxious weeds pose a threat to the natural processes of plant community succession, fire frequency, biological diversity, and species composition. The survival of some populations of special-status species could be adversely affected by the success of an introduced plant species. In areas subject to wildfires, exotic plants can quickly out-compete natives and change the ecology of the system. Noxious weeds present a severe threat to natural habitats. Monocultures of noxious weeds can create unfavorable conditions for native plants and wildlife. Heavy infestations of some species can also significantly reduce the recreational or aesthetic value of open space.

The Forest Service management direction indicates that noxious and invasive plant species pose a threat to native plant and animal species on NFS lands. FSM 2900 directs the Forest Service to require all equipment be cleaned when working in a site contaminated with noxious weeds.

Surveys within the Study Area identified 51 non-native plant species. Several of these are considered noxious weeds by the California Invasive Plant Council (Cal-IPC, 2013). Table C.3-3 lists the noxious and invasive plant species that were identified during the surveys. Figure C.3-8 depicts the location of each species in relation to the Reservoir and haul route. Appendix C-3 provides additional information on the life history characteristics, threat level, and currently recognized methods for their control or eradication.

Table C.3-3. Noxious and Invasive Plant Species Identified in the Vegetation Study Area

Common Name	Scientific Name	Threat Level*
Brome grasses	*Bromus* spp.	High
Tocalote	*Centaurea melitensis*	Moderate
Short-pod mustard	*Hirschfeldia incana (Brassica geniculata)*	Moderate
Tree tobacco	*Nicotiana glauca*	Moderate
Jerusalem thorn	*Parkinsonia aculeata*	Evaluated But Not Listed
Rabbitsfoot grass	*Polypogon monspeliensis*	Limited
White horsenettle	*Solanum elaeagnifolium*	Evaluated But Not Listed
Smilo grass	*Stipa miliacea*	N/A
Tamarisk	*Tamarix sp.*	High
Wand mullein	*Verbascum virgatum*	N/A

*Cal-IPC threat levels:
Evaluated But Not Listed – there is insufficient information available to assign a rating, or the available information indicates that the species does not have significant impacts at the present time.

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

C.3.1.5 Common Wildlife

The Project area supports a wide range of vegetation communities associated with disturbed areas, rural residential properties, active quarries, and natural lands. The distribution of wildlife in the Project area varies greatly depending on location, vegetation community, and disturbance level.

The habitat with the greatest intrinsic value to wildlife is the riparian community. Little Rock Creek provides a diverse set of habitats that support a variety of wildlife species. These habitat types contribute to the diversity and abundance of wildlife in the region as they provide for permanent and migratory residency, foraging, and breeding behaviors. In addition, the creek bed and adjacent uplands provide breeding and refugia for a number of wildlife species. However, the Project area is also extensively used by recreationists including families, day users, boaters, and anglers. In the fall, portions of the site are subject to OHV use. The disturbance caused by these recreational activities limits the daytime use of the Project area by some species of wildlife and degrade the value for wildlife that enters the Reservoir area. Nonetheless, common and sensitive wildlife were detected at or near the Study Area. Appendix C-4 provides a list of all the wildlife detected in the Project area.

Invertebrates

Habitat conditions in the Study Area provide a suite of microhabitat conditions for a wide variety of terrestrial and aquatic insects, crustaceans, and other invertebrates. This includes swift running portions of Little Rock Creek with cobble and rocks, thick leaf litter, and pools of slow-moving or still water. As in all ecological systems, invertebrates play a crucial role in a number of biological processes. They serve as the primary or secondary food source for a variety of fish, bird, reptile, and mammal predators; they provide important pollination vectors for numerous plant species; they act as efficient components in controlling pest populations; and they support the naturally occurring maintenance of an area by consuming detritus and contributing to necessary soil nutrients. Surveys detected a wide variety of Anisoptera (dragonflies) Zygoptera (damselflies), Hemiptera (true bugs), Coleoptera (beetles), Diptera (flies), Pleocoptera (stone flies), Lepidoptera (moths and butterflies), Hymenoptera (wasps, bees, and ants), and Trichoptera (caddis flies).

Both non-native Argentine ants (*Linepithema humile*, formerly *Iridomyrmex humile*), and native harvester ants (*Pogonomyrmex californicus*) were detected in the Study Area. Harvester ants were commonly observed in upland habitats to the east and west of the Reservoir. Stream invertebrates were common and included a variety of aquatic larvae such as damselflies, dragonfly larvae, and water bugs (i.e., toe biters [family Belostomatidae]). These aggressive insects prey on other insects, small fish, and amphibians.

Fish

Flows in the lower portion of Little Rock Creek below the Reservoir are primarily ephemeral and do not support year-round habitat for fish. The Reservoir does support perennial water; however, the amount of water available to fish fluctuates depending on annual rainfall and water releases. Habitat conditions in

Little Rock Creek above the Reservoir include overhanging vegetation, deep pools, and sections with short runs and riffles. Substrate conditions vary by location, but Little Rock Creek contains areas supporting silty sands, gravel, cobble, and boulder-dominated zones. Macro algae communities are present during portions of the year within localized areas and include mat-forming algae (*Charra sp*.). The Reservoir, when full, is approximately 100 feet deep and supports inundated vegetation that provides shelter for a variety of fish. Shallows and coves are present around portions of the Reservoir and provide habitat for species tolerant of warmer waters (i.e., Sunfish). Reservoir and creek temperatures vary by season and are a function of depth, location, and snow pack in the upper watershed.

Native fish were not detected during the surveys. Bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*) were the most common non-native species detected and were found to occur in the Reservoir and portions of Little Rock creek above Rocky Point. In addition, a gold fish (*Carassius auratus auratus*) was captured during surveys of the Reservoir in 2014. Rainbow trout (*Oncorhyncus mykiss*), and brown trout (*Salmo trutta*) have been detected in the Reservoir and the Little Rock Creek Watershed. However, due to potential negative effects on arroyo toad populations, a court order in 2009 required the CDFW to halt stocking activities at the Reservoir. Nonetheless, rainbow trout have been detected by Aspen as recently as 2014 in small pools above the Reservoir. However, due to drought conditions these pools dried up and the fish were lost through thermal stress, loss of oxygen, desiccation, or predation. As with many reservoirs and streams in California, nonnative and invasive fish were routinely detected during the surveys. Although not detected during the surveys, the watershed is known to support exotic species including green sunfish (*Lepomis cyanellus*), pumpkinseed sunfish (*L. gibbosus*), common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), and bullhead (*Ameiurus* sp.).

Contaminated Fish and Soils in Reservoir. In 2014, the California Office of Environmental Health Hazard Assessment (OEHHA) issued a bulletin noting high levels of mercury and polychlorinated biphenyls (PCBs) in fish tissue sampled from the Reservoir (LRWQCB, 2014). Sediment and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. Fifteen samples, including 11 sediment samples and four fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. All of the tissue (i.e., four samples) tested positive for chlorinated pesticides (i.e., DDT, DDD, and DDE) with levels that exceed the reporting limit. In addition, a goldfish sampled at the Reservoir also tested positive for Hexachlorobenzene. All four fish tissue samples also tested positive for PCB congeners and for mercury, with the mercury results ranging from 0.3644 to 0.6601 ppm. The EPA and FDA require that fish sold across state lines contain less than 1.0 ppm of mercury (ATSDR, 1999). The OEHHA has provided Advisory Tissue Levels for contaminants in fish intended for human consumption. The bass, which had the highest levels mercury of all the sampled fish tissue, exceeded the “No Consumption” limit for children and women of child-bearing age (OEHHA, 2008). Although the sample size was small for fish (i.e., four fish), the tests support the previous work conducted by the State Water Resources Control Board’s (SWRCB) Surface Water Ambient Monitoring Program in 2007-2008, which detected elevated levels of mercury and PCB’s in fish collected from the Reservoir (LRWQCB, 2014).

Sediment samples did not detect chlorinated pesticides (including DDT), at or above the method detection limit (MDL). One PCB analyte (PCB138) was detected in 3 of the 11 samples, but the amount is extremely small (i.e., ranging from 1.1 to 1.9 parts per billion [ppb]). The MDL for this analyte is 1.0 ppb, and the reporting limit (RL) is 5.0 ppb. Because the three positive results for PCB138 in sediment all fall below the RL, the values reported are estimates. As mercury was analyzed as total mercury (Hg) (i.e., the element was not speciated in this analysis), it is unknown what percentage is organic mercury versus methylmercury. All 11 sediment samples tested positive for the presence of mercury (i.e., ranging from

0.0032 to 0.0213 parts per million [ppm]). The Agency for Toxic Substances and Disease Registry reports that normal levels of mercury in soil range from 0.02 to 0.625 ppm (ATSDR, 1999). All but one of the sediment sample results fall below the lower value of this range, and the one result that falls within this range lies at the extreme lower end of the range. A recent peer-reviewed synthesis study defined a critical upper limit for mercury in soils below which 95 percent of the 52 species sampled (including plants, animals, and microbes) would be unharmed by chronic exposure. This limit was found to be 0.13 ppm (Tipping et al., 2010). All 11 sediment sampling results are roughly an order of magnitude below this critical upper limit. In contrast to the fish samples, the sediment sampling results show that the Reservoir sediment is mostly free of contaminants and where a contaminant was detected the level of contamination was extremely low.

Amphibians

Amphibians often require a source of standing or flowing water to complete their life cycle. However, some terrestrial species can survive in drier areas by remaining in moist environments found beneath leaf litter and fallen logs, or by burrowing into the soil. Conditions within the Study Area generally provide year-round habitat for a variety of amphibian species. When flowing, Little Rock Creek can provide small pools, shallow rills and runs, and deep, wide slow-moving water supporting several native and nonnative species. The southern extents of the Reservoir provide a year-round water source within coves and shallows that are capable of supporting amphibian species. However, the presence of predatory fish likely decreases the numbers of amphibians that occur along the margins of the lake. Additionally, small pools and/or depressions located on the west side of the main access road were found to support breeding populations of amphibians. Observations of amphibians were also recorded along the western edges of the main entrance road to the recreational area below the dam.

Adjacent upland habitat and existing riparian vegetation provide ample foraging opportunities. Amphibians that were observed during surveys include the California tree frog (*Pseudacris cadaverina*), Baja California chorus frog (*P. hypochondriaca*), and the nonnative bullfrog (*Lithobates catesbeiana*). Western (California) toad (*Anaxyrus boreas* [*halophilus*]) adults and egg masses were also observed. Upland areas adjacent to the Reservoir have the potential to support populations of western spadefoot toad (*Spea hammondii*). Although not detected in the Study Area, both newts and salamanders are well documented in the region. These species are highly cryptic and often difficult to detect. Downed logs, bark, and other woody material in various stages of decay (often referred to as coarse woody debris) provide shelter and feeding sites for a variety of wildlife, including amphibians and reptiles (Maser and Trappe, 1984). Within the Study Area, these features are generally found within the Reservoir itself or the Little Rock Creek channel. Many native amphibians are adversely affected or excluded by exotic fish and amphibian species, which are common within the Study Area.

Reptiles

The number and type of reptile species that may occur at a given site is related to a number of biotic and abiotic features. These include the diversity of plant communities, substrate, soil type, and presence of refugia such as rock piles, boulders, and native debris. Reptiles were commonly observed in the Study Area, in both disturbed and natural areas. Western fence lizard (*Sceloporus occidentalis*), desert spiny lizard (*Sceloporus magister*), sagebrush lizard (*Sceloporus graciosus*), southern alligator lizard (*Elgaria multicarinata*), and side blotch lizard (*Uta stansburiana*) were observed whenever weather conditions were favorable and were broadly distributed within the uplands and along the edge of riparian habitats.

The Study Area also supports a variety of snakes. Southwestern threadsnake (*Rena humilis humilis*), San Diego gopher snake (*Pituophis catenifer annectens*), San Diego nightsnake (*Hypsiglena ochrorhyncha*

klauberi), patch-nosed snake (*Salvadora hexalepis*), striped racer (*Masticophis lateralis*), red racer (*Coluber flagellum piceus*), California lyersnake (*Trimorphodon lyrophanes*), long-nosed snake (*Rhinocheilus lecontei*), ring-neck snake (*Diadophis punctatus*), California kingsnake (*Lampropeltis getula californiae*), and Southern pacific rattlesnake (*Crotalus helleri*) were observed within the Study Area.

Although not observed, several other common reptiles likely occur in the Study Area. Most reptile species, even if present in an area, are difficult to detect because they are cryptic and their life history characteristics (i.e., foraging and thermoregulatory behavior) limit their ability to be observed during most surveys. Further, many species are active only within relatively narrow thermal limits, avoiding both cold and hot conditions, and most take refuge in microhabitats that are not directly visible to the casual observer, such as rodent burrows, in crevices, under rocks and boards, and in dense vegetation where they are protected from unsuitable environmental conditions and predators. In some cases, they are observed only when flushed from their refugia.

Common reptiles that may occur in desert scrub communities associated with the sediment disposal areas or in habitat present along the haul routes include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), gopher snake (*P. catenifer*), desert iguana (*Dipsosaurus dorsalis*), desert night lizard (*Xantusia vigilis*), long-nosed leopard lizard (*Gambelia wislizenii*), and Mohave rattlesnake (*Crotalus scutulatus*). Other reptiles that are expected to occur in the Project area include glossy snake (*Arizona elegans*), common kingsnake (*Lampropeltis getula*), California whipsnake (*Masticophis lateralis*), red racer (*M. flagellum*), night snake (*Hypsiglena chlorophaea*), long-nosed snake (*Rhinocheilus lecontei*), spotted leaf-nosed snake (*Phyllorhynchus decurtatus*), western patch-nosed snake (*Salvadora hexalepis*), and lyre snake (*Trimorphodon biscutatus*).

Reptile species that may be present below the Reservoir in areas supporting Mojave riparian forest and desert wash habitats include the Gilbert skink (*Eumeces gilberti*), common garter snake (*Thamnophis sirtalis*), and southern alligator lizard (*Elgaria multicarinata*).

Desert tortoise. The desert tortoise (*Gopherus agassizii*) is a federal and State threatened species that ranges from the Mojave and Sonoran deserts of southeastern California and southern Nevada, south through Arizona into Mexico. It occurs primarily on flats and bajadas with soils ranging from sand to sandy gravel with scattered shrubs. The desert tortoise requires sufficient suitable plants for forage and cover, and suitable substrates for burrows and nest sites. The desert tortoise is threatened by off-road vehicles, livestock grazing, and mining. Disease related to human-caused stress is also taking a heavy toll on the desert tortoise (Christopher et al., 2003). Desert tortoise habitat is present at the proposed 47th Street East sediment disposal site and along the haul routes. Historically, desert tortoises were likely abundant in the Project area and likely utilized the foothills of the ANF. However, urbanization, infrastructure, and agricultural practices have fragmented existing populations in the region.

Habitat on the sediment disposal site has been mapped as suitable for desert tortoise by the DRECP (See Figure C.3-9). The predictive model (based on Nussear et al., 2009) ranks tortoise habitat based on sixteen environmental data layers including soils, landscape, climate, and biotic factors that were merged with desert tortoise presence data region wide. This model provides an output of the statistical probability of habitat potential that can be used to map potential areas of desert tortoise habitat (ibid.). The habitat quality is given a numeric value ranging from zero to 1. Areas within the designated mapping unit of one square kilometer given a rank of zero are not considered suitable habitat for desert tortoise; areas given the value of 1.0 represent high-quality habitat for this species. Model values for the sediment disposal site range from 0.6 to 1. Although the map identifies most of the sediment disposal site as high-quality desert tortoise habitat, portions of the Project site are clearly degraded or developed and do not constitute suitable habitat for desert tortoise. The model reflects hypothesized habitat

potential given the range of environmental conditions where tortoise occurrence was documented (Nussear et al., 2009). Therefore, there are likely areas of potential habitat for which habitat potential was not predicted to be high, and likewise, areas of low potential for which the model predicted higher potential (ibid.). Nussear et al. (2009) also states that the map of desert tortoise potential habitat does not account either for anthropogenic effects, such as urban development, habitat destruction, or fragmentation, which has been ongoing in this portion of the Antelope Valley for decades. Based on surveys of the 47th Street sediment disposal site PWD considers the habitat to be isolated from known occupied habitat and provide little value for the recovery of desert tortoise due to the development in the region.

Birds

Eighty-five species of common and sensitive birds were identified in the Study Area during surveys completed between 2010 and 2012. It is possible that many other birds use the site either as wintering habitat, seasonal breeding, or as occasional migrants. Special-status species are further discussed below.

The diversity of birds at this location is a function of the presence of perennial water and the wide variation in plant communities that provide habitat for a number of different groups of birds. For example, shore birds and other more aquatic species were commonly detected within the Reservoir and along Little Rock Creek. In a few locations both upstream of the Reservoir and downstream of the dam, the presence of small rock weirs have resulted in the formation of large pools where shore birds and ducks prey on insects and/or small fish. Mallard duck (*Anas platyrhynchos*), American coot (*Fulica americana*), green heron (*Butoroides virescens*), northern shoveler (*Anas clypeata*), and ruddy duck (*Oxyura jamaicensis*) were commonly observed, often feeding, within the surveyed areas. Great blue heron (*Ardea Herodias*), a CDFG Special Animal, and ring-necked duck (*Aythya collaris*) were also observed within the Study Area.

Various common song birds were detected within the Study Area and were closely associated or dependent on the riparian vegetation that borders portions of the Reservoir and is present along the Little Rock Creek Channel downstream of the dam structure. Riparian systems are frequently considered one of the most productive forms of wildlife habitat in North America. Many bird species are wholly, or at least partially, dependent on riparian plant communities for breeding and foraging (Warner and Hendrix., 1984). Some of the detected species included song sparrow (*Melospiza melodia*), ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), cliff swallow (*Petrochelidon pyrrhonota*), house finch (*Carpodacus mexicanus*), yellow-rumped warbler (*Setophaga coronata*), warbling vireo (*Vireo gilvus*), lesser goldfinch (*Carduelis psaltria*), and least Bell's vireo (*Vireo bellii pusillus*).

Bird use of the upland areas east and west of the Reservoir and adjacent to Little Rock Creek was common and included a variety of song birds, raptors, vultures, and game birds. Western king bird (*Tyrranus verticalis*), spotted towhee (*Pipilo maculatus*), oak titmouse (*Baeolophus inornatus*), mourning dove (*Zenaida macroura*), and California quail (*Callipepla californica*), were fairly common. Rock wren (*Salpinctes obsoletus*), California towhee (*Melozone crissalis*), and mountain quail (*Oreortyx pictus*) were also observed. Common ravens (*Corvus corax*) were observed nesting in several locations along the nearly vertical rock faces of the northeastern perimeter of the Reservoir. Several lesser nighthawk (*Chordeiles acutipennis*), a ground nesting species, were detected near the Reservoir and in Little Rock Creek above and below the dam.

Several raptors including red-tailed hawk (*Buteo jamicensis*), great horned owl (*Bubo virginianus*), western screech owl (*Otus kennicottii*), and American kestrel (*Falco sparverius*) were observed either

soaring over the site (red-tailed hawks) or foraging for small birds in the Study Area (great horned owl and kestrel).

Although not detected during surveys described in this report, a review of available online eBird (eBird, 2016) data report observations of northern shoveler, Say's phoebe (*Sayornis saya*), western bluebird (*Sialia mexicana*), double-crested cormorant (*Phalacrocorax auritus*), red-breasted sapsucker (*Sphyrapicus ruber*), ladder-backed woodpecker (*Picoides scalaris*), ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), and white-crowned sparrow (*Zonotrichia leucophrys*) at the Reservoir. Bald eagle (*Haliaeetus leucocephalus*), a state-listed endangered and fully protected species, was also reported at the Reservoir from eBird data.

A number of birds are expected to be present at the proposed sediment disposal sites or in desert communities along the proposed haul routes. Some of the species include verdin (*Auriparus flaviceps*), LeConte's thrasher (*Toxostoma lecontei*), black-throated sparrow (*Amphispiza bilineata*), and California quail (*Callipepla californica*). Joshua trees provide suitable nesting substrate for numerous species including red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), ladder-backed woodpecker (*Picoides scalaris*), loggerhead shrike (*Lanius ludovicianus*), Bewick's wren (*Thryomanes bewickii*), cactus wren (*Campylorhynchus brunneicapillus*), northern mockingbird (*Mimus polyglottos*), and Scott's oriole (*Icterus parisorum*).

Lesser nighthawk (*Chordeiles acutipennis*), horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), sage sparrow (*Amphispiza belli canescens*), migrant or wintering Brewer's (*Spizella breweri*), chipping (*Spizella passerina*), and savannah sparrows (*Passerculus sandwichensis*) are all known from local desert scrub communities. Juniper woodland habitat supports western scrub jay (*Aphelocoma californica*), phainopepla (*Phainopepla nitens*), and house finch (*Carpodacus mexicanus*). Although not observed Bendire's thrasher (*Toxostoma bendirei*) and American robin (*Turdus migratorius*) would also be expected to occur in desert scrub communities.

The Reservoir and surrounding region is home to a variety of wintering birds and there is a well-known change in use by "migrant" species between the breeding season in spring and summer and in the winter. Most of the "Neotropical migrants" that are present during the breeding season are absent in the winter, and a different complement of "winter migrant" bird species is encountered (in addition to resident species that are present in all seasons). Studies in the Central Valley (Motroni, 1979) have indicated that the absolute numbers of wintering riparian birds may equal or even exceed the numbers present in the breeding season. At the Reservoir, periodic wintering use by bald eagles has been noted in addition to other common winter visitors. Wintering ferruginous hawk (*B. regalis*), great horned owl (*Bubo virginianus*), and other raptors are common in the Antelope Valley and may periodically visit the Reservoir. Other common birds that forage on invertebrates and/or seeds in agricultural fields in the Antelope Valley include killdeer (*Charadrius vociferous*) and American pipit (*Anthus rubescens*), species known from the Reservoir. Alfalfa fields are especially important as the primary foraging area for the locally nesting Swainson's hawk (*B. swainsoni*), a species listed as threatened by the CDFG. Other wintering species known from the region include mountain plovers (*C. montanus*).These species were not observed in the Survey Area; however, they may overfly the area. Similarly, western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) has not been detected at the Project site. Nesting habitat for this species is marginal at best below the dam and generally lacks the size and structure preferred by this bird. It was determined that suitable habitat for this species is not present at the Reservoir.

Mammals

The distribution of mammals in the Study Area is associated with the presence of such factors as access to perennial water, topographical and structural components (i.e., rock piles, vegetation, and stream terraces) that provide for cover and support prey base; and the presence of suitable soils for fossorial mammals (i.e., sandy areas in the upper portions of the Reservoir when water levels are low).

Small mammals or their sign were commonly observed during most of the surveys. These included California ground squirrel (*Spermophilus beecheyi*), desert shrew (*Notiosorex crawfordi*), California vole (*Microtus californicus*), deer mouse (*Peromyscus maniculatus*), Botta's pocket gopher (*Thomomys bottae*), black-tailed jackrabbit (*Lepus californicus*), and desert cottontail (*Sylvilagus audubonii*). Mojave riparian forest located below the Reservoir provides foraging and breeding habitat for ornate shrew (*Sorex ornatus*), brush mouse (*Peromyscus boylii*), and southern grasshopper mouse (*Onychomys torridus*). Predators such as the long-tailed weasel (*Mustela frenata*) are likely to be attracted to the wooded riparian habitats that occur on Little Rock Creek.

Mid-size mammals including raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), bobcat (*Felis rufus*), mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionus*), gray fox (*Urocyon cinereoargenteus*), and coyote (*Canis latrans*) were detected. While not detected during surveys, striped skunk (*Mephitis mephitis*) and American badger (*Taxidea taxus*) have the potential to occur within the Study Area. Because Littlerock and Santiago Creeks provide a large continuous corridor through the Angeles National Forest, far-ranging species like black bear (*Ursus americanus*) appear to frequent the Study Area.

Juniper woodland habitat located at the Reservoir and to some degree at the proposed 47th Street East disposal site provides breeding and foraging habitat for many mammals, such as California ground squirrel (*Spermophilus beecheyi*), desert kangaroo rat (*Dipodomys deserti*),long-tail pocket mouse, pinyon mouse (*Peromyscus truei*), and mule deer. Gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and kit fox (*Vulpes macrotis*) also may occur.

Creosote bush scrub and other desert scrub communities located along the haul roads provide foraging and breeding habitat for many species including pocket mouse (*Perognathus* spp.), white-tailed antelope squirrel (*Ammospermophilus leucurus*), California ground squirrel, desert kangaroo rat (*Dipodomys deserti*), Merriam's kangaroo rat (*D. merriami*), desert cottontail (*Sylvilagus audubonii*), desert woodrat (*Neotoma lepida*), kit fox, and coyote.

Joshua trees provide foraging and breeding habitat for cactus mouse (*Peromyscus eremicus*), canyon mouse (*P. crinitus*). Several bat species may forage over desert scrub and Joshua tree woodland, such as pallid bats (*Antrozous pallidus*), western pipistrelles (*Pipistrellus hesperus*), big free-tailed bat (*Nyctinomops macrotis*), western mastiff bat (*Eumops perotis*), Mexican free-tailed bat (*Tadarida brasiliensis*), and spotted bat (*Euderma maculatum*).

Bats were commonly detected and forage over most of the Study Area where they prey on small insects, moths, and other invertebrates. Many bats concentrate foraging activities in riparian and wetland habitats where insect abundance is high (CDFG, 2000). Common bats detected in the Study Area, using visual searches (utilizing a Echo Meter EM3) and a Sonobat system, included canyon bat (*Parastrellus hesperus*), greater bonneted bat (*E. perotis*), Mexican free-tailed bat, and big brown bat (*Eptesicus fuscus*). Special-status bats (discussed further in Section 4.4 below) detected in the Study Area included pallid bat (*Antrozous pallidus*), Yuma myotis (*Myotis yumanensis*), and western small-footed myotis (*Myotis ciliolabrum*). Although not detected, it is likely that fringed myotis (*M. thysanodes*) and long-

legged myotis (*M. volans*) occur within or adjacent to the Study Area. Migrant bats such as the western red bat (*Lasiurus blossevilli*) and the hoary bat (*L. cinereus*) may occur in riparian areas in the spring and early fall.

Mohave ground squirrel. Historically, the Mohave ground squirrel (*Spermophilus mohavensis*), a State listed species, was widely distributed in the region possibly including the proposed sediment disposal site. Since the early 1950s, urbanization, infrastructure, and agricultural practices have fragmented existing populations in the region and the population has declined in the Palmdale region. Habitat on the sediment disposal site has been mapped as suitable for this species by the DRECP (See Figure C.3-9). Model values for the sediment disposal site range from poor quality habitat ranked at 0.0 to 0.2 to moderate habitat ranked from 0.4 to 0.6. However, a 2015 survey determined that the sediment disposal site does not contain suitable habitat for this species (Phoenix, 2015).

C.3.1.6 Management Indicator Species

The Angeles National Forest Land Management Plan offsets a goal of sustaining viable populations of native and desired non-native species. The LMP selected Management Indicator Species (MIS), defined as species whose population or habitat trends are believed to indicate the effects of management activities on National Forest System lands (36 CFR 219.19(a) (1) [1982]; 36 CFR 219.14 [2005]), and as a focus for monitoring (36 CFR 219.19(a) (6) [1982]). On the ANF, the following habitat types and management issues have been assigned an indicator species as a measure of management success:

- Healthy Diverse Habitats (Mule deer)
- Fragmentation (Mountain lion)
- Montane Conifer Forest (California spotted owl, California Black oak, and White fir)
- Riparian Habitat (Song sparrow)
- Aquatic Habitat (Arroyo toad)
- Oak Regeneration (Blue oak, Engleman oak, and Valley oak)
- Bigcone Douglas-fir Forest (Bigcone Douglas-fir)
- Coulter Pine Forest (Coulter pine)

MIS that occur in the Project area include mule deer, mountain lion, arroyo toad, and song sparrow. A description of each MIS in the Project area is provided below.

Healthy Diverse Habitats (Mule Deer). Mule deer are common on the ANF and have been routinely observed at the Reservoir. These animals occupy a wide range of habitats but prefer to forage and shelter near riparian areas, seeps, and oak woodlands. While these species occupy most habitats, late successional chaparral typically is not preferred for foraging. Mule deer on NFS lands use dense vegetation for cover and forage mainly in open sagebrush and edge habitats. These species are able to move along an elevational gradient to maximize use of climatic conditions and forage availability during different seasons. Movement usually occurs in the fall and spring and roughly the same routes are used by the same herds year after year. On the ANF, the current deer herd is believed to include approximately 2,180 mule deer (USFS, 2005). Mule deer have been chosen as an indicator of the effectiveness of forest management strategies on landscape patterns in chaparral age class diversity (USFS, 2005).

Fragmentation (Mountain lion). The mountain lion is selected as an MIS to monitor the effects of forest activities and uses on a landscape-level scale to determine effects of habitat fragmentation and habitat linkages (USFS, 2005). The general health of this species largely depends on current deer populations and this solitary animal prefers large areas of undisturbed habitat that supports a stable prey base. Populations of this species on NFS lands are low primarily because this species requires large home ranges and has limited social interaction (USFS, 2005). The greatest concern to this species is loss of

habitat and connectivity between home ranges. Suitable range for this species occurs in the Project area and this species is expected to be present at the Reservoir.

Riparian Habitat (Song sparrow). The song sparrow is selected as an MIS because its relative abundance is expected to be responsive to disturbance or management activities. The primary threat to the song sparrow and other riparian birds is the destruction of habitat, loss of water in riparian areas, and human disturbance (USFS, 2005). Long-term monitoring of song sparrow populations would provide a measure of forest management success in increasing the quality of riparian areas. Song sparrow was detected in the Project area at the Reservoir and below Littlerock Dam.

Aquatic Habitat (Arroyo toad). The arroyo toad occurs in semi-arid regions including valley-foothill, desert riparian, and desert wash habitat. This species breeds in shallow, gravelly streams, and rivers with sandy banks that typically contain willows, cottonwoods, and sycamores, and it has been known to utilize upland habitat within 2,000 meters (6,562 feet) of breeding habitat for foraging and wintering (USFWS, 2011).

This species is present in the Project area above Rocky Point upstream from the proposed grade control structure. The Forest Service has designated the Lower Little Rock Creek Critical Biological Land-Use Zone (CBLUZ) for the protection of arroyo toad, and defined allowable recreational activities in this CBLUZ. The distribution of arroyo toad in the Project area below Rocky Point is restricted to some degree from operation of the reservoir, exotic fish (i.e., bass), and from human use of the Reservoir (i.e., trampling, creek diversion, illegal OHV) during periods when the creek bed is not inundated.

C.3.1.7 Sensitive Vegetation Communities

Sensitive vegetation communities are defined by CDFG (2010) as, "...communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects." Sensitive vegetation communities in the Project area include southern cottonwood-willow riparian forest, Mojave riparian forest, riparian scrub, and Joshua tree woodland. Subsequent field surveys determined that areas mapped as Fremont cottonwood forest generally meet the classification requirements of southern cottonwood-willow riparian forest and Mojave riparian forest (See Table C.3-2 above and Figures C.3-3, C.3-4, and C.3-5).

C.3.1.8 Special-Status Plants

Approximately 24 special-status plant taxa have the potential to occur in the Project area. Figures C.3-10a and C.3-10b illustrate the known locations of special-status plants occurring in or near the Study Area (CDFW, 2015). Three special-status plants, Johnston's monkeyflower (*Mimulus johnstoni*), short-joint beavertail (*Opuntia basilaris var. brachyclada*), and Lemmon's syntrichopappus (*Syntrichopappus lemmonii*), were detected within the Vegetation Study Area during botanical surveys conducted from 2010–2014. None of these plants were detected in the Project area. Table C.3-4 lists the sensitive plant species that have the potential to occur in the Vegetation Study Area. Species descriptions having a low, moderate, or high potential to occur are described in Appendix C-5.

Each of these taxa were assessed for their potential to occur within the study area based on the following criteria:

- Present: Taxa were observed within the Study Area during recent botanical surveys or population has been acknowledged by CDFW, USFWS, or local experts.

- High: Both a documented recent record (within 10 years) exists of the taxa within the Study Area or immediate vicinity (approximately 5 miles) and the environmental conditions (including soil type) associated with taxa present within the Study Area.
- Moderate: Both a documented recent record (within 10 years) exists of the taxa within the Study Area or the immediate vicinity (approximately 5 miles) and the environmental conditions associated with taxa presence are marginal and/or limited within the Study Area or the Study Area is located within the known current distribution of the taxa and the environmental conditions (including soil type) associated with taxa presence occur within the Study Area.
- Low: A historical record (over 10 years) exists of the taxa within the Study Area or general vicinity (approximately 10 miles) and the environmental conditions (including soil type) associated with taxa presence are marginal and/or limited within the Study Area.
- Not Likely to Occur: Species or sign not observed on the site, outside of the known range, and conditions unsuitable for occurrence.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Federal or State Endangered or Threatened Species			
Astragalus brauntonii Braunton's milkvetch	CRPR 1B.1, FE	Coastal scrub and chaparral. Recent burns or disturbed areas. <2,300'. Los Angeles, Orange, and Ventura Counties.	Unlikely: The project area is outside of the historic range of the species. Suitable habitat is not present.
Berberis nevinii Nevin's barberry	CRPR 1B.1, FE	Sandy to gravelly soils. Washes, chaparral, cismontane woodland, and coastal scrub. Generally found in lowlands or drainages. <2,200'.	Unlikely: The project area is outside of the historic range of the species. Suitable habitat is not present.
Brodiaea filifolia Thread-leaved brodiaea	CRPR 1B.1, FT	Grasslands and vernal pools, grassy openings in chaparral or coastal sage scrub, playas. 100-2,900'. Often found in clay. Southern base of San Gabriel Mtns. at Glendora and San Dimas & San Bernardino at Arrowhead Springs.	Unlikely: The project area is outside of the historic range of the species. Suitable habitat is not present.
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	CRPR 1B.1, SE, FC, FSS	Sandy places in coastal or desert shrublands; historically from San Fernando Valley, adjacent foothills, and coastal Orange Co.; now known only in E Ventura & W LA Cos; Elev. 490-4,000 ft.; May-June.	Low: The project area is outside of the historic range of the species. Suitable habitat is, however, present.
Dodechema leptoceras Slender horned spineflower	CRPR 1B.1, FE	Sandy alluvial fans, benches, and terraces in coastal scrub, chaparral and cismontane woodland areas. 700-3,000'.	Low: The project area is outside of the historic range of the species. Suitable habitat is, however, present.
Forest Service Sensitive and CRPR Species			
Acanthoscyphus parishii var. *abramsii* Abram's flowery puncturebract	CRPR 4.2, FSS	In chaparral on soils derived from sandy or shale substrates at elevations of 3,750–6,750 feet.	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Androsace elongata ssp. *acuta* California androsace	CRPR 4.2, FSW	Coastal scrub, chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland habitats. Elev. 492 to 3,936 ft. March to June.	Moderate: There are several populations on the foothill desert slopes of the San Gabriel and Liebre Mountains. Suitable habitat is present.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Anomobryum julaceum Slender silver moss	CRPR 4.2	Non-vascular moss that grows on mesic soils and rocks along creeks in broadleaf and coniferous forests. Elev. 300 to 3,000 ft. Year-round.	Low: This species is represented in southern California from a single collection made from the high elevations of the San Gabriel Mtns. Suitable habitat is present in the project area.
Arctostaphylos *glandulosa* ssp. *gabrielensis* San Gabriel manzanita	CRPR 1B.2, FSS	Large shrub that grows on rocky chaparral habitats; endemic to San Gabriel Mtns near Mill Creek Summit, Elev. 5,000 ft.; March.	Low: This species is known from the upper watershed but the project area is below the elevation range for this species. It has a low potential to disperse into the project area from the upper watershed.
Arctostaphylos parryana ssp. *tumescens* Interior manzanita	CRPR 4.3, FSS	Primarily found in montane chaparral, but may also be seen in riparian corridors, willow scrub and adjacent upland forest, ridgetops, ecotones between chaparral and woodland, Yellow Pine Forest, and Pinyon, Juniper, and Joshua Tree Woodland. 5500-7580'.	Low: This species is known from the upper watershed but the Project area is below the elevation range for this species. It has a low potential to disperse into the Project area from the upper watershed.
Astragalus bicristatus Crested Milk-vetch	CRPR 4.3, FSS	Open, rocky areas in coniferous forests. 5,500-9000'. Los Angeles, Riverside and San Bernardino Counties.	Unlikely: No suitable habitat present, the project area is well below the elevation range of the species.
Astragalus lentiginosus var. *antonius* San Antonio Milk-vetch	CRPR 1B.3, FSS	Open slopes in pine forest, 5,000-8,500', San Gabriel Mtns.	Unlikely: No suitable habitat present, the project area is well below the elevation range of the species.
Botrychium crenulatum Scalloped Moonwort	CRPR 2B.2, FSS	Bogs and fens, lower montane coniferous forest, meadows and seeps, and marshes & swamps (freshwater). 4,900-10,800'.	Unlikely: No suitable habitat present, the project area is well below the elevation range of the species.
Calochortus clavatus var. *clavatus* Club-haired mariposa lily	CRPR 4.3, FSS	Chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland at 75-1300 meter elevations	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Calochortus clavatus var. *gracilis* Slender Mariposa Lily	CRPR 1B.2, FSS	Chaparral on slopes or in canyons below 1200 m, south base of San Gabriel and Sierra Pelona mountains.	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Calochortus fimbriatus Late-Flowered Mariposa Lily	CRPR 1B.2, FSS	Dry, open coastal woodland; chaparral, 400-1500 m, locally up to 2500 m. Often in serpentine soil. Coast ranges, Ventura county west.	Unlikely: Not known to occur on the ANF and soil type not found in project area. Suitable habitat for this species not present in project area.
Calochortus palmeri var. palmeri Palmer's mariposa lily	CRPR 1B.2, FSS	Wet meadows and seeps in lower montane coniferous forest and chaparral habitats. Elev. 3,281-7,841 ft. May-July.	Moderate: This species was not observed during recent surveys but is known from the general area.
Calochortus plummerae Plummer's mariposa lily	CRPR 4.2	Granitic rock outcrops or rocky soils of granitic origin, in lower montane coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland, and chaparral habitats. Elev. 328-5,577 ft. May-July	Low: The Project is just outside of the known geographic range for this species but suitable habitat is present within the project area.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Calochortus striatus Alkali mariposa lily	CRPR 1B.2, FSS	Alkaline soils, in floodplains and springs in chaparral, chenopod scrub, and Mojavean desert scrub. Elev. 230-5,232 ft. April-June.	Low*: The species is known from alkaline soils in the Mojave Desert. Poor quality habitat was observed at the northern end of the haul roads but it is not expected in the project area.
Calystegia piersonii Pierson's morning-glory	CRPR 4.2	Shrublands and lower elev. forests; below about 5000 ft. elev.; northern San Gabriel Mts., Liebre Mts., and adjacent Mojave Desert. May-June.	Moderate: This species was not observed during recent surveys, but is known from the general area.
Canbya candida Pygmy-poppy	CRPR 4.2, FSS	Joshua tree woodland, Mojavean desert scrub, or pinyon and juniper woodland habitats with gravelly, granitic, or sandy soils. Elev. 1,968-4,790 ft. March-June.	High: Suitable habitat is preset within the Vegetation Study Area and numerous historic records are known from the area. May be present at the proposed sediment disposal site at 47th Street.
Castilleja gleasonii Mt. Gleason paintbrush	CRPR 1B.2, SR, FSS	Rocky places within lower montane coniferous forest and pinyon and juniper woodland communities. Elev. 2,700-7,120. May-June.	Moderate: This species is known from higher elevation of the San Gabriel Mtns but several collections from lower elevations have been made. Suitable habitat is present.
Castilleja plagiotoma Mojave paintbrush	CRPR 4.3, FSS	Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, and pinyon and juniper woodland habitats. Elev. 984-8,200 ft. April-June.	High: This species was not detected during recent surveys but suitable habitat is present within the Vegetation Study Area and it is known from the general vicinity of the Project.
Chorizanthe parryi var. *parryi* Parry's Spineflower	CRPR 1B.1, FSS	Valley-floor and foothill habitats. Dry, sandy or gravelly soils in washes, alluvial benches, and in foothill microhabitats with unconsolidated soils and low vegetation cover. Coastal sage scrub, chaparral, alluvial fan scrub, and the ecotone between chaparral and oak woodland. 30-1,130 m. (100-3700ft)	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Cladium californicum California saw-grass	CRPR 2B.2, FSS	Alkaline marshes, swamps, springs (including hot springs), perennial streams, and ponds. In sunny or partly shaded areas by riparian trees. Soil is usually moist to wet, often alkaline, and may be clay or gravel. Immediately adjacent vegetation is usually riparian, such as palms or willows, and may be dense. 100-7,000'.	Low: Suitable habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area.
Claytonia lanceolata var. *peirsonii* Peirson's Spring Beauty	CRPR 3.1, FSS	Gravelly conifer woodlands, scree slopes. 5,000-8,500'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Deinandra mohavensis Mojave tarplant	CRPR 1B.3, SE, FSS	Washes, seasonal creeks/seeps, openings in chaparral, disturbed areas. Not known from ANF, most occurrences in San Bernardino, San Jacinto mts. 900-1600 m.	Unlikely: Project area is well outside of the known range of the species.
Drymocallis glanduloas ssp. *ewanii* Ewan's Cinquefoil	CRPR 1B.3, FSS	Seeps, springs, wet areas in central San Gabriel Mountains, 1900-2400 m	Low: Suitable habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area.
Dudleya cymosa ssp. *crebrifolia* San Gabriel River Dudleya	CRPR 1B.2, FSS	On exposed granite outcroppings in CSS or chaparral areas. Fish Canyon, Lytle Creek area. 300-1100 m.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Dudleya densiflora San Gabriel Mountain Dudleya	CRPR 1B.1, FSS	Steep granitic canyon walls adjacent to chaparral, coastal scrub, and coniferous forest. Southeast San Gabriel Mountains. 900-1,700'	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Dudleya multicaulis Many-stemmed Dudleya	CRPR 1B.2, FSS	Heavy soils, often clayey, coastal plain. Chaparral, coastal scrub, and valley & foothill grassland. <2,000'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Eremegone macradenia var. *arcuifolia* Forest Camp Sandwort	FSS	Ridgetops in chaparral (openings, granitic, usually oak dominated). 4,000-5,600'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Eriogonum kennedyi var. *alpigonum* Southern Alpine Buckwheat	CRPR 1B.3, FSS	Alpine boulder and rock fields, subalpine, granitic gravel, found on high peaks and ridgetops. 8,500-11,550'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Eriogonum microthecum var. *johnstonii* Johnston's Buckwheat	CRPR 1B.3, FSS	Rocky, subalpine coniferous forest and upper montane coniferous forest. 8,500-9,500'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Galium grande San Gabriel Bedstraw	CRPR 1B.2, FSS	Open, broad-leafed forest, open chaparral, cismontane woodland, and lower coniferous forest. Rocky slopes. 1,450-5,000'. San Gabriel Mtns.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Heuchera abramsii Abram's Alumroot	CRPR 4.3, FSS	Rocky crevices in upper montane forest, 2800-3500 m.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Heuchera caespitosa Urn-Flowered Alumroot	CRPR 4.3, FSS	Rocky crevices in montane conifer forest in San Gabriel Mountains, 1500-2500 m	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Horkelia cuneata ssp. *Puberula* Mesa horkelia	CRPR 1B.1, FSS	Sandy or gravely areas in coastal sage scrub, chaparral, or oak woodland. 50-850 m.	Unlikely: Project area is well outside of the known range of the species.
Hulsea vestita ssp. *gabrtielensis* San Gabriel Mountains sunflower	CRPR 4.3, FSS	Rocky, subalpine coniferous forest, upper montane coniferous forest, talus slopes or rock outcroppings. 1500-2,900 m.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Hulsea vestita ssp. *pygmaea* Pygmy Alpinegold	CRPR 1B.3, FSS	Gravelly sites of granitic substrate alpine areas or subalpine forest ; 2800-3900 m	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Imperata brevifolia California satintail	CRPR 2B.1, FSS	Meadows and seeps within chaparral, coastal scrub, and Mojavean desert scrub communities. Elev. below 4,000 ft. September-May.	Low: Suitable habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area.
Lepechinia fragrans Fragrant Pitcher Sage	CRPR 4.2, FSS	Chaparral areas, including those recovering from recent fire. Mt. Lukens, western Santa Monica Mountains. 20-1350 m.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Lepechinia rossii Ross's Pitcher Sage	CRPR 1B.2, FSS	Rocky outcrops of reddish sedimentary rock, on north to northeast facing slopes; between 305-790 m in elevation. Generally associated with open areas and appears to be in greatest abundance following fire.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Lewisia brachycalyx Short-sepaled Lewisia	CRPR 2B.2, FSS	Seasonally wet habitats within open coniferous forest; specifically in montane meadows or seeps and often in sandy soils	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Lilium humboldtii ssp. ocellatum Ocellated Humboldt lily	CRPR 4.2, FSW	Riparian woodland openings within chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest communities; generally on gravelly soils within gullies. Elev. below 6,000 ft. March-July.	Low: This species is known from deep shaded canyons throughout the San Gabriel Mtns, but it was not detected during recent surveys and is not known from the area.
Lilium parryi Lemon lily	CRPR 1B.2, FSS	Meadows and seeps within lower and upper montane coniferous forests communities. Elev. 4,000-9,000 ft. July-August.	Low: Known from the upper reaches of the drainage but the project area is below the elevation range for this species and the project area lacks suitable habitats.
Linanthus concinnus San Gabriel linanthus	CRPR 1B.2, FSS	Dry rocky slopes within chaparral and montane coniferous forest communities. Elev. 5,000-9,200 ft. May-July.	Unlikely: Known from higher elevation areas of the San Gabriel Mtns, the project area is well below the elevation range of the species.
Linanthus orcuttii Orcutt's Linanthus	CRPR 1B.3	Openings in chaparral, lower montane coniferous forest, and pinyon-juniper woodland at elevations of 3,000–7,050 feet. Usually in vernally moist openings.	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Loeflingia squarrosa var. *artemisiarum* Sagebrush loeflingia	CRPR 2B.2	Sandy soils (dunes) in Great Basin scrub and Sonoran desert scrub. Elev. 2,200-5,300 ft. April-May	Low*: The species is known from very few locations in the vicinity of alkali flats to the north of the project area. Poor quality habitat was observed at the northern end of the haul roads but it is not expected in the project area.
Lupinus peirsonii Peirson's lupine	CRPR 1B.3, FSS	Gravelly or rocky slopes within Joshua tree woodland, lower and upper montane coniferous forest, and pinyon and juniper woodland communities. Elev. 3,200-8,200 ft. April-May.	Low: This species is not known from the project vicinity, but occurs in the upper reaches of the watershed. It could be present within the vegetation study area as a wash-down waif species but is not expected to persist in the Reservoir.
Malacothamnus davidsonii Davidson's bush-mallow	CRPR 1B.2	Chaparral, cismontane woodland, coastal scrub, and riparian woodland. Elev. 300-2,500 ft. June-January.	Low: Very few records of this species within the general vicinity of the project area.
Mimulus johnstoni Johnston's monkeyflower	CRPR 4.3	Gravelly or rocky slopes within Joshua tree woodland, lower and upper montane coniferous forest, and pinyon and juniper woodland communities. Elev. 3,200 0-6,000 ft. April-May.	Present*: Observed within the Vegetation Study Area, just downstream of Littlerock Dam on a steep sandy slope, not observed within the project area.
Monardella australis ssp. Jokerstii Jokerst's Monardella	CRPR 1B.1, FSS	Found at elevations from 4430-5740 ft, with possible waifs as low as 525 ft. On steep scree or talus slopes between breccia, ravines, canyon bottoms, and secondary alluvial benches along drainages and washes. In loamy soil derived from granite or mixed alluvium. In chaparral, montane coniferous forest or woodland, or sometimes riparian.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Monardella macrantha ssp. *hallii* Hall's Monardella	CRPR 1B.3, FSS	Chaparral, broadleaved upland woodland, cismontane woodland, coniferous forest (usually Bigcone Spruce), and valley & foothill grassland. 2,000-6,600'. San Gabriel and San Bernardino Mtns.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Monardella viridis ssp. *saxicola* Rock Monardella	CRPR 4.3, FSS	Broadleaved upland forest, montane chaparral, coniferous forest, and cismontane woodland. Usually in dry, rocky areas. 1,650-6,000'. San Gabriel Mtns.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Navarretia peninsularis Baja Navarretia	CRPR 1B.2, FSS	Wet areas in open forest or chaparral. 4,950-7,600'.	Unlikely: No suitable habitat present, the project area is well outside of the known range and elevation of the species.
Nemacladus secundiflorus var. robbinsonii Robbins' nemacladus	CRPR 1B.2, FSS	Openings in chaparral and foothill grasslands; Elev. 875-4250 ft.; April-June.	Unlikely: The subspecies is known from a single location in the San Gabriel Mtns, east of the Project area. No suitable habitat is present.
Opuntia basilaris var. brachyclada Short-joint beavertail	CRPR 1B.2, FSS	Open chaparral, juniper woodland, or similar woodland communities. Elev. 1,394-5,900 ft. April-June.	Present: This variety was observed at two locations within the Vegetation Study Area just outside of the Project area.
Oreonana vestita Woolly mountain-parsley	CRPR 1B.3, FSS	Ridge tops and on rocky soils such as dry gravel or talus in lower and upper montane coniferous forest and subalpine coniferous forest at elevations of 6,500–11,500 feet.	Unlikely. This species is not known from the project vicinity and the project area is well below the elevation range of this species.
Orobanche valida ssp. valida Rock Creek broomrape	CRPR 1B.2, FSS	Granitic soils within chaparral and pinyon and juniper Woodland communities. Elev. 4,000-7,000 ft. May-July.	Unlikely: This species is not known from the project vicinity and the project area is below the elevation range of this species.
Oxytropis oreophila var. *oreophila* Rock-loving Oxytrope	CRPR 2B.3, FSS	Open sunny areas; on gravelly or rocky flats, slopes, ridges, or summits; or in alpine boulder fields or fell-fields. Surrounding vegetation is usually composed of alpine cushion plants when above treeline, or subalpine coniferous forest at lower elevations. Soils are usually dry, sandy to rocky. 8860-12500 ft	Unlikely: No suitable habitat present, the project area is well outside of the known range and elevation of the species.
Parnassia cirrata var. *cirrata* Fringed Grass-Of-Parnassus	CRPR 1B.3, FSS	Mesic areas in open, broad-leafed forest, open chaparral, cismontane woodland, and lower forest. Rocky slopes. 455-1,525 m. San Gabriel Mtns.	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Scutellaria bolanderi ssp. austromontana Southern Skullcap	CRPR 1B.2, FSS	Gravelly streambanks and mesic sites, chaparral, cismontane woodland, lower montane conifer forest. 425-2000 m. Mainly in Riverside, San Diego counties.	Unlikely: Project area is well outside of the known range of the species.
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	CRPR 1B.2, FSS	Chaparral, cismontane woodland, and montane conifer habitat at elevations of 3,300–8,200 feet (1,000–2,500 meters).	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Sidalcea neomexicana Salt Spring Checkerbloom	CRPR 2B.2, FSS	Flat or gently sloped, moist alkaline areas such as springs, marshes, bogs, swamps, or playas. Also hillsides, roadcuts and roadsides, in pastures and fields, and in meadows. 100-5020 ft	Low: Potential habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Sidotheca caryophylloides Chickweed Starry Puncturebract	CRPR 4.3, FSS	Sandy or gravelly flats, washes, and slopes, chaparral, montane conifer woodlands; 1300-2600 m	Low: Potential habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area. Nearest record over 10 miles south.
Streptanthus campestris Southern Jewelflower	CRPR 1B.3, FSS	Rocky openings in chaparral, conifer forest, oak woodland, 600-2790 m. High variation in habitat and elevation of species. San Diego, Riverside, San Bernardino counties.	Unlikely: Project area is well outside of the known range of the species.
Stylocline masonii Mason's neststraw	CRPR 1B.1, FSS	Ephemeral annual; sandy washes, saltbush shrubland, pinyon-juniper woodland, etc., western Central Valley (Monterey Co. south to Kern Co.) and Soledad Cyn. wash in LA Co., below about 4,000 ft. elev.; March-April.	Low: This species is not known from the project vicinity but suitable habitat is present.
Symphyotrichum defoliatum San Bernardino aster	CRPR 1B.2, FSS	Occurs near ditches, springs and seeps in cismontane woodland, valley foothill grasslands, coastal scrub, lower montane coniferous forest, meadows, swamps and marshes from 2 to 2040 meters. (7-6700 ft)	Unlikely: Project area is well outside of the known range of the species.
Symphytotrichum greatae Greata's aster	CRPR 1B.3	Woodlands, chaparral, lower montane forests; around springs or mesic sites, Elev.1,000–6,600 ft.; San Gabriel Mts. and Liebre Mts. August-October.	Low: This species is known from the upper watershed and although the habitat in the project area is not ideal, it has some potential to occur.
Syntrichopappus lemmonii Lemmon's syntrichopappus	CRPR 4.3, FSW	Chaparral, Joshua tree woodland, and pinyon and juniper woodlands within sandy or gravelly soils. Elev. 1,640-6,004 ft. April-May.	Present*: This species was detected within the vegetation study area, just downstream of the dam. It was growing on a steep talus slope adjacent to the haul road. It was not detected within the Project area.
Thelypteris puberula var. *sonorensis* Sonoran Maiden Fern	CRPR 2B.2, FSS	Streams, meadows, and seeps below 550 m.	Unlikely: Project area is well outside of the known range of the species.
Thysanocarpus rigidus Rigid Fringepod	CRPR 1B.2, FSS	Often dry rocky slopes or ridges, or generally open areas. It grows between 1970-7200 ft in elevation, usually in pine and oak woodlands.	Low. No suitable habitat in Project disturbance area, but could occur in open areas in chaparral on the slopes surrounding the Project area.

Source: CDFW, 2014

SE – California-listed Endangered
ST – California-listed Threatened
SR – California-listed Rare
FSS – USDA Forest Service Sensitive Species
FSW – USDA Forest Service Watch List

CRPR 1B – Rare or endangered in California and elsewhere
CRPR 2 – Rare or endangered in California, more common elsewhere
CRPR 3 – More information needed (Review List)
CRPR 4 – Limited Distribution (Watch List)
0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 = Fairly threatened in California (20-80% occurrences threatened)
0.3 = Not very threatened in California (<20% of occurrences threatened or no current threats known

* = likelihood with an asterisk is based only on habitat adjacent to the haul roads and not within the project area.

C.3.1.9 Special-Status Wildlife

Special-status taxa include those listed as threatened or endangered under the federal or California Endangered Species Acts, taxa proposed for listing, Species of Special Concern, and other taxa which have been identified by the USFWS and CDFW, and Forest Service Sensitive species. Figures C.3-11a and C.3-11b illustrates the known locations of special-status wildlife occurring within or near the Study Area (CDFW, 2015). The specific habitat requirements and the locations of known occurrences of each special-status wildlife taxa were the principal criteria used for inclusion in the list of taxa potentially occurring within the Study Area. There are currently 87 special-status wildlife taxa documented within the general region of the Study Area.

Each of the 87 taxa were assessed for their potential to occur within the Study Area based on the following criteria:

- Present: Taxa (or sign) were observed in the Study Area or in the same watershed (aquatic taxa only) during the most recent surveys, or a population has been acknowledged by Forest Service, CDFW, USFWS, or local experts.
- High: Habitat (including soils) for the taxa occurs on site and a known occurrence occurs within the Study Area or adjacent areas (within 5 miles of the site) within the past 20 years; however, these taxa were not detected during the most recent surveys.
- Moderate: Habitat (including soils) for the taxa occurs on site and a known regional record occurs within the database search, but not within 5 miles of the site or within the past 20 years; or, a known occurrence occurs within 5 miles of the site and within the past 20 years and marginal or limited amounts of habitat occurs on site; or, the taxa's range includes the geographic area and suitable habitat exists.
- Low: Limited habitat for the taxa occurs on site and no known occurrences were found within the database search and the taxa's range includes the geographic area.
- Not Likely to Occur: Species or sign not observed on the site, outside of the known range, and conditions unsuitable for occurrence.

Twenty taxa were observed or considered in or adjacent to the Study Area. The remaining 67 taxa have a low, moderate, or high potential to occur based on existing recorded occurrences, known geographic range, and the presence of suitable habitat (See Table C.3-5). Special-status wildlife species having a low, moderate, or high potential to occur are described in Appendix C-5.

Special-status invertebrates or fish were not detected in the Study Area. Arroyo toad, federally listed as endangered and a CDFW Species of Special Concern, was the only sensitive amphibian detected within Little Rock Creek. This species was detected upstream of Rocky Point and was routinely observed during surveys. The USFWS proposed to downlist the status of this species from Endangered to Threatened in March 2014. The USFWS withdrew the proposed rule on December 23, 2015 and this species remains federally listed as Endangered.

A number of special-status reptiles were observed in the Project Study Area. A single coast horned lizard (*Phrynosoma blainvillii*), a CDFW Species of Special Concern, was observed in a sandy drainage adjacent to the main access road to the Reservoir. Coastal whiptail (*Aspidoscelis tigris*), a CDFW Special Animal, was observed along the fringes of the riparian areas just below the dam. Southwestern pond turtle (*Actinemys marmorata*) and two-striped garter snake (*T. hammondi*), both CDFW Species of Special Concern and Forest Service Sensitive Species, were observed within aquatic habitat above and below the dam.

Desert tortoise has not been observed in the Project area but habitat for this species is present at the proposed 47th Street East sediment disposal site and along the haul routes. Historically, desert tortoises were likely abundant in the Project area and likely utilized the foothills of the ANF. Although habitat on the sediment disposal site has been mapped as suitable for desert tortoise by the DRECP and USGS (see Figure C.3-9), it is unlikely this species is present in this location. No tortoises or sign of tortoises were observed during surveys.

Seven special-status songbirds were detected within riparian areas of the Study Area and included least Bell's vireo (*Vireo bellii pusillus*), willow flycatcher (*Empidonax traillii*), Lawrence's goldfinch (*Spinus lawrencei*), Vaux's swift (*Chaetura vauxi*), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), summer tanager (*Piranga rubra cooperi*), and yellow warbler (*Setophaga petechia*).

Sharp-shinned hawk (*Accipiter striatus*), a CDFW Watch List species, and bald eagle (*Haliaeetus leucocephalus*) were observed at the Reservoir. Bald eagle is a state-listed endangered species and a Forest Service Sensitive Species that appears to be a routine winter visitor to the Reservoir. Although not observed, Swainson's hawk could forage at the 47th Street East sediment disposal site. This species is not expected to nest at the Reservoir.

Sensitive mammals detected at the site included the pallid bat, a CDFW Species of Special Concern and Forest Service Sensitive Species, and Yuma myotis, a CDFW Special Animal. Although not detected during surveys, Nelson's (San Gabriel Mountains) bighorn sheep (*Ovis canadensis nelsoni*) have been observed upstream of the Reservoir by CDFW biologists (L. Welch, personal communication, 10 September 2012).

Mohave ground squirrel has not been observed in the Project area. Historically, this species was widely distributed in the region possibly including the proposed sediment disposal site. However, a 2015 survey determined that the sediment disposal site does not contain suitable habitat for this species (Phoenix, 2015).

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
INVERTEBRATES					
Callophrys mossii hidakupa	San Gabriel Mountains elfin	SA, FSS	Endemic to the San Gabriel and San Bernardino Mountains at elevations of 3,000-5,500 feet, typically on steep, rocky, north-facing cliffs. The larval host plant is a stonecrop (*Sedum spathulifolium*).	There are no known recent records for this species in the Study Area. The Study Area lacks suitable habitat, including host plant.	Not likely to occur
Helminthoglypta traskii	Trask shoulderband snail	SA	Terrestrial; southern California endemic known from Ventura, Los Angeles, Orange, and San Diego Counties; prefers coastal sage scrub and chaparral.	There are no known recent records for this species within a 20 mile radius of the Study Area. However the Study Area is located within the known geographic distribution for this species (Magney, 2011); suitable habitat is limited within the Study Area.	Moderate
Plebejus saepiolus aureolus	San Gabriel Mountains blue butterfly	SA, FSS	Type locality is wet meadow seep in yellow pine forest. The foodplant is *Trifolium wormskioldii.*	There are no known recent records for this species in the Study Area. The Study Area lacks suitable habitat, including foodplant.	Not likely to occur
Plebulina emigdionis	San Emigdio blue butterfly	SA, FSS	Often near streambeds, washes, or alkaline areas. Associated with four-wing saltbush (*Atriplex canescens*) and quail brush (*Atriplex lentiformis*).	There are no known recent records for this species in the Study Area. The Study Area is located within the known geographic distribution for this species. Suitable habitat occurs within limited portions of the Study Area.	Low
FISH					
Catostomus santaanae	Santa Ana sucker	FT, CSC	Typically inhabits small, shallow streams and rivers less than 23 feet (7 meters) wide where water temperature is generally below 72 º F (22 º C), and where currents range from swift to sluggish	This species has not been documented within the Study Area. The Study Area is located outside of the known geographic distribution for this species. The closest known record of this species is from the Santa Clara River approximately 11–12 miles to the west of the Study Area.	Not likely to occur
Gasterosteus aculeatus williamsoni	Unarmored threespine stickleback	FE, SE, CFP	Slow-moving and backwater areas of coastal and inland streams.	This species has not been documented within the Study Area. The Study Area is located outside of the known geographic distribution for this species. The closest known record of this species is from the Santa Clara River approximately 12–13 miles to the west of the Study Area.	Not likely to occur
Gila orcuttii	Arroyo chub	CSC, FSS	Los Angeles Basin southern coastal streams; slow water stream sections with mud or sand bottoms; feeds heavily on aquatic vegetation and associated invertebrates.	There are no known recent records for this species in the Study Area. The Study Area is not located within the known geographic distribution for this species. The nearest known recorded occurrence of this species is over 15 miles to the southeast in the San Gabriel River.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Rhinicthys osculus ssp. 8	Santa Ana speckled dace	CSC, FSS	Inhabit various stream and channel types, small springs, brooks, and pools in intermittent streams and perennial rivers.	There are no known recent records for this species in the Study Area. The Study Area is not located within the known geographic distribution for this species. The closest known record of this species is from the Big Tujunga Creek approximately 13–15 miles to the west of the Study Area.	Not likely to occur
AMPHIBIANS					
Anaxyrus californicus	Arroyo toad	FE, CSC	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash; rivers with sandy banks, willows, cottonwoods, and/or sycamores.	This species has been documented within the Study Area. More specifically, arroyo toads have been recorded from Rocky Point (at the Reservoir) and upstream within Little Rock Creek past the confluence with Santiago Creek. Arroyo toads have also been detected within Santiago Creek.	Present
Batrachoseps gabrieli	San Gabriel Mtns. slender salamander	FSS, SA	Known only from 13 sites within forest communities of the San Gabriel Mountains. Primarily inhabits talus and large rocks, logs, and bark during periods of surface activity.	Not known to occur in Study Area but could potentially utilize Little Rock Creek and adjacent riparian areas. The Study Area is outside of the known range of this species but it is known from the portions of the San Gabriel Mountains to the south of the Study Area.	Low
Ensatina eschscholtzii croceater	Yellow-blotched salamander	CSC, FSS	Litter and debris of oak woodland, pine dominated open woodland, and fir dominated open forest.	Suitable habitat does not occur in the Study Area, and it is well outside the known range of this subspecies.	Not likely to occur
Rana boylii	Foothill yellow-legged frog	CSC, FSS	Inhabits shallow, small to medium-sized, rocky streams, from sea level to about 6,365 feet.	Although suitable habitat occurs within portions of the Study Area, it is outside the known range of this subspecies. This species is believed to be extirpated from the San Gabriel Mountains.	Not likely to occur
Rana draytonii	California red-legged frog	FT, CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation; requires 11-20 weeks of permanent water for larval develop-ment; must have access to aestivation habitat.	Although suitable habitat occurs within portions of the Study Area, it is outside the known range of this subspecies.	Not likely to occur
Rana muscosa	Sierra Madre (= southern mountain) yellow-legged frog	FE, SE, CSC	Prefers partly shaded, shallow streams with a rocky substrate; requires a minimum of 15 weeks of permanent water for metamorphosis.	The largest known population of this species occurs within the upper portions of the Little Rock Creek watershed. Pockets of suitable habitat may occur when flows and/or pools are present within Little Rock Creek; this species has not been detected within the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Spea hammondii	Western spadefoot	CSC	Occurs in numerous habitat types, primarily in grasslands but can be found in valley-foothill hardwood woodlands, sage scrubs, chaparral where pooled/ponded water, supporting typically clay-rich soils, remains through early spring (April/May); in some areas, vernal pools, stock ponds, and road pools are essential for breeding, egg-laying, and larval development.	There are no known records for this species in the Study Area within a 15 mile radius. The Study Area is located just outside the known geographic distribution for this species. Pockets of suitable habitat occur within the Study Area.	Low
Taricha torosa	Coast Range newt	CSC	Historically distributed in coastal drainages from central Mendocino County in the North Coast Ranges, south to Boulder Creek, San Diego County. Breeds in ponds, reservoirs, streams; terrestrial individuals occupy various adjacent upland habitats, including grasslands, woodlands, and forests.	Suitable habitat is present onsite above Rocky Point. Known from locations throughout the San Gabriel Mountains.	Moderate
REPTILES					
Actinemys marmorata	South western pond turtle	CSC, FSS	Inhabits permanent or nearly permanent bodies of water in various habitat types; requires basking sites such as partially submerged logs, vegetation mats, or open mud banks.	This species was observed within the Study Area (above and below the Reservoir) during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species.	Present
Anniella pulchra pulchra	Silvery (=California) legless lizard	CSC, FSS	Sandy or loose loamy soils under sparse vegetation; soil moisture is essential; prefer soils with high moisture content.	This species was detected within the Study Area under a small woodpile, adjacent to the Reservoir, during surveys conducted in 2012.	Present
Aspidoscelis tigris stejnegeri	Coastal whiptail	SA	Found in deserts and semi-arid areas with sparse vegetation and open areas; also found in woodland and riparian habitats; substrates may be firm soil, sandy, or rocky.	This species was documented within the Study Area during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs throughout the Study Area.	Present
Charina bottae umbratica	Southern rubber boa	ST	Occurs in conifer forests near streams and meadows. Known to occur in the Transverse Range, San Bernardino Mountains, and thought to be extirpated from the San Gabriel Mountains.	Thought to be extirpated from the San Gabriel Mountains, but focused surveys have not been conducted. Suitable habitat does not occur in the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Charina trivirgata roseofusca (Lichanura orcutti)	Coastal rosy boa	SA, FSS	Fairly dense vegetation and rocky habitat within desert and chaparral from the coast to Mojave and Colorado deserts.	Suitable habitat is present within the Study Area outside the perimeter of the Reservoir. This species was reported approximately 6 miles west of the Study Area in June 2009 along a transmission line corridor.	Moderate
Diadophis punctatus modestus	San Bernardino ringneck snake	SA, FSS	Canyons with rocky outcrops or rocky talus slopes in conifer forest or chaparral habitats.	Suitable habit occurs within the Study Area and this species was observed during surveys.	Present
Gopherus agassizii	Desert tortoise	FT, ST	Inhabits semi-arid grasslands, gravelly desert washes, canyon bottoms and rocky hillsides. Associated plant species includes creosote bush, Joshua tree, cheese bush, saltbush, grasses, and cacti.	The Study Area lies outside of the known range of this species; portions of the identified haul routes, however, do occur within the range and have suitable habitat. Habitat on the sediment disposal site has been mapped as suitable for desert tortoise by the DRECP.	Not likely to occur
Lampropeltis zonata parvirubra	San Bernardino mountain kingsnake (California mountain kingsnake, San Bernardino population)	CSC, FSS	Inhabits canyons with low to moderate tree canopy, with rock outcrops or talus, frequently in association with big cone spruce and chaparral vegetation at lower elevations.	Suitable habitat occurs within the Study Area.	Moderate
Phrynosoma blainvillii	Coast (San Diego) horned lizard	CSC,	A variety of habitats, including coastal sage scrub, chaparral, oak woodland, riparian woodland, and coniferous forest. Friable, sandy soils in areas with an abundant prey base of native ants are key habitat components.	This species was documented within a sandy drainage, adjacent to the main access road through the Reservoir, during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs in portions of the Study Area.	Present
Thamnophis hammondii	Two-striped garter snake	CSC, FSS	Highly aquatic; found in or near perma-nent fresh water; often along streams with rocky beds and riparian growth.	This species was documented within the Study Area downstream of the dam and upstream of Rocky Point during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs throughout the Study Area.	Present
BIRDS					
Accipiter cooperii	Cooper's hawk	WL	Woodland, chiefly of open, interrupted, or marginal type; nest sites mainly in riparian growths of deciduous trees.	The eBird online database documents sightings of this species at the Reservoir and the CNDDB reports a historic occurrence approximately 8 miles northwest of the Study Area. These sightings do not indicate if the individuals were foraging, passing through, or nesting. Suitable habitat is present within the riparian areas of the Reservoir perimeter and Little Rock Creek.	Present (non-nesting)
Accipiter gentilis	Northern goshawk	CSC, FSS	Nests in old-growth stands of conifer and conifer/hardwood forests.	Suitable nesting habitat for this species does not occur within the Study Area and is highly fragmented within the Angeles National Forest.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Accipiter striatus	Sharp-shinned hawk	WL	Prefers, but not restricted to riparian habitats; breeds in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats; requires north-facing slopes with perches.	This species was observed within the Study area during surveys conducted in 2010 as was presumed to be overwintering. No nesting activity was observed.	Present
Agelaius tricolor	Tricolored blackbird	SE, CSC, BCC	Highly colonial species; requires open water, protected nesting substrate, and foraging areas with insect prey within a few kilometers of colony.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding and foraging habitat occurs, depending on water levels, within the upper extents of the Reservoir (changes year to year). Nearest recorded occurrence is approximately seven miles northwest of the Study Area in Lake Palmdale.	Moderate
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	WL	Resident in southern California coastal sage scrub and sparse mixed chaparral; frequents relatively steep, often rocky hillsides with grass and forb patches.	This species was observed within the Study Area during surveys conducted in 2012; breeding was confirmed within the Study Area.	Present
Artemisiospiza belli belli	Bell's sage sparrow	WL, BCC	Found in shrubby habitats including coastal sage scrub and chaparral, primarily of the chamise type.	There are no known records for this species in the Study Area; suitable habitat is present within the Study Area outside of the Reservoir footprint. Nearest recorded occurrence, from 2005, is approximately 13 miles northwest of the Study Area.	Moderate
Aquila chrysaetos	Golden eagle	BGEPA, BCC, CFP, WL	Forages in open grasslands, desert scrub and agricultural fields. Nests on ledges on cliff faces, rock outcrops and occasionally in large trees.	There are no known records for this species within the Study Area; limited suitable nesting habitat for this species occurs within the Study Area but does occur on portions of the ANF. Suitable foraging habitat is present within Study Area.	Moderate (nesting)/High (foraging)
Ardea herodias	Great blue heron	SA	Rookery sites typically occur in groves of large trees within proximity to aquatic foraging areas of streams, wetlands, and grasslands.	This species was documented in the Study Area during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; limited suitable rookery habitat occurs within the eastern portions of the Study Area within and adjacent to the Reservoir, suitable foraging habitat occurs throughout the Study Area.	Present (No rookery observed)
Asio flammeus	Short-eared owl	CSC	Usually occurs in open areas with few trees, such as grasslands, prairies, dunes, meadows, agricultural fields, emergent wetlands; requires dense vegetation for cover.	There are no known recent records for this species in the Study Area; suitable habitat is not present within the Study Area. Limited suitable habitat may be present along the proposed haul routes.	Low**
Asio otus	Long-eared owl	CSC	Breeds in thickly vegetated desert washes and oases, montane coniferous forests and in riparian and pinyon-juniper woodlands. Requires adjacent open habitats for foraging.	Suitable habit occurs within the Study Area; however, there are no known reports of this species within or adjacent to the Study Area. This species is known to occur on portions of the ANF to the southwest of the Study Area.	Moderate

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Athene cunicularia	Burrowing owl	BCC, CSC	Open, dry perennial or annual grasslands, deserts, and scrublands characterized by low-growing vegetation; subterranean nester, dependent upon burrowing mammals, particularly California ground squirrels.	There are no known records for this species in the Study Area; nearest CNDDB record for this species occurs approximately 10 miles to the northwest. While suitable habitat for this species does not occur within the Study Area it does occur along portions of the proposed haul routes.	Moderate**
Buteo regalis	Ferruginous hawk	BCC, WL	Forages in grasslands and agricultural fields.	There are no known records for this species in the Study Area; nearest CNDDB record for this species occurs approximately 10 miles to the northwest. This species is a known winter resident in the Antelope Valley. Limited foraging habitat is present within the Study Area.	Moderate
Buteo swainsoni	Swainson's hawk	ST, BCC	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannahs.	Limited suitable nesting habitat is present within the Study Area; there are no known records for this species within the Study Area. This species may move through the Study Area during migration and while foraging.	Moderate
Calypte costae	Costa's hummingbird	SA	Primarily occurs in desert wash, edges of desert riparian and valley-foothill riparian, coastal scrub, desert scrub, low-elevation chaparral.	This species was documented during surveys within the Study Area in 2012. Suitable habitat is present within the Study Area.	Present
Chaetura vauxi vauxi	Vaux's swift	CSC	Breeds in coniferous and mixed coniferous forests; requires large-diameter, hollow trees for breeding and roosting; forages in areas of open water where insect prey congregates.	This species was documented during surveys within the Study Area in May 2012 although the breeding status of the individuals was not confirmed.	Present
Charadrius montanus	Mountain plover	BCC, CSC	Winters in short grasslands and agricultural fields. Breeds in short-grass prairies outside of California.	Suitable habitat is not present within the Study Area; there are no known records for this species in the Study Area.	Not likely to occur
Circus cyaneus	Northern harrier	CSC	Prefer open country, grasslands, steppes, wetlands, meadows, agriculture fields; roost and nest on ground in shrubby vegetation often at edge of marshes.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding and foraging habitat occurs within the Study Area.	Moderate
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	FT, SE, BCC, FSS	Nests along the broad, lower flood-bottoms of larger river systems; also nests in riparian forests and riparian jungles of willow often mixed with cottonwoods, with an understory of blackberry, nettles, or wild grape.	There are no known records for this species in the Study Area; there are no CNDDB records for this species within a 15 mile radius of the Study Area; the Study Area is located within the known geographic distribution for this species; suitable breeding and foraging habitat does not occur in the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Dendroica petechia brewsteri	Yellow warbler	BCC, CSC	Riparian plant associations; prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging.	This species was documented within the Study Area during surveys conducted in 2012 and was noted as a potential breeding resident; the Study Area is located within the known geographic distribution for this species; suitable breeding and foraging habitat occurs in the Study Area.	Present
Elanus leucurus	White-tailed kite	CFP	Typically nests at lower elevations in riparian trees, including oaks, willows, and cottonwoods; forages over open country.	There are no known records for this species in the Study Area or surrounding areas. The Study Area is located within the known geographic distribution for this species; limited breeding and foraging habitat occurs in the Study Area.	Low
Empidonax traillii	Willow flycatcher	SE	Moist, shrubby areas, often with standing or running water for breeding, and winters in shrubby clearings and early successional growth	There are no known breeding records for this species in the Study Area or surrounding areas. The Study Area is located within the known geographic distribution for this species; and 5 willow flycatchers of undetermined subspecies were observed below the Dam and in Littlerock Creek during Project surveys in May 2012. Suitable breeding habitat is not present within the Study Area as this species prefers riparian areas of greater density than are present. Suitable foraging habitat occurs throughout the Study Area.	Present (Non-nesting migrants)
Empidonax traillii extimus	Southwestern willow flycatcher	FE, SE	Riparian woodlands in southern California.	There are no known breeding records for this species in the Study Area or surrounding areas. The Study Area is located within the known geographic distribution for this species. Willow flycatchers of undetermined subspecies were observed below the Dam and in Littlerock Creek during Project surveys in May 2012. Suitable breeding habitat is not present within the Study Area as this species prefers riparian areas of greater density than are present. Suitable foraging habitat occurs throughout the Study Area.	Potentially Present (Non-nesting migrants)
Eremophila alpestris actia	California horned lark	WL	Occurs in open habitats, forages in bare dirt in short and/or sparse grassland and areas of scattered shrubs.	There are no known records for this species in the Study Area; there are no CNDDB records for this species within a 15 mile radius of the Study Area. Limited breeding and foraging habitat occurs in the Study Area.	Low
Falco columbarius	Merlin	WL	Wide-variety of habitats including marshes, deserts, seacoasts, open woodlands, fields.	There are no known records for this species in the Study Area or surrounding areas; This species is a winter resident that does not breed in California; the Study Area is located within the known geographic winter distribution for this species; suitable foraging habitat occurs throughout the Study Area.	Moderate
Falco mexicanus	Prairie falcon	BCC, WL	Rare in southern California; nests along cliff faces or rocky outcrops; forages over open spaces, agricultural fields.	There are no known records for this species in the Study Area. The CNDDB reports one historic occurrence approximately 10 miles to the west of the Study Area. Marginal (at best) nesting habitat occurs within the Study Area; suitable foraging habitat occurs throughout the Study Area.	Low

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Falco peregrinus anatum	American peregrine falcon	BCC, CFP	Occurs in various open habitats, especially where suitable nesting cliffs present.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding habitat does not occur within but may be present in areas adjacent to the Study Area; foraging habitat occurs throughout the Study Area.	Low
Gymnogyps californianus	California condor	FE, SE, CFP	Nests in caves, crevices, behind rock slabs, or on large ledges on high sandstone cliffs; requires vast expanses of open savannah, grasslands, and foothill chaparral with cliffs, large trees and snags for roosting and nesting.	There are no known records for this species in the Study Area. The ANF is within the range of the condor and this wide ranging species has been documented as using the Forest for foraging, loitering, and roosting. Suitable nesting habitat is not present within the Study Area.	Low
Haliaeetus leucocephalus	Bald eagle	SE, CFP, BGEPA, FSS	Nests on large trees in the vicinity of large lakes, reservoirs and rivers. Wintering birds are most often found near large concentrations of waterfowl or fish.	Although not documented nesting within the Study Area, this species was observed foraging at the Reservoir during surveys conducted in 2015. A bald eagle has been observed overwintering at the Reservoir.	Present (non-nesting)
Icteria virens	Yellow-breasted chat	CSC	Inhabits riparian thickets of willow and other brushy tangles near water courses; nests in low, dense riparian vegetation; nests and forages within 10 feet of ground.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; limited breeding and foraging habitat occurs in the Study Area.	Moderate
Lanius ludovicianus	Loggerhead shrike	BCC, CSC	Broken woodland, savannah, pinyon-juniper woodland, Joshua tree woodland, riparian woodland, desert oases, scrub, and washes; prefers open country for hunting with perches for scanning and fairly dense shrubs and brush for nesting.	Although not documented within the Study Area an occurrence of this species is reported from the CNDDB approximately 2.5 miles east of the Study Area. Suitable foraging and breeding habitat occurs within the Study Area.	High
Numenius americanus	Long-billed curlew	BCC, WL	Generally nest in short grasses including grass prairies or agricultural fields and move to denser grasslands after young have fledged. Winter at the coast and in Mexico.	There are no known recent records for this species in the Study Area; There are a variety of eBird records for this species approximately 20 miles to the north within the Lancaster Area. Suitable habitat occurs within portions of the Study Area.	Low
Pandion haliaetus	Osprey	WL	Forages and nests along rivers, lakes, and reservoirs.	There are no known recent records for this species in the Study Area; however, this generally coastal species is known from the San Gabriel Mountains. Suitable foraging habitat occurs within and adjacent to the Reservoir.	Low
Piranga rubra	Summer tanager	CSC	Breeds in mature, desert riparian habitats dominated by cottonwood and willow.	This species was documented during surveys within the Study Area in May and July 2012 although the breeding status of the individuals was not confirmed.	Present

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Polioptila californica californica	Coastal California gnatcatcher	FT, CSC	Various sage scrub communities, often dominated by California sage and buckwheat; generally avoids nesting in areas with a slope of greater than 40%, and typically less than 820 feet in elevation.	There are no known records for this species in the Study Area or surrounding areas; the Study Area is located within the known geographic distribution for this species. Suitable habitat for this species does not occur within the Study Area.	Not likely to occur
Pyrocephalus rubinus	Vermilion flycatcher	CSC	Nests in desert riparian and landscaped cottonwoods and other trees in developed areas including golf courses; often near agricultural or grassland areas.	There are no known recent records for this species in the Study Area; There is a 2010 eBird record for this species approximately 7 miles to the northwest at Lake Palmdale. Suitable habitat occurs within portions of the Study Area.	Moderate
Riparia riparia	Bank swallow	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert; requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, or the ocean to dig a nesting hole.	There are no known recent records for this species in the Study Area; There are numerous eBird records for this species approximately 20 miles to the northwest near the City of Lancaster. Suitable habitat occurs within portions of the Study Area.	Low
Selasphorus sasin	Allen's hummingbird	BCC, SA	Most commonly breeds in coastal scrub, valley-foothill hardwood, and valley-foothill riparian habitats; occurs in a variety of woodland and scrub habitat as a migrant.	There are no known recent records for this species in the Study Area. There are several eBird records for this species approximately 5 miles to the northwest and 10 miles to the east. Suitable habitat occurs throughout the Study Area.	Moderate
Spinus lawrencei	Lawrence's goldfinch	BCC, SA	Breeds in a variety of habitats throughout its range in southern California, including mixed conifer-oak forest, blue oak savannah, pinyon-juniper woodland, chaparral, riparian woodland, and desert oases.	This species was observed within the Reservoir and within the southern extent of the Study Area in 2012. Suitable habitat occurs within portions of the Study Area.	Present
Strix occidentalis occidentalis	California spotted owl	CSC, BCC, FSS	In Southern California occupies montane hardwood and montane hardwood/conifer forests with dense, multi-layered canopies.	There are no known records for this species in the Study Area or surrounding areas. Suitable habitat does not occur within the Study Area.	Not likely to occur
Toxostoma bendirei	Bendire's thrasher	CSC, BCC	Prefers desert habitats with tall vegetation comprised of cholla cactus, creosote bush and yucca. Also found in juniper woodland.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species. Limited suitable habitat is present within the Study Area.	Not likely to occur.
Toxostoma lecontei	Le Conte's thrasher	CSC, BCC	Sparse desert scrub such as creosote bush, Joshua tree, and saltbush scrubs, or sandy-soiled cholla-dominated vegetation. Nests in dense, spiny shrubs or densely branched cactus in desert wash habitat.	There are no known records for this species in the Study Area. The CNDDB reports occurrences of this species approximately 5 miles northeast of the Study Area. Suitable habitat occurs within portions of the Study Area.	Moderate

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Vireo bellii pusillus	Least Bell's vireo	FE, SE	Summer resident of southern California in low riparian habitats in vicinity of water or dry river bottoms; found below 2000 ft; nests placed along margins of bushes or on twigs projecting into pathways, usually willow, mesquite, mulefat.	This species was detected during surveys conducted below the dam in 2010, 2011, and 2012. Suitable habitat occurs within the northern extent of the Study Area.	Present
Vireo vicinior	Gray Vireo	FSS	Summer resident of southern California in desert and riparian areas. Known to nest in chaparral, scrub oak, and big sagebrush.	Known from Liebre Mountain and Mint Canyon (near Vasquez Rocks), Los Angeles County.	Moderate
MAMMALS					
Antrozous pallidus	Pallid bat	CSC, FSS	Desert, grassland, shrubland, woodland, forest; most common in open, dry habitats with rocky areas for roosting; very sensitive to disturbance of roosting sites.	This species was detected during surveys in the Study Area. Suitable habitat occurs throughout the Study Area.	Present
Bassariscus astutus	Ring-tailed cat	CFP	Occurs in chaparral, coastal sage scrub, riparian scrub, oak woodlands, and riparian woodlands in proximity to permanent water.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species and it is known to occur within sections of the San Gabriel Mountains. Suitable habitat is present within portions of the Study Area.	Moderate
Chaetodipus fallax pallidus	Pallid San Diego pocket mouse	CSC	Prefers to inhabit desert wash, desert scrub, desert succulent scrub and/or pinyon-juniper woodland.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species. Nearest CNDDB for this record is approximately 7 miles to the southeast of the Study Area. Suitable habitat occurs within portions of the Study Area.	Low
Corynorhinus townsendii	Townsend's big-eared bat	SC, CSC, FSS	Coastal conifer and broadleaved forests, oak and conifer woodlands, arid grasslands and deserts, and high-elevation forests and meadows. Primarily roosts in caves and abandoned mines, but may roost in buildings, bridges, rock crevices, and hollow trees in many habitat types.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species. Roosting and foraging habitat occur within portions of the Study Area.	Moderate
Dipodomys merriami parvus	San Bernardino kangaroo rat	FE, CSC	Generally found in alluvial scrub vegetation on sandy loam substrates found in alluvial fans and/or floodplains. Needs early to intermediate seral stage vegetation.	There are no known recent records for this species in the Study Area. The nearest CNDDB record is approximately 10 miles northeast of the Study Area and this is likely a misidentification. Suitable habitat is not present within the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Euderma maculatum	Spotted bat	CSC	Occupies a wide variety of habitats from arid deserts and grasslands, to mixed conifer forests; feeds over water and along washes; needs rock crevices in cliffs or caves for roosting.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	Moderate
Eumops perotis californicus	Western mastiff bat	CSC	Many open, semi-arid to arid habitats, including coniferous and deciduous woodland, coastal scrub, grassland, chaparral; roosts in crevices in cliff faces, high buildings, trees, tunnels.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	Moderate
Lasiurus blossevillii	Western red bat	CSC	Primarily roosts in mature riparian forest but also found in upland forests, woodlands, and orchards	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	Moderate
Lasiurus cinereus	Hoary bat	SA	Prefers deciduous and coniferous woodlands; primarily roosts in tree foliage.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	High
Macrotus californicus	California leaf-nosed bat	CSC	Prefers caves, mines and rock shelters in Sonoran desert scrub.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	Low
Myotis ciliolabrum	Western small-footed myotis	SA	Occurs in a wide variety of arid upland habitats at elevations ranging from sea level to 2,700 meters (8,860 feet); day roosts include rock crevices, caves, tunnels and mines, and, sometimes, buildings and abandoned swallow nests.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	High
Myotis thysanodes	Fringed myotis	SA, FSS	Occurs in a wide variety of habitats. Optimal habitats include pinyon–juniper, valley foothill hardwood and hardwood-conifer woodlands. Forms maternity colonies and roosts in caves, mines, buildings and crevices.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	High
Myotis volans	Long-legged myotis	SA	Generally found along forest edges with good sun exposure. Breeds in tree cavities, under loose bark, rock crevices, cliffs and buildings. Forage over ponds, streams and forest clearings.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	High

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Myotis yumanensis	Yuma myotis	SA	Inhabits open forests and woodlands with sources of water. Species is closely tied to bodies of water, over which it feeds. Forms maternity colonies in caves, mines, buildings, or crevices.	This species was detected within the Study Area during surveys conducted in 2012. Suitable foraging and breeding habitat occurs within portions of the Study Area.	Present
Neotamias speciosus speciosus	Lodgepole chipmunk	SA	Occurs in isolated populations in the Southern California mountains in open-canopy forests and mixed-conifer from 6000–10,350 feet in elevation	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species and is well below the preferred elevation of this species. The CNDDB reports a historic occurrence of this species approximately 10 miles southeast of the Study Area.	Not likely to occur
Onychomys torridus ramona	Southern grasshopper mouse	CSC	Occurs primarily in grassland and sparse coastal sage scrub habitats.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; Suitable habitat occurs within limited portions of the Study Area.	Moderate
Ovis canadensis nelsoni	Nelson's (San Gabriel Mountains) bighorn sheep	SA, FSS	Inhabits open, rocky, steep areas with access to water and herbaceous vegetation. Populations currently managed in the Sheep management area of the San Gabriel Mountains.	This species has been observed upstream of the Reservoir near Santiago Creek in 2005. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs within portions of the Study Area.	Present
Perognathus alticolus alticolus	White-eared pocket mouse	CSC, FSS	Known only from a series of allopatric populations in arid yellow pine communities in the vicinity of Little Bear Valley and Strawberry Peak, San Bernardino Mountains, San Bernardino County. This species is likely to be found among Sagebrush and other shrubs in open, Ponderosa Pine forests and Pinyon-Juniper woodlands and in Sagebrush covered areas on the northern slopes and Big Bear Basin of the San Bernardino Mountains.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species.	Low
Perognathus alticolus inexpectatus	Tehachapi pocket mouse	CSC, FSS	Occurs in a diversity of habitats including, Joshua tree woodland, pinyon-juniper woodland, oak savanna, and native and non-native grasslands. Burrows in friable, sandy soil.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species. This species is, however, known to occur on the east slopes of the San Gabriel Mountains. Suitable habitat is present within the Study Area.	Not likely to occur

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Taxa		Status	Habitat Type	Comments	Occurrence Potential
Scientific Name	Common Name				
Perognathus longimembris brevinasus	Los Angeles pocket mouse	CSC	Found in open ground of fine sandy composition; prefers fine, sandy soils and may utilize these soil types for burrowing; may be restricted to lower elevation grassland and coastal sage scrub.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species.	Not likely to occur
Taxidea taxus	American badger	CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils; require sufficient food source, friable soils, and open, uncultivated ground; prey on burrowing rodents.	There are no known records for this species in the Study Area; the Study Area is located within the known geographic distribution for this species; suitable habitat occurs within portions of the Study Area.	Moderate
Xerospermophilus mohavensis	Mohave ground squirrel	ST	Occurs in the Mojave Desert in desert scrub and Joshua tree woodlands with winterfat (*Krascheninnikovia lanata*) and spiny hopsage (*Grayia spinosa*).	This species is not expected to occur at the Reservoir. A 2015 survey determined that the sediment disposal sites do not contain suitable habitat for this species (Phoenix, 2015).	Not likely to occur

Federal Rankings:
FE = Federally Endangered
FT = Federally Threatened
FP = Federal Proposed for Listing
FC = Federal Candidate for Listing
BCC = USFWS Bird of Conservation Concern
FSS = Forest Sensitive Species (ANF; USFS, 2014)
BGEPA = Bald and Golden Eagle Protection Act

State Rankings:
SE= State Endangered
ST = State Threatened
SC = State Candidate for Listing
CFP = California Fully Protected
CPF = California Protected Fur-bearer
SA = CDFW Special Animal
WL = CDFW Watch List
CSC = California Species of Special Concern

* Although these species have the some potential to occur or are present within the Study Area, they are likely to be limited to occasional or sporadic use of the Project area.

** The occurrence potential for these species is limited to the proposed haul routes only and the 47th Street East sediment disposal site. Suitable habitat for the indicated species is not present within Reservoir.

C.3.1.10 Designated Critical Habitat

Designated Critical Habitat for the arroyo toad, Unit 21 (50 CFR Part 17), is present immediately south of the proposed grade control structure at Rocky Point (USFWS, 2011). Refer to Figure C.3-6 for a graphical depiction of critical habitat within the Study Area.

C.3.1.11 Jurisdictional Waters and Wetlands

The Antelope Valley Watershed, which contains the majority of the Project, is a large (3,387-square-mile) closed basin in the western Mojave Desert. All water that enters the watershed either infiltrates into the underlying groundwater basin, or flows toward three playa lakes located near the center of the watershed. These playa lakes are located on Edwards Air Force Base and include Rosamond Lake, Rogers Dry Lake, and Buckhorn Dry Lake. Rosamond and Rogers Dry Lakes are used by Edwards Air Force Base for flight test activities, research operations, and emergency landings.

Little Rock Creek is a major intermittent drainage that transports water from the San Gabriel Mountains to the playas described above. During periods of normal rainfall, the creek readily overtops the dam and flows for several miles into the Antelope Valley. Riparian vegetation is present at the Reservoir and along Little Rock Creek below the dam. The proposed 47th Street East sediment disposal site is located in the lower foothills of the San Gabriel Mountains immediately below the California Aqueduct. This site is bisected by a series of ephemeral drainages that carry surface water off the site. As a result of the dry climate in the Project area, the existing ephemeral streams typically flow only during periods of heavy rainfall.

A preliminary jurisdictional delineation of State and or federal waters/wetlands was conducted at the Reservoir, at Little Rock Creek below the dam, and at 47th Street East sediment disposal site (see Figures C.3-12a, C.3-12b). Based on this survey the preliminary jurisdictional determination and delineation of waters report identified 92.306 Federal non-wetland waters and 97.428 acres of State jurisdictional waters (see Table C.3-6). Federal wetland waters do not occur in the Reservoir or in Little Rock Creek. Littlerock Reservoir, Little Rock Creek, and the ephemeral drainages on the 47th Street East sediment disposal site would be considered “waters of the United States” and would be subject to the jurisdiction of the USACE, the CDFW, and the RWQCB.

Table C.3-6. Jurisdictional Waters in the Project area

Location	Corps/LRWQCB Waters and Wetlands (Acres)		
	Non-wetland Waters of U.S.	Wetlands	CDFW Jurisdictional Waters (acres)
Reservoir	91.9	0.0	96.4
District Access Road	0.006	0.0	0.028
47th Street East Sediment Disposal Area	0.4	0.0	1.0
Total	92.306	0.0	97.428

C.3.1.12 Wildlife Corridors and Linkages

The ability for wildlife to move freely among populations is important to long-term genetic variation and demography. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short term, wildlife movement may also be important to individual animals’ ability to occupy home ranges, if a species range extends across a potential movement barrier. These

considerations are especially important for rare, threatened, or endangered species, and wide-ranging species such as large mammals, which exist in low population densities.

The Reservoir is located within the boundaries of the ANF, traversing an area dominated by steep, mountainous ridgelines and deep valleys. From a wildlife movement perspective, the ANF can be considered a large block of continuous open space surrounded by transitional ecotones, including the arid desert regions to the north and the highly developed San Gabriel Valley and Los Angeles Basin to the south. As a result, the ANF provides expansive habitat for wildlife movement and represents a broad, regional linkage between the San Bernardino Mountains to the east and the Santa Susana and Sierra Madre Mountains to the west. The proposed sediment disposal areas are located in the urban interface but may still provide passage or resting areas for some species.

The California Essential Habitat Connectivity Project was commissioned by the California Department of Transportation (Caltrans) and CDFW to create a statewide assessment of essential habitat connectivity to be used for conservation and infrastructure planning (Spencer et al., 2010). One of its goals was to create the Essential Connectivity Map, which depicts large, relatively natural habitat blocks that support native biodiversity (natural landscape blocks) and areas essential for ecological connectivity between them (essential connectivity areas).

The Essential Connectivity Map (*ibid*) identifies the San Gabriel Mountains as a natural landscape block with essential connectivity areas in some of the more developed areas. This map does not provide a fine enough scale to identify the Project site, but it is either within or adjacent to a natural landscape block.

The Project area is adjacent to Los Angeles County's proposed Antelope Valley Significant Ecological Area (SEA) and portions of the haul route are within the SEA. The SEA designation is given to land that supports irreplaceable biological resources, and SEAs are mapped as a zoning overlay in the Los Angeles County General Plan (LADRP, 2014). Development within the SEAs is regulated by Los Angeles County Ordinance (Hillside Management and Significant Ecological Areas Ordinance) intended to preserve the biological resources and sustainability of the SEAs (LADRP, 2014).

The Antelope Valley SEA extends from the ANF to the playa lakes within Edwards Air Force Base, encompassing most of the two largest drainages (Little Rock Creek and Big Rock Creek) exiting the northern slope of the San Gabriel Mountain range. The Little Rock Creek segment of the SEA extends from the Littlerock Dam north along the Little Rock Creek Wash and floodplain (LADRP, 2014).The SEA serves as a major habitat linkage and movement corridor for plant and wildlife species. The Little Rock Creek (and Santiago Creek) riparian corridor, and its associated uplands, is recognized as a vital pathway for wildlife moving from the higher elevations of the surrounding ANF to desired lower elevation habitats. Several migratory songbirds utilize the riparian vegetation within the corridor for breeding, nesting, and foraging, or at a minimum, as transient rest sites during migration. Additionally, large, wide-ranging animals, such as black bear, mountain lion, and coyote have been documented at the Reservoir in search of prey opportunities, water, and cover. In the Project area the Dam acts as a seasonal barrier for some species.

C.3.2 Regulatory Framework

The following are federal, state, and local laws, ordinances, regulations, and standards that apply to biological resources and jurisdictional waters and wetlands. See Section C.9 (Recreation and Land Use) for an evaluation of policies within the Forest Service Land Management Plan that are applicable to biological resources.

C.3.2.1 Federal

- **Endangered Species Act of 1973.** The Endangered Species Act (ESA) (16 USC 1531 et seq.) and subsequent amendments establish legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend. The ESA also requires the USFWS to designate critical habitat for listed threatened and endangered species. The effects analyses for designated critical habitat must consider the role of the critical habitat in both the continued survival and the eventual recovery (i.e., the conservation) of the species for which it was designated. ESA provisions protect federally listed threatened and endangered species and their habitats from unlawful take and ensure that federal actions do not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.
- **Clean Water Act.** The Clean Water Act (33 USC 1251 et seq.) establishes legal requirements for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.
  - **Section 404.** Section 404 establishes a permit program administered by the U.S. Army Corps of Engineers (USACE) regulating the discharge of dredged or fill material into waters of the United States, including wetlands. Implementing regulations by the USACE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines and were developed by the EPA in conjunction with the USACE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts. A 404(b)(1) Evaluation Summary is included in Appendix F of this EIS/EIR.
  - **Section 401.** Section 401 requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the United States must obtain a State certification that the discharge complies with other provisions of the Clean Water Act. The Regional Water Quality Control Boards administer the certification program in California.
- **Migratory Bird Treaty Act.** The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711) makes it unlawful to possess, buy, sell, purchase, barter or "take" any migratory bird listed in Title 50 of the Code of Federal Regulations Part 10. "Take" is defined as possession or destruction of migratory birds, their nests, or eggs. Disturbances that cause nest abandonment and/or loss of reproductive effort or the loss of habitats upon which these birds depend may be a violation of the Migratory Bird Treaty Act. The Federal Migratory Bird Treaty Act (MBTA) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary. This act encompasses whole birds, parts of birds, and bird nests and eggs. Executive Order 13186 (January 10, 2001) identifies the responsibilities of federal agencies to protect migratory birds, and directs executive departments and agencies to take certain actions to further implement the MBTA. The Order requires each agency that undertakes actions that could affect migratory birds to enter into a Memorandum of Understanding (MOU) with the USFWS to promote the conservation of migratory bird populations. The Forest Service entered into the required MOU with the USFWS on December 8, 2008 (FS Agreement #08-MU-1113-2400-264). The MOU identifies specific activities to be undertaken by the Forest Service and USFWS to promote bird conservation.
- **Bald and Golden Eagle Protection Act.** The Bald Eagle Protection Act of 1940 (16 U.S.C. 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. Take of bald and golden eagles is defined as follows: "disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering

behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior'' (72 FR 31132; 50 CFR 22.3).

- The USFWS is the primary federal authority charged with the management of bald and golden eagles in the United States. USFWS guidance on the applicability of current Eagle Act statutes and mitigation is currently under review. On November 10, 2009 the USFWS implemented new rules (74 FR 46835) governing the "take" of golden and bald eagles. The new rules were released under the existing Bald and Golden Eagle Act which has been the primary regulation protection unlisted eagle populations since 1940. All activities that may disturb or incidentally take an eagle or its nest as a result of an otherwise legal activity must be permitted by the USFWS under this act.
- **Noxious Weed Act of 1974, as amended.** This act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. Under this act, the Secretary of Agriculture was given the authority to designate plants as noxious weeds, and inspect, seize, and destroy products, and to quarantine areas, if necessary to prevent the spread of such weeds.

C.3.2.2 State

- **California Endangered Species Act.** Provisions of California Endangered Species Act protect State-listed Threatened and Endangered species. The CDFW regulates activities that may result in "take" of individuals ("take" means "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of "take" under the California Fish and Game Code. Additionally, the California Fish and Game Code contains lists of vertebrate species designated as "fully protected" (California Fish & Game Code §§ 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], 5515 [fish]). Such species may not be taken or possessed.
- In addition to federal and State-listed species, the CDFW also has produced a list of Species of Special Concern to serve as a "watch list." Species on this list are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Species of Special Concern may receive special attention during environmental review, but they do not have statutory protection.
- Birds of prey are protected in California under the State Fish and Game Code. Section 3503.5 states it is "unlawful to take, possess, or destroy any birds of prey (in the order Falconiformes or Strigiformes) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by the CDFG. Under Sections 3503 and 3503.5 of the State Fish and Game Code, activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory nongame bird as designated in the Migratory Bird Treaty Act, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the Migratory Bird Treaty Act, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800 are prohibited.
- **California Code of Regulations (Title 14, sections 670.2 and 670.5).** Identifies the plants and animals of California that are declared rare, threatened, or endangered.
- **Protected furbearing mammals (California Code of Regulations, Title 14, section 460).** Fisher, marten, river otter, desert kit fox, and red fox may not be taken at any time.

- **Native Plant Protection Act (Fish & Game Code 1900-1913).** California's Native Plant Protection Act (NPPA) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of NPPA prohibit the taking of listed plants from the wild and require notification of the CDFG at least 10 days in advance of any change in land use. This allows CDFG to salvage listed plant species that would otherwise be destroyed. The Applicant is required to conduct botanical inventories and consult with CDFG during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.
- **Section 3503 & 3503.5 of the Fish and Game Code.** Under these sections of the Fish and Game Code, the Applicant is not allowed to conduct activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory non-game bird as designated in the Migratory Bird Treaty Act, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the Migratory Bird Treaty Act, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800.
- **Porter-Cologne Water Quality Control Act.** Regional water quality control boards regulate the "discharge of waste" to "waters of the State." All projects proposing to discharge waste that could affect waters of the State must file a waste discharge report with the appropriate regional board. The board responds to the report by issuing waste discharge requirements (WDR) or by waiving WDRs for that project discharge. Both of the terms "discharge of waste" and "waters of the State" are broadly defined such that discharges of waste include fill, any material resulting from human activity, or any other "discharge." Isolated wetlands within California, which are no longer considered "waters of the United States" as defined by Section 404 of the CWA, are addressed under the Porter-Cologne Act.
- **State-Regulated Habitats.** The State Water Resources Control Board is the State agency (together with the Regional Water Quality Control Boards [RWQCB]) charged with implementing water quality certification in California. The Project falls under the jurisdiction of the Los Angeles (Region 4) RWQCB.
- The CDFW extends the definition of stream to include "intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams (USGS defined), and watercourses with subsurface flows. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife" (CDFG, 1994).
- Activities that result in the diversion or obstruction of the natural flow of a stream; or which substantially change its bed, channel, or bank; or which utilize any materials (including vegetation) from the streambed may require that the Project applicant enter into a Streambed Alteration Agreement with the CDFW.
- **Fully Protected Designations – California Fish and Game Code Sections 3511, 4700, 5515, and 5050.** Prior to enactment of CESA and the federal ESA, California enacted laws to "fully protect" designated wildlife species from take, including hunting, harvesting, and other activities. Unlike the subsequent CESA and ESA, there was no provision for authorized take of designated fully protected species. Currently, 36 fish and wildlife species are designated as fully protected in California, including golden eagle.
- California Senate Bill 618 (signed by Governor Brown in October 2011) authorizes take of fully protected species, where pursuant to an NCCP, approved by CDFW. The legislation gives fully protected species the same level of protection as is provided under the Natural Community Conservation Planning Act for endangered and threatened species (see below).
- **Native Birds – California Fish and Game Code Sections 3503 and 3513.** California Fish and Game Code Section 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; Section 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and Section 3513 provides for the adoption of the

MBTA's provisions (above). With the exception of a few non-native birds such as European starling, the take of any birds or loss of active bird nests or young is regulated by these statutes. Most of these species have no other special conservation status as defined above. The administering agency for these sections is the CDFW. As with the MBTA, these statutes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game migratory birds.

- **Streambed Alteration Agreements – California Fish and Game Code Sections 1600-1616.** Under these sections of the Fish and Game Code, an applicant is required to notify CDFW prior to constructing a project that would divert, obstruct, or change the natural flow, bed, channel, or bank of a river, stream, or lake. Preliminary notification and project review generally occur during the environmental review process. When a fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the Project. CDFW jurisdiction is determined to occur within the water body of any natural river, stream, or lake. The term "stream," which includes creeks and rivers, is defined in Title 14, CCR, Section 1.72.

C.3.2.3 Local

- **Los Angeles County Ordinances**
  - **Hillside Management and Significant Ecological Areas Ordinance.** This ordinance regulates development within Significant Ecological Areas (SEAs) to preserve biological resources and sustainability. The SEA designation is given to land that supports irreplaceable biological resources, and SEAs are mapped as a zoning overlay in the Los Angeles County General Plan.
  - **Los Angeles County Oak Ordinance.** This ordinance requires permitting and mitigation for the removal of oak trees.
- **City of Palmdale General Plan (January 1993).** The General Plan sets forth goals to preserve and protect biological resources, including: (1) preserve significant natural and man-made open space areas; (2) protect significant ecological resources and ecosystems, including, but not limited to, sensitive flora and fauna habitat areas; (3) preserve designated natural hillsides and ridgelines in the Planning Area, to maintain the aesthetic character of the Antelope Valley; (4) protect the quality and quantity of local water resources; and (5) promote the attainment of state and federal air quality standards.
- Biological resources are addressed in the City's General Plan Goal ER2, which calls for protecting "…significant ecological resources and ecosystems, including, but not limited to, sensitive flora and fauna habitat areas." Significant Ecological Areas are identified at Big Rock Wash, Little Rock Wash, Ritter Ridge, Portal Ridge, and Alpine Butte. Biological surveys are required for any new development in these areas, and significant environmental resources are required to be considered and preserved to the extent feasible. The plan also calls for the preservation of natural drainage courses and riparian areas containing significant concentrations of ecological resources, as well as significant Joshua tree woodlands.
- The City would require biological assessments and reports for projects in known or suspected natural habitat areas prior to Project approval. These reports would be used to establish significant natural habitat areas and ecologically sensitive zones to prevent disturbance and degradation of these areas. Recommended mitigation measures as identified in the reports would be required to be implemented as development occurs.
- **City of Palmdale Native Desert Vegetation Ordinance.** The City has adopted Ordinance No. 952, referred to as the Native Desert Vegetation Ordinance. This ordinance is designed to preserve a number

of specimen-quality juniper and Joshua trees that add to community identity, and to encourage the use of native vegetation in new development landscaping. All landscaping for new developments must conform to the requirements set forth in the Native Desert Vegetation Ordinance.

- **Antelope Valley Area Plan.** This plan requires minimizing disruption and degradation of the environment, integrating land uses with natural environmental systems, instituting measures to mitigate the impacts of environmental hazards, and prohibiting expansion of urban uses into areas of rare and endangered species. It promotes the designation of significant plant and wildlife habitats as Significant Ecological Areas (SEAs) and preservation of biotic diversity in the valley by designating rare and unique plant and animal SEAs and the measures for their protection. This plan promotes the establishment of an open space network.

C.3.3 Issues Identified During Scoping

Table C.3-7 below provides a list of biological resource issues raised during the public scoping period for the EIS/EIR (see Appendix E, Summary of Scoping Process). Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.3-7. Scoping Issues Relevant to Biological Resources

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should identify an alternative and define mitigation measures to ensure that the concentrations of Hg and PCBs in fish tissue are not increased by the Project and are decreased to the extent feasible.	The EIS/EIR includes a reasonable range of alternatives including allowing the Reservoir to fill with sediment. The presence of Hg and PCBs in fish tissue is considered part of the baseline condition. Standard Project Commitments have been incorporated into the Project that require sediment testing for these and other constituents. Fish tissue and sediment samples were collected to analyze Hg and PCB content. The source of these contaminants is currently unknown. The potential effect of each alternative on levels of Hg and PCBs in surface waters, sediments, and fish tissue is analyzed in Section C.12.5.
The Draft EIS/EIR should evaluate changes to management of fish species as a tool in addressing mercury impairments. Which species are present and how they are managed is an important factor in determining the severity of the problem in a given reservoir. Stocking reservoirs with less predatory fish might limit methylmercury bioaccumulation.	Reservoir management alternatives (such as pH adjustment, nutrient addition, oxygenation, and stocking practices) to reduce methylmercury production are not part of the proposed action. Measures are included as part of the proposed action to ensure that contaminated sediments would not be mobilized or otherwise allowed to enter the aquatic ecosystem. Due to the presence of arroyo toads in Little Rock Creek the CDFW no longer stocks recreational fish in the Reservoir. Native fish were not detected during the surveys. Bluegill and largemouth bass were the most common non-native species detected in the Reservoir and portions of Little Rock Creek above Rocky Point. Green sunfish, pumpkinseed sunfish, common carp, channel catfish, and bullhead are also expected to occur. Rainbow trout and brown trout have been recorded above the Reservoir and in some areas have been removed by the CDFW. Non-native fish would be removed from the Reservoir as part of the proposed action.

Table C.3-7. Scoping Issues Relevant to Biological Resources

Comment	Consideration in the EIS/EIR
Recommend researching existing thresholds for mercury in prey fish and evaluating the potential risk to wildlife that may exist. Utilize the recent data on collected tissue of sport fish to assess potential impacts on wildlife that consume small fish from the reservoir. Include the results of this analysis in the EIS/EIR.	Non-native fish would be removed as part of the proposed action (see Sections B.2.3.2 and C.3.1.5), which would avoid exposure of bird species to elevated levels of contaminants.
Department of Fish and Wildlife	
The Draft EIS/EIR should: (1) Focus on adverse Project impacts to Least Bell's Vireo and identify avoidance measures; and (2) Identify sediment disposal locations and evaluate their impacts to biological resource. Any sediment disposal sites should be carefully evaluated for the presence of wetland habitat (e.g., existing depressions or mining pits).	The EIS/EIR provides an evaluation of impacts to least Bell's vireo and other threatened, endangered, proposed, candidate, sensitive species habitats and wetlands. Standard Project Commitments have been incorporated into the Project to reduce impacts to these species or their habitats. The EIS/EIR provides a thorough analysis of the proposed sediment disposal sites and includes an evaluation of jurisdictional waters at those locations.
Per CEQA Guidelines, §15125(c), information on the regional setting that is critical to an assessment of environmental impacts should place special emphasis on resources that are rare or unique to the region.	The EIS/EIR provides a thorough description of the baseline setting.
The analysis should include a thorough, recent floristic-based assessment of special status plants and natural communities, following the Department of Fish and Wildlife's (DFW) Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (http://www.dfg.ca.gov/habcon/plant/). Conduct floristic, alliance- and/or association-based mapping and vegetation impact assessments within the Project area with use of the Manual of California Vegetation (2nd ed., 2008). Include adjoining habitat areas in this assessment where site activities could lead to direct or indirect impacts off site.	In conformance with CDFG (2009), surveys were (a) floristic in nature, (b) consistent with conservation ethics, (c) systematically covered all habitat types on the sites, and (d) are well documented, by this report and by voucher specimens to be deposited at Rancho Santa Ana Botanic Garden. Vegetation descriptions included the Project area and a 500-foot buffer. Vegetation names are based on Sawyer et al. (2009) and have been defined at least to the alliance level and in some cases to the association level.
Inventory rare, threatened and endangered, and other sensitive species on site and within the area of potential effect, as defined by CEQA Guidelines § 15380. Address seasonal variations in use of the Project area. Develop species-specific survey procedures in consultation with U.S. Fish and Wildlife Service.	Field surveys were conducted between 2007 and 2014 and included a wide range of focused and protocol surveys. Please see Section C.3.1.1 for a description of survey methods.
Analysis should include a 9-quad search around the Project vicinity to identify potential sensitive species. Include a current inventory of the biological resources associated with each habitat type on site and within the area of potential effect. Contact the California Natural Diversity Data Base (www.wildlife.ca.gov/biogeodata/) to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code.	The literature review included a nine quad search in addition to extensive review of existing regulatory plans, technical studies and consultation with local experts.
The DFW strongly discourages disturbance to wetlands or conversion of wetlands to uplands. All wetlands and water-courses, whether intermittent episodic or perennial, should be retained and provided with substantial setbacks that preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations.	A preliminary jurisdictional delineation of State and or federal waters/wetlands was conducted at the Reservoir, at Little Rock Creek below the dam, and at 47th Street East sediment disposal site Based on this survey the preliminary jurisdictional determination and delineation of waters report identified 92.306 Federal non-wetland waters and 97.428 acres of State jurisdictional waters. Federal wetland waters do not occur in the Reservoir or in Little Rock Creek.

Table C.3-7. Scoping Issues Relevant to Biological Resources

Comment	Consideration in the EIS/EIR
The DFW has regulatory authority over activities in streams and/or lakes that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed. Project applicants must provide written notification to the DFW pursuant to the Fish and Game Code (§1600 et seq.) and may need to obtain a Lake and Streambed Alteration Agreement (LSA). In order to issue a LSA, the DFW would require the EIS/EIR to include a full discussion of the Project's potential impacts to the stream or riparian resources and the incorporation of adequate avoidance, mitigation, monitoring and reporting commitments.	Littlerock Reservoir, Little Rock Creek, and the ephemeral drainages on the 47th Street East sediment disposal site would be considered "waters of the United States" and would be subject to the jurisdiction of the USACE, the CDFW, and the RWQCB. As required by law PWD would comply with all regulatory requirements.
The DFW considers adverse impacts to a CESA-listed species to be significant without mitigation. The DFW recommends that the Applicant seek appropriate take authorization under CESA prior to Project implementation (e.g., Incidental Take Permit, Consistency Determination). Early consultation is encouraged, as significant modification to a project and its mitigation measures may be required in order to obtain a CESA Permit. The DFW may need to prepare a separate CEQA document for the issuance of an Incidental Take Permit unless the Project addresses all impacts to CESA-listed species and specifies a mitigation monitoring and reporting program in sufficient detail.	The EIS/EIR provides an analysis of impacts to State and federally listed species. Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts to listed species. In addition, PWD would be seeking take coverage through Section 2081 for potential impacts to State listed species.
Include a discussion of potential adverse impacts to biological resources from sediment-removal activities, staging areas, lighting, noise, human activity, exotic species, and drainage, as well as proposed mitigation measures.	The EIS/EIR provides an analysis of impacts from sediment-removal activities, staging areas, lighting, noise, human activity, exotic species, and to drainages. Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts from the Project.
Evaluate indirect Project impacts on biological resources, including resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands. Evaluate impacts on, and maintenance of, wildlife corridor/ movement areas, including access to undisturbed habitats in adjacent areas.	The EIS/EIR provides an analysis of impacts on impacts on biological resources, including wildlife corridor/movement areas, resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands. Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts from the Project.
Develop a cumulative effects analysis for biological resources as described under CEQA Guidelines, §15130.	The EIS/EIR provides an analysis of cumulative effects impacts on biological resources.
The EIS/EIR should include measures to fully avoid and otherwise protect Rare Natural Communities from Project-related impacts. The DFW considers these communities as threatened habitats having regional and local significance.	Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts from the Project.
The EIS/EIR should include mitigation measures for adverse impacts to sensitive plants, animals, and habitats. Mitigation measures should emphasize avoidance and reduction of Project impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail. If on-site mitigation is not feasible or would not be biologically viable and therefore not adequately mitigate the loss of biological functions and values, off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed.	Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts from the Project. Where required, PWD would acquire off-site compensation lands that would be preserved in perpetuity.

Table C.3-7. Scoping Issues Relevant to Biological Resources

Comment	Consideration in the EIS/EIR
The EIS/EIR should include measures to perpetually protect the targeted habitat values from direct and indirect negative impacts. Issues that should be addressed include, but are not limited to, restrictions on access, proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, and increased human intrusion.	The EIS/EIR proposed Standard Project Commitments that reduce or avoid impacts from the Project.
The DFW recommends that measures be taken to avoid impacts to nesting birds during the implementation of the Project. Proposed activities (e.g., staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season which generally runs from February 1 to September 1 (as early as January 1 for some raptors) to avoid take of birds or their eggs. If avoidance of the avian breeding season is not feasible, the DFW recommends surveys by a qualified biologist (i.e., experience in conducting breeding bird surveys) to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300 feet of the disturbance area (within 500 feet for raptors). Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or possibly other factors.	To reduce impacts to nesting birds, PWD would implement Standard Project Commitments that require the protection of nesting birds through worker education, pre-construction surveys for nesting birds, avoidance of active nest sites, construction monitoring, and the control of fugitive dust.
Habitat Restoration Plans should be prepared by persons with expertise in southern California ecosystems and native plan revegetation techniques and should include: (a) location of mitigation sites; (b) plant species to be used, container sizes, and seeding rates; (c) schematic depicting the mitigation area; (d) planting schedule; (e) description of the irrigation method-ology; (f) measures to control exotic vegetation on site; (g) specific success criteria; (h) detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity.	Habitat restoration plans would be prepared by a qualified botanist with experience restoring arid ecosystems.

C.3.4 Environmental Consequences

Significance Criteria. The following significance criteria are based on the CEQA environmental checklist presented in Appendix G of the CEQA Statutes and Guidelines and are used to describe the potential impacts of the Project and alternatives on the sensitive biological resources that may occur in the Project area. All direct, indirect, short-term, and long-term impacts associated with the Project and project alternatives are assessed within this section. The Project would have a significant adverse environmental impact on biological resources if it would:

- Criterion BIO1: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW, Forest Service, or USFWS.
- Criterion BIO2: Have an adverse effect, either directly or through habitat modifications, on any species listed as fully protected, endangered, threatened, or proposed or critical habitat for these species.

- Criterion BIO3: Have a substantial adverse effect, 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 CDFW, Forest Service, or USFWS
- Criterion BIO4: 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.
- Criterion BIO5: 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.
- Criterion BIO6: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances.
- Criterion BIO7: Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP.

Impact Assessment Methodology. Impacts to biological resources were assessed through consideration of Project effects on the landscape, habitat, community, and species level for the Project and alternatives. Impacts refer to initial excavation and sediment removal activities, construction of the grade control structure; annual and semi-annual sediment removal activities that would be conducted as part of operation; periodic road repairs below the Reservoir to maintain access to Project facilities; and the effects of water delivery on biological resources at the Reservoir and in downstream locations.

C.3.4.1 Description of Direct, Indirect, and Operational Impacts

Direct impacts are defined under CEQA as those that result from a project and occur at the same time and place. For biological resources in the Project area, direct impacts include the removal of vegetation or habitat; disturbance to wildlife from construction of the grade control structure, sediment removal activities, and road repairs below Littlerock Dam; crushing of burrows or animals in soft sediment; and mortality from road kill. Indirect impacts are caused by a project, but can occur later in time or are farther removed in distance but are reasonably foreseeable and related to the Project. Indirect impacts can include the disruption of native seed banks, spread of invasive plant species, changes to soil or hydrology that adversely affects native species over time, disruption of prey base, or increased predation through alterations of the physical landscape from project features. Indirect impacts may also include increased traffic and human disturbance from annual sediment removal activities and alterations to water surface elevations that result from water deliveries.

C.3.4.2 Permanent and Temporary Impacts

Permanent impacts include the conversion of land to a new use, such as the construction of the grade control structure or the placement of fill on natural lands. Temporary impacts are considered activities that are of short duration (i.e., 6 to 12 months) and that do not result in a permanent land use conversion.

C.3.4.3 Impacts to Biological Resources from Construction, Sediment Removal, and Road Repair Activities

The following discussion provides a summary of the types of impacts to biological resources that could occur due to construction of the grade control structure, sediment removal, and road repair activities within the Reservoir.

Direct impacts to vegetation from general excavation and sediment removal would involve clearing vegetation and disrupting native seed banks. Indirect effects include fugitive dust and the spread of non-native and invasive weeds (especially to adjacent habitats off site or in upstream riparian areas). Excessive dust can reduce photosynthetic capacity in plants over time and inhibit reproduction by physically coating reproductive structures or excluding insect pollinators.

Direct impacts to wildlife could occur from excavation activities as a result of mechanical crushing, road kill, loss of breeding sites, disturbance from human activity and vehicles, and trampling. Disturbances to wildlife would be associated with the removal of vegetation, excavation of the grade control structure, and changes to existing topographical and hydrological conditions. Indirect impacts to wildlife could include noise and vibration from earthmoving, fugitive dust, the degradation of water quality, changes in water runoff due to alterations in topography, increased erosion and sediment transport, and the spread of noxious weeds. Increased lighting during low-light periods (i.e., when pouring soil cement for the grade control structure) and noise can cause some species to leave the area and may disrupt foraging, breeding, or other activities. Many insects are drawn to light, and species that prey on insects, such as bats, may be attracted to lighted areas which would increase the potential for disturbance or mortality. General direct impacts to wildlife are summarized in Table C.3-8.

Table C.3-8. Direct Impacts to Wildlife from Construction, Sediment Removal, and Road Repair Activities

Activity	Impacts
MAMMALS	
Earth moving, grading, habitat/vegetation removal	▪ Direct mortality to small or less mobile species ▪ Crushing of burrows or fossorial animals, disruption of soil surfaces, compaction of soils, and displacement of native species ▪ Reduced use of area as a foraging or movement corridor ▪ Fugitive dust and habitat loss ▪ Creation of barriers disrupting movement
Noise and vibration	▪ Interference with breeding or foraging activities and movement patterns ▪ Avoidance of areas adjacent to the excavation zone ▪ Interference with hearing resulting in increased predation ▪ Abandonment of burrows or habitat
Man-made sources of light	▪ Disturbance or mortality to species that prey on insects attracted to light sources ▪ Collisions with vehicles at night
Placement and use of temporary access roads	▪ Crushing of burrows, disruption of soil surfaces, compaction of soils, and displacement of native species ▪ Establishment of ruts or depressions that can alter soil conditions and hydrology ▪ Alteration of physical characteristics of soil underneath roads (placement of roads increases compaction up to 200 times relative to undisturbed sites) ▪ Effect on animal behavior by altering home range use, affect movement patterns, reduce reproductive success, alter escape response, and increase physiological stress
Traffic	▪ Accidental mortality of small diurnal animals from vehicle collision ▪ Secondary vehicular mortality of opportunistic predators feeding on road kill
Waste	▪ Ingestion of trash or leaked/spilled fluids such as ethylene glycol antifreeze
BIRDS	
Earth moving, grading, habitat/vegetation removal	▪ Displacement of breeding birds and the abandonment of active nests (during breeding season) ▪ Loss of eggs and nestlings including ground nesting birds ▪ Loss of foraging habitat in the Reservoir

Table C.3-8. Direct Impacts to Wildlife from Construction, Sediment Removal, and Road Repair Activities	
Activity	Impacts
Noise and vibration	▪ Interference with breeding or foraging activities and movement patterns ▪ Avoidance of areas adjacent to the disturbance zone ▪ Interference with hearing resulting in increased predation ▪ Abandonment of nests
Man-made sources of light	▪ Disturbance or mortality to species that prey on insects attracted to light sources
Placement and use of temporary access roads	▪ Crushing of ground nests
Traffic	▪ Accidental mortality of opportunistic predators and scavengers (such as carrion birds) feeding on road kill ▪ Disruption of breeding, foraging, and movement of bird species resulting in nest, roost, or territory abandonment and subsequent reproductive failure (during breeding season)
Waste	▪ Ingestion of trash or leaked/spilled fluids such as ethylene glycol antifreeze
AMPHIBIANS, REPTILES, AND FISH	
Earth moving, grading, habitat/vegetation removal	▪ Direct mortality to small or less mobile species ▪ Crushing of burrows, disruption of soil surfaces, compaction of soils, and displacement of native species ▪ Fugitive dust and habitat loss ▪ Degradation of water quality in breeding areas from erosion and sedimentation
Noise and vibration	▪ Interference with breeding or foraging activities and movement patterns ▪ Avoidance of areas adjacent to the excavation zone ▪ Interference with hearing resulting in increased predation ▪ Abandonment of burrows
Placement and use of temporary access roads	▪ Unintentional entombment within burrows or aestivation sites ▪ Establishment of ruts or depressions that can alter soil conditions and hydrology ▪ Effect on animal behavior by altering home range use, affect movement patterns, reduce reproductive success, alter escape response, and increase physiological stress
Traffic	▪ Accidental mortality of small diurnal animals from vehicle collision ▪ Secondary vehicular mortality of opportunistic predators and scavengers feeding on road kill

C.3.4.4 Proposed Action/Project

Direct and Indirect Effects Analysis

Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or FWS (Criterion BIO1)

Impact BIO-1: The Project would result in temporary and permanent losses of native vegetation.

The Project would result in 11.6 acres of permanent and 65.3 acres of temporary disturbance to vegetation and unvegetated landforms including riparian woodlands, herbaceous wetland, unvegetated lake bottom, and sandy wash. Approximately 5.8 acres of juniper woodland and 5.5 acres of disturbed habitat would be lost at the 47th Street disposal site (See Table C.3-9 and Figures C.3-13, C.3-14, and C.3-15). Sediment disposed at the exhausted quarries would be limited to disturbed areas that do not support native vegetation. The acreages of these communities are based on mapping conducted in 2012 and 2014 and vary in response to scour from winter storms and seasonal flooding.

Table C.3-9. Total Project Disturbance by Location

Vegetation Community[1]		Type	Total Disturbance in Acres by Location Temporary/Permanent		
Sawyer et al. (2009) Vegetation Classification	Holland (1986) Vegetation Classification		Reservoir[2]	Haul Roads	Sediment Disposal Site
Arroyo willow thickets	Southern willow scrub	Riparian	0/0	0/0	0/0
Big sagebrush scrub	Big sagebrush scrub	Upland	0/0	0/0	0/0
Black willow scrub	Riparian scrub	Riparian	2.59/0.14	0/0	0/0
California buckwheat scrub	Mojave mixed woody scrub	Upland	0.02/0	0/0	0/0
California juniper woodland	Mojavean juniper woodland and scrub	Upland	0/0	0/0	5.8/5.8
Cattail marsh	Freshwater marsh	Riparian	0/0	0/0	0/0
Creosote bush scrub	Mojave creosote bush scrub	Upland	0/0	0/0	0/0
Fremont cottonwood forest	Southern cottonwood willow riparian forest	Riparian	0.06/0	0/0	0/0
	Mojave riparian forest				
Herbaceous wetland	Freshwater marsh	Riparian	3.46/0.04	0/0	0/0
Joshua tree woodland	Joshua tree woodland	Upland	0/0	0/0	0/0
Mormon tea scrub	Mojave mixed woody scrub	Upland	0/0	0/0	0/0
	Great Basin mixed scrub				
Rubber rabbitbrush scrub	Rabbitbrush scrub	Upland	0/0	0/0	0/0
Singleleaf pinyon woodland	Mojavean pinyon woodland	Upland	0/0	0/0	0/0
Other Cover Types and Landforms					
Developed		Upland	0/0	0/0	5.5/5.5
Non-native woodland		Upland	0/0	0/0	0/0
Open water		Riparian	0/0	0/0	0/0
Ruderal		Riparian	0/0	0/0	0/0
Sandy wash		Riparian	11.78/0.15	0/0	0/0
Unvegetated lake bottom		Riparian	47.42/0	0/0	0/0
Total			65.33/0.33	0/0	11.3/11.3

1 – Communities in bold type are considered sensitive by the CDFW.
2 – Impacts to vegetation in the Reservoir would only occur when the Reservoir is dry. When full, the Reservoir comprises approximately 95 acres of open water.

Prior to construction of the grade control structure or sediment removal activities the Reservoir would be drained to the dead pool elevation (i.e., the lowest water surface elevation that can be achieved). At this time, much of the Reservoir would be limited to recently colonizing vegetation. Construction of the grade control structure would require temporary removal of sediment from the stream channel in order to reach a sufficient depth to ensure the stability of the structure and to provide a safe work area for construction crews. In addition, a small berm and dewatering wells would be placed upstream of the work area to divert stream flows around the work area should they occur. Sediment from the grade control structure would be stockpiled in a downstream area. Once completed, only a narrow portion of the grade control structure would remain at grade. Sediment removal activities would occur throughout the Reservoir in areas previously subject to inundation.

Implementation of the Project would remove vegetation, alter soil conditions, result in the loss of native seed banks, and result in temporary changes in the topography of the drainage. Sediment removal, processing of materials, and associated vehicle travel on Cheseboro Road and other paved streets could result in increased fugitive dust to native vegetation in adjacent areas. Wind-blown dust can degrade soils and vegetation over a wide area (Okin et al., 2001). Dust can have deleterious physiological effects on plants and may affect their productivity and nutritional qualities (Sharifi et al., 1997). Fugitive dust can kill plants by burial and abrasion, interrupt natural processes of nutrient accumulation, and allow the loss of soil resources. The destruction of plants and soil crusts by windblown dust exacerbates the erodibility of soil and accelerates the loss of nutrients (Okin et al., 2001). Additional information on potential direct and indirect impacts to native vegetation is described above under Impacts to Biological Resources from Construction, Sediment Removal, and Road Repair Activities (See also Table C.3-8).

The vast majority of sediment removal activities would occur in unvegetated sandy wash. Most of the vegetation at the Reservoir is limited to scattered elements along the margin of the Reservoir and within a few well defined communities. These areas abut recreation facilities and are routinely subject to disturbance from anglers, recreationists, and OHV use. Riparian habitat would be removed; however, the functional value of the community in the Reservoir has been adversely affected or lost through mortality or previous disturbance and/or removal. While many of the large trees previously mapped as Fremont Cottonwood have been lost through inundation or disturbance, riparian vegetation is found along the stream corridor in the upper end of the Reservoir.

Mortality of submerged riparian vegetation is related to a number of factors including the duration of inundation, water clarity, time of year, and most importantly, the age class of the tree. Plants flooded during early stages of development may not have the energy reserves required to persist for extended periods of time (Gladwin and Roelle, 1998). This factor greatly influences the distribution of riparian trees in the reservoir. Many of the trees in the Reservoir remained submerged for extended periods between 2006 and 2009 as a result of winter storms, the accumulation of sediment, and water delivery requirements. During this period, large areas of riparian forest became decadent and died. Recruitment of new tress was also limited. Sprenger et al. (2001) noted that total submergence of cottonwood seedlings resulted in complete mortality of first-year saplings. While many of the trees are lost, the area still supports important components that are utilized by some wildlife. Similarly, during periods when the Reservoir is drained, a mosaic of native and non-native vegetation can become temporarily established in newly exposed soils; however, these are lost through seasonal inundation.

Ongoing operations and maintenance impacts, including annual sediment removal and repairs to PWD access road below the dam, would be limited to previously disturbed areas of the Reservoir and existing access roads. Impacts to vegetation would be primarily limited to herbaceous plants and saplings; however it is expected that due to the timing of these activities (i.e., immediately after Reservoir draw down) vegetation would have limited time for recruitment in the disturbance area.

Implementation of the Project is not expected to result in the degradation or loss of riparian habitat in downstream areas. The impacts of controlled flows on seedling establishment and survival have been documented in many riparian systems. In some circumstances, the regulation of flow regimes can result in a loss of riparian vegetation along rivers and streams. Implementation of the Project would increase the current storage capacity of Littlerock Reservoir by 463 acre-feet, resulting in diversions by PWD to Palmdale Lake for municipal use within the limits of their annual allotment. Without the Project, PWD would be required to increase water extraction from groundwater wells and further depend on water from the State Water Project.

As described in Section C.7.1.2, about one year in six (16 percent of all years) does not produce enough runoff to fill the reservoir. Based on USGS records, approximately 43 percent of the years (21 out of 49) do not produce sufficient inflow to Littlerock Reservoir to satisfy PWDs allotment. For these years, there would be no difference between without Project and with Project conditions below the dam. The remaining 57 percent of the years with sufficient runoff to satisfy the allotment could be held in the reservoir for diversion to Palmdale Lake. During these periods, water would still overtop the dam and be available for downstream beneficial uses.

On average, for the entire 49 years of record, the overflow volume available below the dam could be reduced by approximately 265 acre-feet annually as a result of the Project. The average annual recharge to the Antelope Valley Groundwater Basin below the dam is estimated at approximately 48,000 acre-feet per year (DWR, 2004). A reduction of 265 acre-feet amounts to 0.55 percent of the total overall recharge to this basin; that is, water that is available to riparian communities below the dam. The reduction of this level of water is not considered an adverse impact. Additionally, leakage through the Dam was maintained during the Dam restoration activities that occurred in 1994.

Although much of the riparian vegetation in the Reservoir and the juniper woodland present at the 47th Street disposal site has been degraded, the removal of these communities would be considered an adverse impact. To reduce impacts to these communities, PWD would implement a series of Standard Project Commitments (SPCs) that include restoration, habitat acquisition, and worker training. Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan) would reduce impacts from the Project.

PWD would replace lost vegetation along the margin of the Reservoir and establish riparian communities in backwater areas at a ratio of 3:1. Impacts to juniper woodland would be replaced through habitat acquisition at a ratio of 1.5:1. As described Section C.2 (Air Quality), all existing activities are subject to dust control requirements and prohibitions on visible emissions (APCD Rule 401) and are prohibited from causing dust at a level that constitutes a nuisance (APCD Rule 403). Compliance with these regulations, which typically requires the application of dust control measures, would ensure that the generation of fugitive dust is minimized.

SPCs Applicable to Impact BIO-1

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

CEQA Significance Conclusion

In arid regions such as Southern California, riparian habitats play a particularly crucial role in maintaining biodiversity because up to 80 percent of vertebrate species rely on them for at least part of their lifecycle (Knopf et al., 1988) and because of the central role riparian habitats play in a variety of ecological functions (Rottenborn, 1999; Fischer and Fischenich, 2000). In the Antelope Valley, large areas of riparian habitat and juniper woodlands have been lost to development. However, implementation of Standard Project Commitment (SPC) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan) would ensure impacts to native vegetation remain less than significant (Class III).

Impact BIO-2: The Project would result in the establishment and spread of noxious weeds.

Construction of the grade control structure, sediment removal activities, and road repairs below Littlerock Dam would result in soil disturbance that could introduce new noxious weeds to the Project area, haul roads, or sediment disposal sites. New introductions occur when seeds are inadvertently introduced, most often with mulch, hay bales, or wattles used for erosion control, or when they are transported on construction equipment or tires from off-site areas. Many invasive non-native species are adapted to and promoted by soil disturbance (Lathrop & Archbold, 1980). Once introduced, they can out-compete native species because of minimal water requirements, high germination potential, and high seed production; and can outcompete native annuals where nitrogen deposition (major roadways such as Highway 138) and precipitation rates are higher, leading to higher risk of wildfire (Allen et al., 2010). Weeds can become locally dominant, representing a serious threat to native desert ecosystems (Abella et al., 2008).

The spread of invasive plants is a major threat to biological resources because nonnative plants can displace native plants, increase the threat of wildfire, and supplant wildlife foods that are important to desert tortoise and other herbivorous species. Noxious and invasive weeds pose a threat to the natural processes of plant community succession, fire frequency, biological diversity and species composition. The introduction of noxious and invasive weed species is a special concern for native plant communities and is recognized by the Forest Service as a threat to native vegetation communities and wildlife.

Direct impacts occur when noxious weeds become established in an area by increasing vegetative cover, creating a dense layer that prevents native vegetation from germinating, or altering the edaphic and hydrological conditions. Noxious weeds can create such an unfavorable environment for wildlife that associate, mutualistic species necessary for native plant life cycles, such as seed dispersers, fossorial mammals, or pollinators, are lost from the area.

Indirect impacts attributed to the colonization of noxious weeds could include a gradual decrease in natural biodiversity as noxious weed infestations may extirpate native plant populations. To reduce the potential for the spread of invasive plants, the applicant has proposed measures such as cleaning vehicles and equipment prior to working off-road and restoring temporarily disturbed habitat at the conclusion of construction. Additional information on direct and indirect impacts from weeds is described above under Impacts to Biological Resources from Construction, Sediment Removal, and Road Repair Activities (See also Table C.3-8).

The term “noxious weeds” includes all plants formally designated by the U.S. Secretary of Agriculture or other responsible State official, and these species usually possess one or more of the following characteristics: “aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof” (USFS Manual 2080). The Project site does not currently support a large amount of exotic vegetation, as frequent disturbance by inundation limits the establishment of most plants in the reservoir. However, noxious and invasive weeds are widespread in the region and several species occur along Cheseboro Road, along the access road to the Dam, and the proposed disposal sites. Although the region currently supports wide populations of noxious weeds, the introduction of new species not currently present in the Project area or the spread of noxious plant species would be considered an adverse impact.

To reduce impacts from the spread or establishment of weeds, PWD would implement SPC-BIO-2 (Prepare and Implement a Weed Control Plan) which includes guidelines for the use of weed control treatments (i.e., herbicide, manual, and mechanical methods) during construction of the grade control

structure, sediment removal, and road repair activities. The implementation of SPC-BIO-1a (Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC-BIO-1b (Worker Environmental Awareness Program) would further reduce the spread of invasive plants through restoration and detection. Each of the proposed SPCs described above combine to provide a suite of Best Management Practices (BMPs) intended to reduce the spread of noxious or invasive weeds on the Project site. These include common measures such as stabilizing soils, limiting erosion, reducing ground disturbance, targeting local weed infestations, cleaning vehicles and equipment, and comprehensive actions such as restoration, weed management, and the acquisition of mitigation lands.

The Weed Control Plan, including the control methods to be used, would be prepared consistent with the FS's *Plan for Invasive Plants, Angeles National Forest and San Gabriel Mountains National Monument Environmental Assessment (EA)* (September 2015). Control of weeds would be important to ensure successful establishment of native vegetation along the Reservoir and to prevent new infestations along the access roads. However, manual treatments and herbicide use can result in indirect impacts to vegetation and wildlife in the Reservoir and in off-site riparian and aquatic habitat unless appropriate precautions are implemented, as outlined in the *Plan for Invasive Plants EA*. Any herbicide use would conform to the FS's *Plan for Invasive Plants EA*, including formulations to be used and the methods of application. Adhering to this existing FS guidance on weed control would ensure that any mechanical or chemical weed control implemented as part of the proposed Project would not result in secondary impacts to vegetation or wildlife.

The management of weed infestations is best accomplished by species-specific methodologies, which may include herbicide application, mechanical removal, and bio-control methods such as sheep grazing. Due to typically large seed banks and the ability of some weed species to re-sprout following removal methods, most species require more than one round of treatment, or require a different follow-up treatment method after the initial removal occurs. However, effective weed management is expected to be successful with the proposed monitoring and reporting standards. Implementation of the SPCs described above, in accordance with the existing FS weed management guidelines, would provide a reasonable and feasible suite of mechanisms that would be effective in reducing impacts from the spread of invasive of noxious weeds from the proposed project. Table C.3-10 contains a list of herbicides, including their potential risks to native vegetation and wildlife, which are proposed for use within the Project area on National Forest System lands. It is important to note that there is an extensive variability related to different types of exposure scenarios and dosages for each herbicide. Furthermore, the effects of certain herbicides can vary exclusively at the species level. Therefore, the information presented in Table 3.3-10 is intended as a general overview of the possible effects of herbicide use. Of the four herbicides listed in Table C.3-10, glyphosate would most likely be used within the Project area. However, the application of any herbicide would be conducted by a licensed herbicide applicator. Full analyses on the effects of these four listed herbicides on human and ecological health can be found in the Forest Service Risk Assessment Final Reports (http://www.fs.fed.us/foresthealth/pesticide/risk.shtml) and the *Plan for Invasive Plants, Angeles National Forest and San Gabriel Mountains National Monument Environmental Assessment* (September 2015) and is incorporated by reference.

Table C.3-10. General Effects of Herbicides on Plant and Wildlife Species

Herbicide	Effects on Vegetation	Effects on Wildlife
Chlorsulfuron	Rate and extent of uptake following foliar application varies by species Inhibits an enzyme that is essential for plant growth	Causes weight loss and decreased body weight gain in experimental mammals Appears to have low toxicity in mammals, birds, fish, and invertebrates
Glyphosate	Inhibits shikimic acid pathway, effectively blocking synthesis of certain phenolic compounds and aromatic amino acids Inhibits photosynthesis, respiration, and nucleic acid synthesis	May reduce food conversion efficiency leading to loss of body weight in mammals and birds Certain surfactants used with glyphosate are much more toxic to fish that others May cause histological changes in gills, kidneys, and liver of some fish
Imazapyr	Inhibits an enzyme that is essential for plant growth Practically non-toxic to conifers	Appears to be relatively non-toxic to terrestrial and aquatic animals
Triclopyr	Mimics indole auxin plant growth hormones causing uncontrollable growth At sufficiently high levels of exposure, abnormal growth is so severe that vital functions cannot be maintained and plants die	May cause developmental effects at levels that cause maternal toxicity in mammals May have adverse effect on mammalian kidney functions Higher concentrations may cause mortality or immobility in frog tadpoles Larger doses may cause a decrease in body length and smaller doses may lead to lethargic behavior in some fish Relatively non-toxic to birds

Source: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

While the overall benefits of herbicide use are generally straightforward, herbicide use may have detrimental effects on ecosystem values and functions. As noted in the CNPS Policy on the use of herbicides in situations where native vegetation may be affected, the tradeoff between the benefits and costs of using herbicide – either proven or alleged – has made it difficult for the public at large, CNPS members, other organizations, and public agencies to evaluate whether or not to use herbicides (CNPS, 2008). It is generally desirable to select an herbicide that has low toxicity, would not move from its target or leach into groundwater (low water solubility), and would not remain in the environment for a long period of time (low persistence). Furthermore, the application method selected depends on the type of control needed, the type of vegetation, and the site situation (site conditions and locations). Not all herbicides or application methods are equally appropriate, effective, or safe, given different site conditions and weed species.

There are several exposure scenarios possible for herbicides and wildlife. These include direct spray; indirect contact through grooming or contact with affected vegetation; and ingestion of contaminated media, including vegetation, prey species, and water. Because of the relationship of body weight to surface area and to the consumption of food and water, small animals would generally receive a higher dose, in terms of body weight, than large animals would receive for a given type of exposure (Durkin, 2007). However with the Project SPCs and compliance with existing FS guidelines on herbicide application, the potential for impacts to aquatic fauna would be minimized. For non-target terrestrial plants, the primary hazard is unintended direct spray or spray drift. Off-site drift typically depends on the droplet size and meteorological conditions. Other off-site exposure scenarios for vegetation include percolation, runoff, sediment transport, and wind erosion. Although overspray may adversely affect some non-target species, the removal of noxious or invasive weeds and the control of existing populations would be considered a beneficial effect. To reduce the effects of herbicides on listed species including arroyo toads (located upstream of the proposed grade control structure), if used, PWD would implement SPC BIO-2 (Prepare and Implement a Weed Control Plan), which would include guidelines for

the use of weed control treatments (i.e., herbicide, manual, and mechanical methods) to reduce the risk of overspray or non-target application.

SPCs Applicable to Impact BIO-2

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

CEQA Significance Conclusion

Due to the intense effects of noxious weed establishment and the difficulty in controlling existing infestations or restoring arid habitats, Project-related activities that result in the spread of noxious weed populations would have long-lasting consequences for desert and riparian communities in the Project area. To reduce the potential spread of weeds, PWD would implement SPC B-2 (Prepare and Implement a Weed Control Plan). The implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-1b (Worker Environmental Awareness Program) would further reduce the spread of invasive plants through restoration and detection. Incorporation of these SPCs would ensure impacts from weeds remain less than significant (Class III).

Habitat-Related Impacts to Wildlife

Impact BIO-3: The Project would cause the loss of foraging habitat for wildlife or result in disturbance to wildlife in adjacent habitat.

The Reservoir and surrounding NFS lands support a broad assemblage of wildlife. Natural lands on the sediment disposal site at 47th street, while disturbed, provide foraging habitat for a number of species. Some of these species potentially affected by the Project are permanent residents such as black bear, mountain lion, desert kit fox, and American badger. Other species including bald eagles and ferruginous hawks are winter residents that forage in the region.

Direct impacts from the Project would include temporary disturbance of vegetation communities and land forms (i.e., the unvegetated Reservoir bottom) utilized as foraging habitat for common and rare wildlife, fugitive dust, and increased noise levels due to heavy equipment and vehicle traffic. Other direct impacts include mortality from trampling or crushing; increased noise levels due to heavy equipment use; light impacts from construction during low-light periods; increased vehicular and human presence along existing access roads. Noise from clearing, grading, and construction activities could affect wildlife in adjacent habitats by interfering with breeding or foraging activities and movement patterns, causing animals to temporarily avoid areas adjacent to the construction zone. Construction could affect nocturnal wildlife that roost in the Project area by displacing these species and increasing their risk of injury or mortality. More mobile species such as birds and larger mammals would likely disperse into adjacent habitat areas during sediment removal activities. However, smaller animals along the margins of the reservoir or at sediment disposal sites would be less able to disperse.

Sediment removal activities would require extensive road use along Cheseboro Road and other designated haul routes. Roads and vehicle use can affect animal behavior by altering home range use, affect movement patterns, reduce reproductive success, alter escape response, and increase physiological stress (Trombulak and Frissell, 2000). Edge effects from roads can last well past the time of construction. Vehicles using Cheseboro Road would result in an increase in accidental wildlife mortality from road kill. Diurnal reptiles such as western fence lizard and small mammals including California

ground squirrels are most likely to be present on access roads and would be more vulnerable to vehicle accidents. Animals killed along access roads as a result of the Project could attract opportunistic predators such as ravens which could act as a subsidy to this species.

Indirect impacts to foraging habitat could include alterations to existing topographical and hydrological conditions, increased erosion and sediment transport, and the establishment of noxious weeds. Operational impacts from annual sediment removal include increased human presence, the spread of noxious weeds, and vehicle traffic.

Construction activities associated with the Project would result in disturbance to a variety of wildlife. With the exception of some good quality riparian vegetation the majority of the Reservoir consists of sparsely to unvegetated wash. Construction activities would limit the ability for some species to forage at the Reservoir for several months at a time. However, access to surface water is generally present above and below the dam and work would not be conducted at night when many species are foraging. Similarly, construction activities would stop at the commencement of the rainy season. Nonetheless, the loss of juniper woodland, although subject to disturbance from ongoing anthropogenic disturbance, and the reduction in access to the Reservoir to wildlife over the life of the Project would be considered adverse and remove nesting and foraging habitat for wildlife. Similarly, even disturbed areas may provide access to edge habitats or early successional plant communities which are preferred foraging areas for some wildlife species.

To reduce impacts to wildlife from the loss of important foraging habitat or project disturbance, the PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan). These measures include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education and the control of invasive weeds. Implementation of these SPCs would provide for the protection of common wildlife by educating workers on the avoidance mechanisms in place to avoid impacts to common and sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The measures would include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species.

SPCs Applicable to Impact BIO-3

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

CEQA Significance Conclusion

Project-related impacts on common wildlife are typically not considered significant under CEQA. However, the large scale of the Project and the required annual sediment removal activities would result in long-term operational impacts to a wide variety of snakes, amphibians, small mammals, and birds. Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan) would ensure impacts to common wildlife would remain less than significant (Class III).

Impact BIO-4: The Project would result in disturbance to nesting birds or raptors.

The Project site provides foraging, cover, and/or breeding habitat for a variety of resident and migratory birds. Nesting birds have been commonly observed nesting in the few remaining trees along the margins of the Reservoir, in native vegetation adjacent to parking areas, and on open ground within the stream channel. Nesting birds have been observed in riparian vegetation below the dam and in upstream areas. Juniper trees present at the 47th Street sediment disposal site provide rare substrate in the desert and support nesting habitat for a variety of birds. Scattered Joshua trees, which were also documented at the 47th Street disposal site, are another important nest substrate in the desert. Although not detected in the Project area, Joshua trees often support nesting for large birds including raptors. During surveys of the Project site, nesting birds were detected in crevices on the steep walls of the Reservoir.

Direct impacts to nesting birds include ground-disturbing activities associated with construction of the grade control structure, sediment removal activities, and road repairs below Littlerock Dam, as well as increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. Construction and operations during the breeding season could result in the displacement of breeding birds and the abandonment of active nests, as well as a disruption in foraging activity.

Indirect impacts to nesting birds could include the loss of habitat due to the colonization of weeds, dust, or human disturbance due to repairs to the access road or routine inspection of the Reservoir. Weed management could also affect nesting.

Ground-disturbing activities associated with the Project have the potential to disturb nesting birds. The removal of habitat during the breeding season could result in the displacement of breeding birds and the abandonment of active nests. Breeding birds and other wildlife may temporarily or permanently leave their territories to avoid construction activities, which could lead to reduced reproductive success and increased mortality. Increased vehicle travel on Cheseboro Road and other access routes could displace nesting birds or result in lower nest success.

Construction of the grade control structure would be initiated in July toward the end of the breeding season which would reduce the potential for nesting birds to be present in the work areas. Sediment removal activities commence after Labor Day and continue until mid- to late November. This would greatly reduce the potential for nesting birds to be present in the work area. However, some birds remain on the nest well into July and nesting periods are affected by a number of factors including weather and access to forage. Similarly, some birds even in desert regions would be expected to have active nests or young well into the summer. Depending on the species, birds may actively nest on the ground close to equipment, on spoil piles, or idle construction equipment. In other arid ecosystems in Southern California, birds have been documented nesting on vehicles, foundations, construction trailers, and equipment left overnight or during a long weekend. With the exception of a few non-native birds such as European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*), the loss of active bird nests or young is regulated by the Federal Migratory Bird Treaty Act (MBTA) and Fish and Game Code Section 3503 and would be considered an adverse impact.

To minimize impacts to nesting birds PWD would Implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) and SPC BIO-1b (Worker Environmental Awareness Program). Implementation of these SPCs would protect nesting birds through worker education, pre-construction surveys for nesting birds, avoidance of active nest sites, construction monitoring, and the control of fugitive dust. A discussion of potential impacts to special-status birds is presented below.

SPCs Applicable to Impact BIO-4

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)

SPC BIO-1b (Worker Environmental Awareness Program)

CEQA Significance Conclusion

The loss or abandonment of nests, eggs, or their young would be a violation of State and federal law. To avoid potential impacts to nesting birds, PWD would implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) and SPC BIO-1b (Worker Environmental Awareness Program). Implementation of SPC BIO-4 would establish a 300-foot buffer around active nest sites to provide for the protection of nesting birds, while SPC BIO-1b would educate workers on mitigation requirements and the sensitivities of plant and wildlife species. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Have an adverse effect, either directly or through habitat modifications, on any species listed as fully protected, endangered, threatened, or proposed or critical habitat for these species (Criterion BIO2)

Threatened and Endangered Plant Species

Impact BIO-5: The Project could disturb endangered, threatened, or proposed plant species or their habitat.

State or federally listed plant species were not detected in the Project area. Although native plant communities are present there is no indication that rare plants occur or have the potential to occur in the Reservoir or at the proposed grade control location. Nearby habitat could potentially support sensitive plants and three Forest Service sensitive species were detected. Listed plants were not found at the proposed 47th Street East sediment disposal site. However, seasonal rainfall across Southern California has been extremely limited which could reduce the potential to detect sensitive plants at the proposed sediment disposal sites or along the margins of the Reservoir.

Focused botanical surveys of the Reservoir and access roads were conducted on 16 May 2007, 23 May 2010, 7 Jul 2011, 20 May 2012, and 30 May 2012. Surveys of the 47th Street sediment disposal site were conducted on 16 April 2014. The recent drought has limited the detectability of some annual plants in the Project area. However, plant expression was considered good to excellent in many portions of the alignment during the 2007 to 2008 rain years. Surveys conducted during this period resulted in good plant detection including ephemeral annuals that cannot be detected in some years. Subsequent surveys including a summer survey conducted in 2011 provided access to plants responding to summer monsoons. With the exception of the 47th Street East sediment disposal site all of the Project areas received multiple botanical surveys.

Listed plant populations are not expected to occur in the Project area and would not be adversely affected by the Project. However, because plant expression can vary and rainfall has been patchy in the Project area, the PWD would conduct pre-construction surveys of the 47th Street East sediment disposal site. If listed plant species are detected PWD would not place sediment or disrupt natural hydrology within 200 feet of the population. The following SPCs would also be implemented to avoid impacts to listed plant species: SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native

Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan). SPC BIO-1a and SPC BIO-1b would limit construction work to previously surveyed and historically disturbed areas (i.e., the Reservoir) while using best management practices. SPC BIO-2 (Prepare and Implement a Weed Control Plan) would prevent or reduce the potential spread of noxious weeds, control existing weed populations, and restore native habitats as required by Forest Service Manual 2080.

SPCs Applicable to Impact BIO-5

SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

CEQA Significance Conclusion

Listed plant species were not identified during focused surveys of the Project. Implementation of SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan) would ensure impacts to listed plants remain less than significant (Class III).

Threatened and Endangered Wildlife

Habitat in the Project area has the potential to support a variety of State and federally listed wildlife species. Two federally listed species are occur in the Project area: arroyo toad and least Bell' vireo. Arroyo toad is present in Little Rock Creek above Rocky Point and least Bell's vireos were documented below the dam downstream of the existing PWD access road. Mountain yellow-legged frogs occur in the upper watershed but are not expected at the Reservoir. Three other State or federally listed species or species proposed for listing have the potential to occur at the Reservoir or sediment disposal sites. These include:

- California condor
- Southwestern willow flycatcher
- Swainson's hawk

Threatened or Endangered Invertebrates

There are no known threatened or endangered invertebrates in Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal areas.

Threatened and Endangered Amphibians

The presence of and potential for amphibians to occur in the Project area is linked to the physical characteristics of the landscape, existing anthropogenic activities (i.e., human trampling, OHV, and road traffic) and the presence of non-native predatory fish in the Reservoir. The operation of the Reservoir,

which includes wide fluctuations in water surface elevations, also affects the distribution of amphibians in the Project area. Amphibians often require a source of standing or flowing water to complete their life cycle. However, some more terrestrial species including arroyo toads known from the Project area are linked to aquatic resources for a very limited time during the breeding season and spend significant times away from the creek channel. Other species can survive in drier areas by remaining in moist environments found beneath leaf litter and fallen logs, or by burrowing into the soil. These xeric-adapted species conserve moisture by emerging only under conditions of high humidity or when the weather is cool and/or wet. Depending on the location portions of the Project area provide suitable habitat for amphibians.

In southern California, mountain yellow-legged frogs inhabit rocky and shaded streams from 1,200 to 7,500 feet elevation. Typical habitat consists of perennial creeks fed by snowmelt and springs. Non-aquatic habitats commonly include willow, alder, and big-cone spruce at lower elevations and various pines, white fir, and incense cedar at higher elevations. (USFWS, 2012). Mountain yellow-legged frogs have not been detected during focused surveys of the Project area, have not been recorded in the vicinity, and are not expected to occur at the Reservoir.

Contaminated Fish Removal. The Littlerock Reservoir does not support any species of native fish. As discussed in Section B.2.3.2, all non-native fish will be removed from the Reservoir during sediment removal activities in order to improve habitat conditions for arroyo toad and other native species. The fish tissue that was sampled from the Reservoir show a large number of contaminants at high levels, relative to the sediment samples (see Section C.3.1.5). Based on the surveys conducted by the SWRCB and the Lahontan Regional Water Quality Control Board, animals ingesting fish from the Reservoir would be exposed to elevated levels of mercury and PCBs (LRWQCB, 2014). Removal of invasive fish during the Project's first year of sediment excavation would create a beneficial effect on wildlife that would otherwise be at risk from ingesting fish with elevated levels of contaminants.

Impact BIO-6: The Project would result in loss or disturbance to arroyo toads.

The arroyo toad (*Anaxyrus californicus*) is federally listed as endangered and a CDFW Species of Special Concern. The current distribution of arroyo toad in the Project area is well studied and appears limited to Little Rock Creek above Rocky Point and Santiago Creek, a tributary drainage (See Figure C.3-16). Ramirez (Cadre, 2002) conducted a radio telemetry study of this species above Rocky Point in 2002. Similarly, the Forest Service conducts routine surveys of this population. In addition, Aspen has conducted numerous diurnal and nocturnal inspections of the Project area for over seven years in coordination with Forest Service and CDFW biologists. This species was not found during surveys of the small side canyons that flow into the Reservoir below Rocky Point or in Little Rock Creek below the dam.

Factors influencing survival between breeding seasons may include desiccation, starvation, predation by native and introduced species, and activities that disturb non-breeding habitats (Sweet, 1992). Drought, especially when combined with water diversions from streams, can lead to a scarcity or early drying of breeding pools and restrict foraging during the period essential for rapid growth. Drought and water diversions also cause the loss of damp subsurface soil, which may result in high adult mortality (Sweet, 1992). The extended 5-year drought in Southern California during the late 1980s has been closely tied to extremely low reproductive success and subsequent population declines of arroyo toads during this period (Sweet, 1992). During the 2006-2007 rain year, one of the driest years on record in Southern California, reproduction of this species was also reduced. Protocol surveys conducted by Aspen at Little Rock Creek and Castaic Creek on the ANF detected little evidence of large-scale breeding and few

metamorph toads were identified later in the season. Conversely Aspen noted numerous metamorph toads during surveys at Littlerock in 2010.

Direct impacts to arroyo toad could occur as a result of crushing from pedestrian traffic, mechanized equipment, temporary disruption of foraging or thermoregulation sites in adjacent upland areas, fugitive dust, or the disruption of egg masses from impacts to water quality. Arroyo toads spend the majority of their life cycles well away from aquatic habitat, that is, post breeding this species occupies streamside terraces and adjacent uplands and impacts to adjacent vegetation can have deleterious effects on this species (Cadre, 2002). Breeding behavior could also be disrupted due to construction noise.

Disturbance would be associated with the temporary removal of vegetation for the grade control structure and sediment removal activities. The Project would result in a permanent loss of 0.33 acre of suitable habitat. Construction activity may result in the incidental take of individual toads, egg masses, and larvae depending on the construction season. Because this species is largely nocturnal, impacts from pedestrian traffic and vehicle use at dawn, dusk, and during the evening would be of concern because this species is known to traverse roads between riparian and upland habitats, especially during rain events. Large numbers of toads, both adults and juveniles, can be active at night during the spring and early summer under otherwise dry conditions. During these activities, toads may move onto and across roads, where they are subject to road kill by passing vehicles.

Direct effects to juvenile toads may also occur. In many cases, recruitment of metamorphic arroyo toads may occur in only a small section of the stream, even if breeding activity has been more widely distributed. Observations on the Los Padres National Forest (Sweet, 1992) and on other sites in Orange and San Diego Counties indicate that even brief human activities are likely to result in substantial mortality of metamorphic toads. This is usually not a deliberate act; the cryptic nature, very small size (less than 20 mm or 0.8 in) and immobility (when on the surface) of metamorphic toads foster accidental trampling.

Indirect effects to this species may be caused by the diversion or modification of water flows at the grade control structure, increased downstream sediment transport, or the establishment of noxious weeds. Human activities can indirectly affect arroyo toads by increased noise or by attracting predators such as the common raven, kit fox, and coyote from trash and litter (Boarman, 2004). Other indirect effects could result from fuel, lubricant, or concrete spills (used in the soil cement for the grade control structure) near water, which could be mobilized into the water by a subsequent storm event and cause lethal or sublethal poisoning effects.

Operational impacts to arroyo toad are similar to sediment removal activities and include crushing by vehicles, trampling, increased sedimentation, dust, and the spread of exotic weeds. The timing and delivery of water releases from the Reservoir can also adversely affect egg masses, larvae, and metamorph toads if they become stranded by receding water surface elevations. USGS (2003) found that toads were at the greatest risk of loss from water deliveries during the months of April, May and June at the Sweetwater Reservoir. While seasonal variations in breeding occur, toads at Little Rock Creek would be at risk during this same period.

Arroyo toad has the potential to move into the Reservoir as the water level recedes; however, this species has not been detected below Rocky Point as of 2014. Animals that move into this area are susceptible to predation by non-native fish, mechanical crushing from OHVs, or trampling. Predatory non-native species have been identified as a significant threat to this species (Stephenson and Calcarone, 1999), and game fish in the reservoir would prey on any toads or larvae present. Animals that

aestivate in the seasonally dry portions of the Reservoir would likely drown as water levels return to winter levels and aestivation sites become submerged.

Implementation of the Project has the potential to adversely affect arroyo toads and may result in loss or mortality. In order to avoid or minimize impacts to arroyo toad, PWD would implement a series of actions that include general construction best management practices described in SPC BIO-1b (Worker Environmental Awareness Program), and specific measures focused on the arroyo toad. SPC-BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries) describe the proposed methods that would be implemented during construction of the grade control structure sediment removal activities, and during scheduled water releases.

Under SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), PWD would limit sediment removal activity to seasonally inundated portions of the Reservoir after the water has been lowered in the late summer months. Arroyo toads are not expected to occur in this area or be limited to the upstream margin of the Reservoir. The greatest potential risk to arroyo toads would be the construction of the grade control structure. This area supports suitable habitat as the water levels recedes and is adjacent to occupied habitat. Animals in upstream areas could forage in this area or burrow into soft, moist sands during the day. In accordance with SPC BIO-6a, PWD would conduct pre-construction surveys of the Project area and install toad fencing along the upstream margin of the Reservoir to reduce the potential for toads to enter the proposed work area. PWD would install fencing around the entire work area and would include mesh screens on diversion structures to prevent animals from entering the Reservoir from a culvert.

Per SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), PWD would conduct clearance surveys of the fenced work area prior to excavation, monitor construction, and implement other best management practices such as good housekeeping, inspecting equipment for leaks, and following the fieldwork code of practice developed by the Declining Amphibian Population Taskforce. Clearance surveys would be conducted at night and during daylight periods to increase the potential to locate any toads that may occur within the exclusion area.

Per SPC BIO-6c (Seasonal Surveys During Water Deliveries), PWD would conduct annual monitoring and reporting at the Reservoir to reduce the potential stranding of arroyo toads egg strings, larvae, or metamorphs during water deliveries. At the maximum water surface elevation, the edge of the Reservoir merges with sandy terraces above Rocky Point. This interface provides approximately 3,015 feet of shoreline that would be directly affected by water deliveries from the Reservoir. Although the water is deep enough in many areas to support non-native fish, it is possible that arroyo toads may produce egg strings in the shallow margins of the Reservoir. In a study conducted by USGS (2003) at the Sweetwater Reservoir, it was postulated that eggs, larvae and metamorphs would have varying ranges of mortality risk due to their placement (i.e., egg strings in shallow water) or their mobility. Eggs were assumed to be at greatest risk with 80 to 100 percent estimated to be lost as a result of a dam release from being stranded on the shore or in quickly drying pools (ibid). Due to their mobility, larvae are assumed to have a greater chance of surviving a release event with 50 to 100 percent estimated to be lost as a result of a dam release and can possibly swim to safety or track the falling water levels to avoid getting displaced or stranded. Due to their mobility and ability to leave the streambed, metamorphs were assumed to have the greatest chance of surviving a release event with 0 to 50 percent estimated to be lost as a result of a dam release (Ibid).

To reduce potential impacts to this species PWD would implement SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries). In addition, SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts from the spread of weeds, contaminated water, and fugitive dust.

SPCs Applicable to Impact BIO-6

SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures)

SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring)

SPC BIO-6c (Seasonal Surveys During Water Deliveries)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

SPC WQ-1 (Prepare Spill Response Plan)

CEQA Significance Conclusion

To reduce potential impacts to arroyo toad eggs, larvae, metamorphs, and adult toads, PWD would implement SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC Bio 6b (Conduct Surveys and Implement Avoidance Measures), and SPC BIO-6c (Seasonal Surveys During Water Deliveries). In addition SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Threatened and Endangered Reptiles

There are no known threatened or endangered reptiles in Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal areas. Protocol surveys for desert tortoise were conducted on the sediment disposal site and evidence of this species was not observed. Although the sediment disposal site supports habitat for this species the site is subject to routine disturbance, is functionally isolated from known occupied habitat, and is nearly surrounded by urban development. No records for desert tortoise exist within the Project area and no sign of their presence was detected during protocol surveys.

Threatened or Endangered Fish

There are no known threatened or endangered fish in the Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal areas. Threatened or endangered fish are not expected to be affected by the Project.

Threatened, Endangered, or Fully Protected Birds

Several State and federally listed bird species have the potential to occur at Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal area. Least Bell's vireo has been documented below the dam and fledged chicks in 2011. California condor, while not observed, is a far ranging species, which could water at the Reservoir. Swainson's hawks were not detected, but could forage near the sediment disposal site. Bald eagle is a periodic winter visitor to the Reservoir and it is possible that golden eagles forage in the area. Similarly, many species of migratory birds may be short-term seasonal visitors to the Project area.

Impact BIO-7: The Project could result in the loss of California condors.

The California condor is considered present on the ANF and may soar over portions of the Project site. Although condors have not been observed at the Reservoir, they occur broadly over the region during foraging trips. They have been documented roosting or loitering at Whittaker Peak, Bear Divide, and Mt. Lukens on the ANF.

California condors are a wide ranging species with potential to occur at any time within the Project area. USFWS management of condors includes use of feeding stations strategically located to direct condor activity away from areas where human activity is high. The supplemental feeding program has been successful in directing condors to areas within USFWS managed refuge lands. However, over the life of this Project, it is possible that individual condors could fly over or stop in the Project area.

Within the Project area, the greatest risk for condors is associated with the potential for ingestion of objects such as microtrash (i.e. broken glass, hardware, plastic waste, bottle caps, small pieces of metal) or substances such as ethylene glycol antifreeze. These are existing conditions present within the Littlerock site and not associated with the project activities. Adults can bring microtrash back to nest sites where young birds can be injured or killed when they ingest the material. California condors are known to forage on a variety of carrion including small mammals such as jack rabbits (Collins, 2000) and may be attracted to small animals killed during construction activities on the proposed haul routes. Other hazards include power line collisions or vehicle strikes. The proposed action includes SPCs to avoid injury or mortality to California condors.

While California condors are not currently present in the Project area, they could become periodic visitors as their population increases. Proper implementation of Project SPCs will ensure avoidance of potential impacts to condors. PWD would implement SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash), which includes periodic monitoring, cessation of Project activities within 500 feet of a California condor, and the removal of microtrash, waste, and road kill from the Project site. In addition, the implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds, limit fugitive dust, and further reduce potential for Project impacts to any condors that might visit the Project area.

SPCs Applicable to Impact BIO-7

SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

California condors are not present in the Project area but could become periodic visitors as their populations increase. To avoid potential for impacts to California condor, PWD would implement SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash) which includes periodic monitoring, the cessation of Project activities within 500 feet of a California condor, and the removal of Project-generated debris, trash, waste, and road kill from the Project site. In addition, SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds, limit fugitive dust, and avoid the potential for Project-related impacts to this species if present. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-8: The Project could disturb nesting willow flycatchers, southwestern willow flycatchers, least Bell's vireos, or their habitat.

Willow flycatchers, including the federally listed southwestern willow flycatcher, have not been documented breeding within the Project area. Five willow flycatchers of undetermined subspecies were observed in riparian habitat below the dam and in Littlerock Creek on May 18, 2012. No breeding activity was detected, and no willow flycatchers were observed during follow-up surveys in July 2012. It is unknown whether these individuals were the federally listed southwestern willow flycatcher or a different subspecies (all subspecies are state listed). It was determined that the individuals were migrants, and no breeding is expected at these locations because the habitat quality is not typical of the habitat used by breeding southwestern willow flycatchers, and the Project area is well south of the breeding range for the other willow flycatcher subspecies.

Potential threats that have been identified on NFS lands are directed towards nesting habitat and include wildfires and resultant flooding, water diversion or extraction, unauthorized vehicle use, high levels of dispersed recreation, road and trail construction and use, invasive non-native vegetation, cowbird parasitism, and predation. However, suitable breeding habitat for willow flycatchers is not present at the Reservoir.

Least Bell's vireo nest below the dam but have not been observed at the Reservoir. Suitable habitat for this species may become established above Rocky Point given limited scouring and seasonal access to water. Critical Habitat for this species is not present in the Project area. Project activities have potential to impact least Bell's vireos through ground-disturbing activities associated with construction of the grade control structure, sediment removal, road repair activities, increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. However, SPCs have been incorporated into the Project to minimize or avoid impacts to nesting least Bell's vireos, as described below.

Least Bell's vireos are not expected to nest at the Reservoir and would not be affected by the construction of the grade control structure, sediment removal, or road repair activities. The most likely disturbance to this species would be from haul trucks driving on Cheseboro Road and repairs to the access road below the dam. The nests are located in Little Rock Creek east and adjacent to Cheseboro Road. The creek in this area is located in a deep channel (approximately 40 to 80 feet) below the

elevation of the road. Sound measurements taken below the dam — see Section C.8 (Noise) — identify that the area has low ambient noise when water is not flowing. During periods of heavy flow (i.e., winter and early spring), the noise from the creek can easily exceed 60 dB(A) at the nest sites. Road noise or dust may adversely affect nesting birds. Many riparian birds including least Bell's vireo and other neo-tropical migrants are adversely affected by noise and human disturbance. Reijnen et al., 1995 demonstrated that for two species of European warbler (*Phylloscopus* spp.), sound levels between 26 dB(A) and 40 dB(A) reduced breeding density by up to 60 percent compared to areas without disturbance. In addition, while current sound thresholds for most birds in California are considered to be approximately 60 dB(A), this level may still adversely affect breeding success for least Bell's vireo. W. Haas (personal communication, 2007) reported that in 1999, sound levels were recorded at 87 locations containing similar habitat conditions in the vicinity of the San Luis Rey River, the most robust and stable population of flycatchers in California. Data indicated that noise levels were the most important factor for occupancy. These data suggest disturbance from adjacent road noise and urban development may be a contributing factor in the use of habitat adjacent to developed areas. Conversely Aspen has noted least Bell's vireo successfully fledging chicks in a number of locations with high levels of ambient noise. This includes urban areas of Murrieta Creek, at the Santa Clara River Highway 101 overpass in Ventura, and at Prado Dam in Riverside County.

Construction of the grade control structure would be initiated in July toward the end of the breeding season, which would reduce the potential for least Bell's vireo and other breeding neo-tropical migrants to be present in the work areas. Sediment removal activities commence after Labor Day and continue until mid- to late November. However, many birds remain on the nest well into July and nesting periods are affected by a number of factors including weather and access to forage.

Project activities will have no direct effects on nesting least Bell's vireos below the dam, but foraging birds may avoid areas closest to the road during haul periods. Fugitive dust is not expected since the access road has an asphalt surface. Use, maintenance, and repair of the access road will occur on an as-needed basis. Therefore, these activities could occur during the reproductive season. Habitat in immediate proximity of the road is not suitable for nesting least Bell's vireos, but could be used by foraging birds. Access road use, maintenance, and repair could lead to some short-term displacement of foraging birds. No permanent displacement or impacts to reproductive success are expected.

Any Project activities that result in the loss or degradation to habitat for least Bell's vireo and other neo-tropical migrants would be considered adverse. To reduce impacts to least Bell's vireo and other neo-tropical migrants, PWD would implement SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) which includes protocol surveys of suitable habitat, avoidance of any active nests, and monitoring of nest buffers. In addition, general SPC's including SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would further reduce impacts to this species, if present.

SPCs Applicable to Impact BIO-8

SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

To reduce or avoid impacts to least Bell's vireo and other neo-tropical migrants, PWD would implement SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), which includes protocol surveys of suitable habitat, avoidance of any active nests, and monitoring of nest buffers. In addition, general SPCs including SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would further reduce impacts to this species if present. Implementation of these measures would ensure impacts remain less than significant (Class III).

Impact BIO-9: The Project would disturb Swainson's hawks.

Swainson's hawks nest in areas such as riparian woodlands, roadside trees, trees along field borders, and the edges of remnant oak woodlands. In the Antelope Valley, they are found in Joshua trees and in large non-native trees that border agricultural fields. There are no known records of this species within the vicinity of the Reservoir; however, migratory and foraging birds may pass through the canyons. Aspen biologists noted one adult Swainson's hawk foraging in a field north of the Los Angeles World Airports' Palmdale Regional Airport and another bird perched in a tree at 90th Street East in September 2009, over 5 miles north of the sediment disposal site. The closest known nesting sites are over 10 miles away north of Alpine butte (CDFW, 2014).

Swainson's hawk has not been detected at the Reservoir or sediment disposal sites. This species is not expected to forage at the Reservoir, although it has a moderate potential to forage at the sediment disposal sites. Nesting is also not expected at the Reservoir and is unlikely to occur at the sediment disposal sites. Direct impacts to Swainson's hawk, if present, would include disruption of foraging activity due to increased dust, noise, and human presence associated with the placement of fill or loss of habitat at the sediment disposal site. Indirect impacts include a reduction in habitat suitability due to the establishment of noxious weeds. Operational impacts are not expected but could occur if the species nests in adjacent habitat.

Because annual sediment removal activities would occur for many years and this species is known from the Antelope Valley, it is not possible to predict what use may occur at the debris disposal site in the future. Project activities that cause Swainson's hawks to abandon their nests or otherwise fail to reproduce would be considered an adverse impact. To reduce or avoid impacts to this species PWD would implement SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks), which includes a pre-construction survey at the sediment disposal site on 47th Street East prior to land disturbance and the establishment of buffers to avoid nesting birds if detected. The loss of foraging habitat would be off-set through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). The implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds and fugitive dust.

SPCs Applicable to Impact BIO-9

SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)
SPC BIO-2 (Prepare and Implement a Weed Control Plan)
SPC AQ-2 (Fugitive Dust Controls)
SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Swainson's hawk has not been detected at the Reservoir or sediment disposal site. This species is not expected to forage at the Reservoir and has a moderate potential to forage at the sediment disposal site. Because annual sediment removal activities would occur for many years and this species is known from the Antelope Valley, it is possible that this species may be present in the future. SPCs have been incorporated into the Project to ensure activities will not have significant impacts associated with abandonment of Swainson's hawk nests or failed reproductive success. To reduce or avoid impacts to this species, PWD would implement SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks), which includes a pre-construction survey at the sediment disposal site on 47th Street East prior to land disturbance and the establishment of buffers to avoid nesting birds if detected. The loss of foraging habitat would be offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). The implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds and fugitive dust. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-10: The Project would result in disturbance to Bald or Golden Eagles.

Bald eagle is State-listed as endangered and is a Forest Service Sensitive Species that appears to be a routine winter visitor to the Reservoir. Golden eagles are fully State protected and may forage over the Project area. Bald and golden eagles are also protected under the federal Bald and Golden Eagle Protection Act (BGEPA). Golden eagles have not been observed but could forage in undisturbed habitat adjacent to the Reservoir or at the sediment disposal site at 47th Street East. Eagles could also nest on large trees near the reservoir but may be precluded from this activity due to ongoing human disturbance and use of the Reservoir. Human intrusions near golden eagle nest sites have resulted in nest abandonment; high nestling mortality when young go unattended due to altered behavior by the parent birds; premature fledging; and ejection of eggs or young from the nest (Pagel et al., 2010). Other protected raptors including peregrine falcons may also periodically forage in the Reservoir.

The Project must be in compliance with the BGEPA and will include measures designed to avoid impacts to reproductive success. Direct impacts if present would include temporary disturbance due to noise and human presence associated with sediment removal activities or the placement of fill at the sediment disposal site. Golden and bald eagles are not expected to nest at the Reservoir at this time. Indirect impacts include the loss of habitat due to the establishment of noxious weeds and from the placement of fill at the sediment disposal site at 47th Street East. Under the BGEPA, nest abandonment or decreased golden eagle reproductive success caused by substantial interference with normal breeding, feeding, or sheltering behavior, would constitute "take." Impacts that result in the disruption of breeding or foraging would be considered an adverse impact.

Sediment removal activities are not expected to substantially alter the use of the Reservoir by bald or golden eagles. Golden eagles may forage in the Project area at any time of year but have not been recorded at the Reservoir, while bald eagles appear to be only a periodic winter visitor. To reduce impacts to sensitive wildlife and maximize use of the water reserves in the Reservoir, the majority of

sediment removal activities would occur between late summer and early winter when stream flows would fill the Reservoir and preclude sediment removal activities. Bald eagles are not typically found at the Reservoir during this period. Bald eagles would retain access to the site during the winter and would be able to forage on fish and other prey. In addition, the removal of invasive fish from Littlerock Reservoir would create a beneficial effect on golden and bald eagles by preventing the exposure of bird species to elevated levels of contaminants.

The placement of fill at the 47th Street East sediment disposal location would remove up to approximately 5 acres of potential foraging habitat that could be used by golden eagles. To reduce this impact, and to avoid other impacts to bald and golden eagles from the Project, PWD would implement SPC BIO-4, SPC BIO-8, SPC BIO-9, SPC BIO-1a, and SPC BIO-2. SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) includes pre-construction surveys for nesting birds and the establishment of buffers if nesting birds are detected. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) and SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) would increase the potential to detect any nesting raptors in the Project area. The loss of foraging habitat would be offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). The implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds and fugitive dust.

SPCs Applicable to Impact BIO-10

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)
SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat)
SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks)
SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)
SPC BIO-2 (Prepare and Implement a Weed Control Plan)
SPC AQ-2 (Fugitive Dust Controls)
SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

To reduce or avoid impacts to bald and golden eagles, PWD would implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) which includes pre-construction surveys for nesting birds and the establishment of buffers to avoid nesting birds if detected. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) and SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) would increase the potential to detect any nesting raptors in the Project area. The loss of foraging habitat would be offset through SPC BIO-1a (Restoration/Compensation for Impacts to Native Vegetation Communities). The implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds and fugitive dust. Implementation of these SPCs would ensure impacts to golden and bald eagles would remain less than significant (Class III).

Threatened, Endangered, or Fully Protected Mammals

Protocol surveys for Mohave ground squirrel were conducted at the sediment disposal site and evidence of this species was not observed (see Section C.3.1.5). Based on the known distribution of this species in

the region, the habitat conditions at the Project site, and the level of ongoing human use, it was determined that the sediment disposal site does not provide suitable habitat for Mohave ground squirrel.

Impact BIO-11: The Project would result in disturbance or loss of habitat for the ringtail.

Ringtail, a fully protected species in California, has the potential to occur in chaparral and riparian habitat associated with Little Rock Creek. Although not observed during several years of surveys this species is known from the San Gabriel Mountains. Ringtails are similar to raccoons in that they are often found within 0.6 mile (1 kilometer) of a permanent water source (Zeiner et al., 1990b).

Direct impacts from the construction of the grade control structure, sediment removal, and road repair activities would include mortality of individual ringtail or disturbance of ringtail maternity dens during the pup-rearing season (May 1 to September 1). Construction in riparian areas could also disturb denning ringtails if present. Dens may be in a hollow tree, a rock pile, a crevice in a cliff, or in abandoned burrows or woodrat nests (Zeiner et al., 1990b). Ringtails change dens frequently and an individual rarely spends more than three days in the same shelter. However, females with young remain in the same den for 10 to 20 days after giving birth. After that time dens may be changed daily (Poglayen-Neuwall and Toweill, 1988). Construction noise, dust, human presence, or ground disturbance could result in the abandonment of these den sites or result in mortality of juvenile animals. Indirect impacts to ringtail could include the spread of noxious weeds that degrade habitat quality, degradation of water quality due to siltation, and alteration of soils. Operational impacts would include disturbance to ringtail dens, the spread of noxious weeds, and disturbance from annual sediment removal activities or repairs to PWD access road below the dam.

The degradation of riparian areas has been identified by the Forest Service as a potential threat to the species on NFS lands (Stephenson and Calcarone, 1999). However, the total area of riparian habitat affected by the Project is low and it is not likely to make this species highly vulnerable to adverse effects from sediment removal activities. Ringtails that den in some of the large riparian trees that remain in the Reservoir would be affected; however, sediment removal activities of the grade control structure would primarily occur outside of the denning season for this species. With the exception of the denning period, this species is highly mobile and may leave the work area undetected. However, as this species is primarily nocturnal (although this species has been observed during the day in remote canyons) there is some potential to disturb denning or resting animals. If present impacts to this species would be considered adverse.

To reduce impacts to this species PWD would implement SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid denning Areas) that includes preconstruction surveys to evaluate the potential presence of this species in or adjacent to the proposed work area. If present, work would be redirected to adjacent areas. In addition, SPC BIO-1a (Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts to this species from the loss to riparian habitat, educate workers regarding sensitive wildlife, reduce impacts from the spread of weeds, and limit fugitive dust in riparian habitats.

SPCs Applicable to Impact BIO-11

SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid denning Areas)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

This is a California fully protected species and direct loss of this species is prohibited. To reduce or avoid impacts to this species, PWD would implement SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid denning Areas) which includes preconstruction surveys to evaluate the potential presence of this species in or adjacent to the proposed work area. If present, work would be redirected to adjacent areas. In addition, SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts to this species from the loss to riparian habitat, educate workers regarding sensitive wildlife, reduce impacts from the spread of weeds, and limit fugitive dust in riparian habitats. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Have a substantial adverse effect, 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 CDFW, Forest Service, or USFWS (Criterion BIO3)

Special-status Plants

Approximately 24 special-status plant taxa have the potential to occur in the Project area. Figure C.3-10 illustrates the known locations of special-status plants occurring in or near the Study Area (CDFW, 2015). Three special-status plants, Johnston's monkeyflower (CRPC 4.3), short-joint beavertail (CRPR 1.B/FSS), and Lemmon's syntrichopappus (CRPR 4.S/FSW), were detected within the Vegetation Study Area during botanical surveys conducted from 2010 to 2014. None of these plants were detected in the Project area. Table C.3-4 lists the sensitive plant species that have the potential to occur in the Vegetation Study Area.

Impact BIO-12: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.

Direct, indirect, and operational impacts to special-status plant species would be the same as described for listed plant species (Impact BIO-5) and may occur in a variety of ways, including the direct removal of plants during the construction of the grade control structure, sediment removal or road repair activities, or the placement of fill at the disposal site. Indirect impacts may include the invasion of weedy invasive and dust from grading or from trucks along Cheseboro Road and the other designated haul routes. Rare plants may also be disturbed from annual sediment removal activities, from repairs to PWD access road below the dam, or from weed management activities that include manual treatments and the use of herbicides. If present, the loss of sensitive plants would be considered an adverse impact.

Rare plants have not been found and are not expected to be present in the Reservoir. Based on surveys the most likely area to support rare plants would be in the juniper woodland habitat on the sediment disposal site at 47th Street East. Although not observed, sensitive plant species including pygmy poppy (*Canbya candida*) and Mojave paintbrush (*Castilleja plagiotoma*) CRPR 4.3 and Forest Service Sensitive species could be present. Although rare plants were detected in only a few locations, there is a potential

for some species to occur in areas that have not been subject to intense focused surveys (i.e., the 47th Street sediment disposal area) or may have failed to germinate even though plant expression on the sediment removal site was adequate in 2014 despite the poor rain year. If any of these species are encountered during pre-construction focused surveys, all individuals or populations within Project disturbance areas would be marked and avoided to the maximum extent possible. However, it is possible that some sensitive plants would be subject to Project disturbance.

Typically, impacts to a small number of non-State- or federally listed special-status plants (i.e., impacts to a few individuals) or impacts to a population where loss of the population would not negatively affect the range of the special-status plant species are not typically considered adverse. However, if Project activities result in the loss of more than ten percent of the known individuals within the Forest Service Sensitive, and/or special-status plant species (list 1.B or list 2 only) occurrence to be impacted, PWD shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 ratio (habitat preserved: habitat impacted).

To reduce impacts to sensitive plant species, PWD would implement SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants). The implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-1b (Worker Environmental Awareness Program) would further reduce impacts to sensitive plants by limiting work to previously surveyed and historically disturbed areas (i.e., the Reservoir) and using best management practices. Indirect effects on listed plants from the spread of invasive weeds would be minimized by implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan). This measure would prevent or reduce the potential spread of noxious weeds, control existing weed populations, and restore native habitats as required by Forest Service Manual 2080. SPC AQ-2 (Fugitive Dust Controls) and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would limit fugitive dust impacts to plant species.

SPCs Applicable to Impact BIO-12

SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

PWD has incorporated SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants) into the Project to reduce impacts to sensitive plant species. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-1b (Worker Environmental Awareness Program) would further reduce impacts to sensitive plants by limiting work to previously surveyed and historically disturbed areas (i.e., the Reservoir) and using best management practices. Indirect effects on special-status plants from the spread of invasive weeds

would be minimized by implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan). This measure would prevent or reduce the potential spread of noxious weeds, control existing weed populations, and restore native habitats as required by Forest Service Manual 2080. SPC AQ-2 (Fugitive Dust Controls) and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would limit fugitive dust impacts. The implementation of these SPCs would ensure impacts to sensitive plants remain less than significant (Class III).

Special Status Invertebrates

Special-status invertebrates were not detected; however, portions of the Study Area have the potential to support shoulderband snails. Shoulderband snails are a group of pulmonate (air-breathing) snails that can occur in areas with suitable micro-habitat such as rock or debris piles, dead vegetation, or small drainages where soil moisture persists. Although there are no known records for Trask shoulderband snail (*Helminthoglypta traskii*), a California Special Animal, this species is known from the region. San Emigdio blue butterfly, a Forest Sensitive Species, is not expected to occur in the Project area but may be associated with salt bush along the margins of Little Rock Creek in downstream areas. This species is known from the Mojave River in Victorville.

Impact BIO-13: The Project could result in the loss of Shoulderband Snails or San Emigdio Blue Butterfly.

Sensitive invertebrates are not expected to occur in the Reservoir, but may be associated with adjacent riparian and upland communities that provide suitable microhabitat conditions. If present, direct impacts would include loss or mortality from construction, sediment removal, or road repair activities that crush individuals or alter microhabitat conditions to the degree the species can no longer survive (i.e., removal of leaf litter). Impacts to butterflies would most likely result from vehicle strikes. Indirect and operational impacts could include the spread or colonization of weeds, weed management, fugitive dust, and the alteration of hydrology or the disruption of flows to off-site areas at the sediment disposal sites. Impacts to these species would be considered adverse.

To reduce or avoid impacts to these species, PWD would implement SPC BIO-1a (Provide Restoration/ Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs provide for protection by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species.

SPCs Applicable to Impact: BIO-13

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Trask shoulderband snail and San Emigdio blue butterfly have not been detected in the Project area. While it is possible these species occur in adjacent habitat, impacts would be reduced or avoided through implementation of the following SPCs: SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs provide for protection by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Special-Status Reptiles and Amphibians

Coast horned lizard, a CDFW Species of Special Concern and coastal whiptail, a CDFW Special Animal, and silvery legless lizard, a CDFW Species of Special Concern and Forest Service Sensitive Species, were observed near the dam. Southwestern pond turtle and two-striped garter snake, CDFW Species of Special Concern and Forest Service Sensitive Species, were observed within aquatic habitat above and below the dam. In addition, the Project area provides habitat for a variety of special-status reptiles and amphibians.

Impact BIO-14: The Project could result in mortality or injury to southwestern pond turtles or a disruption of nesting habitat.

Southwestern pond turtles have been observed at the Reservoir near Rocky Point and below the dam. The pond turtle is normally found in and along riparian areas, although gravid females have been reported to nest more than 1,300 feet away from the nearest aquatic habitat (Holland, 1994). Pond turtles may also make overland movements up to one mile between areas of aquatic habitat (Bury, 1972 in Ernst et al., 1994). The preferred habitat for these turtles includes ponds or slow-moving water with numerous basking sites (logs, rocks, etc.), food sources (plants, aquatic invertebrates, and carrion), and few predators (raccoons, introduced fishes, and bullfrogs). Juvenile and adult turtles are commonly seen basking in the sun at appropriate sites, although they are extremely wary animals and often dive into the water at any perception of danger.

Direct effects to southwestern pond turtle may occur as a result of mechanical crushing; loss of nesting, breeding or basking sites; and human trampling. Disturbance would be associated with the removal of vegetation and construction of the grade control structure. Disruption of basking activity and potential impacts to southwestern pond turtles may result from construction activities, if pond turtles are present near the proposed construction site. To date, pond turtles have rarely been seen and when observed were noted at the upper margin of the Reservoir. It is possible they breed in the Reservoir; however, young turtles would fall prey to bass and other fish.

Direct impacts to southwestern pond turtles could also result from temporary impacts to water quality, fugitive dust, temporary loss of upland nesting sites and foraging habitat, disruption of breeding activity, or disturbance of basking sites. Juvenile southwestern pond turtles typically move from nesting sites in adjacent upland or riparian areas to the stream in the spring (Buskirk, 1992). Hatchlings are very small, often less than one inch, and may be inadvertently trampled during Project construction. In addition,

access to zooplankton, an important hatchling food source, may be disrupted if water quality were to be severely degraded by the Project.

Indirect impacts to southwestern pond turtle would include alteration of habitat that precludes pond turtle use, degradation of water quality over time due to siltation and sedimentation, and the spread of noxious weeds. Operational impacts include risk of mortality by vehicles and disturbance during annual sediment removal activities or repairs to PWD access road below the dam.

The greatest potential for injury or mortality to southwestern pond turtles as a result of Project activities is the damage or destruction of nesting areas. Since southwestern pond turtles often nest communally, damage or destruction of a nesting area could result in injury or mortality to a large number of incubating eggs or hatchling turtles and could disrupt egg-laying activities of adult female turtles. Sediment removal activities would be limited to dry portions of the Reservoir that were previously inundated. In addition, sediment removal activities and the construction of the grade control structure would commence in late summer after water surface elevations have been reduced in the Reservoir. Construction of the grade control structure and sediment removal activities would not be conducted in ponded or flowing water. Pond turtles or their eggs may be present in vegetated areas subject to clearing; however these areas are seasonally inundated and pond turtles that place eggs in these areas would be lost. Nonetheless any impacts to pond turtles would be considered adverse.

To reduce impacts to pond turtles, PWD would implement SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures) which includes clearance surveys for southwestern pond turtles prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education on how to identify pond turtles, and the control of invasive weeds. Implementation of these SPCs would provide for protection of pond turtles by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-14

SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

To reduce impacts to pond turtles, PWD would implement SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures) which includes clearance surveys for southwestern pond turtles prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide

Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts through acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these measures provide for protection by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-15: The Project could result in injury or mortality for two-striped garter snakes.

The two-striped garter snake is highly aquatic but may move considerable distances into upland habitats, even where permanent water is lacking. Two-striped garter snakes have been observed in riparian, freshwater marsh, coastal sage scrub, chaparral, oak woodland, and grassland habitats. Rathburn et al. (1993) found that these snakes tend to occupy streamside sites during the summer and switch to nearby upland habitats during the winter. Two-striped garter snakes were observed in Little Rock Creek above and below the dam. This species is not expected to occur on the sediment disposal sites.

Direct impacts due to construction activities include mortality or injury of individual two-striped garter snakes as a result of mechanical crushing; loss of nesting, breeding, or basking sites; fugitive dust; and human trampling. Other direct effects to these species include degradation of water quality through siltation caused by vehicles using wet ford stream crossings and removal of vegetation. Indirect effects include compaction of soils and introduction of exotic plant species. Operational impacts include risk of mortality by vehicles and disturbance on PWD access road below the dam or during annual sediment removal activities.

Project effects to this species would be similar to southwestern pond turtle and would be considered adverse. By design, the Project would limit work to dry areas of the Reservoir and stream channel. This would reduce the potential for direct effects to this species. To reduce effects of the Project on two-striped garter snakes PWD would implement SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures), which includes clearance surveys for two-striped garter snakes prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs would provide for protection by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-15

SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

To reduce impacts to two-striped garter snakes, PWD would implement SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures) which includes clearance surveys for southwestern pond turtles prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these measures provide for protection by educating workers to avoid sensitive species and their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these measures ensures that potential impacts would remain less than significant (Class III).

Impact BIO-16: The Project could result in injury or mortality for Coast Range newts.

The Coast Range newt requires water for breeding, but uses adjacent upland habitat extensively. It is often found where water sources dry up for the summer, and during moist conditions, can be found beneath logs, boards, rocks, and in rodent burrows. This species can also be found in drier habitats such as oak forests, chaparral, and rolling grasslands. A permanent water source is not necessary as this species needs water only during breeding. In areas where newts utilize streams, they can be found in slow-moving areas and pools. The range of the Coast Range newt within southern California is highly fragmented; however, Coast range newts have been identified on the ANF.

This species has not been detected in the Project area but may occur in Little Rock Creek and in many of the perennial or nearly perennial aquatic habitats on the south slopes of the San Gabriel Mountains. The primary threats to this species on NFS lands include predatory non-native species, maintenance of aquatic stream flows, water quality, and illegal collecting. Coast Range newts are expected to have a low potential to occur in the Reservoir due to the presence of predatory fish. Coast Range newts are not expected to occur at the proposed 47th Street sediment disposal site.

Direct impacts to Coast Range newts include mortality or injury of individual animals as a result of mechanical crushing; loss of breeding sites; fugitive dust; and human trampling. Other direct effects to these species include degradation of water quality through siltation caused by vehicles using wet ford stream crossings; and removal of vegetation. Indirect effects include compaction of soils and introduction of exotic plant species. Operational impacts include risk of mortality by vehicles and disturbance on PWD access road below the dam or during annual sediment removal activities. Seasonal fluctuations in the water surface elevations could also strand egg masses of juvenile newts.

Project effects to this species would be similar to reptiles and amphibians that rely on aquatic areas to support their life history and would be considered adverse if they occur. By design, the Project would limit work to dry areas of the Reservoir and stream channel. This would reduce the potential for direct effects to this species. To reduce effects of the Project, PWD would implement SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures),

which includes clearance surveys for Coast Range newts prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts through the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), and SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP]) would limit construction in wetted areas and reduce the potential for hazardous spills into waterways. Implementation of these SPCs would protect Coast Range newts by educating workers to avoid sensitive species and their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Seasonal surveys conducted for arroyo toads (SPC BIO-6c [Seasonal Surveys During Water Deliveries]) along the margins of the Reservoir prior to water deliveries would reduce the potential for standing of egg masses.

SPCs Applicable to Impact BIO-16

SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

SPC WQ-1 (Prepare Spill Response Plan)

SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])

CEQA Significance Conclusion

Project activities that result in the loss of coast range newts would be considered a significant impact. To reduce effects of the Project, PWD would implement SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures). This SPC includes clearance surveys for Coast Range newts prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) and SPC WQ-1 (Prepare Spill Response Plan) would limit construction in wetted areas and reduce the potential for hazardous spills into waterways. Implementation of these SPCs would protect Coast Range newts by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Seasonal surveys conducted for arroyo toads (SPC BIO-6c [Seasonal Surveys During Water Deliveries]) along the margins of the Reservoir prior to water deliveries would reduce the potential for standing of egg masses. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-17: The Project could result in injury or mortality of terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.

Several non-listed special-status reptiles and amphibians (terrestrial herpetofauna) could be affected by the Project. These include the following terrestrial California Species of Special Concern and Forest Service Sensitive species:

- San Diego horned lizard
- Silvery legless lizard
- Orange-throated whiptail
- Coastal rosy boa
- San Bernardino ringneck snake
- San Bernardino mountain kingsnake
- Coast patch-nosed snake

Several of these species, including San Diego horned lizard, silvery legless lizard, San Bernardino ringneck snake, and orange-throated whiptail were detected near the reservoir. Given the ecology of these species and cryptic nature, it is likely that some or all of the species identified above may occur in or near the Project area. Special-status terrestrial herpetofauna potentially present in the Project area would be subject to similar types of impacts. Direct impacts include being hit by vehicles on access roads, mechanical crushing during construction of the grade control structure, or the placement of fill at the 47th Street East sediment disposal site. Other impacts include fugitive dust; and general disturbance due to increased human activity. Project implementation may also result in permanent loss of habitat at the sediment disposal site. Special-status terrestrial herpetofauna could be injured or killed during ground-disturbing Project activities in undeveloped upland habitats and in some developed areas throughout the Project including staging areas near the Reservoir. Indirect impacts to these species include compaction of soils and the introduction of exotic plant species. Operational impacts include risk of mortality by vehicles and disturbance on access roads during annual sediment removal activities or during repairs to PWD access road below the dam.

Direct loss of these species would be considered an adverse impact. To reduce effects of the Project, PWD would implement SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures). This SPC includes clearance surveys for terrestrial herpetofauna prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts through the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), and SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP]) would limit construction in wetted areas and reduce the potential for hazardous spills into waterways. Implementation of these SPCs would protect terrestrial herpetofauna by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-17

SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)
SPC BIO-2 (Prepare and Implement a Weed Control Plan)
SPC AQ-2 (Fugitive Dust Controls)
SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)
SPC WQ-1 (Prepare Spill Response Plan)
SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])

CEQA Significance Conclusion

Direct loss of these species would be considered a significant impact. To reduce effects of the Project PWD would implement SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures). This SPC includes clearance surveys for terrestrial herpetofauna prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) and SPC WQ-1 (Prepare Spill Response Plan) would limit construction in wetted areas and reduce the potential for hazardous spills into waterways. Implementation of these SPCs would protect terrestrial herpetofauna by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Special-Status Birds

The Project area supports a variety of special-status birds. Impacts to special-status birds would be similar to those described for common wildlife (see Impact B-3). Impacts to nesting birds are described in Impact BIO-4. Non-listed, special-status birds are discussed in greater detail below.

Impact BIO-18: The Project would result in the loss of suitable burrowing owl habitat.

Burrowing owls, a CDFW Species of Special Concern, are known from the Antelope Valley and may occur at the 47th Street East sediment disposal site. Protocol surveys for this species did not detect signs of this species; however, owls may occupy a suitable site at any time. Burrowing owls are not expected to occur at the Reservoir. This species is not known to nest on NFS lands, although burrowing owls may occur along the lower margins of the forests where they come in contact with desert slopes and valleys that abut NFS lands. Management of NFS lands does not significantly influence the conservation status of this species given its range and habitat requirements (Stephenson and Calcarone, 1999).

Direct impacts to burrowing owls as a result of construction activities for the Project could include the crushing of burrows, removal or disturbance of vegetation, increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of noxious weeds. Operational impacts include disturbance on access roads during annual sediment removal activities.

Burrowing owls are not expected to be adversely affected at the Reservoir or during annual sediment removal activities. If burrowing owls are present at the sediment disposal site, the placement of fill could destroy occupied burrows or cause the owls to abandon burrows. However, SPCs have been incorporated into the proposed action to ensure construction during the breeding season does not result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. The loss of occupied burrowing owl habitat (habitat known to have been occupied by owls during the nesting season within the past 3 years) or reductions in the number of this rare species, directly or indirectly through nest abandonment or reproductive suppression, would constitute an adverse impact. Furthermore, raptors, including owls and their nests, are protected under both federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5.

To reduce or avoid these adverse effects, PWD would implement SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls). This SPC includes pre-construction surveys for burrowing owls at the sediment disposal site or any area supporting suitable habitat and the establishment of buffers if detected. Should the Project result in habitat loss for this species, PWD would acquire suitable habitat to replace lost territories. Implementation of SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) and SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) would increase the potential to detect burrowing owls in the Project area. The loss of foraging habitat would be further offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education and the control of invasive weeds. Implementation of these measures would protect burrowing owls by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-18

SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls)
SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)
SPC BIO-1b (Worker Environmental Awareness Program)
SPC BIO-2 (Prepare and Implement a Weed Control Plan)
SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)
SPC BIO (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat)
SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks)
SPC AQ-2 (Fugitive Dust Controls)
SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

The loss of occupied burrowing owls or their habitat would be considered a significant impact. Furthermore, raptors, including owls and their nests, are protected under both federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5. To reduce or avoid the effects of the Project, PWD would implement SPC BIO-18 (Conduct Surveys for Burrowing Owls and Implement Monitoring, Avoidance, and Minimization Measures). This

SPC includes pre-construction surveys for burrowing owls at the sediment disposal site or any area supporting suitable habitat and the establishment of buffers if detected. Should the Project result in habitat loss for this species, PWD would acquire suitable habitat to replace lost territories. Implementation of SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) and SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) would increase the potential to detect burrowing owls in the Project area. The loss of foraging habitat would be further offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education and the control of invasive weeds. Implementation of these SPCs would protect burrowing owls by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-19: The Project could disturb Forest Service Sensitive or California Species of Special Concern birds.

A variety of birds considered sensitive by the Forest Service or CDFW were documented in the Project area (see Table C.3-5). These include Lawrence's goldfinch, Vaux's swift, Southern California rufous-crowned sparrow, summer tanager, and yellow warbler. Yellow warblers would be expected to breed in the area while Vaux's swift are typically associated with coniferous forests. While not observed, species including yellow-breasted chat (*Icteria virens*) may occur in riparian areas of Little Rock Creek, and gray vireo (*Vireo vicinior*) could occur in riparian areas or surrounding upland scrub habitats. Loggerhead shrike (*Lanius ludovicianus*) and Le Conte's thrasher (*Toxostoma lecontei*) could occur in or near juniper woodlands present at the 47th Street East sediment disposal site.

Direct, indirect, and operational impacts to nesting birds would be the same as described for common birds and raptors (see Impact BIO-4), southwestern willow flycatchers and least Bell's vireos (see Impact BIO-8), and burrowing owls (see Impact BIO-18). Direct impacts to nesting birds include ground-disturbing activities associated with construction of the grade control structure, sediment removal, road repair activities, increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. Construction of the grade control structure during the breeding season has potential to impact breeding birds and reproductive success. Because sediment removal activities are scheduled to start after September 1, the potential for impacts to reproductive success is greatly reduced.

Indirect impacts to nesting birds include human disturbance, the spread of noxious weeds and disruption of breeding or foraging activity due to repairs to the access road or routine inspection of the Reservoir. Weed management could also affect nesting.

Project activities have potential to affect foraging and roosting birds if present during grade control construction, sediment removal, or access road repair. Birds and other wildlife may temporarily or permanently leave their territories to avoid construction activity, which could lead to reduced reproductive success and increased mortality. The loss of nesting birds would be considered adverse. Because of the potential for displacement of breeding birds and the abandonment of active nests, removal of vegetation during the breeding season will only be implemented if surveys have first been conducted to locate nesting birds.

Nesting birds are protected under federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5. To reduce effects of the Project on

nesting birds, PWD would implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds). This SPC includes pre-construction surveys for nesting birds and the establishment of buffers if detected. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks), and SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) would increase the potential nesting birds in the Project area. The loss of foraging habitat would off-set through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education, and the control of invasive weeds and dust. Implementation of these SPCs would protect nesting birds by educating workers, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-19

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)
SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat)
SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks)
SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls)
SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)
SPC BIO-1b (Worker Environmental Awareness Program)
SPC BIO-2 (Prepare and Implement a Weed Control Plan)
SPC AQ-2 (Fugitive Dust Controls)
SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

The loss of nesting birds would be considered a significant impact and could violate State and federal laws that protect migratory and resident birds. To reduce or avoid effects of the Project on nesting birds, PWD would implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds). This SPC includes pre-construction surveys for nesting birds and the establishment of buffers if detected. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks), and SPC BIO-18 (Conduct Surveys for Burrowing Owls and Implement Monitoring, Avoidance, and Minimization Measures) would increase the potential nesting birds in the Project area. The loss of foraging habitat would offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts through worker education and the control of invasive weeds and dust. Implementation of these measures would protect nesting birds by educating workers, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Special-Status Mammals

The Project area supports a variety of special-status mammal species including several species of bats, small rodents, mid-size carnivores such as American badger, and Nelsons bighorn sheep. Some of the

species have widespread distributions such as the black-tailed jackrabbit; whereas other species including bats and pocket mice occur in very limited areas and are often reliant on specific habitat types, such as rocky canyons, large trees with cavities, caves, bridges, and tunnels for many species of bats. Nelsons bighorn sheep is a periodic visitor to the hills above the Reservoir.

Impacts to sensitive mammals would be similar to those described for common wildlife (see Impact B-4). Wide-ranging species such as black-tailed jackrabbit are not likely to be affected by the Project. These species are able to quickly egress an area and the short duration of construction at any single point would not result in adverse impacts to the species; however, other species may be affected by the Project. These are discussed in greater detail below.

Impact BIO-20: The Project could result in mortality of, and loss of habitat for, special-status bat species.

Sensitive bats detected at the Reservoir included the pallid bat, a CDFW Species of Special Concern and Forest Service Sensitive Species, and Yuma myotis, a CDFW Special Animal. Townsend's big-eared bat, western red bat, hoary bat, spotted bat, western mastiff bat, big free-tailed bat, long-legged myotis, and pocketed free-tailed bat are all California Species of Special Concern that have the potential to occur within the Project area. Pallid bat and Townsend's big-eared bat are also Forest Service Sensitive species. The Project area includes numerous locations that constitute suitable bat foraging and roosting habitat, including Little Rock Creek, the Reservoir, juniper woodland on the sediment disposal site, and in adjacent scrub communities. The presence of large trees with exfoliating bark (i.e., large willow and cottonwood trees, Joshua trees, and junipers), water delivery tunnels below the dam, rock outcroppings, mine shafts, and hollow trees, provide suitable habitat for day roosts and hibernaculum.

Bat life histories vary widely. Some species hibernate during winter, or migrate to warmer areas. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on species. Some species feed mainly over open water where insect production is especially high, but others forage over open shrublands. The decline of bat populations is often due to roost site disturbance, loss of foraging habitat, and loss of roost sites. Activities that have been documented to impact bats include livestock grazing, vegetation treatments, and water reclamation that could lead to loss of a water source or riparian habitat. Due to their sensitivity to human disturbance, roost protection is important for bats. Roost protection measures may include seasonal use restrictions or physical closures as necessary.

Direct impacts to bats include mortality or displacement of bats during ground-disturbing activities associated with construction of the grade control structure, sediment removal, road repair activities, increased noise levels from heavy equipment, human presence, and exposure to fugitive dust. Noise, vibration, and human activity could disrupt maternity roosts during the breeding season. Indirect effects could include increased traffic, dust, and human presence in the Project area that could result in bats abandoning their roosts or maternal colonies. For example, Townsend's big-eared bat is known to abandon young when disturbed. Bats that forage near the ground, such as the pallid bat, would also be subject to crushing or disturbance by vehicles driving at dusk, dawn, or during the night. The use of access roads during dusk and dawn could also disturb bats or result in vehicle strikes.

Implementation of the Project would not prevent bats from foraging in the Reservoir or result in the loss of known maternity sites or roosting trees. However, bats are known from the Reservoir and could be disturbed from Project activities. The loss or disturbance to special-status bats would be considered adverse. To reduce impacts to bats, PWD would implement SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats). This SPC includes pre-construction surveys for roosting bats and the

avoidance of maternity colonies or hibernaculum. If maternity colonies are found, a construction buffer would be established and work diverted to another area. The loss of foraging habitat would offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education and the control of invasive weeds. Implementation of these SPCs would protect bats by educating workers, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-20

SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Although bat roosts have not been confirmed at the reservoir or below the reservoir, there is potential for bats to use the dam tunnel and area trees and rock faces for roosting. Implementation of the Project would not prevent bats from foraging in the Reservoir or result in the loss of known maternity sites or roosting trees. However, bats are known from the Reservoir and could be disturbed from Project activities. To reduce impacts to bats, PWD would implement SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats). This SPC includes pre-construction surveys for roosting bats and the avoidance of maternity colonies or hibernaculum. If maternity colonies are found, a construction buffer would be established and work diverted to another area. The loss of foraging habitat would be offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education and the control of invasive weeds. Implementation of these SPCs would protect bats by educating workers, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-21: The Project could result in mortality of, and loss of habitat for, special-status mammals.

Although not detected during surveys, the Project area may support a variety of small rodents including the Los Angeles pocket mouse, San Joaquin pocket mouse, pallid San Diego pocket mouse, and Southern grasshopper mouse. San Diego black-tailed jackrabbit may also occur in the region. These species are not expected to occur in the Reservoir but may be present in adjacent habitat, at the sediment disposal site, or along the proposed haul routes. The pallid San Diego pocket mouse has been found in pinyon-juniper woodland, desert scrub, rocky slopes, and agave-ocotillo habitat (Lackey, 1996). On desert slopes of the eastern San Gabriel Mountains, the species' distribution was closely correlated with the presence of yucca, particularly on dry, rocky southern slopes (Vaughan, 1954).

Direct impacts to these species would include mechanical crushing by vehicles and construction equipment, trampling, dust, and loss of habitat at the 47th Street East sediment disposal site. Construction disturbance can also result in the flushing of small animals from refugia which increases the predation risk for small rodents. Indirect impacts include alteration of soils, such as compaction that could preclude burrowing and the spread of exotic weeds.

These species are not expected to be subject to impacts from sediment removal activities and are likely distributed across the sediment disposal site in low densities. Nonetheless, the Project would remove or disturb vegetation and these animals would be subject to mortality from the placement of fill at this location. Impacts to these species would be considered adverse. To reduce impacts to small mammals PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs would provide for the protection of wildlife by educating workers on avoidance mechanisms, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species.

SPCs Applicable to Impact BIO-21

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

The distribution of small mammals in the Project area is greatly influenced by the fluctuating water surface elevations on the Reservoir and sensitive mammals are not expected to subject to impacts from sediment removal activities. Sensitive mammals are likely distributed across the sediment disposal site in low densities partly due to anthropogenic disturbance including OHV use. Nonetheless, the Project would remove or disturb vegetation and these animals would be subject to mortality from the placement of fill at this location. Impacts to these species would be considered significant. To reduce impacts to small mammals, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs would provide for the protection of wildlife by educating workers on avoidance mechanisms, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-22: The Project could result in mortality of American badgers or desert kit fox.

American badgers and desert kit fox (a fully protected species under California Code of Regulations, Title 14, Section 460) were not detected in the Project area but may occur in drier, open habitats with friable soil anywhere within the Project area. Nonetheless, the Project would remove or disturb foraging habitat and these animals could be subject to adverse effects from the placement of fill at the 47th Street East sediment disposal site. Impacts to these species would be considered adverse.

Direct impacts to American badger and desert kit fox include mechanical crushing of individuals or burrows by vehicles and construction equipment, noise, dust, and loss of habitat. Indirect impacts include alteration of soils such as compaction that could preclude burrowing and the spread of exotic weeds. Operational impacts include risk of road kill on Cheseboro Road and other haul routes and the spread of noxious weeds.

To reduce impacts to American badger and desert kit fox PWD would implement SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season). This SPC includes pre-construction surveys and avoidance of maternity dens and construction monitoring. If required for the placement of fill, PWD would passively relocate badgers out of the work area to reduce the potential for mortality. This includes monitoring and collapsing the dens once the animal leaves the site. However, badgers often retreat to burrows when alarmed and without active monitoring of a den it is difficult to determine the status of individual burrows. PWD would be required to avoid impacts to desert kit fox natal dens.

To reduce impacts, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these measures provide for protection of American badgers and desert kit fox by educating workers on avoidance mechanisms, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-22

SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Badgers and kit foxes are categorized as “fur-bearing mammals” (CDFG Code Section 4000). California Code of Regulations, Title 14, section 460, designates kit fox as “protected,” and they are protected by CDFG Game Code (section 86) prohibition against take, defined as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” American badger is also considered a Species of Special Concern. Direct and indirect impacts to American badgers and desert kit fox would be significant

if present. To reduce impacts to small mammals, PWD would implement SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season). This SPC includes pre-construction surveys and avoidance of maternity dens and construction monitoring. If required for the placement of fill, PWD would passively relocate badgers out of the work area to reduce the potential for mortality. PWD would avoid impacts to desert kit fox natal dens. To reduce impacts, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs provide for protection of American badgers and desert kit fox by educating workers on avoidance mechanisms, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-23: The Project would disturb Nelson's bighorn sheep.

Bighorn sheep are known from the local mountain ranges and are periodic visitors to Littlerock Canyon. Direct effects to bighorn sheep could include disturbance from construction activities, noise, and lighting. However, because of the distance to known herds, the Project is not expected to result in direct impacts from noise, dust, or human activity unless sheep move close to the Reservoir. During most summer months access to surface water remains in upstream portions of Little Rock Creek. The most likely risk to bighorn sheep would be increased road traffic. If present, the disruption of foraging or limiting sheep's access to water would be considered adverse impact.

The Project would not result in the loss of foraging habitat or disrupt inter-mountain movement for Nelson's bighorn sheep. While sheep may range far from mountainous areas, especially during intermountain movement, the Project is not expected to result in the loss of annual spring forage for this species or act as a barrier to movement. Sediment removal activities would take place in late summer after most spring plants have completed their bloom.

Indirect impacts to bighorn sheep could include the degradation of habitat from invasive weeds and risk of wildfires. Preventing access to watering sources is another potential effect. Operational impacts include the risk of road kill on Cheseboro Road.

To reduce impacts to Nelson's bighorn sheep, PWD would implement a series of measures including SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs provide for protection of Nelson's bighorn sheep by educating workers on avoidance mechanisms and restoring temporarily disturbed areas after sediment removal activities. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species. In addition, SPC FIRE-1 (Curtailment of Activities), SPC FIRE-2 (Preparation of a Fire Plan), and SPC FIRE-3 (Spark Arrester Requirements) would be implemented to minimize risk of wildfire from Project activities.

SPCs Applicable to Impact BIO-23

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)
SPC AQ-2 (Fugitive Dust Controls)
SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
SPC FIRE-1 (Curtailment of Activities)
SPC FIRE-2 (Preparation of a Fire Plan)
SPC FIRE-3 (Spark Arrester Requirements)

CEQA Significance Conclusion

Nelson's bighorn sheep are designated sensitive by the Forest Service and are protected by CDFW regulations. To reduce or avoid impacts to Nelsons bighorn sheep, PWD would implement a series of measures including SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). Implementation of these SPCs provide for protection of Nelson's bighorn sheep by educating workers on avoidance mechanisms and restoring temporarily disturbed areas after sediment removal activities. In addition, SPC FIRE-1 (Curtailment of Activities), SPC FIRE-2 (Preparation of a Fire Plan), and SPC FIRE-3 (Spark Arrester Requirements) would be implemented to minimize risk of wildfire from Project activities.

The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species. Implementation of these SPCs would ensure that impacts remain less than significant (Class III).

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. (Criterion BIO4)

Impact BIO-24: The Project could result in the loss of wetland habitats.

The preliminary jurisdictional determination and delineation of waters report identified approximately 92.306 acres of federal non-wetland waters and 97.428 acres of State waters in the Project area (see Figure C.3-12). Federal wetland waters do not occur in the Reservoir or in Little Rock Creek.

Construction of the grade control structure and sediment removal activities would result in approximately 73.2 acres of temporary disturbance to State and federal non-wetland waters. Annual repairs to PWD access road below the dam would disturb approximately 0.006 acres of federal non-wetland waters and 0.028 acres of State waters. The placement of fill on the 47th Street East sediment disposal site would avoid direct impacts to all jurisdiction waters. As currently proposed, sediment would be stored on no more than 8 acres of the site (See Figure C.3-15). Construction of the grade control structure would result in permanent impacts to approximately 0.33 acres above grade. Soil cement bank protection would extend laterally from the primary structure, as well as along the west upstream bank, to protect adjacent side slopes. This soil cement structure plus adjacent bank protection would span approximately 250 to 476 feet of channel (bank to bank) with a maximum depth of approximately 56 feet underground. The subterranean portion of the structure would extend downstream approximately 112 feet at an approximately 2-to-1 slope (see Figures B-3 and B-4). Because the grade control structure and most of the adjacent bank protection would be constructed below grade, only the upper lip of the structure would be visible when the reservoir water level is lowered

(approximately 8 feet by 200 feet). Soil cement bank protection adjacent to the structure and on the west bank upstream of the structure would extend approximately 9 feet above the reservoir bed.

The importance of intermittent and ephemeral streams to wildlife in arid environments is well known (Levick et al., 2008). Ephemeral washes similar to those on the proposed sediment disposal site provide unique habitat that is distinct from the surrounding uplands providing more continuous vegetation cover and microtopographic diversity than the surrounding uplands. Ephemeral and intermittent streams in the arid west provide important habitat for wildlife and are responsible for much of the biotic diversity (Levick et al., 2008). They have higher moisture content and provide shade and cooler temperatures within the channel. In cases where the habitat is distinct in species composition, structure, or density, wash communities provide habitat values not available in the adjacent uplands. Riparian and wash dependent vegetation along desert washes drive food webs, provide seeds for regeneration, habitat for wildlife, access to water, and create cooler, more hospitable microclimatic conditions essential for a number of plant and animal species. Baxter (1988) noted that washes, because of their higher diversity plant communities, are probably important foraging locations for desert tortoise; in smaller washes, there is greater cover and diversity of spring annuals, providing important food sources.

Sediment removal activities would be considered temporary and would not substantially alter the functions of the Reservoir. At the completion of sediment removal activities, the Reservoir would fill with water for the season and continue to provide habitat for non-native fish and other aquatic resources. Habitat functions in much of the wash have been compromised by OHV use and riparian vegetation is limited to a few areas of the Reservoir. Nonetheless, impacts to these resources from the Project would be considered adverse. Permanent impacts from the placement of the grade control structure would be limited in scale and largely buried at the completion of construction which would allow for the annual recruitment of herbaceous vegetation above the structure in this area.

The small ephemeral washes present on the 47th Street East sediment disposal site appear to flow from at least one culvert under the California Aqueduct to off-site areas. PWD would avoid direct impacts to these features to maintain hydrology across the site.

Direct impacts to State and federal waters would include the removal of native riparian vegetation, the discharge of fill, degradation of water quality, and increased erosion and sediment transport. Indirect impacts could include alterations to the existing topographical and hydrological conditions and the introduction of non-native, invasive plant species. Operational impacts to wetland habitats would be similar to direct and indirect impacts and would primarily occur as a result of annual sediment removal activities or repairs to PWD access road below the dam. As required by law, PWD would comply with the regulations regarding conducting Project activities in water bodies under the jurisdiction of the State and federal government. Therefore, PWD would obtain required permits pursuant to Section 401 and 404 of the CWA and the State Porter-Cologne Act (see Appendix F for a 404(b)(1) Evaluation Summary) and CDFG Code 1605. On NFS lands, PWD would comply with the Forest Service requirements regarding Riparian Conservation Areas. There would be no net loss of wetlands from the implementation of the Project.

To reduce impacts to State and federal waters PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), SPC AQ-5 (Reduce Off-Road Vehicle Speeds), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan). These measures include restoration, habitat acquisition, the avoidance of jurisdictional features on the sediment disposal site, worker training, and dust control. PWD would not conduct work in areas

supporting ponded or flowing water and would replace lost vegetation along the margin of the Reservoir at a ratio of 3 to 1. Impacts to juniper woodland habitat would be replaced through habitat acquisition at a ratio of 1.5 to 1. Compliance with State and federal regulations and the SPCs proposed by PWD would minimize impacts to State and federal waters.

SPCs Applicable to Impact BIO-24

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

SPC WQ-1 (Prepare Spill Response Plan)

CEQA Significance Conclusion

Due to the importance of riparian and wash communities and its suitability to support special-status species, any loss of these habitats associated with the Project is significant. As required by law, PWD would comply with the regulations regarding conducting Project activities in water bodies under the jurisdiction of the State and federal government. Therefore, PWD would obtain required permits pursuant to Section 401 and 404 of the CWA and the State Porter-Cologne Act (see Appendix F for a 404(b)(1) Evaluation Summary) and CDFG Code 1605. On NFS lands, PWD would comply with the Forest Service requirements regarding Riparian Conservation Areas. To reduce impacts to State and federal waters, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), SPC AQ-5 (Reduce Off-Road Vehicle Speeds), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan). These measures include restoration, habitat acquisition, the avoidance of jurisdictional features on the sediment disposal site, worker training, and dust control. PWD would not conduct work in areas supporting ponded or flowing water and would replace lost vegetation along the margin of the Reservoir at a ratio of 3 to 1. Impacts to juniper woodland habitat would be replaced through habitat acquisition at a ratio of 1.5 to 1. Compliance with State and federal regulations and the SPCs proposed by PWD would ensure impacts to State and federal remain less than significant (Class III).

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. (Criterion BIO5)

Studies suggest that habitat fragmentation and isolation of natural areas ultimately results in the loss of native species within those communities (Soulé et al., 1988). The ability for wildlife to move freely among populations is important to long-term genetic variation and demography. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short term, wildlife movement may also be important to an animal's ability to occupy home ranges, if a species range extends across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species, and wide-ranging species such as large mammals, which exist in low population densities. The Project area is located in the San Gabriel

Mountains which has been designated an essential connectivity area (Spencer et al., 2010). Littlerock dam is the only major physical obstacle in the area and precludes passage for aquatic species or wildlife with limited dispersal ability. Otherwise the Reservoir is surrounded by open natural lands with little to any physical barriers. The 47th Street east sediment disposal site is located in an area that has been subject to extensive development and does not appear to contribute to wildlife connectivity or movement for most species.

Direct impacts include the placement of physical structures such as the grade control structure at Rocky Point or the placement of fill at the 47th Street East sediment disposal area. Ground-disturbing activity including construction of the grade control structure or sediment removal activities and use of existing access roads would be expected to interfere with terrestrial wildlife movement during construction or sediment removal activities. The Project could also affect wildlife in adjacent habitats by interfering with movement patterns or causing animals to temporarily avoid areas adjacent to the construction zone. More mobile species such as birds and larger mammals would likely disperse into adjacent habitat areas during the clearing and sediment removal. Wildlife use of the area would be affected during these activities and from annual sediment removal activities.

Indirect impacts include human disturbance, colonization or expansion of invasive weeds, and vehicle traffic. Operational impacts would be the same as described for direct and indirect impacts.

Construction activities may temporarily limit terrestrial wildlife movement at the Reservoir; however, the broad geographic range and habitat that occurs in the region would remain available to wildlife. Wildlife would maintain access to the Reservoir during the morning and early evening as well as during nighttime hours. The Project would not substantially interfere with the movement of any native resident or migratory fish, reptile, or amphibian species. There are no listed reptiles or amphibians below the dam and sensitive amphibians that enter the Reservoir are considered lost through predation or from existing land uses. Existing barriers to movement currently limit movement in the Project area. Native and migratory fish are not present in this watershed and would not be affected by the Project.

There are no known bird or bat migratory corridors that would be directly impeded by the Project. Large concentrations of migrants are not known to utilize any specific portion of the Project site and Project activities are not expected to preclude use of the area. Migrating birds would have access to riparian communities above and below the dam during sediment removal activities.

Impact BIO-25: The Project would interfere with established wildlife migratory corridors.

Direct impacts include the placement of physical structures such as the grade control structure at Rocky Point or the placement of fill on approximately eight acres of the 47th Street East sediment disposal area. Ground-disturbing activity including construction of the grade control structure or sediment removal activities and use of existing access roads would be expected to interfere with terrestrial wildlife movement during construction or sediment removal activities. The Project could also affect wildlife in adjacent habitats by interfering with movement patterns or causing animals to temporarily avoid areas adjacent to the construction zone. More mobile species such as birds and larger mammals would likely disperse into adjacent habitat areas during the clearing and sediment removal. Wildlife use of the area would be affected during these activities and from annual sediment removal activities.

Indirect impacts include human disturbance, colonization or expansion of invasive weeds, and vehicle traffic. Operational impacts would be the same as described for direct and indirect impacts.

Construction activities may temporarily limit terrestrial wildlife movement at the Reservoir; however, the broad geographic range and habitat that occurs in the region would remain available to wildlife. Wild-

life would maintain access to the Reservoir during the morning and early evening as well as during night-time hours. The Project would not substantially interfere with the movement of any native resident or migratory fish, reptile, or amphibian species. There are no listed reptiles or amphibians below the dam and sensitive amphibians that enter the Reservoir are considered lost through predation or from existing land uses. Existing barriers to movement currently limit movement in the Project area. Native and migratory fish are not present in this watershed and would not be affected by the Project.

There are no known bird or bat migratory corridors that would be directly impeded by the Project. Large concentrations of migrants are not known to utilize any specific portion of the Project site and Project activities are not expected to preclude use of the area. Migrating birds would have access to riparian communities above and below the dam during sediment removal activities.

CEQA Significance Conclusion

Construction activities may temporarily limit terrestrial wildlife movement at the Reservoir; however, the broad geographic range and habitat that occurs in the region would remain available to wildlife. Wildlife would maintain access to the Reservoir during the morning and early evening as well as during nighttime hours. The Project would not substantially interfere with the movement of any native resident or migratory fish, reptile, or amphibian species. There are no listed reptiles or amphibians below the dam. Existing barriers to movement currently limit movement in the Project area. Native and migratory fish are not present in this watershed and would not be affected by the Project.

There are no known bird or bat migratory corridors that would be directly impeded by the Project. Large concentrations of migrants are not known to utilize any specific portion of the Project site and Project activities are not expected to preclude use of the area. Migrating birds would have access to riparian communities above and below the dam during sediment removal activities. Although species would be disrupted during certain activities, impacts to migratory corridors from the Project would be less-than-significant (Class III).

Impact BIO-26: The Project would result in effects to Management Indicator Species.

The 2005 Forest Service's Land Management Plan (USFS, 2005) requires forest scale monitoring of habitat status and trend for select MIS on the ANF. Detailed information addressing effects to MIS are incorporated by reference and will be included in Final EIS/EIR. Table C.3-11 identifies permanent impacts to MIS habitat that would occur during implementation of the Project.

Table C.3-11. Impacts to Management Indicators and Management Indicator Species on the ANF

Management Indicator (MI)	Management Indicator Species (MIS)	Acres Directly Impacted by Proposed Project
Fragmentation	Mountain lion	65
Healthy Diverse Habitats	Mule deer	65
Aquatic Habitat	Arroyo toad	0.33
Riparian Habitat	Song Sparrow	0.33

Healthy Diverse Habitats (Mule Deer)

Mule deer are used by the Forest Service as an indicator of healthy diverse habitats. Availability of suitable vegetation for fawning, forage, and cover in close proximity to water is the most limiting factor for mule deer. The ANF LRMP (USFS, 2005) considers all habitat types as potentially suitable for mule

deer. Therefore, the entire Project area on the ANF is considered suitable habitat for mule deer. Implementation of the Project would impact approximately 65 acres of mule deer habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends. Mule deer are known to inhabit the entire forest, consisting of a total of 701,122 acres. Forest-wide deer population distribution is stable. The Project would result in a temporary decrease in forest-wide habitat (0.01 percent of forest-wide habitat) for deer during sediment removal activities. This decrease is negligible and equivalent to less than one deer home range. The Project-level habitat impacts would not modify the existing forest-wide population distribution trend.

Fragmentation (Mountain lion)

Availability of adequate prey base and habitat connectivity between subpopulations has been identified as the limiting factors for mountain lion populations. The Forest LRMP (USFS, 2005) considers all habitat types as potentially suitable for the mountain lion. Therefore, the entire Project area on the ANF is considered suitable habitat. Implementation of the Project would impact approximately 65 acres of mountain lion habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends. Mountain lions are known to inhabit the entire forest, consisting of a total of 701,122 acres. Forest-wide mountain lion population distribution is stable. The Project would result in a slight temporary decrease in forest-wide habitat (0.01 percent of forest-wide habitat) for mountain lion. Based on the small size of the affected habitat, Project activities are not expected to lead to a decrease in population numbers or modify the existing forest-wide population distribution trend.

Riparian Habitat (Song Sparrow)

The primary threat to song sparrows and other riparian birds is the destruction of riparian habitat and loss of water (USFS, 2005). Acres of suitable habitat are used to assess the effects of the Project and alternatives on song sparrow habitat. Implementation of the Project would permanently impact approximately 0.33 acres of song sparrow habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends. The Project would result in a slight temporary decrease in song sparrow habitat, which is equivalent to one song sparrow home range (Zeiner et al., 1990a).The slight decrease in habitat is not expected to lead to a decrease in population numbers or modify the existing declining forest-wide population distribution trend.

Aquatic Habitat (Arroyo toad)

Acres of suitable aquatic and riparian habitat are used to assess the effects of the Project and alternatives on arroyo toad habitat. Implementation of the Project would permanently impact 0.33 acre of suitable arroyo toad habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends. The effects of the Project would result in a small decrease in forest-wide suitable habitat for arroyo toad. The Project would not alter or contribute to the existing forest-wide habitat or population trend.

To reduce effects of the Project on MIS, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC

BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries). These measures target restoration of riparian vegetation; limit disturbance to riparian songbirds and arroyo toads, and provide best management practices to reduce or avoid impacts to MIS.

SPCs Applicable to Impact BIO-26

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)

SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures)

SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring)

SPC BIO-6c (Seasonal Surveys During Water Deliveries)

CEQA Significance Conclusion

Impacts to MIS would occur during implementation of the Project and are evaluated in the context of habitat loss. For all MIS in the Project area, loss of habitat would be minimal, largely temporary, and replaced at the conclusion of sediment removal activities. To further reduce effects of the Project on MIS, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries). These measures target restoration of riparian vegetation, limit disturbance to riparian songbirds and arroyo toads, and provide best management practices to reduce or avoid impacts to MIS. Implementation of these SPCs ensures impacts would remain less than significant (Class III).

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances. (Criterion BIO6)

The Project may result in the loss of Joshua trees and juniper trees at the 47th Street East sediment disposal area. These species receive protection from the Palmdale Native Desert Vegetation Ordinance. Chapter 14.04 of the City of Palmdale Municipal Code requires a desert vegetation preservation plan with minimum preservation standards for removal of vegetation at sites with Joshua trees and other species included in the California Desert Native Plants Act, California Food and Agriculture Code, Division 23. In compliance with these regulations, PWD shall obtain permits from both Los Angeles County for the removal of Joshua trees and other native vegetation that do not occur on NFS lands. If onsite preservation is not feasible PWD would acquire additional lands preserving protected trees. PWD may also pay in lieu fees in compliance with this regulation.

Because of the development of SPC's described above in Criteria BIO1 through BIO5, the Project is consistent with local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Therefore, no additional impact not already discussed elsewhere in the document would occur.

CEQA Significance Conclusion

Through Project design and implementation of SPC's described in Criteria BIO1 through BIO5, the Project is consistent with local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Therefore, no impact would occur.

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP. (Criterion BIO7)

The sediment disposal sites including the exhausted quarries are located on private lands included in the West Mojave Plan Habitat Conservation Plan (WMPHCP). The WMPHCP was completed in March 2006 but has not been formally adopted on private lands. The Reservoir is located on lands included in the 2005 Forest Service's Land Management Plan. The 2005 Land Management Plan includes objectives and direction for managing resources on the ANF, including plant and wildlife species that are federally listed and/or Forest Service sensitive. The Plan includes Management Strategy WL-1 (Threatened, Endangered, Proposed, Candidate, and Sensitive Species Management) which requires the Forest Service to manage habitat to move listed species toward recovery and de-listing and to prevent listing of proposed and sensitive species. Management Strategy WL-2 (Management of Species of Concern) directs the Forest Service to maintain and improve habitat for fish, wildlife, and plants, including those designated as game species, harvest species, management indicator species, and watch list species. The Plan directs Forest Service management activities to prevent the introduction of new invaders, to conduct early treatment on new infestations, and contain and control established infestation of invasive species through Management Strategy IS-1.

As part of the Project, PWD would implement SPC's, described in Criteria BIO1 through BIO5. Implementation of these SPC's would ensure the Project is compliant with the 2005 Land Management Plan and no impact would occur.

C.3.4.5 Alternative 1: Reduced Sediment Removal Intensity

Under Alternative 1, construction of the grade control structure would be identical to the Project. This alternative would differ in the timing and duration of sediment removal activities. Under this Alternative sediment removal would commence on July 1st compared to the day after Labor Day; work would be conducted 5 days a week instead of 6; and the duration of sediment removal activities would increase to 13 years, instead of 6.

Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or FWS (Criterion BIO1)

Implementation of Alternative 1 would result in the same impacts to native vegetation (Impact BIO-1), from habitat loss and from the spread of invasive plant species (Impact BIO-2) as described for the Project. Under certain circumstances, weeds could become established earlier and fewer areas supporting herbaceous vegetation may be present as water levels are generally lowered at the end of summer in response to reduced inflow and ongoing water deliveries.

Implementation of Alternative 1 would result in the same impacts to wildlife (Impact BIO-3) and nesting birds (Impact BIO-4) as described for the Project. The reduction in truck trips (180 per day vs. 480 per day) would reduce adverse effects from road kill to some extent but the extended construction period

would still result in similar impacts to these species. Similarly, the commencement of work on July 1 would increase the likelihood of disturbing nesting birds. Implementation of the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 1 from Alternative 1.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same impacts to biological resources identified under Criterion BIO 1 as described for the Project and would be considered significant. Implementation the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 1 to a less-than-significant level (Class III).

Have an adverse effect, either directly or through habitat modifications, on any species listed as fully protected, endangered, threatened, or proposed or critical habitat for these species (Criterion BIO2)

Implementation of Alternative 1 would result in the same impacts or greater to species listed as fully protected, endangered, threatened, or proposed or critical habitat as the Project. Listed plant species (Impact BIO-5) are not present and would be avoided if detected. Impacts to arroyo toads (Impact BIO-6) would be greater because commencing work in July would require draining the reservoir earlier in the season. If arroyo toads are present in the upstream margin of the reservoir they could be subject to stranding. However, arroyo toad egg masses are typically not found in July and metamorph toads and larvae may be capable to moving closer to the active stream channel.

Alternative 1 would result in the same impacts to California condors (Impact BIO-7) as described for the Project if present. The reduction in truck trips (180/day vs. 480/day) would reduce adverse effects from road kill which may attract condors. Impacts to listed songbirds (Impact BIO-8), Swainson's hawk (Impact BIO-9), and bald or golden eagles (Impact BIO-10) would also be the same; however, the commencement of work on July 1 would increase the likelihood of disturbing nesting birds in the Reservoir, sediment disposal sites, or along Cheseboro Road. Commencing work earlier in the season may also slightly increase the risk to ringtail (Impact BIO-11) when compared to the Project by disturbing pupping season. Implementation of the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO2 from Alternative 1.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same impacts to biological resources identified under Criterion BIO 2 as described for the Project and would be considered significant. Implementation of the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 2 to a less-than-significant level (Class III).

Have a substantial adverse effect, 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 CDFW, Forest Service, or USFWS (Criterion BIO3)

Implementation of Alternative 1 would result in the same impacts to candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, Forest Service, or USFWS species as described for the Project. Sensitive plants (Impact BIO-12) or invertebrates (Impact BIO-13) were not found in the disturbance area and would be subject to the same direct and indirect impacts as the Project. Implementation of Alternative 1 may result in a minor reduction in road kill to butterflies should they occur from fewer truck trips.

Implementation of Alternative 1 would result in the same impacts to southwestern pond turtles (Impact BIO-14), two-striped garter snakes (Impact BIO-15), coast range newts (Impact BIO-16), and sensitive amphibian and reptile species (Impact BIO-17) as described for the Project. Reduced water levels required to construct in July could reduce habitat for these species in the Reservoir; however, fluctuating water levels at the reservoir occur during below-normal rain years.

Implementation of Alternative 1 would result in the same impacts to burrowing owls (Impact BIO-18), special status nesting birds (Impact BIO-19), special status bats (Impact BIO-20), and other special-status mammals (Impact BIO-21, Impact BIO-22, and Impact BIO-23) or greater as described for the Project. The commencement of work on July 1 would increase the likelihood of disturbing active breeding birds or disrupt mammal denning or pupping should they occur. Implementation of the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 3 from Alternative 1.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same impacts to biological resources identified under Criterion BIO 3 as described for the Project and would be considered significant. Implementation the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 3 to a less than significant level (Class III).

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. (Criterion BIO4)

Implementation of Alternative 1 would result in the same impacts to jurisdictional waters (Impact BIO-24) as described for the Project. Implementation of the same SPCs for the Project would reduce impacts to jurisdictional waters identified under Criterion BIO 4 from Alternative 1. Please refer to Appendix F for a 404(b)(1) Evaluation Summary of the proposed Project and alternatives.

CEQA Significance Conclusion

Implementation of Alternative1 would result in the same impacts to jurisdictional waters as described for the Project and would be significant. Implementation of the same SPCs for the Project would reduce impacts to jurisdictional waters identified under Criterion BIO 4 to a less-than-significant level (Class III).

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. (Criterion BIO5)

Implementation of Alternative 1 would result in the same impacts to established wildlife corridors (Impact BIO-25) and MIS (Impact BIO-26) as described for the Project. Implementation of the same SPCs for the Project would reduce impacts to established wildlife corridors and MIS identified under Criterion BIO 5 from Alternative 1.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same impacts to established wildlife corridors and MIS as described for the Project and would be less than significant (Class III).

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances. (Criterion BIO6)

Implementation of Alternative 1 would result in the same determination of compliance with existing policies or ordinances protecting biological resources as described for the Project. Because of the development of SPC's described above in Criteria BIO1 through BIO5, the Alternative 1 is consistent with the local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Therefore, no additional impact, not already discussed elsewhere in the document, would occur.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same determination of compliance with existing policies or ordinances protecting biological resources as described for the Project. Therefore, no impact would occur.

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP. (Criterion BIO7)

Implementation of Alternative 1 would result in the same determination of compliance with existing HCPs, NCCP's, or State HCP's as described for the Project. Because of SPC's described in Criteria BIO1 through BIO5, the Project is compliant with the 2005 Forest Service Land Management Plan and no impact would occur.

C.3.4.6 No Action/No Project Alternative

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year. Under the No Action/No Project Alternative continued sediment deposition could compromise the long-term integrity of the Dam. In this event, the California Department of Water Resources (DWR) Division of Safety of Dams could require the Dam to be breached. In addition, as the Dam would no longer function as a viable water storage facility, it would not be in compliance with the Forest Service Special Use Permit under which it currently operates. Subsequently, the Dam may need to be demolished per the conditions identified in the Forest Service's Special Use Permit. Demolition of the Dam would result in the elimination of the potential for water impoundment at the existing Reservoir, and permanent loss of this potable water source. All sediment accumulated behind the Dam would have to be removed in a project similar to, but larger than, the Project. At full capacity, sediment accumulated behind the Dam would be approximately 7.4 million cubic yards.

If the Dam remained stable and sediment continued to accumulate within the Reservoir, water storage would diminish and the reservoir would fill with sediment from upstream areas. Similar to upstream conditions, riparian vegetation would be expected to recruit along the margins of the active channel and may eventually develop into a mature riparian community. Other areas of the reservoir likely would be similar to alluvial fan communities and consist of a mosaic of upland and riparian vegetation depending on the scour regime associated with the creek. Should this occur, the Project area may develop characteristics that would support habitat for arroyo toad and other species associated with riparian vegetation and floodplains.

If the dam becomes unstable and must be removed, impacts to native vegetation would be greater and encompass a wider area compared to the Project. Demolition of the dam and restoration of Little Rock Creek would require the removal of 2.8 million cubic yards of sediment and dam concrete. Removal of

sediment and demolition of the dam would result in a project similar to, but larger than, the Project, with greater impacts to native vegetation above and below the dam.

Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or FWS (Criterion BIO1)

Under the No Action/No Project Alternative impacts to native vegetation (Impact BIO-1), habitat loss from the spread of invasive plant species (Impact BIO-2), disturbance to common wildlife (Impact BIO-3) or nesting birds (Impact BIO-4) would not occur. Native vegetation would likely expand as the Reservoir fills with sediment increasing the amount of vegetation in the Project area. Overtime the Reservoir would support extensive nesting habitat for a variety birds. It is uncertain if the acquisition of water to replace the lost Reservoir capacity would result in impacts to these resources at other locations.

If the dam becomes unstable and must be removed, impacts to biological resources identified under Criterion BIO 1 would be greater because of expanded construction activities and encompass a total similar area compared to the Project. Under this scenario, the removal of the dam would also result in habitat degradation to downstream areas. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

Under the No Action/No Project Alternative if the dam becomes unstable and must be removed impacts to biological resources identified under Criterion BIO 1 would be greater and encompass a wider area compared to the Project. These impacts would be considered significant (Class II).

Have an adverse effect, either directly or through habitat modifications, on any species listed as fully protected, endangered, threatened, or proposed or critical habitat for these species (Criterion BIO2).

Under the No Action/No Project Alternative impacts to listed plant populations (Impact BIO-5), arroyo toads (Impact BIO-6), California condors (Impact BIO-7), listed songbirds (Impact BIO-7), Swainson's hawk (Impact BIO-8), bald and golden eagles (Impact BIO-9), or ringtail (Impact BIO-11) would not occur. Over time, it is possible that sensitive plants and other listed species could become established at or near the Reservoir as new habitat develops. The loss of the Reservoir would likely reduce the presence of non-native predatory fish and provide additional habitat for native wildlife in Little Rock Creek. Impacts to habitat in off-site locations would remain available for sensitive wildlife. It is uncertain if the acquisition of water to replace the lost Reservoir capacity would result in impacts to listed plants at other locations.

If the dam becomes unstable and must be removed, impacts to biological resources identified under Criterion BIO 2 would be greater compared to the Project. The removal of sediment and the dam would alter stream and channel morphology in Little Rock Creek upstream of Rocky Point and below the dam. This habitat loss would substantially alter conditions in the creek and result in the acquisition of additional sediment disposal sites in other areas. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed, impacts to biological resources identified under Criterion BIO 2 would be greater compared to the Project. These impacts would be considered significant (Class II).

Have a substantial adverse effect, 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 CDFW, Forest Service, or USFWS (Criterion BIO3)

Under the No Action/No Project Alternative impacts to sensitive plant populations (Impact BIO-12), special-status invertebrates (Impact BIO-13), special-status reptiles and amphibians (Impact BIO-14, Impact BIO-15, Impact BIO-16, and Impact BIO-17), burrowing owls (Impact BIO-18), sensitive birds (Impact BIO-19), special-status bats (Impact BIO-20), and other special-status mammals (Impact BIO-21, Impact BIO-22, and Impact BIO-23) would not occur. Over time it is possible that sensitive plants and other species could become established at or near the Reservoir as new habitat develops. Many of these species may benefit from the loss of deep water lake habitat that currently supports a broad assemblage of predatory fish. Over time, it is possible that more natural stream conditions favored by native species would become established.

If the dam becomes unstable and must be removed, impacts to biological resources identified under Criterion BIO 3 would be greater compared to the Project due to the expanded construction activities. Removal of sediment and demolition of the dam would result in a project similar to, but larger than, the Project, with greater impacts to sensitive species above and below the dam. Increased truck traffic to remove accumulated sediment would indirectly affect sensitive species in adjacent areas. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed impacts to biological resources identified under Criterion BIO 3 would be greater compared to the Project. These impacts would be considered significant (Class II).

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. (Criterion BIO4)

Under the No Action/No Project Alternative impacts to jurisdictional waters (Impact BIO-24) would not occur. Over time, riparian features would increase and the Reservoir would likely shift from an open water community to a more natural stream channel. It is uncertain if the acquisition of water to replace the lost Reservoir capacity would result in impacts to jurisdictional features at other locations. If the dam becomes unstable and must be removed, impacts to jurisdictional waters would be greater compared to the Project. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect jurisdictional resources. Therefore, this alternative would result in a direct and adverse impact. Please refer to Appendix F for a 404(b)(1) Evaluation Summary of the proposed Project and alternatives.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed, impacts to jurisdictional resources identified under Criterion BIO 4 would be greater compared to the Project. These impacts would be considered significant (Class II).

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. (Criterion BIO5)

Under the No Action/No Project Alternative, impacts to established wildlife corridors or MIS would not occur. There are no known bird or bat migratory corridors that would be directly impeded by the Project. Over time, the establishment of riparian vegetation in the reservoir may support additional use by resident and migratory species or MIS.

If the dam becomes unstable and must be removed, this alternative would increase disturbance to wildlife in the region including MIS compared to the Project. However, over time, this alternative would re-establish connectivity within the watershed. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect established wildlife corridors or MIS. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed, impacts to jurisdictional resources identified under Criterion BIO 5 would be greater compared to the Project. These impacts would be considered significant (Class II).

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances. (Criterion BIO6)

Under the No Action/No Project Alternative, the Project would not be implemented and there would no conflict with existing policies or ordinances protecting biological resources. If the dam becomes unstable and must be removed implementation of No Action/No Project Alternative could conflict with existing policies or ordinances protecting biological resources as described for the Project. It is unknown what project commitments would be included in this alternative, or if they would be adequate to comply with policies or ordinances protecting biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed the No Action/No Project Alternative could conflict with existing policies or ordinances protecting biological resources identified under Criterion BIO 6. These impacts would be considered significant (Class II).

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP. (Criterion BIO7)

Under the No Action/No Project Alternative, the Project would not be implemented and there would no conflict with existing HCPs, NCCP's, or State HCP's. If the dam becomes unstable and must be removed implementation of No Action/No Project Alternative could conflict with existing HCPs, NCCP's, or State

HCP's as described for the Project. It is unknown what project commitments would be included in this alternative, or if they would be adequate to comply with HCPs, NCCP's, or State HCP's protecting biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed the No Action/No Project Alternative could conflict with existing HCPs, NCCP's, or State HCP's protecting biological resources identified under Criterion BIO 7. These impacts would be considered significant (Class II).

C.3.5 Impact Summary

Table C.3-12 summarizes direct and indirect environmental impacts of the Project and alternatives. See Section C.3.4 for the environmental analysis and full text of recommended SPCs.

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-1: The Project would result in temporary and permanent losses of native vegetation.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program)
BIO-2: The Project would result in the establishment and spread of noxious weeds.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program)
BIO-3: The Project would cause the loss of foraging habitat for wildlife or result in disturbance to wildlife in adjacent habitat.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan)
BIO-4: The Project would result in disturbance to nesting birds or raptors.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-1b (Worker Environmental Awareness Program)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-5: The Project could disturb endangered, threatened, or proposed plant species or their habitat.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan)
BIO-6: The Project would result in loss or disturbance to arroyo toads.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures) SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring) SPC BIO-6c (Seasonal Surveys During Water Deliveries) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan)
BIO-7: The Project could result in the loss of California condors.	Class III	Class III	No impact* Class II**	No	SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-8: The Project could disturb nesting willow flycatchers, southwestern willow flycatchers, least Bell's vireos, or their habitat.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-9: The Project would disturb Swainson's hawks.	Class III	Class III	No impact* Class II**	No	SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-10: The Project would result in disturbance to Bald or Golden Eagles.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-11: The Project would result in disturbance or loss of habitat for the ringtail.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid denning Areas) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-12: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-13: The Project could result in the loss of Shoulderband Snails or San Emigdio Blue Butterfly.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-14: The Project could result in mortality or injury to southwestern pond turtles or a disruption of nesting habitat.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-15: The Project could result in injury or mortality for two-striped garter snakes.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-16: The Project could result in injury or mortality for Coast Range newts.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan) SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-17: The Project could result in injury or mortality of terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan) SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])
BIO-18: The Project would result in the loss of suitable burrowing owl habitat.	Class III	Class III	No impact* Class II**	No	SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-19: The Project could disturb Forest Service Sensitive or California Species of Special Concern birds.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-20: The Project could result in mortality of, and loss of habitat for, special-status bat species.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-21: The Project could result in mortality of, and loss of habitat for, special-status mammals.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

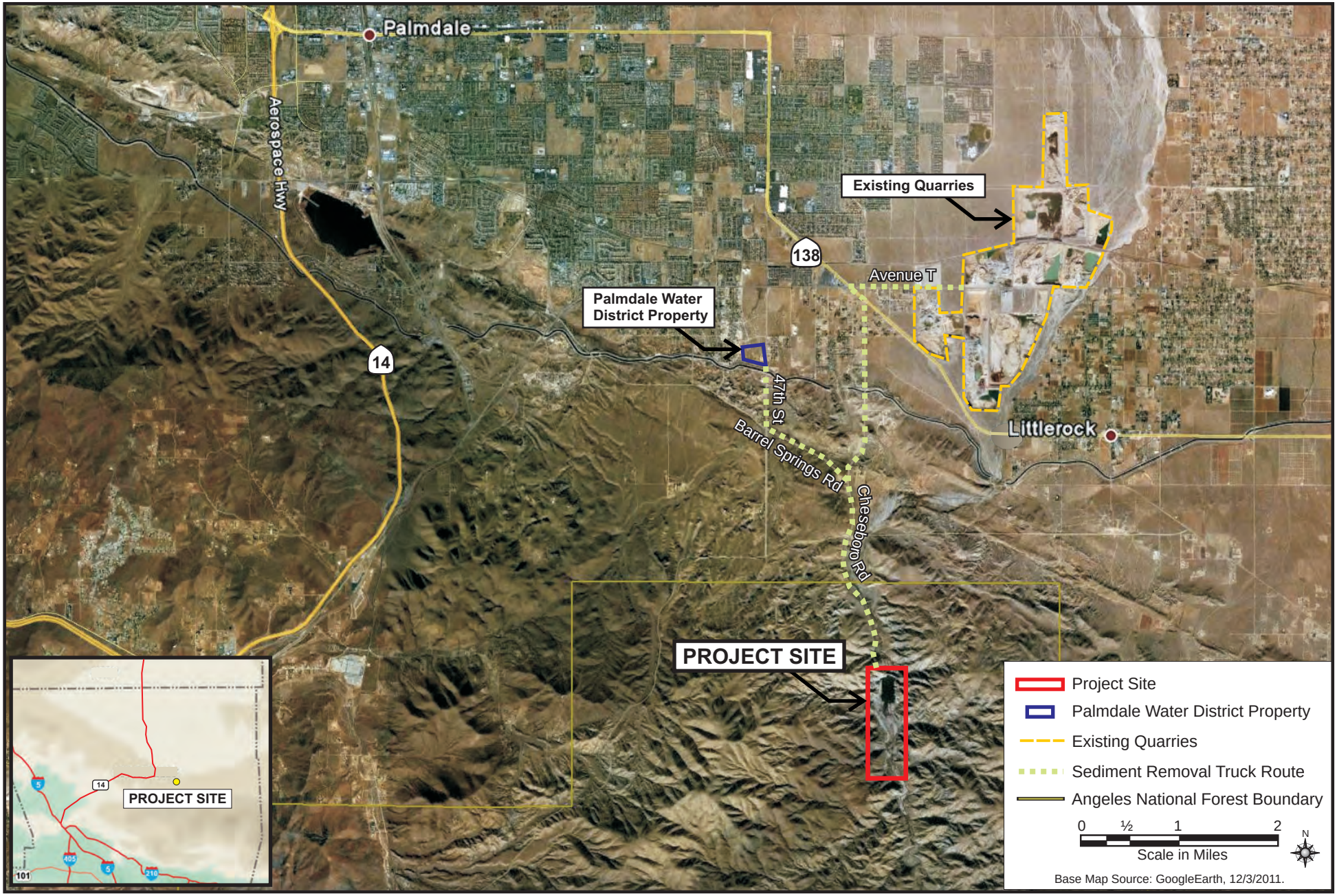
Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-22: The Project could result in mortality of American badgers or desert kit fox.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-23: The Project would disturb Nelson's bighorn sheep.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC FIRE-1 (Curtailment of Activities) SPC FIRE-2 (Preparation of a Fire Plan) SPC FIRE-3 (Spark Arrester Requirements)
BIO-24: The Project could result in the loss of wetland habitats.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-25: The Project would interfere with established wildlife migratory corridors.	Class III	Class III	No impact* Class II**	Yes	Not Applicable
BIO-26: The Project would result in effects to Management Indicator Species.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures) SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring) SPC BIO-6c (Seasonal Surveys During Water Deliveries)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
* Assumes the dam remains stable
**Assumes the dam becomes unstable and requires demolition

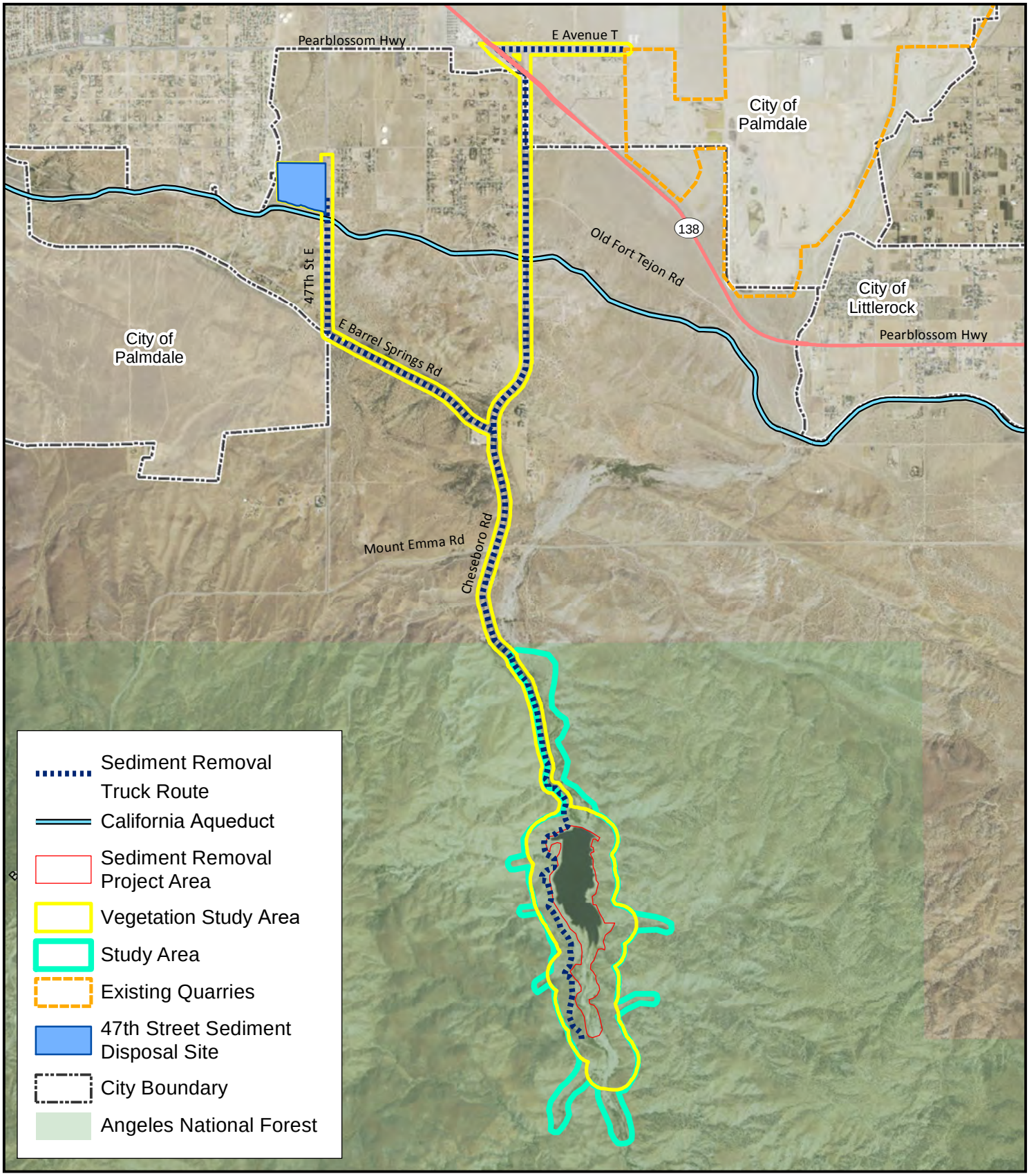


Regional Project Location and Sediment Removal Truck Routes

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.3-1

May 2016



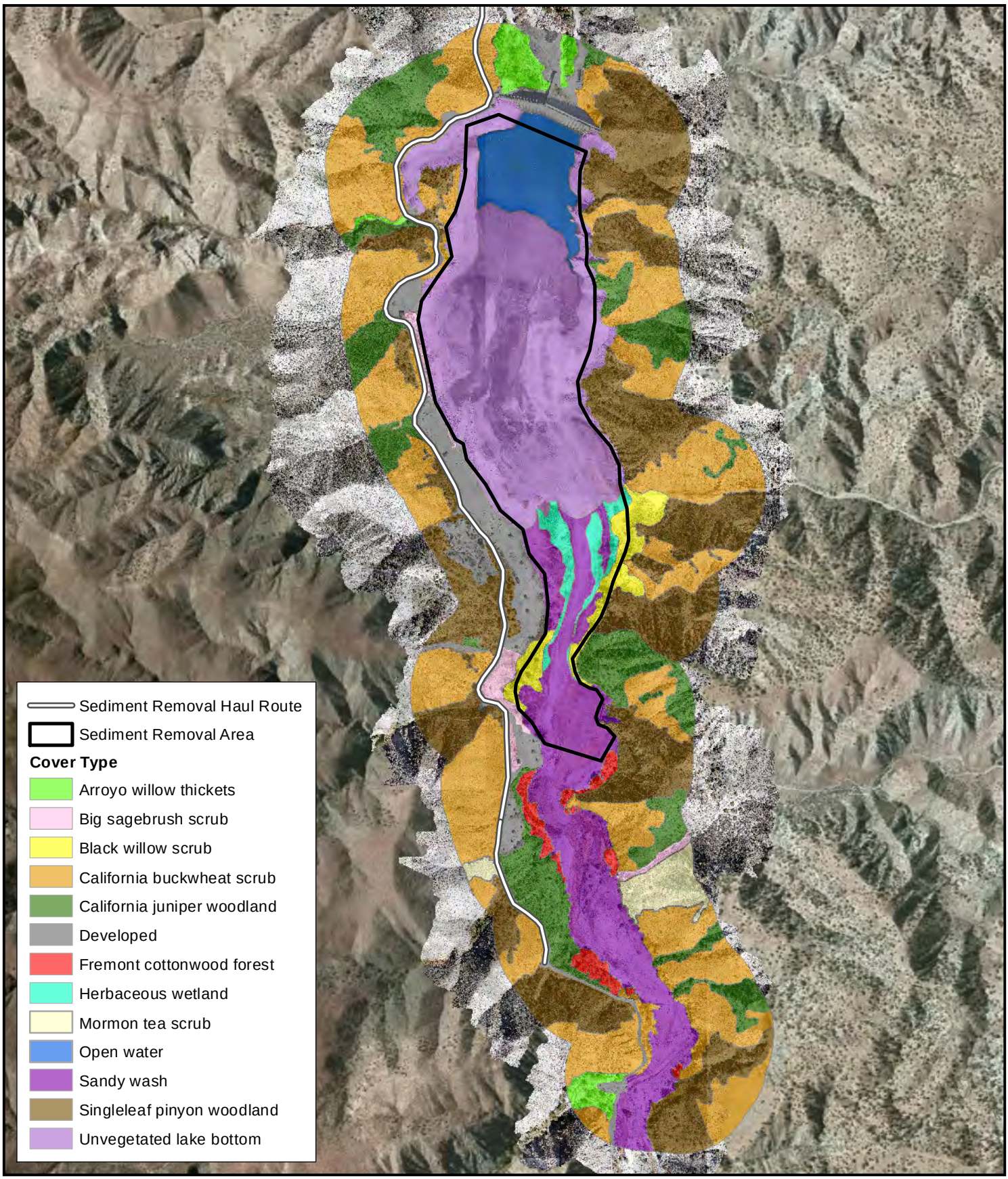
0 0.5 1 Miles

Project Area and Survey Areas

Littlerock Reservoir Sediment Removal Project

Figure C.3-2

May 2016



0 500 1,000 Feet

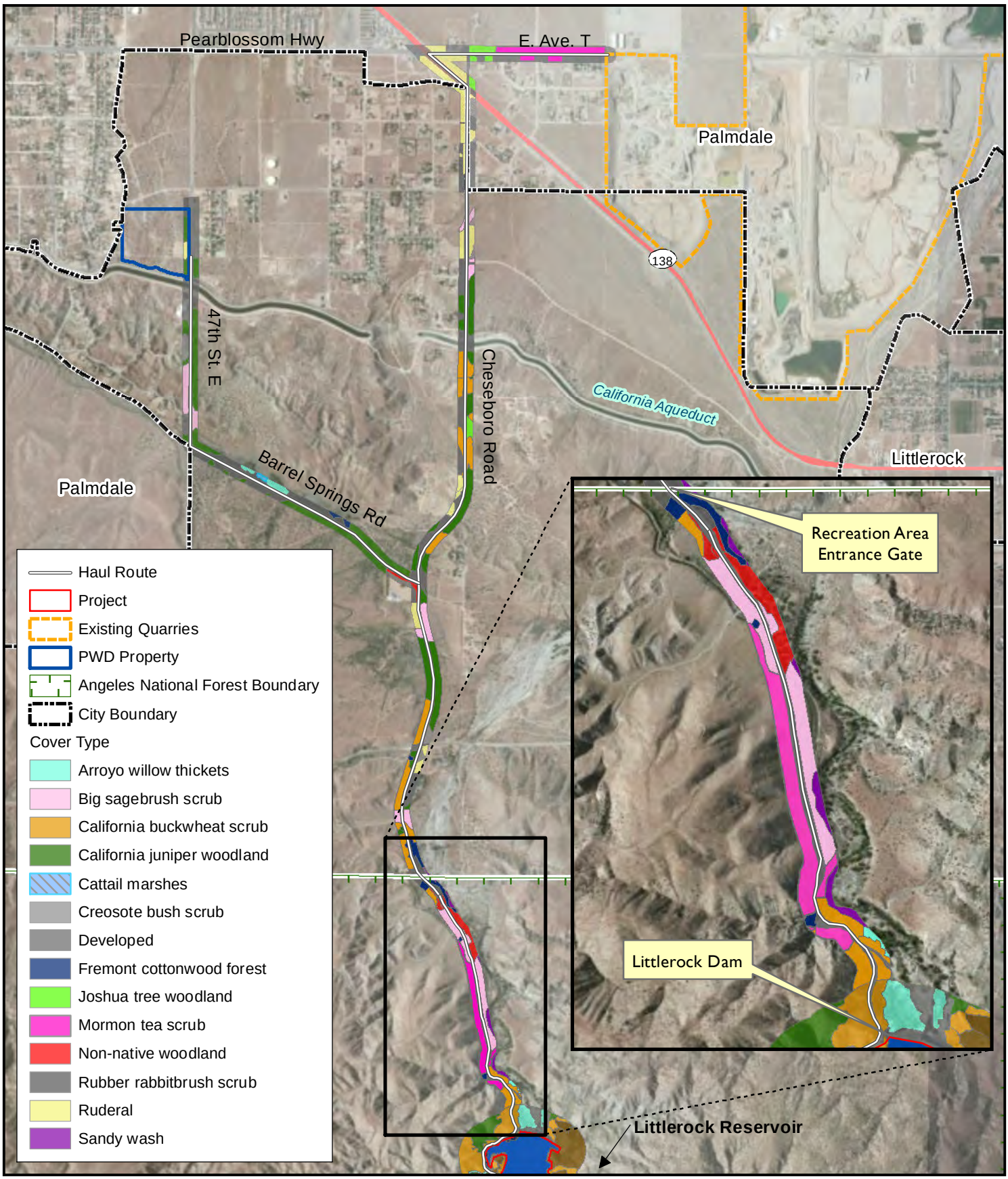
Littlerock Reservoir Vegetation

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-3

May 2016



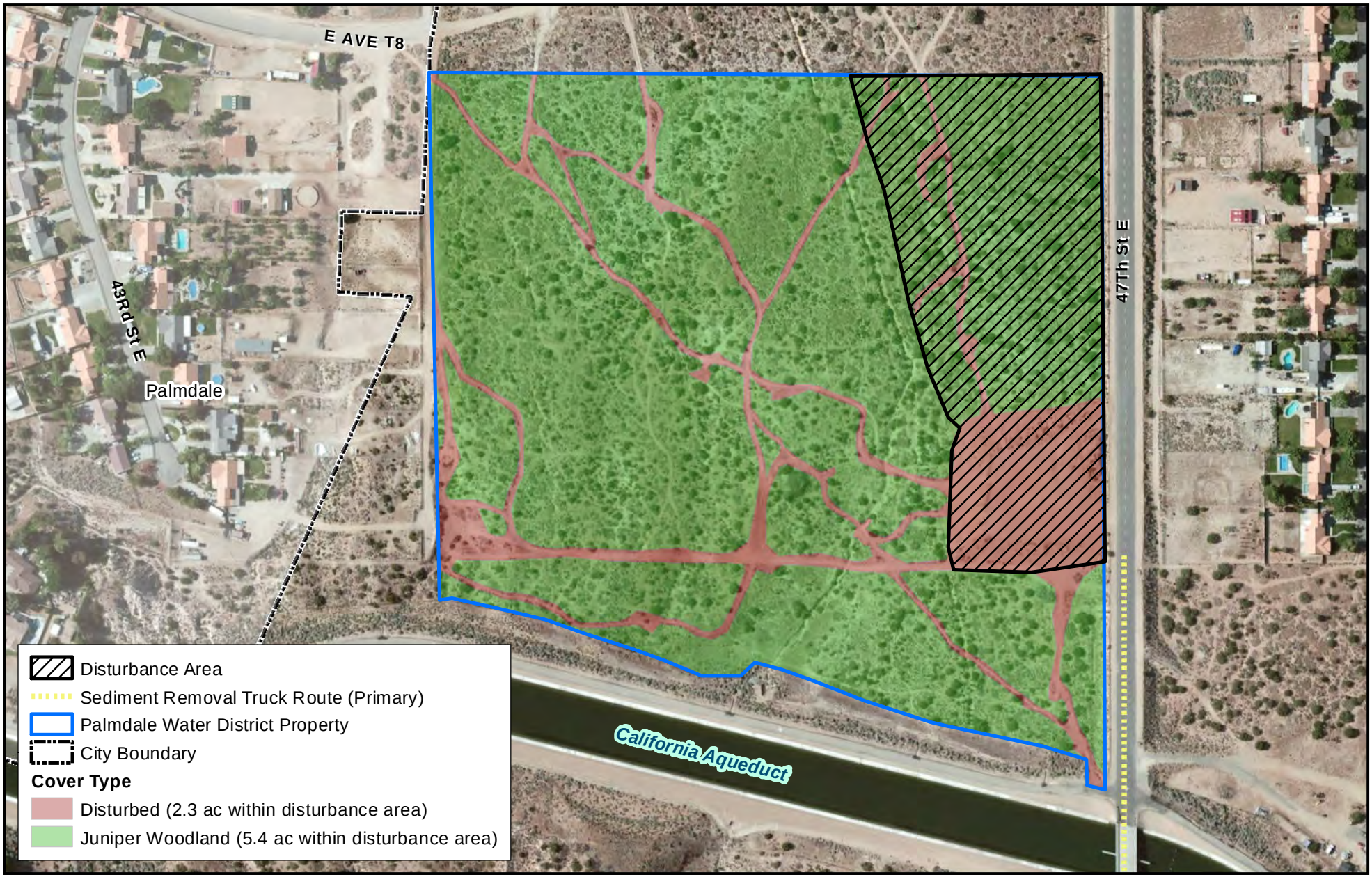
0 0.25 0.5 Miles

Proposed Haul Route Vegetation

Littlerock Reservoir Sediment Removal Project

Figure C.3-4

May 2016



0 225 450 Feet

47th Street Sediment Storage Site
Vegetation

Littlerock Reservoir Sediment Removal Project

Figure C.3-5

May 2016



N

0 0.25 0.5 Miles

Arroyo Toad Critical Habitat

Littlerock Reservoir Sediment Removal Project

Figure C.3-6

May 2016



0 500 1,000 Feet

Dead or Removed Cottonwood Tree Locations

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-7

May 2016

Haul Route Detail 1

Pearblossom Hwy
E AVE T
60Th St E
62Nd St E
E AVE T2
Palmdale
56Th St E
Cheseboro Rd
E AVE T4
E AVE T5
LocKhart Ave
138
E AVE T8

1:10,000

Haul Route Detail 2

1:10,000

Cheseboro Rd

Documented Weed Occurrences

Weeds: Individuals

- Tocalote
- Short-pod mustard
- Tree tobacco
- Jerusalem thorn
- Russian thistle
- White horsenettle
- Smilo grass
- Wand mullein

Patches

- Rabbitsfoot grass
- Tamarisk
- Wand mullein

Project Area Overview

Pearblossom Hwy
E AVE T
Palmdale
E AVE T2
40Th St E
41St St E
42Nd St E
48Th St E
E AVE T8
52Nd St E
53Rd St E
55Th St E
56Th St E
E AVE T4
70Th St E
138
Haul Route Detail 1
Barrel Springs Rd
47Th St E
E Barrel Springs Rd
Cheseboro Rd
Littlerock
Palmdale
E AVE V5
Little Rock Wash Rd
Mount Emma Rd
Bpl Rd
B P And L Rd
Haul Route Detail 2
Reservoir Detail

1:40,000

Reservoir Detail

1:3,000

Cheseboro Rd

1:8,000

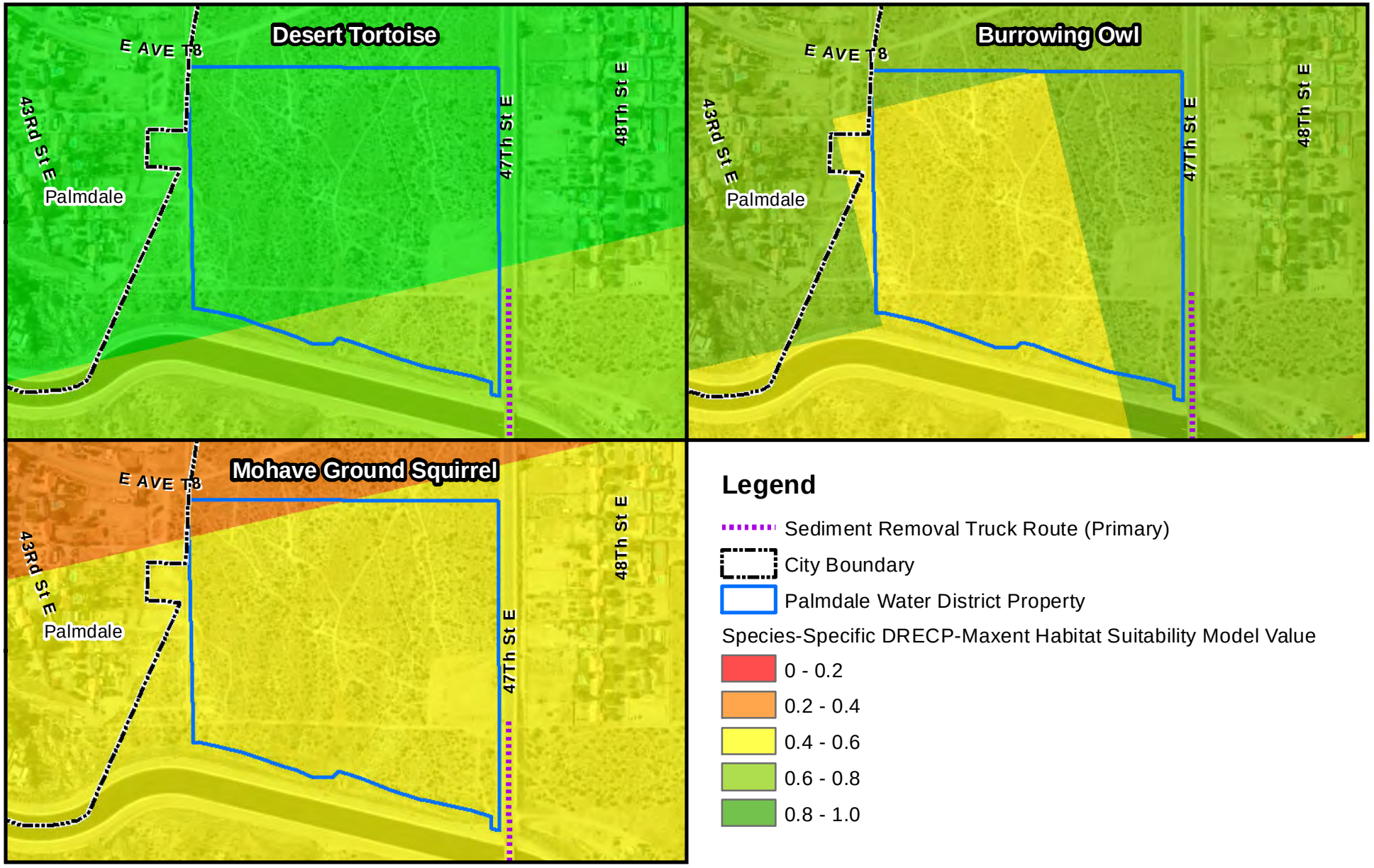
Sediment Removal Truck Route (Primary)
Existing Quarries
Littlerock Reservoir
Palmdale Water District Property
City Boundary
Angeles National Forest Boundary

Project Area and Haul Route Weeds

Littlerock Reservoir Sediment Removal Project

Figure C.3-8

May 2016



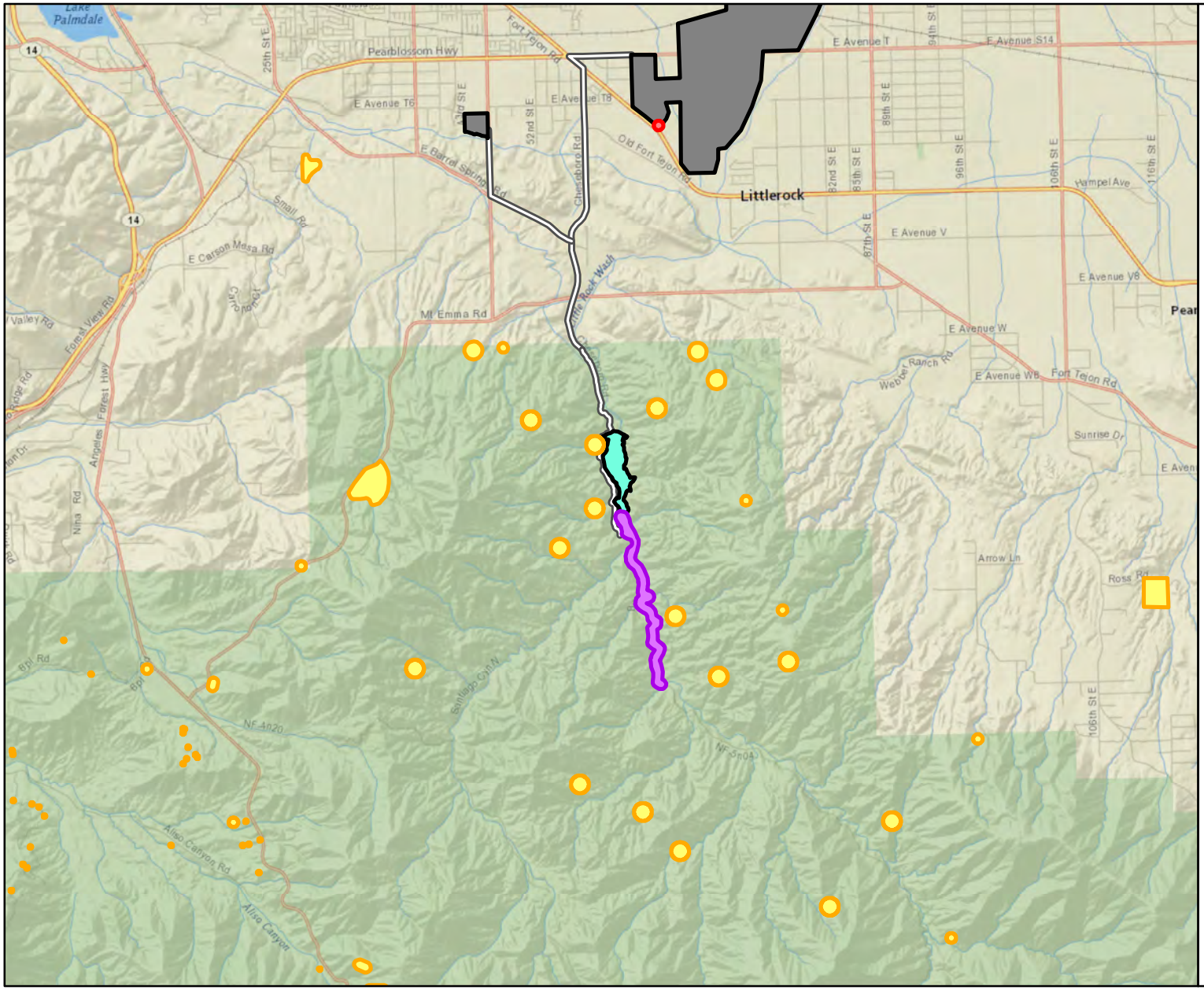
0 500 1,000 Feet

47th Street Sediment Storage Site
DRECP Modelled Habitat

Littlerock Reservoir Sediment Removal Project

Figure C.3-9

May 2016



Sediment Removal Haul Route

Littlerock Reservoir

Sediment Disposal Sites

Angeles National Forest

CNDDB-recorded Occurrence

Sagebrush loeflingia

Short-joint beavertail

White pygmy-poppy

Source: USFWS CNDDB February 2016

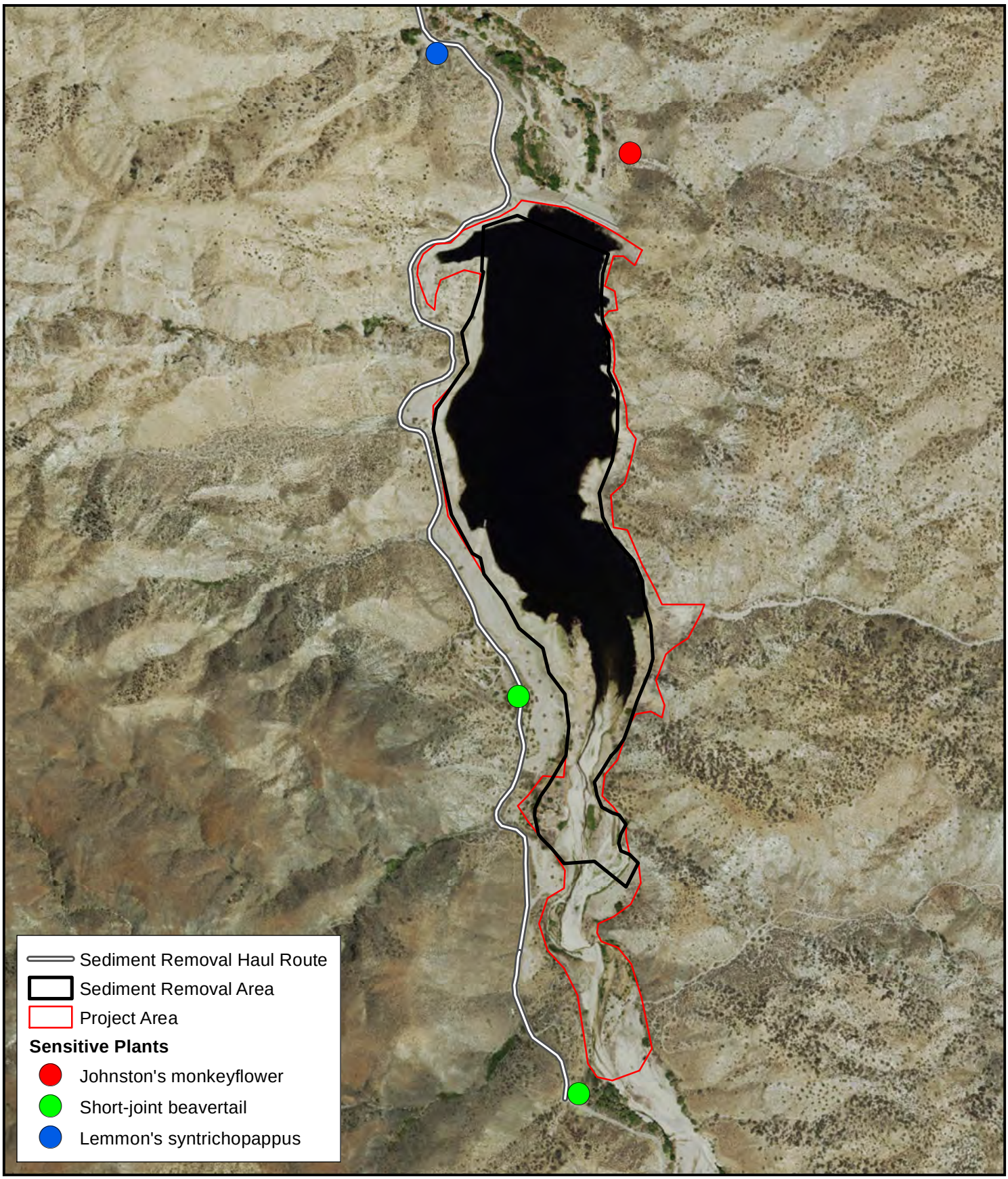
0 1.5 3 Miles

Special-Status Plant Species CNDDB

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.3-10a

May 2016



0 500 1,000 Feet

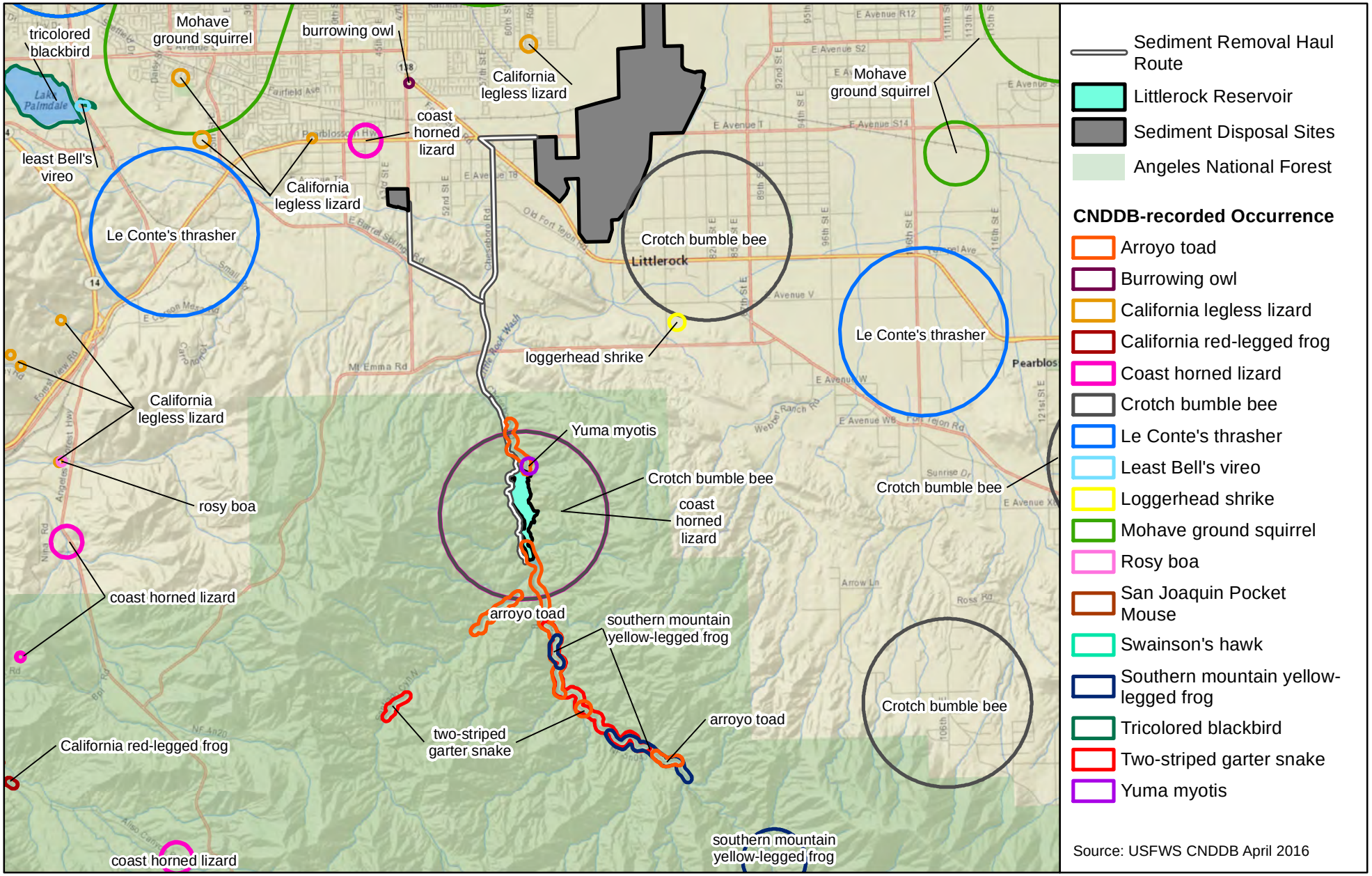
Special-Status Plants Survey Results

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-10b

May 2016

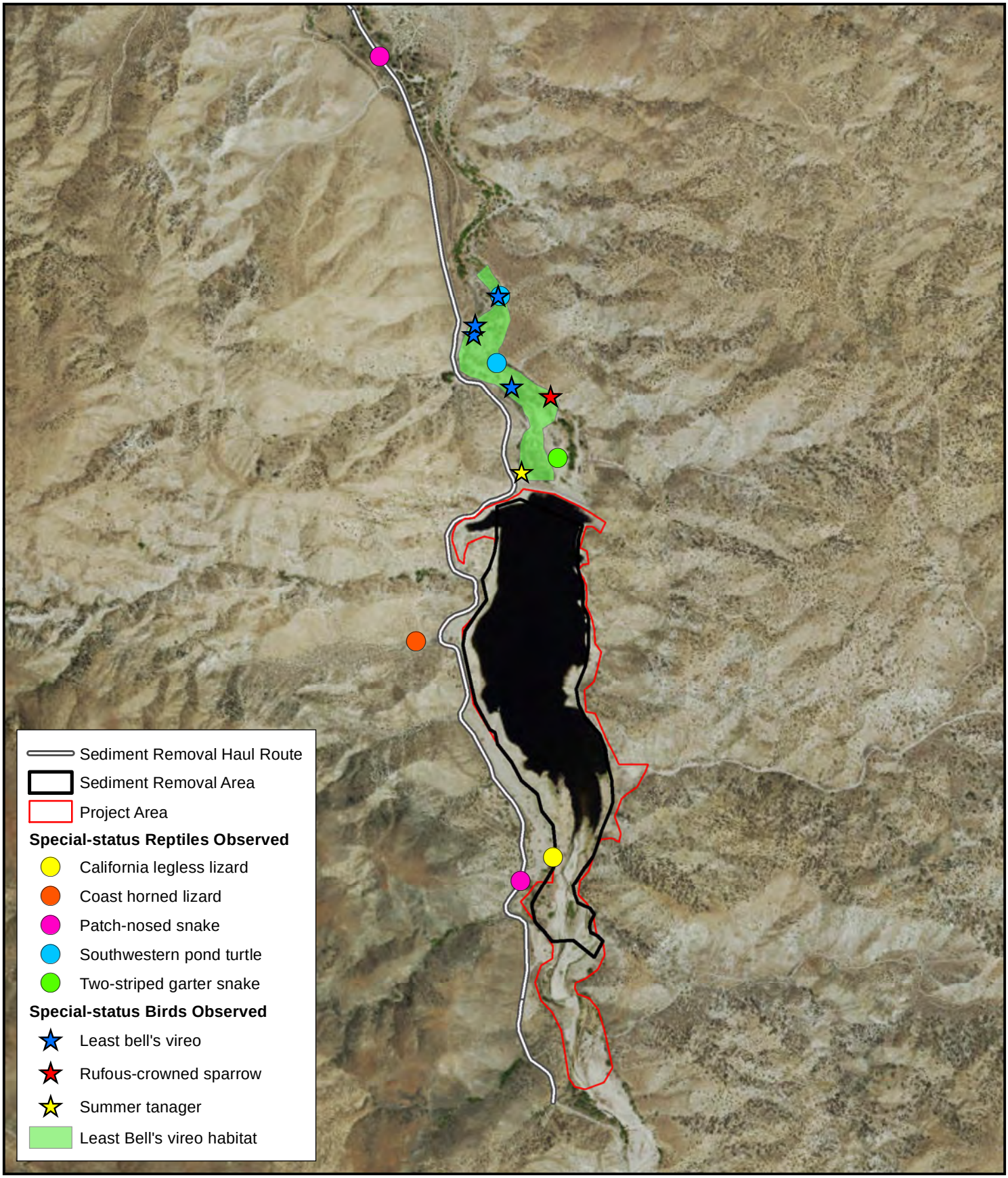


Special-Status Animal Species CNDDB

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.3-11a

May 2016



0 750 1,500 Feet

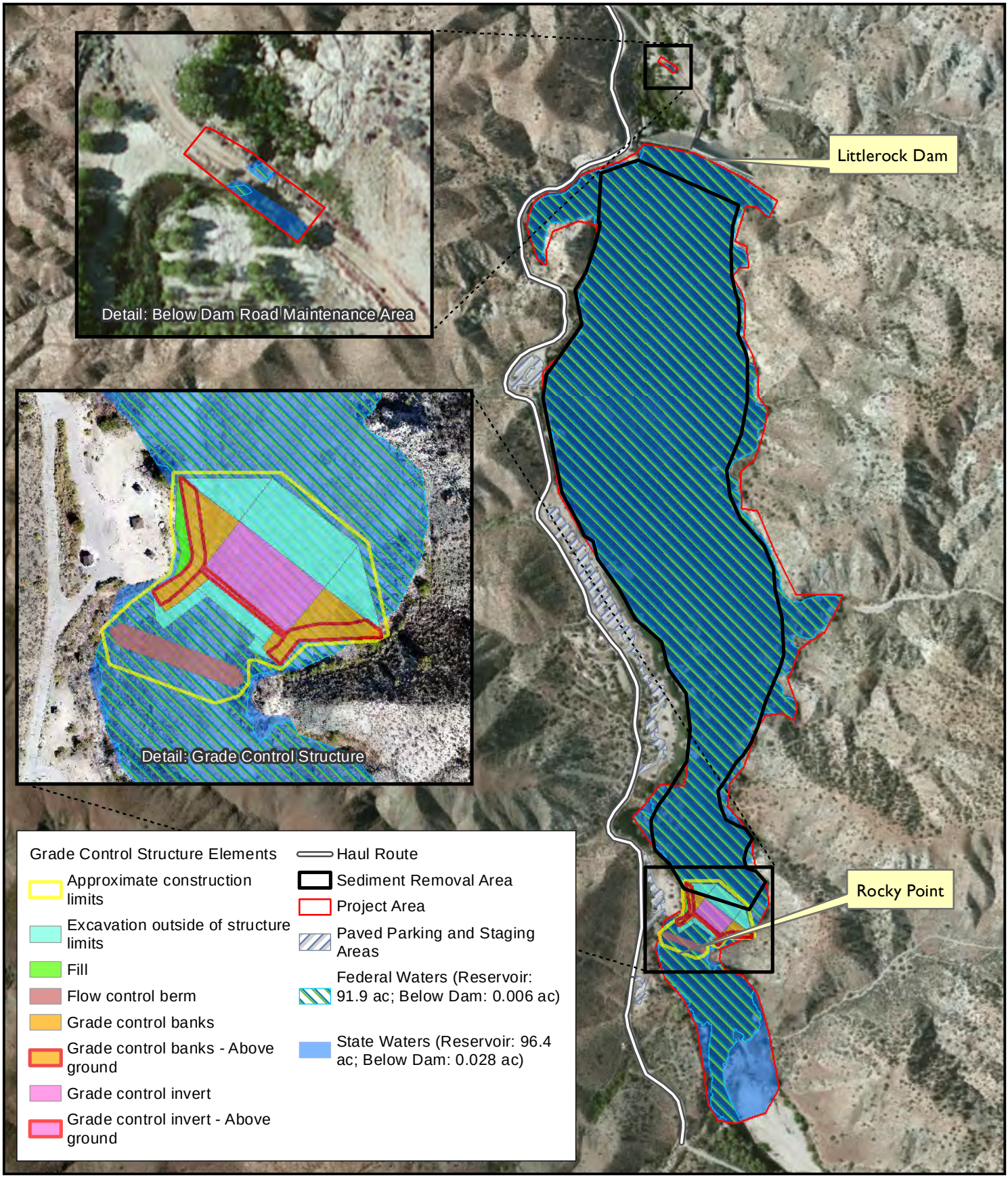
Special-Status Animals Survey Results

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-11b

May 2016



0 500 1,000 Feet

Potentially Jurisdictional Features in Littlerock Reservoir

Littlerock Reservoir Sediment Removal Project

Figure C.3-12a

May 2016



0 225 450 Feet

47th Street Sediment Storage Site
Potentially Jurisdictional Drainages

Littlerock Reservoir Sediment Removal Project

Figure C.3-12b

May 2016



N

0 500 1,000 Feet

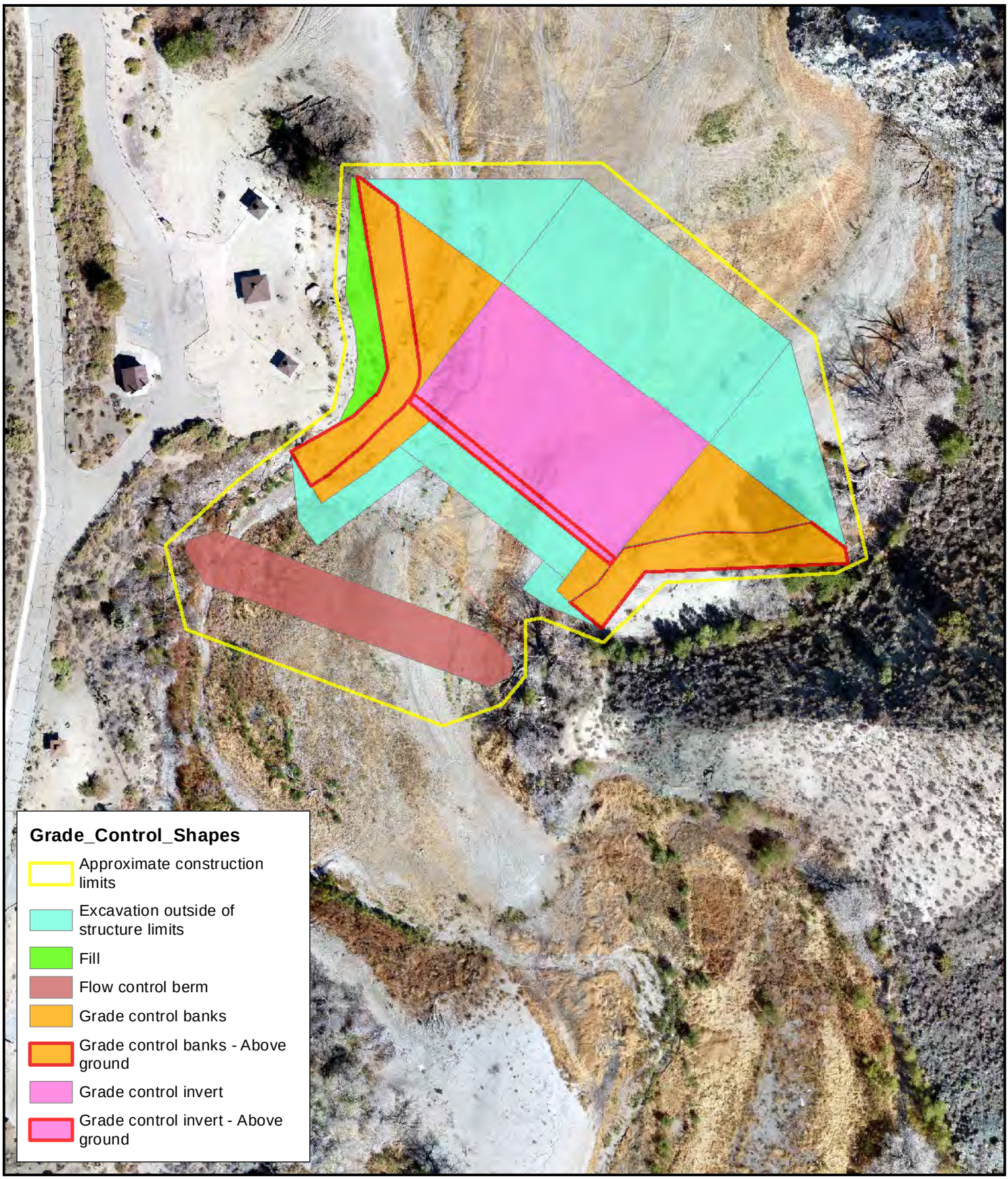
Littlerock Reservoir Sediment Removal Area

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-13

May 2016



0 75 150 Feet

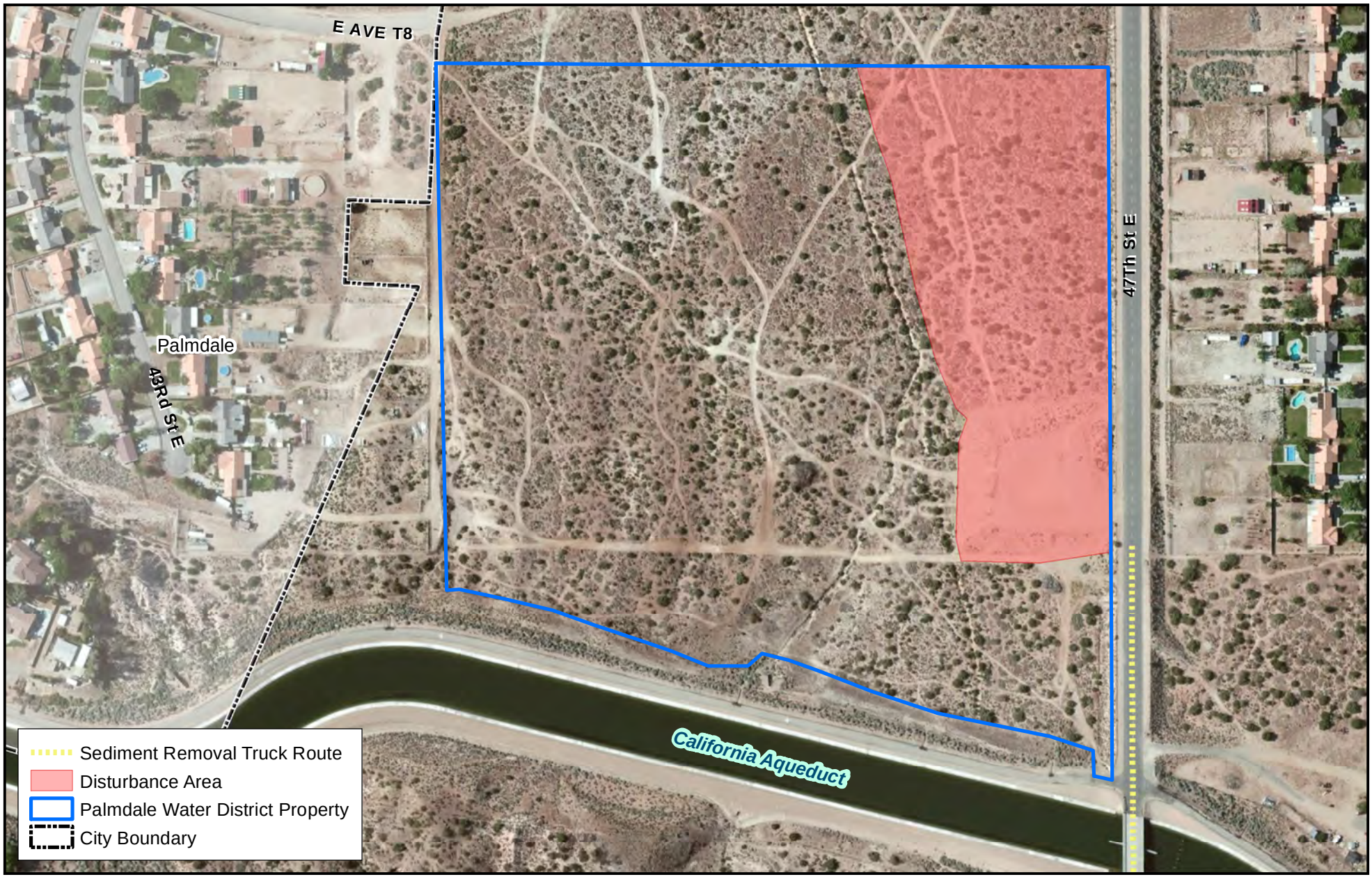
Rocky Point
Grade Control Structure

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame).

Littlerock Reservoir Sediment Removal Project

Figure C.3-14

May 2016



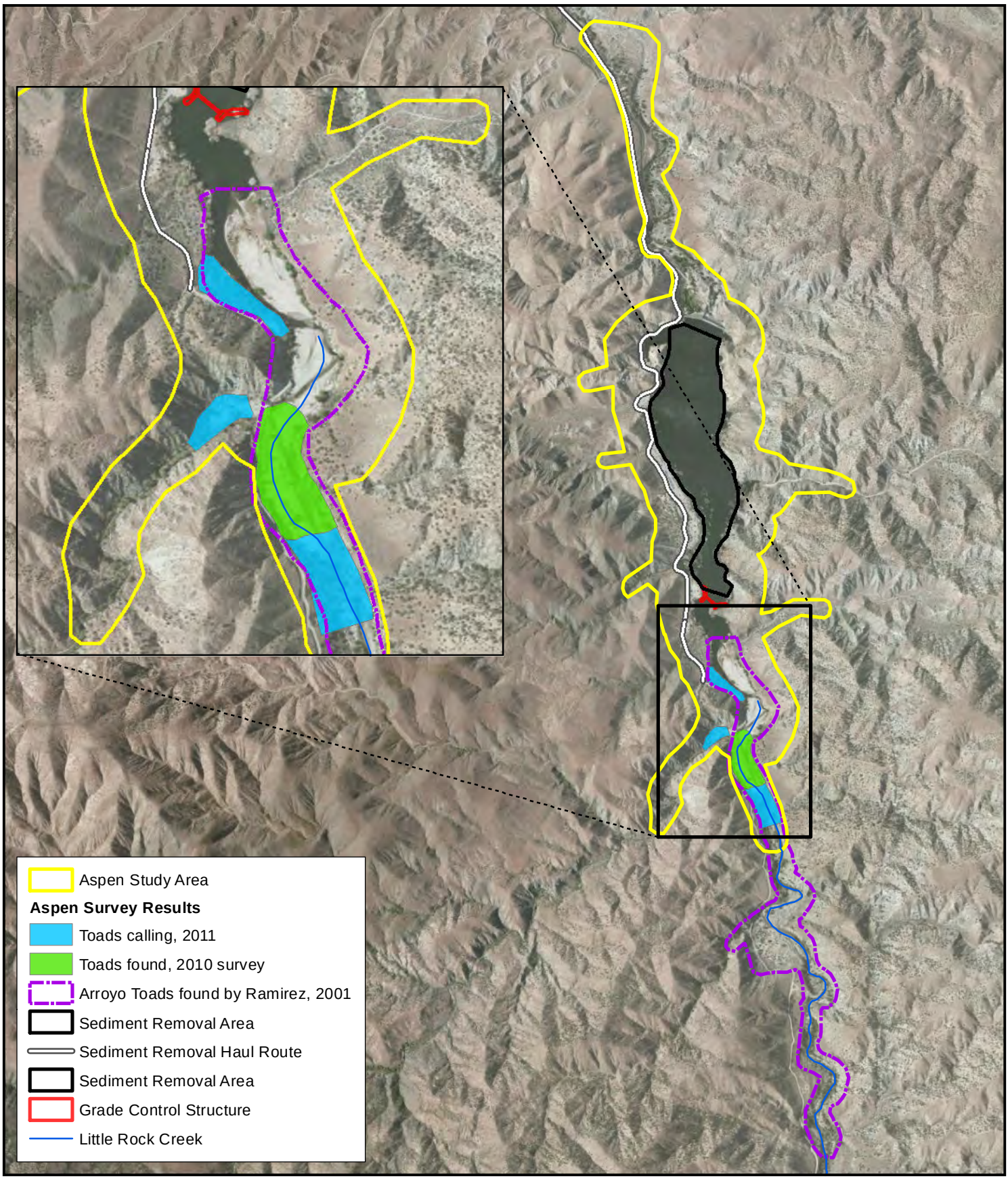
0 225 450 Feet

47th Street Sediment Storage Site
Disturbance Area

Littlerock Reservoir Sediment Removal Project

Figure C.3-15

May 2016



0 0.25 0.5 Miles

Arroyo Toad Survey Results

Littlerock Reservoir Sediment Removal Project

Figure C.3-16

May 2016

C.4 Cultural Resources

A cultural resource is defined as any object or specific location of past human activity, occupation, or use, identifiable through historical documentation, inventory, or oral evidence. Cultural resources can be separated into three categories: archaeological, built environment, and traditional cultural resources.

Archaeological resources include both prehistoric and historical remains of human activity. Historical archaeological resources can consist of structural remains (such as cement foundations), historical objects (such as bottles and cans), and sites (such as trash deposits or scatters). Prehistoric archaeological resources can include lithic scatters, ceramic scatters, quarries, habitation sites, temporary camps/rock rings, ceremonial sites, and trails.

Built environment resources can include buildings, structures (e.g., canals, roads, bridges, and dams), and objects (e.g., boundary markers and monuments).

A traditional cultural resource or traditional cultural property (TCP) can include Native American sacred sites (such as rock art sites) and traditional resources or ethnic communities important for maintaining the cultural traditions of any group.

C.4.1 Affected Environment

C.4.1.1 Regional Setting and Approach to Data Collection

For the purposes of cultural resources, the Project Study Area includes the Littlerock Reservoir (Reservoir) and two off-site dumping locations (47th Street East property and the Hi-Grade Materials Company property). The Area of Potential Effect (APE) defined for the Project includes all disturbance areas within the Reservoir and the off-site dumping locations (totaling approximately 206 acres).

For the Project, records searches were conducted at the South Central Coastal Information Center (SCCIC) housed at the California State University, Fullerton. Records searches consisted of a review of relevant historic maps, and excavation and survey reports. Site forms for recorded sites within a 0.5-mile radius of the Project APE were copied.

Field surveys were conducted in order to verify the location of any previously identified cultural resources and to inspect lands within the Project APE. Field surveys are useful for identifying above-ground or surface cultural resources and for identifying high-probability areas. However, negative pedestrian survey results do not preclude the possibility that buried archaeological deposits could be discovered. Conejo Archaeological Consultants conducted a pedestrian field survey of the Reservoir in December 2006 (Maki, 2006). Applied EarthWorks, Inc. (Æ) conducted pedestrian field surveys of the two off-site dumping areas in September 2014 (Smallwood, 2014).

C.4.1.2 Prehistoric Background

Prehistoric archaeological sites in California are places where Native Americans lived or carried out activities during the prehistoric period before Europeans arrived in 1769 A.D. These sites contain artifacts and subsistence remains, and they may contain human burials. Artifacts are objects made by people and include tools (such as projectile points, scrapers, and grinding implements), waste products from making stone tools (flakes and debitage), and nonutilitarian or decorative artifacts (beads, ornaments, ceremonial items, and rock art). Subsistence remains include the inedible portions of foods, such as animal bone and shell, and edible parts that were lost and not consumed, such as charred seeds.

Over the past century, archaeologists have generally divided the prehistory of the Western Mojave Desert into five distinct periods or sequences distinguished by specific material (i.e., technological) or cultural traits. Early cultural chronologies were proposed by Amsden (1937), Campbell et al. (1937), and Rogers (1939), that were later adapted by Warren and Crabtree in 1972 (later published in 1986 and further detailed by Warren in 1984), in what many consider to be the most influential cultural sequence proposed for the region. Alternative sequences have since emerged (e.g., Bettinger and Taylor, 1974; Hall, 1993; Yohe, 1992) proposing new nomenclature (e.g., Newberry Period vs. Rose Spring Period vs. Saratoga Springs), slightly adjusted cultural chronologies, or attempting to link the Great Basin chronological framework to the Mojave Desert.

Recently, Sutton et al. (2007:233) proposed a cultural-ecological chronological framework based on climatic periods (e.g., Early Holocene) "to specify spans of calendric time and cultural complexes (e.g., Lake Mojave Complex) to denote specific archaeological manifestations that existed during (and across) those periods." The new sequence draws heavily from Warren and Crabtree (1986) and Warren (1984), as well as from the vast body of recent archaeological research conducted in the region.

Pleistocene (ca. 10000 to 8000 cal B.P.)

The earliest cultural complex recognized in the Mojave Desert is Clovis, aptly named for the fluted projectiles often associated with Pleistocene megafaunal remains. Arguments for pre-Clovis Paleoindian human occupation in the Mojave Desert rely on relatively sparse evidence and unpublished data, although in light of the growing body of evidence suggesting a pre-Clovis occupation of the Americas, the argument cannot simply be ruled out. Paleoindian culture is poorly understood in the region due to a relative dearth of evidence stemming from a handful of isolated fluted point discoveries and one presumed occupation site on the shore of China Lake. Archaeologists tend to interpret the available data as evidence of a highly mobile, sparsely populated hunting society that occupied temporary camps near permanent Pleistocene water sources.

Early Holocene (ca. 8000 to 6000 cal B.P.)

Two archaeological patterns are recognized during the Early Holocene: the Lake Mojave Complex (sometimes referred to as the Western Pluvial Lakes Tradition) and the Pinto Complex. The Lake Mojave Complex is characterized by stemmed projectile points of the Great Basin Series, abundant bifaces, steep-edged unifaces and crescents. Archaeologists have also identified, in less frequency, cobble-core tools and ground stone implements. The Pinto Complex, on the other hand, is distinguished primarily by the presence of Pinto-style projectile points. Although evidence suggests some temporal overlap, the inception of the Pinto Complex is assigned to the latter part of the Early Holocene and is generally considered a Middle Holocene cultural complex.

During this period, the Lake Mojave cultural complex utilized more extensive foraging ranges, as indicated by an increased frequency of faraway materials. Spheres of influence also expanded, as potential long-distance trade networks were established between desert and coastal peoples. Groups were still highly mobile, but they practiced a more forager-like settlement-subsistence strategy. Residential sites indicate more extensive periods of occupation and recurrent use. In addition, residential and temporary sites also indicated a diverse social economy, characterized by discrete workshops and special-use camps (e.g., hunting camps). Diet also appears to have diversified, with a shift away from dependence upon lacustral (lake) environments such as lakeside marshes, to the exploitation of multiple environments containing rich resource patches.

Middle Holocene (ca. 7000 to 3000 cal B.P.)

The Pinto Complex is the primary cultural complex in the Mojave Desert during the Middle Holocene. Once thought to have neatly succeeded the Lake Mojave Complex, a growing corpus of radiocarbon dates associated with Pinto Complex artifacts suggest that its inception could date as far back into the latter part of the Early Holocene. Extensive use of toolstone other than obsidian and high levels of tool blade reworking were characteristic of this complex and the earlier Lake Mojave Complex. A reduction in toolstone source material variability, however, suggests a contraction of foraging ranges that had expanded during the Early Holocene. Conversely, long-distance trade with coastal peoples continued uninterrupted, as indicated by the presence of *Olivella* shell beads.

The most distinguishing characteristic of the Pinto Complex is the prevalence of ground stone tools, which are abundant in nearly all identified Pinto Complex sites. The emphasis on milling tools indicates greater diversification of the subsistence economy during the Middle Holocene. Groups increased reliance on plant processing while continuing to supplement their diet with protein from small and large game animals.

Late Holocene (ca. 2000 cal B.P. to Contact)

The Late Holocene in the greater Southern California region is characterized by increases in population, higher degrees of sedentism, expanding spheres of influence, and greater degrees of cultural complexity. In the Mojave Desert, the Late Holocene is divided into several cultural complexes; namely the Gypsum Complex (2000 cal B.C. to cal A.D. 200), the Rose Spring Complex (cal A.D. 200 to 1100), and the Late Prehistoric Complexes (cal A.D. 1100 to contact).

The Gypsum Complex is defined by the presence of side-notched (Elko series), concave-based (Humboldt series), and well-shouldered contracting stem (Gypsum series) projectile points. Other indicative artifacts include quartz crystals, paint, rock art, and twig figures, which are generally associated with ritual activities.

The Rose Spring Complex can also be defined by the presence of distinct projectile points (i.e., Rose Spring and Eastgate series) and artifacts, including stone knives, drills, pipes, bone awls, milling implements, marine shell ornaments, and large quantities of obsidian. Of greater significance, however, are the characteristic advancements in technology, settlement strategies, and evidence for expanding and diverging trade networks. The Rose Spring Complex marks the introduction of the bow and arrow weapon system to the Mojave Desert, likely from neighboring groups to the north and east. As populations increased, groups began to consolidate into larger, more sedentary residential settlements as indicated by the presence of well-developed middens (food refuse heaps) and architecture. West and north of the Mojave River, increased trade activity along existing exchange networks ushered in a period of relative material wealth, exhibited by increased frequencies of marine shell ornaments and toolstone, procured almost exclusively from the Coso obsidian source. East and south of the Mojave River, archaeological evidence suggests there was a greater influence from Southwest and Colorado River cultures (i.e., Hakataya and Patayan).

Between approximately A.D. 1100 and contact, a number of cultural complexes emerged that archaeologists believe may represent prehistoric correlates of known ethnographic groups. During the Late Prehistoric Cultural Complex, material distinctions between groups were more apparent, as displayed by the distribution of projectile point styles (e.g., Cottonwood vs. Desert Side-notched), ceramics, and lithic materials. Long-distance trade continued, benefiting those occupying “middleman” village sites along the Mojave River where abundant shell beads and ornaments, and lithic tools were

recovered from archaeological contexts (Rector et al., 1983). Later on, however, trade in Coso obsidian was significantly reduced as groups shifted focus to the procurement of local silicate stone.

C.4.1.3 Ethnographic Background

Tataviam

The Tataviam, which translates to "people who face the sun," are a Native American group that resided in and around the area encompassing the Project region. They belong to the family of Serrano people who migrated down into the Antelope, Santa Clarita, and San Fernando valleys sometime before 450 A.D. They settled into the upper Santa Clara River Drainage. Some Tataviam settlements in the Santa Clarita and upper valleys were Nuhubit (Newhall); Piru-U-Bit (Piru); Tochonanga, which is believed to have been located at the confluence of Wiley and Towsley Canyons; and the very large village of Chaguibit, the center of which is buried under the Rye Canyon exit of Interstate-5. The Tataviam also lived where Saugus, Agua Dulce, and Lake Elizabeth are located today. This places the Serrano among the larger "Shoshonean" migration into Southern California that occurred 2,000 to 3,000 years ago (Higgins, 1996).

Although primarily living on the upper reaches of the Santa Clara River drainage system, east of Piru Creek, the Tataviam also marginally inhabited the upper San Fernando Valley, including present day San Fernando and Sylmar (which they shared with their inland Tongva/Gabrieleño neighbors). The Tataviam were hunters and gatherers who prepared their foodstuffs in much the same way as their neighbors did. Their primary foods included yucca, acorns, juniper berries, sage seeds, deer, the occasional antelope, and smaller game such as rabbits and ground squirrels. There is no information regarding Tataviam social organization, though information from neighboring groups shows similarities among Tataviam, Chumash, and Gabrieleño ritual practices. Like their Chumash neighbors, the Tataviam practiced an annual mourning ceremony in late summer or early fall which would have been conducted in a circular structure made of reeds or branches. At first contact with the Spanish in the late eighteenth century, the population of this group was estimated at fewer than 1,000 persons. However, this ethnographic estimate of the entire population is unlikely to be accurate, since it is based only on one small village complex and cannot necessarily be indicative of the entire population of Tataviam. Given the archaeological evidence at various Tataviam sites, as well as the numbers incorporated into the Spanish Missions, pre-contact population and early contact population easily exceeded 1,000 persons (Blackburn, 1962; Johnston, 1962).

Kitanemuk

The Kitanemuk belonged to the northern section of the people known as the "Serrano." The name, "Serrano," however, is merely a generic term meaning "mountaineers" or "those of the Sierras." Ethnographers group the Kitanemuk with the Serrano based on linguistic similarities though the Kitanemuk did not identify themselves as Serrano. They lived on the upper Tejon and Paso creeks and also held the streams on the northern extent of the Tehachapi Mountains, the small creeks draining the northern slope of the Liebre and Sawmill Range, with Antelope Valley and the westernmost part of the Mojave Desert. The extent of their territorial claims in the desert region is not certain.

The Kitanemuk lived in permanent winter villages of 50 to 80 people or more. During the late spring, summer, and fall months they dispersed into smaller, highly mobile gathering groups. They followed a seasonal round, visiting different environmental regions as the important food producing plants became ready for harvest. Some staple foods important to the Kitanemuk include acorns and piñon pine nuts, yucca, elderberries, and mesquite beans were available as well (Duff, 2004).

While traveling in the Antelope Valley in 1776, Spanish explorer and Franciscan priest, Francisco Garcés, encountered the Kitanemuk living in communal tule houses. His written account describes the dwellings as consisting of a series of individual rooms surrounding a central courtyard. Each room housed a family and its own door and hearth. Garcés also relates that the Kitanemuk had extensive trade relations with sometimes distant groups. For example, he writes that the Kitanemuk traded with the "Canal" (Chumash of the Santa Barbara Channel region) and describes wooden vessels with inlays of *Haliotis* that bore stylistic similarities to decorations found on the handles of Chumash knives and other objects (Kroeber, 1925).

C.4.1.4 Historical Background

Antelope Valley

The Antelope Valley is a 3,000-square-mile-high desert closed basin that straddles northern Los Angeles County and southern Kern County. The Antelope Valley was a trade route for Native Americans traveling from Arizona and New Mexico to California's coast. Exploration began in the early 1770s, but it was not until the 1840s that the Valley was first settled permanently. The 1854 establishment of the Fort Tejon military post near Castaic Lake and Grapevine Canyon created a gateway for Antelope Valley traffic (Antelope Valley Community History, 2010).

During the nineteenth century, gold mining at the town of Acton and cattle ranching contributed to the growth of Antelope Valley. When news broke that gold was discovered in the Soledad Canyon (located in between Palmdale and Santa Clarita), a number of miners arrived and set up various mining camps near the canyon's rich mineral and silver discoveries. The area grew to the point that a post office was needed. The U.S. Postal Service rejected the area's informal name of "Soledad City" to avoid confusion with Soledad in Monterey County. The city was named "Ravenna" in honor of a local merchant and saloon keeper, Manuel Ravenna. Ravenna became a shipping point from which the canyon's gold, silver and copper ores were hauled off to port in San Pedro. Metal and ore products were first transported out of the area using freight wagons drawn by oxen or mules; this mode of transportation was replaced in 1876 with the completion of the Southern Pacific Railroad through the Antelope Valley. Ravenna became a ghost town shortly thereafter, as the miners moved up the canyon to new rail sidings where Acton now stands (City of Acton, 2010).

The Butterfield mail station, the Los Angeles to San Francisco telegraph line, and the Southern Pacific Railroad brought people and communication through the Valley during the 1860s and 1870s. Antelope Valley produced alfalfa and grain for some time until several dry years ensued. Mining near Acton helped residents sustain during the drought between 1874 and the Great Depression of the 1930s. By 1897 nearly everyone had left the Valley. Mining continues in and around the Antelope Valley today (County of Los Angeles, 1986).

City of Palmdale

The Antelope Valley, where the Project APE is located, was settled once the Southern Pacific Railroad line between San Francisco and Los Angeles was completed in 1876. The region was dependent on stock raising, dry farming, and fruit orchards. The origins of the city of Palmdale are in two early communities: Harold and Palmenthal. Harold (also known as Alpine Station) was at the intersection of the Southern Pacific Railroad tracks and Fort Tejon Road (now Barrel Springs Road). Palmenthal was settled in 1886 by approximately 55 Swiss and German families, mostly from Nebraska and Illinois. The name is supposedly from the settlers' misidentification of the Joshua trees (City of Palmdale, 2009). A drought in the 1890s stifled growth. In 1899, residents from Harold and Palmenthal relocated to a new site, which became Palmdale, near the railroad station and the stagecoach line between San Francisco and New Orleans.

In 1895, the Harold Reservoir, now known as Palmdale Lake, was formed after the South Antelope Valley Irrigation Company constructed an earthen dam. A wooden ditch, flume, and wooden trestle were constructed at the same time to connect Little Rock Creek to the reservoir. The primary purpose of the reservoir was to supply water for agriculture in the area. Beginning in the 1950s, the reservoir's water was also used to supply residences. The Palmdale Irrigation District agreed to purchase water from the then-new East Branch of the California Aqueduct in 1963. Subsequently, the lake was expanded to contain the increased water supply, and a new treatment facility adjacent to the lake was built (Palmdale Water District, 2009).

In 1917, electricity was introduced in the area, and deep wells were constructed to provide a steady water supply. In 1912 and 1913, the construction of the Los Angeles Aqueduct attracted workers to the area. In 1919, a bond issue passed to construct the Littlerock Dam, which is approximately 11 miles southeast of Palmdale within the Angeles National Forest (Los Angeles County Department of Regional Planning, 2009:6).

Beginning in the 1930s, the aerospace industry contributed toward the development of Palmdale. The establishment of Muroc Air Base (now Edwards Air Force Base) in 1933 caused the population of the Antelope Valley to double. In addition, the Palmdale Airport was built in 1940. In 1950, the Federal Government took over the airport for a jet testing facility and renamed it U.S. Air Force Plant 42 (Los Angeles County Department of Regional Planning, 2009:6). The Skunk Works, an alias for Lockheed Martin's group that develops extremely confidential and advanced products, primarily for the U.S. military, is located at Air Force Plant 42. The Skunk Works was formed in 1943 and led by Clarence L. "Kelly" Johnson to create the airframe for the XP-80, a powerful jet designed to answer the German jet threat during World War II. Over the years, the Skunk Works has designed many more famous aircraft designs for the U.S. military (Lockheed Martin, 2009).

C.4.1.5 Littlerock Reservoir

The Littlerock Reservoir contains no previously recorded cultural resources. In addition, no cultural resources were identified within this portion of the Project APE during the pedestrian survey.

C.4.1.6 47th Street East Property

The 47th Street East Property contains one previously recorded cultural resource (P-19-002475/CA-LAN-2475H). Documented in 1996, P-19-002475 consists of a historic-era metal can scatter dating to the late 1930s and early 1940s. In addition to rusted metal cans, it also contained fragments of bottle glass, chinaware sherds, iron pipe, metal scrap, barrel hoops, nails, and spent ammunition cartridges. During the pedestrian survey of the Project APE, no evidence of this site was observed. The area where the site was located appears to have been graded in recent years. This resource is no longer extant. No other cultural resources were identified within this portion of the Project APE during the pedestrian survey.

C.4.1.7 Hi-Grade Materials Company Property

The Hi-Grade Materials Company Property contains no previously recorded cultural resources. In addition, no cultural resources were identified within this portion of the Project APE during the pedestrian survey.

C.4.2 Regulatory Framework

This section provides an overview of the regulatory framework for cultural resources. Section C.9 (Recreation and Land Use) contains an evaluation of policies within the Forest Service Land Management Plan that are applicable to cultural resources.

C.4.2.1 Federal

- **National Historic Preservation Act (NHPA).** Under the NHPA of 1966, the Project is considered a federally licensed "undertaking" per 36 CFR § 800.2 (o) and subject to compliance with Section 106 of the NHPA of 1966, as amended. Under these guidelines, federal agencies are required to identify cultural resources that may be affected by project actions, assess the significance of these resources and their eligibility for inclusion on the National Register of Historic Places (NRHP) as per 16 USC 470w (5), and consult with the Advisory Council on Historic Preservation (ACHP) regarding project effects on significant resources. Eligibility is based on criteria defined by the Department of the Interior. Generally, districts, archaeological sites, buildings, structures, and objects that possess integrity are potentially eligible for inclusion on the NRHP under the following criteria:

  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 (36 CFR § 60.4).

  If a cultural resource is determined to be an eligible historic property under 36 CFR § 60.4, then Section 106 requires that the effects of the proposed undertaking be assessed and considered in planning the undertaking. According to 36 CFR § 800.3 (Regulations of the Advisory Council on Historic Preservation Governing the Section 106 Review Process), the lead agency, State Historic Preservation Office (SHPO), and Council must consider the special concerns of Indian tribes in historic preservation issues, and must allow tribes to participate as "interested persons" regarding properties of historic value to an Indian tribe on non-Indian lands.

- **Native American Graves Protection and Repatriation Act (NAGPRA).** The NAGPRA was enacted on November 16, 1990, to address the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to Native American cultural items, including human remains, funerary objects, sacred objects, and objects of cultural patrimony. NAGPRA assigned implementation responsibilities to the Secretary of the Interior. If human remains are encountered on Federal lands, NAGPRA states that the responsible Federal official must be notified immediately and that no further disturbance shall occur in the area until clearance is given by the responsible Federal official (43 C.F.R. § 10.4). If the remains are determined to be Native American Indian, the Federal agency would then notify the appropriate federally recognized Native American tribe and initiate consultation.

- **Archeological Resources Protection Act (ARPA).** If federal or Indian lands are involved, the ARPA may impose additional requirements on an agency. ARPA: (1) Prohibits unauthorized excavation on federal and Indian lands; (2) Establishes standards for permissible excavation; (3) Prescribes civil and criminal penalties; (4) Requires agencies to identify archeological sites; and (5) Encourages cooperation between federal agencies and private individuals.

- **Antiquities Act of 1906.** The Antiquities Act of 1906 states, in part: That any person who shall appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall upon conviction, be fined in a sum of not more than five

hundred dollars or be imprisoned for a period of not more than 90 days, or shall suffer both fine and imprisonment, in the discretion of the court.

C.4.2.2 State

- **California Environmental Quality Act.** Cultural resource management work conducted as part of the Project is to comply with CEQA Statute and Guidelines, which direct lead agencies to first determine whether cultural resources are "historically significant" resources. CEQA requires that impacts that a project may have on cultural resources be assessed and requires mitigation if significant (or "unique") cultural resources are to be impacted (Section 21083.2 [a-1] and Appendix K). Generally, a cultural resource is considered "historically significant" if the resource is 45 years old or older, possesses integrity of location, design, setting, materials, workmanship, feeling, and association, and meets the requirements for listing on the California Register of Historical Resources (CRHR) under any one of the following criteria:

  1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
  2. Is associated with the lives of persons important in our past;
  3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
  4. Has yielded, or may be likely to yield, information important in prehistory or history (Title 14 CCR, § 15064.5).

The statutes and guidelines specify how cultural resources are to be managed in the context of projects, such as the Project. Briefly, archival and field surveys must be conducted, and identified cultural resources must be inventoried and evaluated in prescribed ways. Prehistoric and historical archaeological resources, as well as built environment resources such as standing buildings, structures, and objects, deemed "historically significant" must be considered in project planning and development. Additionally, any Project that may affect "historically significant" cultural resources must be submitted to the SHPO for review and comment prior to project approval by the responsible agency and prior to construction.

If a Lead Agency determines that an archaeological site is a historical resource, the provisions of California Public Resources Code (CPRC) §21084.1 and CEQA Guidelines §15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site is to be treated in accordance with the provisions of PRC §21083 regarding unique archaeological resources. The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of a project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines §15064[c][4]).

If human remains of any kind are found during construction activities, CEQA Guidelines Section 15064.5(e) and Assembly Bill 2641 are to be followed. These require that all construction activities cease immediately and the County Coroner and a qualified archaeologist must be notified. The coroner would examine the remains and determine the next appropriate action based on his or her findings. If the coroner determines the remains to be of Native American origin, the Native American Heritage Commission (NAHC) must be notified. The NAHC would then identify a most-likely descendant to be consulted regarding treatment and/or reburial of the remains.

- **Native American Heritage Commission (Public Resources Code Sections 15064.5(e) and 15064.5(d), et seq.).** This code requires that excavation activities be stopped whenever human remains are uncovered and that the County coroner be called in to assess the remains. If the County coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours. At that time, the lead agency must consult with the appropriate Native Americans as identified by the Native American Heritage Commission and the lead agency, under certain circumstances, should develop an agreement with the Native Americans for the treatment and disposition of the remains.

C.4.2.3 Local

- **County of Los Angeles General Plan.** The County of Los Angeles General Plan has the following policies regarding cultural resources:
  - Policy C/NR 14.1: Mitigate all impacts from new development on or adjacent to historic, cultural, and paleontological resources to the greatest extent feasible.
  - Policy C/NR 14.2: Support an inter-jurisdictional collaborative system that protects and enhances historic, cultural, and paleontological resources.
  - Policy C/NR 14.3: Support the preservation and rehabilitation of historic buildings.
  - Policy C/NR 14.4: Ensure proper notification procedures to Native American tribes in accordance with Senate Bill 18 (2004).
  - Policy C/NR 14.5: Promote public awareness of historic, cultural, and paleontological resources.
  - Policy C/NR 14.6: Ensure proper notification and recovery processes are carried out for development on or near historic, cultural, and paleontological resources.
- **City of Palmdale General Plan.** The City of Palmdale General Plan has an objective to promote the identification and preservation of historical structures, historical sites, archaeological sites, and paleontological resources in the City. The following policies would protect historical and culturally significant resources that contribute to the community's sense of history:
  - Policy ER7.1.1: Identify and recognize historic landmarks from Palmdale's past.
  - Policy ER7.1.2: Promote maintenance, rehabilitation, and appropriate reuse of identified landmarks where feasible.
  - Policy ER7.1.3: Require that new development protect significant historic, paleontological, or archaeological resources, or provide for other appropriate mitigation.
  - Policy ER7.1.4: Develop and maintain a cultural sensitivity map. Require special studies/surveys to be prepared for any development proposals in areas reasonably suspected of containing cultural resources, or as indicated on the sensitivity map.
  - Policy ER7.1.5: When human remains, suspected to be of Native American origin are discovered, cooperate with the Native American Heritage Commission and any local Native American groups to determine the most appropriate disposition of the human remains and any associated grave goods.
  - Policy ER7.1.6: Cooperate with private and public entities whose goals are to protect and preserve historic landmarks and important cultural resources.

C.4.3 Issues Identified During Scoping

Table C.4-1 below provides a list of cultural resource issues raised during the public scoping period for the EIS/EIR [see Appendix E (Summary of Scoping Process)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion of the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.4-1. Scoping Issues Relevant to Cultural Resources

Comment	Consideration in the EIS/EIR
Fernandeno Tataviam Band of Mission Indians	
The Project would break ground in traditional Tataviam tribal lands and may disturb culturally sensitive deposits.	As noted in Section C.4.4, Impact Assessment Methodology, no archaeologically sensitive areas were identified within the Project area. In addition, should culturally sensitive deposits be encountered during Project construction, SPC CUL-2 provides for treatment of previously unidentified cultural resources and SPC CUL-3 provides for treatment of human remains if encountered during construction.
Native American Heritage Commission	
The Project must adequately comply with CEQA guidelines §15064.5(b) and mitigate Project-related impacts on archaeological resources.	As noted in Section C.4.2, Regulatory Framework, the Project would comply with all state and federal guidelines regarding cultural resources.
Include in the mitigation plans provisions for the identification and evaluation of accidentally discovered archaeological resources, pursuant to CEQA §15064.5(f).	Mitigation Measure C-1b, as noted in Section C.4.4, Environmental Consequences, provides for treatment of previously unidentified cultural resources.
In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.	As noted in Section C.4.4, Impact Assessment Methodology, no archaeologically sensitive areas were identified within the Project area.
California Public Resources Code §21083.2 requires documentation and analysis of archaeological items that meet the standard in §15064.5 (a)(b)(f).	As noted in Section C.4.2, Regulatory Framework, the Project would comply with all state and federal guidelines regarding cultural resources.
If there is federal jurisdiction of this project due to funding or regulatory provisions, then consultation may be required with culturally affiliated Native American tribes to determine if the Project may have an adverse impact on cultural resources per NEPA 42 USC 4321-43351, §106 of the National Historic Preservation Act (16 USC 470 et seq.), and 36 CFR Part 800.14(b).	As noted in Section C.4.2, Regulatory Framework, the Project would comply with all state and federal guidelines regarding cultural resources.
Coordinate, as feasible, additional archaeological activity with the Native American Heritage Commission (NAHC), and submit the final report (including site forms, site significance and mitigation measures) to the NAHC planning department. Any information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure pursuant to California Government Code §6254.10.	PWD would coordinate and communicate with the NAHC regarding archaeological activity as appropriate. In addition, all confidential information would be placed in an appendix and not made available for public disclosure.
A list of appropriate Native American Contacts for consultation concerning the project site has been provided and is attached to this letter to determine if the proposed active might impinge on any cultural resources.	Consultation with Native American tribes in the area was conducted during the public scoping period.

Table C.4-1. Scoping Issues Relevant to Cultural Resources	
Comment	Consideration in the EIS/EIR
Consider first, avoidance for sacred and/or historical sites, pursuant to CEQA Guidelines §15370(a). If the Project goes forward, mitigation and monitoring plans should include provisions for the analysis and disposition of recovered artifacts, pursuant to California Public Resources Code §21083.2 in consultation with culturally affiliated Native Americans.	SPC CUL-2, as noted in Section C.4.4, Environmental Consequences, provides for treatment of previously unidentified cultural resources.
Include provisions for discovery of Native American human remains in mitigation plans. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandate the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.	SPC CUL-3, as noted in Section C.4.4, Environmental Consequences, provides for treatment of human remains if encountered during construction.

C.4.4 Environmental Consequences

Impact Assessment Methodology. The cultural resource literature and records searches for the Littlerock Reservoir indicated that 22 archaeological surveys have been conducted within a 0.5-mile radius of the Littlerock Reservoir. None of these previous studies involved the Project. This search also noted 14 cultural resources within a one-mile radius of the Littlerock Reservoir. None of these previously documented resources are within the Project APE. Finally, no cultural resources were identified during the intensive archaeological survey of the Littlerock Reservoir.

The cultural resources literature and records search for the off-site dumping locations (47th Street East property and the Hi-Grade Materials Company property) indicated that 37 cultural resource studies have been conducted previously within a one-mile radius of the off-site dumping locations. Of these, three studies included various portions of the Project APE. The records search also noted 20 previously documented cultural resources within a one-mile radius of the off-site dumping locations. One of these resources, a historic-era can dump (P-19-002475/CA-LAN-2475H), was identified within the 47th Street East property. The intensive archaeological survey of the off-site dumping locations found no evidence of this site. In addition, the area where the site was documented appeared to have been graded in recent years. Finally, no newly identified cultural resources were observed during the pedestrian survey of the off-site dumping locations.

Information gathered from the cultural resource literature, records searches, and field surveys was also used to assess the potential for encountering previously unrecorded cultural resources in the Project APE.

Significance Criteria. The following significance criteria for cultural resources were derived from the CEQA Guidelines Appendix G. Impacts of the proposed action/project or alternatives would be considered significant and would require mitigation if:

- Criterion CR1: The Project would cause a substantial adverse change in the significance of a cultural resource.
- Criterion CR2: The Project could disturb human remains, including those interred outside of formal cemeteries.

Direct Impacts under CEQA and NEPA. Direct impacts to cultural resources are those associated with project development, construction, and co-existence. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from

the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historical built-environment resources when those buildings or structures must be removed to make way for new buildings or structures or when the vibrations of construction impair the stability of historical buildings or structures nearby. New buildings or structures can have direct impacts on historical built environment resources when the new buildings or structures are stylistically incompatible with their neighbors and the setting, or when the new buildings or structures produce a harmful effect to the materials or structural integrity of the historical built environment resources, such as emissions or vibrations.

Indirect Impacts under CEQA and NEPA. Generally speaking, indirect impacts to archaeological resources are those that may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historical built environment resources can suffer indirect impacts when project construction creates potentially damaging noise and vibration, improved accessibility and vandalism, or greater weather exposure. It should also be noted that NEPA requires the consideration of effects to both NRHP-eligible cultural resources (identified through the Section 106 process), as well as effects to resources that may not be eligible. This includes consideration of cultural resources identified through the consultation process.

Adverse Effects under Section 106. Rather than creating separate categories of direct and indirect impacts, the Section 106 regulations are focused on effects more broadly to historic properties. The regulatory definition of "effect," pursuant to 36 CFR § 800.16(i), is that the term "means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the NRHP." The NHPA is specifically concerned about adverse effects to those properties. The regulations identify adverse effects as occurring when an undertaking is found to "alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association (36 C.F.R. § 800.5(a)(1))." "Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative (36 C.F.R. § 800.5(a)(1))."

C.4.4.1 Proposed Action/Project

Direct and Indirect Effects Analysis

This analysis of direct and indirect impacts for the Project is organized according to the following Project phases: construction and operation and maintenance.

Construction

Project construction would require both temporary and permanent disturbance areas and could result in the direct impact to unanticipated cultural resources including damage and/or displacement of resources, resulting in the loss of information about history and prehistory.

While no known resources are within the Project APE, five cultural resources are documented within a quarter mile of the Littlerock Reservoir and the area is sensitive for prehistoric and historical cultural resources. Therefore, the only potential for direct impacts to cultural resources during the construction phase of the Project is from unanticipated or inadvertent cultural resource discoveries. Due to various surface conditions or changes over time, not all cultural resources are expressed on the surface. Any

project with ground disturbing components has the potential to directly impact unanticipated cultural resources.

Sediment removal from the Reservoir would have no impact on cultural resources, as excavation would be limited to removing sediments deposited after construction of the Littlerock Dam (post-dam sediments) and would not reach the original ground surface that existed prior to construction of the Dam (pre-dam ground surface). Disposal of excavated sediments at the two off-site dumping areas would also have no impact on cultural resources, as sediments would either be stockpiled or dumped into low-lying gullies or exhausted mining pits. No native sediments would be disturbed in this process.

However, construction of the grade control structure would require excavation, with excavation occurring within the Littlerock Reservoir bed and banks adjacent to Rocky Point. Buried or otherwise obscured cultural resources may be present within the portions of the Project APE associated with the grade control structure that are located outside of the Littlerock Reservoir bed. If such resources are encountered, impacts would be reduced through the implementation of SPCs CUL-1 and CUL-2.

No human remains are known to be located within the Project APE. However, there is always the possibility that unmarked burials may be unearthed during construction. In the unlikely event of an accidental discovery of any human remains, the procedures and provisions in SPC CUL-3 would be implemented.

Indirect impacts to cultural resources are not anticipated for the Project.

Operation and Maintenance

Operation and maintenance of the Reservoir and grade control structure would not result in any disturbance of cultural resources. Although maintenance would require the excavation and removal of 38,000 cubic yards of sediment from the Reservoir annually, this excavation would be limited to removing post-dam deposited sediments and would not reach the original pre-dam ground surface. As with the initial excavation of sediment in the Reservoir, this sediment removal would have no impact on cultural resources.

The Project would cause a substantial adverse change in the significance of a cultural resource (Criterion CR1).

Impact C-1: Implementation of the Project would demolish, destroy, relocate, or disturb the cultural resource in a manner that would diminish its integrity or materially impair the significance of the resource.

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with Project construction. The procedures and provisions in SPCs CUL-1 and CUL-2 address inadvertent discoveries and provide detail on how these activities would be implemented.

SPCs Applicable to Impact C-1

SPC CUL-1 (Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed)

SPC CUL-2 (Unidentified Cultural Resource Discovery Procedures)

CEQA Significance Conclusion

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with Project construction of the grade control structure. In

accordance with the Forest Service Land Management Plan, any unknown cultural resources within the Project APE would be considered eligible for listing on the NRHP until proven otherwise. Implementation of SPCs CUL-1 and CUL-2 would ensure that construction is temporarily halted in the event that a previously unknown archaeological resource is discovered, and that impacts to unanticipated archaeological discoveries are reduced to a less-than-significant level (Class III).

The Project could disturb human remains, including those interred outside of formal cemeteries (Criterion CR2)

Impact C-2: Implementation of the Project could uncover, expose, and/or damage human remains.

No formal cemeteries or human remains are known to be located within the Project area. However, there is always the possibility that unmarked burials may be unearthed during construction. The procedures and provisions in SPC CUL-3 provide detail on how this activity would be implemented, in the unlikely event of an accidental discovery of any human remains.

SPCs Applicable to Impact C-2

SPC CUL-3 (Unidentified Human Remains Discovery Procedures)

CEQA Significance Conclusion

No human remains are known to be located within the Project area. However, there is always the possibility that unmarked burials could be inadvertently unearthed during excavation activities, which could result in damage to these human remains. In the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery, SPC CUL-3 would be implemented to reduce impacts. Nonetheless, the effect would be considered adverse under the regulations in the NHPA, and therefore, treatment of the remains, other than protection in place, would be a significant and unavoidable impact (Class I).

C.4.4.2 Alternative 1: Reduced Sediment Removal Intensity

Under Alternative 1, construction of the grade control structure would be identical to that of the Project. Once restored, ongoing sediment removal to maintain Reservoir capacity would be identical to that of the Project. Therefore, this alternative only differs from the Project during the initial (restorative) sediment removal. Alternative 1 seeks to reduce certain environmental impacts (primarily air quality, traffic, and noise) by:

- Starting the initial sediment removal period on July 1 (annually), instead of after Labor Day.
- Sediment removal activities would occur 5 days per week, instead of 6 (with the Project).
- Restoring the Reservoir to 1992 design water storage and flood control capacity within a minimum of 13 years, instead of 6 (with the Project).

Excavated sediment may first be stockpiled within the excavation area if drying is needed. PWD would first seek to recycle excavated material as feasible, likely for use PWD and other municipal projects within Palmdale and the surrounding area. All excavated material that cannot be recycled/reused would be trucked off-site for disposal at one of two locations:

- **The 47th Street East property.** This property is owned by PWD and encompasses approximately 36 acres. The property is located along the west side of 47th Street East, immediately north of the East

Branch of the California Aqueduct. The property comprises vacant, undeveloped land characterized by several ridges, gullies, and knolls, and is located approximately four miles driving distance north of the Reservoir. The Project proposes to stockpile removed sediment from the Reservoir within the low-lying gullies in a manner that it would not mound above adjacent grades.

- **The Hi-Grade Materials Company property.** This property encompasses approximately 170 acres near Pearblossom Highway. The property is located approximately five miles driving distance north of the Reservoir and is an active quarry containing large open pits that have been exhausted of quarry materials. The Project proposes to dispose of removed sediment within the quarry's exhausted pits.

Direct and Indirect Effects Analysis

This analysis of direct and indirect impacts for Alternative 1 is organized according to the following project phases: construction and operation and maintenance.

Construction

Construction of Alternative 1 would require both temporary and permanent disturbance areas and could result in the direct impact to unanticipated cultural resources including damage and/or displacement of resources, resulting in the loss of information about history and prehistory.

While no known resources are within the APE of Alternative 1, five cultural resources are documented within a quarter mile of the Littlerock Reservoir and the area is sensitive for prehistoric and historical resources. Therefore, the only potential for direct impacts to cultural resources during the construction phase of Alternative 1 is from unanticipated or inadvertent cultural resource discoveries. Due to various surface conditions or changes over time, not all cultural resources are expressed on the surface. Any project with ground disturbing components has the potential to directly impact unanticipated cultural resources.

Under Alternative 1, sediment removal would have no impact on cultural resources, as excavation would be limited to removing sediments deposited after construction of the Littlerock Dam (post-dam sediments) and would not reach the original ground surface that existed prior to construction of the Dam (pre-dam ground surface). Disposal of excavated sediments at the two off-site dumping areas would also have no impact on cultural resources as sediments would either be stockpiled or dumped into low-lying gullies or exhausted mining pits. No native sediments would be disturbed in this process.

However, construction of the grade control structure would require excavation to and below pre-dam ground surface levels with the vast majority of this excavation occurring within the Littlerock Reservoir bed and banks adjacent to Rocky Point. Buried or otherwise obscured cultural resources may be present within the portions of the Project APE associated with the grade control structure that are located outside of the Little Rock Creek bed. If such resources are encountered, impacts would be reduced through the implementation of SPCs CUL-1 and CUL-2.

No human remains are known to be located within the APE of Alternative 1. However, there is always the possibility that unmarked burials may be unearthed during construction. In the unlikely event of an accidental discovery of any human remains, the procedures and provisions in SPC CUL-3 would be implemented.

Indirect impacts to cultural resources are not anticipated for Alternative 1.

Operation and Maintenance

Operation and maintenance of the Reservoir and grade control structure would not result in any disturbance of cultural resources. Although maintenance would require the excavation and removal of 38,000 cubic yards of sediment from the Reservoir annually, this excavation would be limited to removing post-dam deposited sediments and would not reach the original pre-dam ground surface. As with the initial excavation of sediment in the Reservoir, this sediment removal would have no impact on cultural resources.

The Project would cause a substantial adverse change in the significance of a cultural resource (Criterion CR1)

Impact C-1: Implementation of the Project would demolish, destroy, relocate, or disturb the cultural resource in a manner that would diminish its integrity or materially impair the significance of the resource.

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with Project construction. The procedures and provisions in SPCs CUL-1 and CUL-2 address inadvertent discoveries and provide detail on how these activities would be implemented.

SPCs Applicable to Impact C-1

SPC CUL-1 (Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed)

SPC CUL-2 (Unidentified Cultural Resource Discovery Procedures)

CEQA Significance Conclusion

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with Project construction of the grade control structure. In accordance with the Forest Service Land Management Plan, any unknown cultural resources within the Project APE would be considered eligible for listing on the NRHP until proven otherwise. Implementation of SPC CUL-2 would ensure that construction is temporarily halted in the event that a previously unknown archaeological resource is discovered, and that impacts to unanticipated archaeological discoveries are reduced to a less-than-significant level (Class III).

The Project could disturb human remains, including those interred outside of formal cemeteries (Criterion CR2)

Impact C-2: Implementation of the Project could uncover, expose, and/or damage human remains.

No formal cemeteries or human remains are known to be located within the Project area. However, there is always the possibility that unmarked burials may be unearthed during construction. The procedures and provisions in SPC CUL-3 provide detail on how this activity would be implemented, in the unlikely event of an accidental discovery of any human remains.

SPCs Applicable to Impact C-2

SPC CUL-3 (Unidentified Human Remains Discovery Procedures)

CEQA Significance Conclusion

No human remains are known to be located within the Project area. However, there is always the possibility that unmarked burials could be inadvertently unearthed during excavation activities, which could result in damage to these human remains. In the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery, SPC CUL-3 would be implemented to reduce impacts. Nonetheless, the effect would be considered adverse under the regulations in the NHPA, and therefore, treatment of the remains, other than protection in place, would be a significant and unavoidable impact (Class I).

C.4.4.3 Alternative 2: No Action/No Project Alternative

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam. Under this alternative, sediment would continue to enter the Reservoir at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually.

Direct and Indirect Effects Analysis

In the event sediment buildup led to safety issues and required demolition/removal of the Dam, construction activities (and related noise) are expected to be greater than that of the Project or Alternative 1. Demolition of the dam and restoration of the waterway would require extensive construction. Activities would be similar or greater in intensity to the Project, and would likely require additional construction years. Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with such construction. While unknown, it is likely similar procedures and provisions as SPCs CUL-1 and CUL-2 would be necessary to address inadvertent discoveries and provide detail on how these activities would be implemented.

In the event the Reservoir became filled with sediment and the Dam was left in place, it is likely that some type of downstream flood-control channeling would need to be constructed. While unknown, should these activities include any significant ground disturbance, it is likely similar procedures and provisions as SPCs CUL-1 and CUL-2 would be necessary to address inadvertent discoveries and provide detail on how these activities would be implemented.

CEQA Significance Conclusion

The No Action/No Project Alternative would not result in impacts to cultural resources.

C.4.5 Impact Summary

Table C.4-2 summarizes the direct and indirect environmental impacts of the proposed action and the alternatives on cultural resources. Refer to Section C.4.4 for the entire environmental analysis and recommended SPCs.

Table C.4-2. Summary of Impacts and Mitigation Measures – Cultural Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
C-1: Implementation of the Project would demolish, destroy, relocate, or disturb the cultural resource in a manner that would diminish its integrity or materially impair the significance of the resource.	Class III	Class III	No impact	Yes	SPC CUL-1 (Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed) SPC CUL-2 (Unidentified Cultural Resource Discovery Procedures)
C-2: Implementation of the Project could uncover, expose, and/or damage human remains.	Class I	Class I	No impact	Yes	SPC CUL-3 (Unidentified Human Remains Discovery Procedures)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.5 Geology and Soils

This section describes the existing conditions and geologic hazards related to geology and soils within the proposed action (Project) area. This analysis focuses on the potential exposure of people or structures to geologic hazards as well as the potential for the proposed action to cause or be affected by unstable soil conditions.

C.5.1 Affected Environment

Baseline data were collected from several sources, including: U.S. Geological Survey (USGS), USDA Natural Resources Conservation Service (NRCS), Department of Conservation California Geological Survey (CGS), and Palmdale Water District (PWD).

C.5.1.1 Regional Setting

The Project study area includes Littlerock Reservoir and dam, the potential sand and gravel pits and PWD disposal areas, and the haul route between the reservoir and the disposal areas, as shown in Figure B-1. The Project area is located on the north-central edge of the Transverse Range's physiographic province, an east-west-trending group of mountain ranges and valleys in Southern California. The reservoir and disposal sites are located along the boundary between the north-facing foothills of the San Gabriel Mountains and the Antelope Valley. The reservoir and upstream contributing area are located in the Angeles National Forest, and are bounded by Mount Emma Ridge and Pacifico Mountain to the west; Kratka Ridge, Mount Hillyer, and Waterman Mountain to the south; and Mount Williamson, Pallett Mountain, and Pleasant View Ridge to the east. The disposal sites are located on the valley floor north of the reservoir. The mining pits are located within the alluvial fan formed by Little Rock Wash, and the PWD property lies to the west of the drainage.

The San Gabriel Mountains were formed by north-south compression of the Earth's crust combined with uplift along east-west trending faults, including the Sierra Madre fault system. The active San Andreas Fault, which runs roughly perpendicular to Little Rock Wash between the reservoir and the disposal sites, represents the northerly boundary of the Transverse Ranges province and the San Gabriel Mountains.

C.5.1.2 Geology

The mountains near the reservoir are formed by an igneous rock complex of Precambrian to Mesozoic age (URS, 2008; USGS, 2005). The valley north of the reservoir near the disposal sites contains Mesozoic-age granitics, Pliocene-age sedimentary rocks, and Holocene fan deposits. The Littlerock Reservoir is underlain by Late Triassic quartz monzonite and monzodiorite. Bedrock beneath the dam and reservoir is mapped as Mesozoic-age Lowe granodiorite. An outcropping of Middle Proterozoic anorthosite and gabbro borders the reservoir to the southwest. As the haul route leaves the quartz formation associated with the reservoir, it traverses Pliocene to Holocene alluvium, Miocene to Pleistocene sandstone and conglomerate, and Mesozoic granodiorite and quartz monzonite. The PWD disposal site is underlain by Mesozoic granodiorite and quartz monzonite, and Pliocene to Holocene alluvium. The mining pits are underlain entirely by Pliocene to Holocene alluvium.

C.5.1.3 Seismicity

The seismicity of Southern California is dominated by the intersection of the north-northwest trending San Andreas Fault system and the east-west trending Transverse Ranges fault system. The closest known active fault to the Project area is the Mojave segment of the San Andreas Fault, located approximately

two miles north of the reservoir. The San Andreas is a right-lateral strike-slip fault that runs over 700 miles from the Gulf of California to Cape Mendocino. Ground rupture associated with the 1857 earthquake on the San Andreas occurred along the segment of the fault that is adjacent to the Project site, and the modern trace has been the site of recurring Holocene ground rupture (URS, 2008).

Neither the Littlerock Reservoir nor the potential disposal sites fall within an Earthquake Fault Zone as defined by CGS. However, the haul route crosses the Earthquake Fault Zone associated with the San Andreas Fault. Although neither the reservoir nor the disposal sites would be subject to surface fault rupture, the entire project area could experience strong ground shaking from both the San Andreas and Transverse Range fault systems (CGS, 2014).

C.5.1.4 Soils

The area surrounding the reservoir and disposal sites is dominated by Entisols, with small areas of Alfisols and Inceptisols interspersed (NRCS, 2014). The reservoir and downstream wash are underlain by riverwash that is composed primarily of sand, gravel, cobbles, and some boulders. Both sides of the reservoir are surrounded by the Trigo family of dry-Lithic Xerorthents. The PWD property disposal site is underlain by Hanford, Ramona, and Vista coarse sandy loam. The mining pits disposal site is surrounded by Arizo gravelly loamy sand and loamy fine sand, and Hesperia fine sandy loam.

The soils surrounding the reservoir are highly susceptible to erosion and have an average slope gradient of 65 percent. Therefore, the potential for landslide in the area surrounding the reservoir is high. The soils surrounding the disposal sites are less susceptible to erosion and lie on the generally flat valley floor. There is no risk of landslide in the areas surrounding the disposal sites.

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake induced, strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. The potential for liquefaction in the upper loose layers of sands within Littlerock Reservoir is high (URS, 2008). The depth of potential liquefiable sands is approximately 20 feet.

C.5.2 Regulatory Framework

This section provides an overview of the regulatory framework for geology and soils, specifically as they relate to geologic hazards and unstable soil conditions. Table C.5-1 provides a list of plans and policies that are applicable to geology and soils, and includes a discussion of the Project's consistency with each plan or policy.

C.5.2.1 California Department of Conservation

- **Alquist-Priolo Earthquake Fault Zoning Act of 1972.** This Act (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. This Act helps define areas where fault rupture is most likely to occur and groups faults into categories of active, potentially active, and inactive in order to assess the potential for damage to structures or injury to people from fault rupture.
- **Seismic Hazards Mapping Act of 1990.** This Act (Public Resources Code, Chapter 7.8, Division 2) directs the California Department of Conservation, California Geological Survey (CGS) to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and

to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes.

C.5.2.2 County of Los Angeles

- **County** of **Los Angeles General Plan.** The County of Los Angeles General Plan Safety Element contains goals and policies to minimize injury, loss of life, and property damage due to seismic and geologic hazards, including earthquakes and landslides.
- **Antelope Valley Areawide General Plan.** The Antelope Valley Areawide General Plan includes policies to protect people and structures from the risk of seismic hazards. Special development standards are required for projects within the Seismic Safety Management Areas, which are based on the Alquist-Priolo Earthquake Fault Zones.

C.5.2.3 City of Palmdale

City of Palmdale General Plan. The City of Palmdale General Plan Safety Element contains a goal to minimize danger and damage to public health, safety, and welfare resulting from natural hazards, including seismic hazards. This goal is implemented through review (and modification when necessary) of development within or adjacent to geologic hazards.

Table C.5-1. Consistency with Applicable Geology and Soil-Related Plans and Policies

Plan/Policy	Consistency	Explanation
Alquist-Priolo Earthquake Fault Zoning Act and Seismic Hazards Mapping Act	Yes	Earthquake Fault Zones, Liquefaction zones, and Landslide zones have been reviewed and identified in Section C.5.1. No structures would be placed within a geologic hazard zone.
County of Los Angeles General Plan, Antelope Valley Areawide General Plan, and City of Palmdale General Plan Seismic and Geologic Hazard Policies.	Yes	Seismic and geologic hazards have been identified in Section C.5.1. The Project will be designed and operated so as to minimize risks associated with seismic and geologic hazards.

C.5.3 Issues Identified During Scoping

Table C.5-2 below provides a list of geology and soil-related issues raised during the public scoping period for the EIS/EIR [see Appendix E (Summary of Scoping Process)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.5-2. Scoping Issues Relevant to Geology and Soils

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should evaluate and consider reducing concentrations of inorganic mercury in reservoir sediment through stabilization of soils.	Soils will be stabilized by the grade control structure to prevent upstream incision and erosion of the stream channel. Soils downstream of the grade control structure will be excavated and disposed of at an appropriate site. Clean sediment will be deposited at one of two disposal sites identified in Figure B-1. Any sediment that is found to be contaminated will be disposed of in an appropriate hazardous waste facility, thereby reducing concentrations of inorganic mercury in reservoir sediment. Soils within the reservoir downstream of the grade control structure will not be stabilized for the purposes of isolating inorganic mercury.

Table C.5-2. Scoping Issues Relevant to Geology and Soils	
Comment	Consideration in the EIS/EIR
The Draft EIS/EIR should identify an alternative and define mitigation measures to ensure that the concentrations of Hg and PCBs in sediments are not increased by the Project and are decreased to the extent feasible.	Reservoir management alternatives (such as pH adjustment, nutrient addition, oxygenation, and stocking practices) to reduce methylmercury production are not part of the proposed action. Concentrations of Hg and PCBs in sediments would not be increased by the Project. Because contaminated sediment that is encountered during excavation would be removed and be disposed of in an appropriate hazardous waste facility, the concentrations of Hg and PCBs in sediments within the reservoir may be decreased under the proposed action.

C.5.4 Environmental Consequences

Significance Criteria. Appropriate criteria have been identified and utilized in order to base the significance conclusions on the CEQA Appendix G Environmental Checklist and to make them relevant to this analysis based on local conditions and the project description. Geologic conditions were evaluated with respect to Project impacts on local geology, as well as the impacts local geologic conditions may have on the Project. For purposes of the CEQA analysis in this report, impacts related to geology and soils are considered significant if the Project would:

- Criterion GEO1: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known Alquist-Priolo earthquake fault, landslides, strong seismic ground shaking, or seismic-related ground failure, including liquefaction.
- Criterion GEO2: Cause or be affected by substantial soil erosion, slope instability, or slope failure.

Impact Assessment Methodology. This impact analysis is based on an assessment of baseline conditions relevant to the site, including geologic formations, soil types and properties, and known or potential geologic hazards, which are presented in Section C.5.1. These baseline conditions were evaluated based on their potential to be affected by, or to affect, construction activities as well as operation and maintenance activities related to the Project and alternatives. Potential impacts were then identified based on the predicted interaction between construction, operation, and maintenance activities with the affected environment, using appropriate technical analysis and the impact significance criteria. Standard project commitments, described in Appendix A, were considered as project features in the impact analysis.

Impacts are described in terms of location, context, and intensity, and identified as being either short- or long-term, and direct or indirect in nature. Beneficial as well as adverse impacts are identified, with a discussion of the effect and risk to public health and safety, and potential violation of environmental laws. Mitigation measures are developed to avoid, minimize or rectify impacts, and described in terms of need and mitigating effect on the impact.

C.5.4.1 Proposed Action/Project

This section describes the direct and indirect effects of the proposed action (Project) on geology and soils and the exposure of people or structures to seismic and geologic hazards.

Direct and Indirect Effects Analysis

Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving, rupture of a known Alquist-Priolo earthquake fault, landslides, strong seismic ground shaking, or seismic-related ground failure, including liquefaction (Criterion GEO1)

Impact G-1: The Project would expose people or structures to potential substantial adverse effects due to seismic or geologic hazards.

Neither the Littlerock Reservoir nor the proposed disposal sites are located within an Alquist-Priolo Earthquake Fault Zone. Additionally, no structures would be constructed under the proposed action. However, the San Andreas Fault runs east-west between the reservoir and the disposal sites, approximately 1.7 miles north of Littlerock Dam. In the event of a large earthquake along this fault, the entire Project area would experience strong seismic ground shaking. This ground shaking would not expose structures to adverse effects because no structures would be constructed under the proposed action. Although construction workers could be exposed to strong seismic ground shaking, they would not experience any direct adverse effects because Project work (excavation, hauling, and disposal of sediment) would occur in an open overhead environment with no risk of injury due to falling objects or collapsing structures.

The greatest risks under the proposed action associated with Criterion GEO1 are landslide and liquefaction. Structures would not be exposed to adverse effects, as no structures would be constructed under the proposed action. Construction workers could be exposed to risk of injury due to landslide or liquefaction. Although the area surrounding Littlerock Reservoir has not been evaluated by the California Geological Survey, the reservoir is surrounded by steep slopes that could be subject to earthquake-induced landslides. A landslide on the surrounding hillsides could affect the Project area and cause injury or death to construction workers. The loose, often saturated sands and silt within the reservoir could be subject to liquefaction during a seismic event. In the event of liquefaction, the ground would become unstable and construction workers could be injured by falling or coming into contact with falling equipment.

Implementation of SPC GEO-1, provided in Appendix A, would reduce the risk of injury or death due to seismic and geologic hazards to a negligible level.

SPCs Applicable to Impact G-1

SPC GEO-1 (Geotechnical Investigation)

CEQA Significance Conclusion

Any potential risk of injury or death due to seismic or geologic hazards would be minor. Landslides or liquefaction would likely only occur during an earthquake, and therefore would be limited to short periods. This risk would be further reduced through implementation of SPC GEO-1. Impacts would be less than significant (Class III).

Production of or exposure to substantial soil erosion, slope instability, or slope failure (Criterion GEO2)

Impact G-2: The Project would cause or be affected by substantial soil erosion, slope instability, or slope failure.

The Project includes construction of a subterranean grade control structure within the reservoir, excavation of accumulated sediment to restore 1992 design water storage and flood control capacity, ongoing

annual sediment removal to maintain reservoir design capacity, and maintenance or improvement of the roadbed along the sediment disposal haul route to prevent or repair damage to affected roadways. The excavation of accumulated sediment is by definition a soil-disturbing activity. Soil disturbance can lead to increased erosion and sedimentation, and can mobilize pollutants that may have attached to the sediment. All excavation work would occur during the dry season and within the reservoir. Any loose or stockpiled soil that is not immediately removed to a disposal site would be naturally redistributed along the bed of the reservoir. This sediment would be confined by Littlerock Dam. Disposal of clean sediment would occur at the PWD property or in abandoned mining pits shown on Figure B-1. Although one small, ephemeral stream crosses the PWD property, SPC HYDRO-1 (refer to Appendix A) would ensure that sediment be placed and graded so that it not enter the stream channel through subsequent erosion and sedimentation. Sediment disposed in the abandoned gravel mining pits would be substantially below the surrounding grade, and no sediment would leave the site or enter any waterbody.

SPC HYDRO-1 would ensure that excavated material to be stockpiled on the PWD alternate disposal site would not obstruct or divert flow in the ephemeral watercourse that crosses that property. Implementation of a Stormwater Pollution Prevention Plan as required by the Clean Water Act would further reduce the potential for sediment eroded by stormwater runoff to leave the disposal site. No Project-related erosion in this watercourse is expected. Sedimentation from the stockpile will be minor due to compliance with existing regulations.

Construction of the grade control structure would also result in soil disturbance. However, this disturbance would also occur only within the reservoir, and any loose or stockpiled soil would similarly be confined by Littlerock Dam. Road maintenance and improvement along the sediment disposal haul route could also lead to soil disturbance. However, the haul routes follow paved roads, and any soil disturbance related to maintenance or improvement of the roadways would be minimal and short-term. No new roads would be created, and no paved surfaces would be converted to bare soil conditions.

Destabilization of natural or constructed slopes could occur as a result of construction activities due to excavation and grading operations. Slope failures are more likely to occur in areas with a history of previous failure, in weak geologic units exposed on unfavorable slopes and in areas of fault-sheared rock. Instances of triggered slope failure from excavation activities could cause damage to construction equipment and could potentially result in injury to workers. However, as discussed above under Impact G-1, a design level geotechnical investigation would be performed prior to construction and would include evaluation of slope stability issues in areas of planned grading and excavation, and provide recommendations for development of grading and excavation plans. Based on the results of the geotechnical investigations, appropriate support and protection measures would be designed and implemented to maintain the stability of slopes adjacent to work areas during and after construction.

SPCs Applicable to Impact G-2

SPC GEO-1 (Geotechnical Investigation)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

Any potential impacts to geology and soils related to erosion or slope failure would be minor. Implementation of SPCs GEO-1 and HYDRO-1 would ensure that slopes within the Project area are properly stabilized prior to and during construction. Impacts would be less than significant (Class III).

C.5.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving, rupture of a known Alquist-Priolo earthquake fault, landslides, strong seismic ground shaking, or seismic-related ground failure, including liquefaction (Criterion GEO1)

Impact G-1: The Project would expose people or structures to potential substantial adverse effects due to seismic or geologic hazards.

Project activities under this alternative related to Impact G-1 would be very similar to those described under the proposed action. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. Fewer workers would be exposed to risks associated with landslide and liquefaction, but over a longer period of time. These risks would remain the same as under the Project, and would be minor.

CEQA Significance Conclusion

SPC GEO-1 would be implemented to avoid any potential risk to people or structures. Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Production of or exposure to substantial soil erosion, slope instability, or slope failure (Criterion GEO2)

Impact G-2: The Project would cause or be affected by substantial soil erosion, slope instability, or slope failure.

Project activities under this alternative related to Impact G-2 would be very similar to those described under the proposed action. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. Fewer workers would be exposed to risks associated with unstable slopes, but over a longer period. These risks would remain the same as under the proposed action, and would be minor. Soil disturbance under this alternative would be potentially less than under the proposed action, but would occur over a longer period.

CEQA Significance Conclusion

Implementation of SPCs GEO-1 and HYDRO-1 would ensure that slopes within the area of proposed activity are properly stabilized prior to and during construction. Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

C.5.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. This lost capacity could be addressed either by breaching the dam and allowing the natural flow of Little Rock Creek to overtop the dam, or by demolishing the dam and removing approximately 2.8 million cubic yards of sed-

iment and dam concrete. Demolition of Littlerock Dam and removal of the accumulated sediment could expose construction workers to risks associated with liquefaction and landslide. This alternative would involve much more earth movement and could involve working on or near steeper slopes. The geotechnical safeguards for this potential demolition and excavation work are unknown, and therefore the No Action/No Project Alternative could result in a direct, adverse impact.

Under the No Action Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. This lost capacity could be addressed either by breaching the dam and allowing the natural flow of Little Rock Creek to overtop the dam, or by demolishing the dam and removing approximately 2.8 million cubic yards of sediment and dam concrete. Whether the dam was breached or demolished, it is likely that substantial downstream erosion and sedimentation would result. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from erosion and sedimentation. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

Impacts to seismic or geologic hazards and substantial soil erosion, slope instability, or slope failure would be significant and unavoidable (Class I).

C.5.5 Impact Summary

Impact G-1 for the Project and Alternative 1 is adverse, but not significant (Class III). Impact G-1 is significant and unavoidable under the No Action Alternative. Impact G-2 for the Project and Alternative 1 is adverse, but not significant (Class III). Impact G-2 is significant and unavoidable under the No Action Alternative. Table C.5-3 summarizes impact significance.

Table C.5-3. Summary of Impacts and Mitigation Measures – Geology and Soils

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
G-1: The Project would expose people or structures to potential substantial adverse effects due to seismic or geologic hazards.	Class III	Class III	Class I	Yes	SPC GEO-1 (Geotechnical Investigation)
G-2: The Project would cause or be affected by substantial soil erosion, slope instability, or slope failure.	Class III	Class III	Class I	Yes	SPC GEO-1 (Geotechnical Investigation) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.6 Hazards and Public Safety

This section provides an analysis of hazards and public safety impacts associated with the construction and operation of the proposed action (Project) and alternatives. Specifically, this section addresses the handling and use of hazardous materials and the potential for environmental contamination to the public. For a discussion of wildland fire hazards, refer to Section C.13. Additionally, the analysis of air quality is provided in Section C.2.

C.6.1 Affected Environment

With respect to hazardous materials and public safety, the study area is defined as 0.5-mile buffer area surrounding the Reservoir, sediment disposal sites, and sediment disposal haul routes. Because the Project would not transport significant quantities of hazardous materials (as discussed further in Section C.6.4), this study area boundary defines the disturbance area limits and geographic extent of Project-related activities with respect to risk of upset.

C.6.1.1 Hazardous Materials

Definition

Hazardous materials are generally substances that by their nature and reactivity have the capacity to cause harm or health hazards during normal exposure, accidental release, or other mishap. Hazardous materials are characterized as being toxic, corrosive, flammable, reactive, an irritant, or strong sensitizers. The term "hazardous substances" encompasses chemicals regulated by both the United States Department of Transportation's (DOT) "hazardous materials" regulations and the U.S. Environmental Protection Agency's (USEPA) "hazardous waste" regulations, including emergency response. Hazardous wastes require special handling and disposal because of their potential to impact public health and the environment. A designation of "acutely" or "extremely" hazardous refers to specific listed chemicals and quantities.

Hazardous substances are defined by State and federal regulations to protect public health and the environment. Hazardous materials have certain chemical, physical, or infectious properties that cause them to be considered hazardous. Hazardous substances are defined in CERCLA Section 101(14), and also in the California Code of Regulations (CCR), Title 22, Chapter 11, Article 2, Section 66261, which provides the following definition:

> A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed.

Hazardous Material Sites

The Littlerock Dam and Reservoir are located on Little Rock Creek below the confluence of Santiago Canyon in the ANF. With the exception of the Littlerock Resort concession area, the area surrounding the dam and reservoir consists of natural land and is void of industrial, commercial, and residential development. Currently, motorized boats are not allowed within the Reservoir. When the Reservoir water level

is lowered for beneficial drinking water use, off-highway vehicle (OHV) use of the Reservoir bottom occurs. However, fuel or vehicle oils are not regularly stored or utilized within the Reservoir.

Existing and past land use activities at and near the sediment disposal sites and along the sediment disposal haul routes are potential indicators of hazardous material storage and use. For example, many industrial sites, historic and current, have soil or groundwater contamination by hazardous substances. Other hazardous materials sources include leaking underground tanks in commercial and rural areas, contaminated surface runoff from polluted sites, orchards, and contaminated groundwater plumes. A review of the following environmental databases was completed for the study area:

- Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) databases (USEPA, 2014)
- Statewide Cortese list, which contains the following (CalEPA, 2014):
  - List of Hazardous Waste and Substances sites from Department of Toxic Substances Control (DTSC) EnviroStor database.
  - List of Leaking Underground Storage Tank Sites by County and Fiscal Year from State Water Resources Control Board (SWRCB) GeoTracker database.
  - List of solid waste disposal sites identified by SWRCB with waste constituents above hazardous waste levels outside the waste management unit.
  - List of "active" Cease and Desist Orders and Cleanup and Abatement Orders from SWRCB. NOTE: This list contains many sites that do not concern the discharge of wastes that are hazardous materials. Therefore, any site within Palmdale was reviewed for applicability.
  - List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC.

The review of these databases indicates there are no known active hazardous waste sites within 0.5 miles of the Reservoir, sediment disposal sites, or sediment disposal haul routes.

Construction Related-Hazardous Materials

Excavation and disposal of accumulated sediments, construction of the grade control structure, and maintenance and improvement of haul route roadways would involve the operation of heavy machinery and construction vehicles. The operation of these vehicles and machinery could result in a spill or accidental release of hazardous materials, including fuel, engine oil, engine coolant, and lubricants.

Reservoir Sediment

For this analysis, soil that is excavated from a site containing hazardous materials would be considered to be a hazardous waste if it exceeded specific CCR Title 22 criteria, or, on National Forest System lands, if it exceeded criteria defined in CERCLA or other relevant federal regulations. Remediation (cleanup and safe removal/disposal) of hazardous wastes found at a site is required if excavation of these materials is performed; it may also be required if certain other activities are proposed. Contaminated soil exceeding regulatory limits for construction backfill would require onsite treatment or transport to offsite processing facilities. Contaminated soil removed from the construction area must be transported according to State and federal regulations and be replaced by imported soil approved for backfill.

Both sediments and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. The detailed results of these tests are provided in Appendix D. Fifteen samples, including 11 sediment samples and 4

fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. For chlorinated pesticides (including DDT), no analyte was detected at or above the method detection limit (MDL). For PCB congeners, one analyte (PCB138) was detected in three of the 11 samples. However, the amount of PCB138 that was detected is extremely small. The three sample results range from 1.1 to 1.9 parts per billion (ppb). The MDL for this analyte is 1.0 ppb, and the reporting limit (RL) is 5.0 ppb. All 11 sediment samples tested positive for the presence of mercury. Mercury was analyzed as total mercury (Hg), and the element was not speciated in this analysis. Therefore, it is unknown what percentage of this mercury is organic mercury versus methylmercury. The sample results range from 0.0032 to 0.0213 parts per million (ppm). The Agency for Toxic Substances and Disease Registry reports that normal levels of mercury in soil range from 0.02 to 0.625 ppm (ATSDR, 1999). All but one of the sediment sample results fall below the lower value of this range, and the one result that falls within this range lies at the extreme lower end of the range. The sampling results show that the sediment in Littlerock Reservoir is mostly free of contaminants, and that in cases where a contaminant was detected, the level of contamination is extremely low.

C.6.1.2 Littlerock Dam

Littlerock Dam is a concrete gravity dam, approximately 170 feet high from foundation to crest, and spans 576 feet across the canyon, forming the Reservoir. In 1994, the last major renovation of the dam was completed, which involved strengthening the downstream face with roller-compacted concrete.

C.6.1.3 Valley Fever

Coccidioidomycosis, often referred to as San Joaquin Valley Fever or Valley Fever, is one of the most studied and oldest known fungal infections. Valley Fever most commonly affects people who live in hot dry areas with alkaline soil and varies with the season. This disease, which affects both humans and animals, is caused by inhalation of arthroconidia (spores) of the fungus Coccidioides immitis (CI). CI spores are found in the top few inches of soil and the existence of the fungus in most soil areas is temporary. The cocci fungus lives as a saprophyte (an organism, especially a fungus or bacterium, which grows on and derives its nourishment from dead or decaying organic matter) in dry, alkaline soil. When weather and moisture conditions are favorable, the fungus "blooms" and forms many tiny spores that lie dormant in the soil until they are stirred up by wind, vehicles, excavation, or other ground-moving activities and become airborne. The City of Palmdale and the entire Project area is located entirely within areas designated as “suspected endemic” for Valley Fever (CDC, 2014).

Persons exposed to airborne *C. immitis* arthrospores may become infected with Valley Fever. Construction workers, agricultural workers, and other people who are outdoors and are exposed to wind, dust, and disturbed topsoil are at an elevated risk of contracting Valley Fever. The resulting infection is most likely to have no symptoms or present with mild cold like symptoms, but it can cause flu like symptoms, or in rare cases (one percent) cause a disseminated form of the disease that can cause severe disabling illness or death.

C.6.2 Regulatory Framework

This section provides an overview of the regulatory framework for hazards and public safety. Table C.6-1 provides a list of plans and policies that are applicable to hazards and public safety, and includes a discussion of the Project’s consistency with each plan or policy.

C.6.2.1 U.S. Environmental Protection Agency (EPA)

- **Federal Toxic Substances Control Act, Resource Conservation and Recovery Act (RCRA), Hazardous and Solid Waste Act (HSWA).** The Federal Toxic Substances Control Act (1976) and RCRA (1976) established a program administered by the U.S. EPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the HSWA, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by HSWA.
- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).** Congress enacted CERCLA, commonly known as Superfund, on December 11, 1980. This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The NCP also established the National Priorities List (NPL). The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA on October 17, 1986.

C.6.2.2 State of California

- **California Hazardous Waste Control Law (HWCL).** The HWCL is administered by CalEPA to regulate hazardous wastes. While the HWCL is generally more stringent than RCRA, until the EPA approves the California program, both the State and federal laws apply in California. The HWCL lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.
- **Hazardous Material Worker Safety.** The California Occupational Safety and Health Administration (CA OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. CA OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

C.6.3.3 Local

- **Los Angeles County Fire Department.** The County of Los Angeles Fire Department, Health Hazardous Materials Division is the agency responsible for regulating and monitoring hazardous material use and storage in unincorporated and most incorporated areas of Los Angeles County. Its mission is to protect the public health and the environment throughout Los Angeles County from accidental releases and improper handling, storage, transportation, and disposal of hazardous materials and wastes through coordinated efforts of inspections, emergency response, enforcement, and site mitigation oversight (LACFD, 2014). Emergency response to a hazardous materials spill within the City of Palmdale would be handled by the Los Angeles County Fire Department.

- **Los Angeles County General Plan.** Both the approved General Plan (1974) and public review draft of the 2035 General Plan (2014) were reviewed for hazards and safety goals and policies applicable to the Project (County of Los Angeles 1974 and 2014a). Neither version of the General Plan contains applicable goals or policies pertaining to hazardous materials or public safety related to the Project.
- **City of Palmdale General Plan.** A review of the Palmdale General Plan Safety and Environmental Resources Elements identified the following applicant General Plan policies related to Project hazards and public safety (City of Palmdale, 1994):
  - Policy S2.1.1: Evaluate potential hazards associated with rupture of the California Aqueduct, to ensure that development in areas threatened with inundation are designed to minimize the threat to life and property.
  - Policy S2.1.2: Evaluate the potential for inundation from failure of the Lake Palmdale or Littlerock dams when reviewing development proposals within potential inundation areas.
  - Policy S2.3.3: Require that soils containing toxic or hazardous substances be cleaned up to the satisfaction of the agency having jurisdiction, prior to the granting of any permits for new development.
  - Policy S2.3.4: Restrict or prohibit land uses and activities that generate excessive amounts of hazardous materials or wastes that cannot be properly maintained or disposed.
  - Policy ER6.2.2: In the Little Rock Wash area, address environmental concerns related to: (6) Public safety.

Table C.6-1. Consistency with Applicable Hazard-Related Plans and Policies

Plan/Policy	Consistency	Explanation
City of Palmdale General Plan – Safety Element		
Policy S2.1.1: Evaluate potential hazards associated with rupture of the California Aqueduct, to ensure that development in areas threatened with inundation are designed to minimize the threat to life and property.	Yes	The Project will not place any structures within an area that would be subject to inundation following rupture of the California Aqueduct. There would be no threat to life or property.
Policy S2.1.2: Evaluate the potential for inundation from failure of the Lake Palmdale or Littlerock dams when reviewing development proposals within potential inundation areas.	Yes	The Project will not place any structures within an area that would be subject to inundation following failure of the Lake Palmdale or Littlerock dams. There would be no threat to life or property.
Policy S2.3.3: Require that soils containing toxic or hazardous substances be cleaned up to the satisfaction of the agency having jurisdiction, prior to the granting of any permits for new development.	Yes	No soils containing toxic or hazardous substances were discovered during pre-construction sampling. Any contaminated soil that is discovered during construction of the Project would be removed and transported to an appropriate hazardous waste disposal facility.
Policy S2.3.4: Restrict or prohibit land uses and activities that generate excessive amounts of hazardous materials or wastes that cannot be properly maintained or disposed.	Yes	The Project would not generate excessive amounts of hazardous materials or wastes.
City of Palmdale General Plan – Environmental Resources Element		
Policy ER6.2.2: In the Little Rock Wash area, address environmental concerns related to: 6. Public safety	Yes	Environmental concerns related to public safety within the Little Rock Wash area are addressed in Section C.6.4.1.

Source: USFS, 2005; City of Palmdale 1994

C.6.3 Issues Identified During Scoping

Table C.6-2 below provides a list of hazard and public safety issues raised during the public scoping period for the EIS/EIR [see Appendix E (Summary of Scoping Process)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.6-2. Scoping Issues Relevant to Hazards and Public Safety

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
Prior to any dredging or sediment disturbing activities in Little Rock Creek and Littlerock Reservoir, soils must be sampled and characterized so that proper handling and disposal methods can be adequately evaluated. Recommend that soils be analyzed for heavy metals (Title 22, CCR), PCBs, volatile organic compounds, and total petroleum hydrocarbons (gas and diesel ranges).	Both sediments and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. Fifteen samples, including 11 sediment samples and 4 fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. VOCs and total petroleum hydrocarbons were not analyzed. The sampling results show that the sediment in Littlerock Reservoir is mostly free of contaminants, and that in cases where a contaminant was detected, the level of contamination is extremely low.
Public Comments	
Concern that communities surrounding the proposed sediment deposit sites will be exposed to Coccidioidomycosis (San Joaquin Valley Fever) following major dust events, and that residents will be subject to unhealthy levels of dust inhalation.	The potential Project impacts related to San Joaquin Valley Fever are discussed in Section C.6.4.1. It is not anticipated that the Project would result in adverse effects related to San Joaquin Valley Fever.

C.6.4 Environmental Consequences

Significance Criteria. The following significance criteria for hazards and public safety were derived from applicable local, State, and federal regulations to protect public health and the environment and review of Project activities within a rural area possibly prone to wildfires. Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion HAZ1: Create an adverse hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Criterion HAZ2: Cause detrimental effects on the public health or well-being of the majority of the surrounding population.

Impact Assessment Methodology. In order to assess the potential for released hazardous materials to affect the public, this analysis identifies the types and required use of hazardous materials during all Project activities. This analysis was conducted by examining the choice and amount of chemicals to be used, the manner in which the Project requires use of the chemicals, the manner by which they would be transported to the site, and the way in which they will be used and stored on site.

Engineering and administrative controls concerning the use of hazardous materials are included as part of the Project. Engineering controls are physical or mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent the spill of hazardous material from occurring, or that can either limit the spill to a small amount or confine it to a small area. Administrative controls are the rules and procedures that workers at the facility must follow that would help to prevent accidents or to keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to contain any spill and

prevent a spill from moving off-site and causing harm to the public. Because the Reservoir serves as both a public drinking supply and recreation area, this analysis considers any hazardous material used during Project activities as having potential to impact public health if not transported, stored, used, or contained during a spill properly. As described in Section C.6.2, the Superfund Amendments and Reauthorization Act (SARA), which amends the Comprehensive Environmental Response and Liability Act, governs hazardous substances. SARA provides regulations primarily for planning, reporting, and notification concerning hazardous substances.

C.6.4.1 Proposed Action/Project

The hazards and public safety impacts of the Project are discussed below under subheadings corresponding to each significance criterion. For each criterion, the analysis determines whether implementation of the Project would result in adverse impacts.

Direct and Indirect Effects Analysis

Create an adverse hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (Criterion HAZ1)

Impact HAZ-1: Hazardous material use and transport may result in spills that contaminate Reservoir water or groundwater, or endanger public health.

Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability, or death. For example, toxic substances can cause eye or skin irritation, disorientation, headache, nausea, allergic reactions, acute poisoning, chronic illness, or other adverse health effects if human exposure exceeds certain levels (the level depends on the substance involved). Carcinogens (substances known to cause cancer) are a special class of toxic substances. Examples of toxic substances include most heavy metals, pesticides, and benzene (a carcinogenic component of gasoline). Ignitable substances are hazardous because of their flammable properties. Gasoline, hexane, and natural gas are examples of ignitable substances. Corrosive substances are chemically active and can damage other materials or cause severe burns upon contact. Examples include strong acids and bases such as sulfuric (battery) acid or lye. Reactive substances may cause explosions or generate gases or fumes. Explosives, pressurized canisters, and pure sodium metal (which react violently with water) are examples of reactive materials.

The principal environmental impact involving hazardous waste associated with the Project would be related to the potential mobilization of contaminants resulting in exposure of workers and the general public (i.e., excavation and handling of contaminated soil). Hazardous materials in the construction area may require special handling as toxic substances and hazardous waste can create an exposure risk to workers and the general public due to spills or upset or from excavation and transport.

Active hazardous waste sites greater than 0.25 miles from the project site would have a low potential to cause contamination at the site. Subsurface migration of contaminants within the unsaturated soil zone is predominantly vertically downward and is not likely to migrate horizontally. Although no known contaminated sites with potential to impact the Project were identified in this review, it is possible that other contaminated sites could be discovered during construction of the Project. Soil contamination may be encountered where no sites are currently designated or identified. Existing contamination of soils may exist in the project area due to unauthorized dumping or historic unreported hazardous materials spills. However, pre-construction analysis of sediment within Littlerock Reservoir has shown that the level of existing contamination is very low.

Activities and operations that use or manage hazardous or potentially hazardous substances could create a hazardous situation if release of these substances occurs. Individual circumstances, including the type of substance, quantity used or managed, and the nature of the activities and operations, affect the probable frequency and severity of consequences from a hazardous situation. During construction, hazardous materials such as vehicle fuels, oils, and other vehicle maintenance fluids would be used and stored on-site. There is potential for accidental incidents involving release of gasoline, diesel fuel, oil, hydraulic fluid, and lubricants from vehicles or other equipment or the release of solvents, adhesives, or cleaning chemicals from construction activities. Improperly maintained equipment could leak fluids during operation and while parked. Spills and leaks of hazardous materials during construction activities could potentially result in soil, groundwater, or surface water contamination. PWD and ANF plan to minimize, avoid, and/or clean up any unforeseen spill of hazardous materials by ensuring construction would be performed in accordance with PWD's Construction Storm Water Pollution Prevention Plan (SWPPP). Additionally, the preparation of a Spill Response Plan under SPC WQ-1 (refer to Appendix A) would further reduce the potential for any adverse impact to water quality.

SPCs Applicable to Impact HAZ-1

SPC WQ-1 (Prepare Spill Response Plan)

CEQA Significance Conclusion

The potential for hazardous materials to enter any waterbody would be reduced through implementation of SPC WQ-1. Impact would be less than significant (Class III).

Cause detrimental effects on the public health or well-being of the majority of the surrounding population (Criterion HAZ2)

Impact HAZ-2: Project activities would result in Littlerock Dam safety or degradation issues.

The Project would involve excavation and grading activities to remove accumulated sediment from Littlerock Reservoir. If improperly designed or executed, these activities could result in unstable soil and slopes, and could adversely impact the strength or stability of Littlerock Dam. However, implementation of Standard Project Commitments would ensure that excavation and grading activities would not adversely impact the strength or stability of Littlerock Dam. A design level geotechnical investigation would be performed prior to construction and would include evaluation of slope stability issues in areas of planned grading and excavation, and provide recommendations for development of grading and excavation plans. Based on the results of the geotechnical investigations, appropriate support and protection measures would be designed and implemented to maintain the stability of slopes adjacent to work areas during and after construction. No bedrock would be excavated and the structural integrity of Littlerock Dam would not be adversely affected. The topography of the reservoir bottom would be returned to 1992 conditions, and the overall weight of material held behind Littlerock Dam would be reduced through Project activities. This reduction in sediment stored behind the dam would reduce the pressure placed on the dam in the event of seismically induced liquefaction. With implementation of Standard Project Commitments, this impact would be negligible.

CEQA Significance Conclusion

Any potential impacts to hazards related to dam failure or instability would be minor and are considered less than significant (Class III).

Impact HAZ-3: Project activities would increase exposure of the public to Valley Fever.

Soil disturbance can result in fugitive dust that could mobilize the spores that cause Valley Fever. The Project would require a large amount of earthmoving; however, much of this would be the movement of sediments that are often submerged below the surface of the Littlerock Reservoir or saturated with water along the active Littlerock Stream, which due to being submerged or saturated for long periods of time would not be subject to C. immitis fungal growth. So, while there may be some limited potential for the C. immitis fungus to exist in the Project excavation area and the sediment storage areas, the risk of the Project activities causing Valley Fever infection is considered low due to the characteristics of the sediment being excavated at the project site, the distance of receptors from the Project excavation site and sediment storage areas, and the implementation of required Antelope Valley Air Quality Management District (AVAQMD) Rule 403 fugitive dust control requirements and additional project commitments (see Appendix A) that would substantially reduce fugitive dust emissions.

SPCs Applicable to Impact HAZ-3

SPC AQ-2 (Fugitive Dust Controls)

CEQA Significance Conclusion

Conformance with existing air quality regulations and implementation of SPC AQ-2 ensures less than significant impacts (Class III).

Impact HAZ-4: Project activities would expose the public to unsafe levels of mercury in fish caught for human consumption.

As discussed in Section B.2.3.2, during the first year of sediment removal, all water will be diverted from the Reservoir in order to strand non-native fish. A qualified biologist will supervise this activity and be available to inspect for any native reptiles or amphibians. If present, these species will be collected and relocated to upstream areas. Fish carcasses will be immediately collected and disposed in an approved landfill accepting such waste to ensure no adverse odor is created and to prevent other species of wildlife from consuming the fish. Prior to each subsequent annual sediment removal period, after water has been diverted from the Reservoir, a biologist will determine if any invasive fish species are present and will assess the need for additional fish removals.

Excavation and grading activities could mobilize mercury that is bound to buried sediment. This exposed and disturbed mercury could enter the water column and eventually bioaccumulate up the food chain. Under current conditions, fish within Littlerock Reservoir have been found with elevated levels of mercury. In some cases, these levels exceed safe consumption thresholds, resulting in a fish consumption advisory issued for Littlerock Reservoir (LRWQCB, 2014). Although it is possible that Project activities could exacerbate the existing level of mercury contamination in fish, pre-construction sediment test results show very low levels of mercury in the soil. Additionally, excavation and grading activities would occur during the dry season when the reservoir is closed to the public. No disturbed sediment would enter Little Rock Creek or Little Rock Wash. The Project would not change operation protocol for Littlerock Reservoir (including drawdown and release schedules), nor would the Project change any fish stocking practices or alter any upstream or downstream habitat. Any Project impacts related to exposure of the public to unsafe levels of mercury in fish caught for human consumption would be negligible.

CEQA Significance Conclusion

Sediment disturbing activities would not expose the public to mercury levels in fish or increase mercury levels within the Reservoir, resulting in less than significant impacts (Class III).

Impact HAZ-5: Project activities would result in unsafe highway conditions or increase the frequency of traffic accidents.

Excavation and removal of accumulated sediment from Littlerock Reservoir would involve the operation of 16 large dump trucks between the hours of 7:00 a.m. and 7:00 p.m. This increase in large vehicle traffic could lead to unsafe highway conditions or an increase in the frequency of traffic accidents. However, the roadways between Littlerock Reservoir and the potential sediment disposal sites are lightly traveled and large vehicles are common in the area due to existing mining operations. Implementation of Standard Project Commitments, including a traffic control plan and flagmen at key intersections, would further reduce the magnitude of this impact. Hazard impacts related to unsafe traffic conditions would be minor.

SPCs Applicable to Impact HAZ-5

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Any potential impacts to hazards related to unsafe traffic conditions would be reduced through the implementation of SCP TRA-1, resulting in less than significant impacts (Class III).

C.6.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Create an adverse hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (Criterion HAZ1)

Impact HAZ-1: Hazardous material use and transport may result in spills that contaminate Reservoir water or groundwater, or endanger public health.

Project activities under this alternative related to Impact HAZ-1 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. Fewer workers would be exposed to risks associated with hazardous materials, but over a longer period of time. These risks would remain the same as under the Project, and would be minor.

SPCs Applicable to Impact HAZ-1

SPC WQ-1 (Prepare Spill Response Plan)

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Cause detrimental effects on the public health or well-being of the majority of the surrounding population (Criterion HAZ2)

Impact HAZ-2: Project activities would result in Littlerock Dam safety or degradation issues.

Project activities under this alternative related to Impact HAZ-2 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. As described above in Section C.6.4.1, a design level geotechnical investigation would be performed prior to construction. Implementation of recommendations from the geotechnical investigation would ensure that soils and slopes in the Project area remain stable and that the structural integrity of Littlerock Dam is not compromised. The risks associated with dam instability or failure would remain the same as under the Project, and would be minor. Impact HAZ-2 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.6.4.1.

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Impact HAZ-3: Project activities would increase exposure of the public to Valley Fever.

Project activities under this alternative related to Impact HAZ-3 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. As described above in Section C.6.4.1, the sediment contained in Littlerock Reservoir is not conducive to fungal growth associated with Valley Fever, and sensitive receptors are not located near the excavation and disposal sites. The risks associated with exposure of the public to Valley Fever would remain the same as under the Project, and would be minor. Impact HAZ-3 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.6.4.1.

SPCs Applicable to Impact HAZ-3

SPC AQ-2 (Fugitive Dust Controls)

CEQA Significance Conclusion

Conformance with existing air quality regulations and implementation of SPC AQ-2 would ensure that impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Impact HAZ-4: Project activities would expose the public to unsafe levels of mercury in fish caught for human consumption.

Project activities under this alternative related to Impact HAZ-4 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. As described above in Section C.6.4.1, the sediment in Littlerock Reservoir contains very low levels of mercury, and no sediment would enter Little Rock Wash or any other downstream receiving water. The risks associated with increased exposure of the public to fish with high levels of mercury would remain the same as under the Project, and would be minor. Impact HAZ-4 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.6.4.1.

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Impact HAZ-5: Project activities would result in unsafe highway conditions or increase the frequency of traffic accidents.

Project activities under this alternative related to Impact HAZ-5 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. This reduced number of dump trucks could lead to a slight reduction in overall traffic impacts, including unsafe highway conditions. The risks associated with unsafe highway conditions would remain the same as under the Project, and would be minor. Impact HAZ-5 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.6.4.1.

SPCs Applicable to Impact HAZ-5

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

C.6.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. This lost capacity could be addressed either by breaching the dam and allowing the natural flow of Little Rock Creek to overtop the dam, or by demolishing the dam and removing approximately 2.8 million cubic yards of sediment and dam concrete.

During demolition and excavation, hazardous materials such as vehicle fuels, oils, and other vehicle maintenance fluids would be used and stored on-site. There is potential for accidental incidents involving release of gasoline, diesel fuel, oil, hydraulic fluid, and lubricants from vehicles or other equipment or the release of solvents, adhesives, or cleaning chemicals from construction activities. Improperly maintained equipment could leak fluids during operation and while parked. Spills and leaks of hazardous materials during construction activities could potentially result in soil, groundwater, or surface water contamination. Standard project commitments regarding the handling, disposal, and spill response for hazardous materials under this project are unknown. Therefore, this alternative could result in a direct and adverse impact.

Project activities under this alternative related to Impact HAZ-3 would be similar to those described under the Project. If Littlerock Dam were demolished under this alternative, a large amount of sediment would need to be excavated. However, as described above in Section C.6.4.1, the sediment contained in Littlerock Reservoir is not conducive to fungal growth associated with Valley Fever, and sensitive receptors are not located near the excavation site. Additionally, under either No Action Alternative scenario, Littlerock Reservoir would likely cease to support a fish population, and the public would not be exposed to unsafe levels of mercury in fish caught for human consumption.

Project activities under this alternative related to Impact HAZ-5 would be similar to those described under the Project. Demolition of Littlerock Dam and excavation of the accumulated sediment would require a much larger number of truck trips. However, those truck trips are not expected to substantially change the overall highway safety conditions, especially considering the existing conditions, including active mining operations in the area. The risks associated with unsafe highway conditions would remain the same as under the Project, and would be minor.

CEQA Significance Conclusion

The impact under HAZ-1 and HAZ-2 would be significant and unavoidable (Class I). Impacts for HAZ-3 are the same as those described for the Project, less than significant (Class III). No impact would occur under HAZ-4. Impacts associated with HAZ-5 are considered less than significant with the implementation of traffic control measures similar to SPC TRA-1 (under a No Project scenario which required removal of the dam).

C.6.5 Impact Significance Summary

Impacts HAZ-1 through HAZ-5 for the Project and Alternative 1 are adverse, but not significant (Class III). Under the No Action Alternative, Impacts HAZ-1 and HAZ-2 would be significant and unavoidable (Class I). Table C.6-3 summarizes impact significance.

Table C.6-3. Summary of Impacts and Mitigation Measures – Hazards and Public Safety

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
HAZ-1: Hazardous material use and transport may result in spills that contaminate Reservoir water or groundwater, or endanger public health	Class III	Class III	Class I	Yes	SPC WQ-1 (Prepare Spill Response Plan)
HAZ-2: Project activities would result in Littlerock Dam safety or degradation issues	Class III	Class III	Class I	Yes	None
HAZ-3: Project activities would increase exposure of the public to Valley Fever	Class III	Class III	Class III	No	SPC AQ-2 (Fugitive Dust Controls)
HAZ-4: Project activities would expose the public to unsafe levels of mercury in fish caught for human consumption	Class III	Class III	No Impact	Yes	None
HAZ-5: Project activities would result in unsafe highway conditions or increase the frequency of traffic accidents	Class III	Class III	Class III	No	SPC TRA-1 (Prepare Traffic Control Plan)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.7 Hydrology

This section describes the existing conditions related to surface water hydrology and groundwater in the area of the proposed action (Project) and alternatives. Surface water and groundwater quality are described in Section C.12 (Water Quality and Resources).

C.7.1 Affected Environment

The Project area for surface water hydrology and groundwater includes the Littlerock Reservoir and Dam, Little Rock Creek downstream of the Dam to Rosamond Dry Lake, and the potential gravel pit and Palmdale Water District (PWD) disposal areas shown in Figures B-1 and B-2.

C.7.1.1 Climate

The climate of the Project area is characterized by long, hot, dry summers, and short, mild, relatively wet winters. Storms that have the potential to produce significant amounts of precipitation and flooding are extra-tropical cyclones of North Pacific origin, which normally occur from December through March. These storms often last for several days, and are capable of producing widespread precipitation. In addition to the extra-tropical cyclones, the area of the Project may receive thunderstorms, which can occur at any time of the year. Thunderstorms cover comparatively small areas, but result in high-intensity precipitation, usually lasting for less than three hours. On a smaller watershed, thunderstorms can produce flash flooding.

The average annual precipitation in the Palmdale area is 7.75 inches, with more than 12 inches possible in the local mountains, which include Littlerock Reservoir and the contributing watershed. More than 80 percent of all annual precipitation occurs between the months of November and March (SDLAC, 2005). Little precipitation occurs during summer.

C.7.1.2 Surface Hydrology

Little Rock Creek drains into the Antelope Valley Watershed, which is a 3,387-square-mile closed basin in the western Mojave Desert. Approximately 80 percent of the watershed has a low to moderate ground slope (0 to 7 percent). The remaining 20 percent consists of foothills and rugged mountains, some of which reach to over 9,000 feet in elevation. The floor of the Antelope Valley Watershed generally lacks defined natural channels outside of the foothills and is subsequently subject to unpredictable sheet flow patterns (SDLAC, 2005). The Antelope Valley Watershed has no outlet to the ocean. All water that enters the watershed either infiltrates into the underlying groundwater basin, or flows toward three playa lakes located near the center of the watershed. These playa lakes, Rosamond, Rogers, and Buckhorn, are usually dry, only containing water following large winter storms. Surface runoff that collects in the dry lakes quickly evaporates from the surface. Only a small quantity of water infiltrates to the groundwater due to the nearly impermeable nature of the playa soils (SDLAC, 2005).

Littlerock Reservoir provides water supply for the PWD and the Littlerock Irrigation District (SDLAC, 2005). The Littlerock Reservoir is approximately 95 acres in size (when full) and is located on Little Rock Creek near Palmdale, California. The reservoir is contained by Littlerock Dam, originally constructed in 1924. The watershed of Little Rock Creek at the reservoir is 63.7 square miles in area. Downstream of the reservoir Little Rock Creek flows north to northeast, intersecting an undergrounded segment of the California Aqueduct and the elevated State Route 138 (SR-138). Beyond SR-138, Little Rock Creek forms a large alluvial fan known as Little Rock Wash, eventually discharging into the Rosamond Dry Lake approximately 22 miles north of Littlerock Reservoir. The 100-year peak discharge of Little Rock Creek at the reservoir is 20,000 cubic feet per second (cfs) (Woodward Clyde, 1992).

Figure C.7-1 shows the Project site and the Littlerock watershed and drainages. Figure C.7-2 shows the Little Rock Creek 100-year floodplain (FEMA, 2008), delineated by approximate methods. Figure C.7-3 shows the maximum reservoir extent at spillway crest on 2013 topography.

Inflow to Littlerock reservoir occurs primarily in the winter months, typically beginning about midway through November and ending in June. Some residual flow, on the order of 1 cfs or less, may occur all summer. Median annual inflow to the reservoir, based on United States Geological Survey data for 1930 to 2005 (USGS, 2014) is 6,979 acre-feet, with average inflow 12,494 acre-feet. The observed annual inflow range from 1930 to 2005 is 432 acre-feet (1951) to 61,464 acre-feet (2005). About one year in six, on average, does not produce enough runoff to fill the reservoir.

Under current conditions, PWD has the right to annually divert 5,500 acre-feet of water per year from Littlerock Reservoir. Beginning when the reservoir has sufficient volume in late fall or early winter, PWD conducts water from Littlerock Reservoir to Lake Palmdale, located approximately 7.1 miles northwest of Littlerock Reservoir, by Palmdale Ditch (above ground culvert). Lake Palmdale acts as a forebay for PWD's water treatment plant, and stores approximately 4,250 acre-feet of State Water Project water and Little Rock Creek water (Aspen, 2005). The rate of water supply removal from Littlerock Reservoir is variable up to a maximum of approximately 50 cfs (design maximum), and averaging 9 to 10 cfs over an entire season (roughly December to September). Not all years produce enough water in the reservoir for PWD to take the entire allotment.

When Littlerock Reservoir is full, and inflow exceeds the outflow to Lake Palmdale, the excess water overtops the dam spillway into Little Rock Creek downstream of the dam. During wet years most reservoir inflow overtops the dam spillway and flows in Little Rock Creek toward Rosamond Dry Lake. During the summer, the reservoir is drained for water supply until a minimal recreation pool is reached. The recreation pool is maintained until Labor Day, after which the lake is further drawn down until it is effectively empty at the end of September.

Littlerock Reservoir currently (year 2013) has capacity for 3,037 acre-feet of water storage. This capacity has been diminishing over the years due to sediment inflow. Since 1992, 463 acre-feet of sediment have accumulated in the reservoir, giving an average accumulation rate of 22 acre-feet (36,000 cubic yards) per year. Since construction in 1924, approximately 1,564 acre-feet of storage have been lost to sediment accumulation.

The existing quarries into which Littlerock Reservoir sediment would be deposited are located in areas of the historic alluvial fan of Little Rock Creek, but these quarries are currently outside the 100-year floodplain (Figure C.7-2). The PWD property that would be used as a temporary sediment storage site is crossed by one small, unnamed ephemeral stream and has no mapped 100-year floodplain.

C.7.1.3 Groundwater

The Project site consists of a sandy streambed, which may hold water when saturated but is not considered to be an aquifer or source of groundwater. Geotechnical borings made in 2008 at the Rocky Point area of the lake, approximately 4,500 feet upstream of the dam, found groundwater 14.5 to 16 feet below the reservoir bed (URS, 2008). The Littlerock Dam foundation is on bedrock (Woodward Clyde, 1992), so it is likely any local groundwater located beneath the streambed upstream of the dam would be contained within the limits of Littlerock Reservoir by the dam.

Little Rock Creek flows into the Antelope Valley Groundwater Basin (Figure C.7-2), which is the principal groundwater basin for southeastern Kern County, City of Palmdale, and the portion of Los Angeles County surrounding the City of Palmdale. The basin is bounded on the northwest by the Garlock Fault zone at the base of the Tehachapi Mountains and on the southwest by the San Gabriel Mountains. To

the east, the basin is bounded by ridges, buttes, and low hills, and to the north it is bounded by the Fremont Valley Groundwater Basin (DWR, 2004). The surface area of the Antelope Valley Groundwater Basin is approximately 1,580 square miles, extending across Kern, Los Angeles, and San Bernardino Counties (DWR, 2004). Most recharge of the Antelope Valley Groundwater Basin occurs at the foot of the mountains and hills by percolation through the head of alluvial fan systems. Eighty percent of natural recharge comes from mountain runoff attributed to Big Rock and Little Rock Creeks.

Portions of the Antelope Valley Groundwater Basin have experienced groundwater extractions and lowering of the groundwater table leading to subsidence in the past due primarily due to agriculture (USGS, 1998). Agricultural use has diminished substantially since the 1960s, although extraction for municipal use has increased (PWD, 1999). Little Rock Creek recharges the Pearland subunit of the Antelope Valley Groundwater Basin which, due to Little Rock Creek and Big Rock Creek flows, during wet years recovers completely from the past effects of pumping (PWD, 1999). PWD obtains approximately 40 percent of their approximately 26,700 acre-foot annual water supply from underground aquifers via 27 active wells in the Antelope Valley Groundwater Basin (Aspen, 2005).

C.7.2 Regulatory Framework

This section provides an overview of the regulatory framework for surface water and groundwater not related to water quality. Water quality is addressed in Section C.12 (Water Quality and Resources).

Table C.7-1 provides a list of plans and policies that are applicable to surface water and groundwater hydrology, and includes a discussion of the Project's consistency with each plan or policy. Section C.9 (Recreation and Land Use) contains an evaluation of policies within the Forest Service Land Management Plan that are applicable to hydrology.

U.S. Environmental Protection Agency

- **Clean Water Act.** The Clean Water Act, described in more detail in Section C.12.2.1, requires the development of a Storm Water Pollution Prevention Plan (SWPPP) requiring best management practices to prevent water quality degradation due to construction activities. Best management practices would apply to sediment control.
- **Watershed Protection and Flood Prevention Act of 1954.** This Act establishes policy that the Federal Government should cooperate with states and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other local public agencies for the purposes of preventing erosion, floodwater, and sediment damages in the watersheds of the rivers and streams of the United States; furthering the conservation, development, utilization, and disposal of water, and the conservation and utilization of land; and thereby preserving, protecting, and improving the Nation's land and water resources and the quality of the environment.
- **National Flood Insurance Act/Flood Disaster Protection Act.** The National Flood Insurance Act of 1968 made flood insurance available for the first time. The Flood Disaster Protection Act of 1973 made the purchase of flood insurance mandatory for the protection of property located in Special Flood Hazard Areas. These laws led to mapping of regulatory floodplains and to local management of floodplain areas according to guidelines, which include prohibiting or restricting development in flood hazard zones.
- **Executive Order 11988: Floodplain Management.** Executive Order 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide

leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

California Department of Fish and Wildlife (CDFW)

- Lake and Streambed Alteration Program. Section 1602 of the California Fish and Game Code protects the natural flow, bed, channel, and bank of any river, stream, or lake designated by the CDFW in which there is, at any time, any existing fish or wildlife resources, or benefit for the resources. Section 1602 requires an agreement between the CDFW and a public agency proposing a project that would:
  - Substantially divert or obstruct the natural flow of any river, stream or lake;
  - Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or,
  - Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.
- The Streambed Alteration Agreement includes conditions necessary to protect stream or lake resources.

County of Los Angeles

- **County of Los Angeles General Plan.** The County of Los Angeles General Plan Safety Element includes provisions to discourage high-risk development in floodplains, minimize flood hazards, and ensure adequate flood control system capacity.
- **Antelope Valley Areawide General Plan.** The Antelope Valley Areawide General Plan encourages the use of floodplain areas for groundwater recharge, and limits other uses in these areas to extractive (sand and gravel), agricultural, or open space/recreational uses unless flood protective measures are included.

City of Palmdale

- **City of Palmdale General Plan.** The City of Palmdale General Plan contains a variety of provisions related to surface waters and groundwater. These primarily relate to preserving floodplain development safety and groundwater preservation. The City has developed a master drainage plan that all new development must be consistent with, and requires that new development be designed or modified so as to minimize the potential adverse impacts affecting floodplains, restore and preserve the natural and beneficial values served by floodplains, and to use measures that mitigate or reduce the risk of flood loss.

Table C.7-1. Consistency with Applicable Hydrology Plans and Policies

Plan/Policy	Consistency	Explanation
County of Los Angeles General Plan, Antelope Valley Areawide General Plan, and City of Palmdale General Plan General Flood Protection and Groundwater Protection Policies		
Various goals and policies to preserve floodplain development safety, ensure adequate flood control system capacity, minimize flood hazards, and preserve groundwater.	Yes	The Project would not alter the integrity of Littlerock Dam, nor would it involve the construction of any structure that would be subject to flood damage or induce flood damage on other property. Flow patterns would not be altered. The flood control capacity of Littlerock Dam would be increased. The ability of floodplain areas to serve as groundwater recharge conduits would not be altered.

C.7.3 Issues Identified During Scoping

Table C.7-2 below provides a list of hydrology issues raised during the public scoping period for the EIS/EIR [see Appendix E (Scoping Summary Report)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.7-2. Scoping Issues Relevant to Hydrology

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should clearly define the 1992 baseline conditions identified in the scoping letter utilizing 1992 bathymetry of the lake, 1992 map of the topographic contours of the lake, or the 1992 contour and surface area of the lake's shoreline, as necessary.	Baseline condition year is 2013. The 2013 shoreline is shown in Figure C.7-3. Topographic mapping of the reservoir bed shows a capacity of 3,500 acre-feet water storage in 1995, and 3037 acre-feet in 2013. See Section C.7.1.2.
The Project is located within the Rock Creek Hydrologic Area of the Antelope Hydrologic Unit 626.00 and overlies the Antelope Valley Groundwater Basin No. 6-44. The Draft EIS/EIR should identify the beneficial uses of the water resources (per Chapter 2 of the Basin Plan) within the Project area, and include an analysis of the potential impacts to hydrology with respect to these resources.	Addressed in Sections C.7.1.2, C.7.4, and C.12.
Requests a Jurisdictional Delineation Report that describes the water resources on the Project sites and outlines the methodology used to define the extent of surface water features. A copy of this report must be submitted to the U.S. ACOE for verification.	Addressed in Section C.5.1.
In determining mitigation for impacts to waters of the State, consider Basin Plan requirements (minimum 1.5:1 mitigation ratio for impacts to wetlands) and utilize 12501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios (ACOE South Pacific Division, Dec. 2012).	Addressed in Section C.5.1.
The EIR/EIS should evaluate a suite of alternatives to stabilize Little Rock Creek upstream of the dam. Stream channel stabilization practices, including various types of revetments, grade control structures, and flow restrictors, have been effective in controlling sediment production caused by hydromodification activities. Bioengineering techniques reduce flow velocities and scour by increasing sediment deposition. Bioengineering includes planting vegetation that forms dense mats of flexible stems such as willow to protect or rehabilitate eroded streambanks. Structural practices, both direct and indirect, protect or rehabilitate eroded streambanks and are usually implemented in combination to provide stability to the stream system. Indirect methods include grade control structures or hydraulic barriers installed across streams to stabilize the channel and control upstream degradation. Vegetative methods should be used in conjunction with or over structural methods because vegetation is relatively easy to establish and maintain, is visually attractive, and is the only streambank stabilization method that can repair itself when damaged. Other advantages to using vegetative erosion control over structural control include increased pollutant attenuation and nutrient uptake capacity, habitat for fish and wildlife, and added cultural resources. Additionally, hardening the banks of streams and rivers with shoreline stabilization protection such as stone riprap revetments can accelerate the movement of surface water and pollutants from upstream, thus degrading water quality in depositional areas downstream.	This is a design issue outside the scope of this impact analysis. The Project includes a grade control to stabilize the streambed upstream of the excavation. Aside from proposed bank protection at the grade control, no other bank protection is necessary. Within the reservoir erosion control measures downstream of the grade control are not needed due to low flow velocities (static or nearly static water) and the need to periodically return and excavate sediment to maintain capacity. The grade control structure is designed to withstand a discharge of 20,000 cfs at flow velocities of 15 feet per second. Vegetative measures may not be appropriate for long-term grade control under this circumstance.

C.7.4 Environmental Consequences

Significance Criteria. Appropriate criteria have been identified and utilized to make these significance conclusions based on the CEQA Appendix G Environmental Checklist, Initial Study and significance threshold guidance from the County of Los Angeles (County of Los Angeles, 1987) and relevance to this analysis based on local conditions and the project description. Not all of the standard Appendix G and Los Angeles County criteria are applicable. For instance, the Project does not involve the construction of housing. Standard criteria related to housing are not used. For purposes of the CEQA analysis in this analysis, hydrology impacts are considered significant if the Project would:

- Criterion H1: Substantially deplete groundwater supplies or interfere with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (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).
- Criterion H2: Place within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in erosion or siltation on or off site.
- Criterion H3: Increase the rate or amount of surface runoff or impede or redirect flood flows in a manner which would result in flooding on or off site, or otherwise create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems.
- Criterion H4: Result in or be subject to damage from seiche or inundation by mudflow.

Impact Assessment Methodology. The impact analysis is based on an assessment of baseline conditions relevant to the site hydrology, presented in Section C.7.1, and an assessment of project-related and alternative-related effects on baseline conditions during project construction, long-term operation, and long-term maintenance using appropriate technical analysis and the impact significance criteria.

C.7.4.1 Proposed Action/Project

This section describes the direct and indirect effects related to surface water and groundwater hydrology in the area of the Project and alternatives. Direct and indirect effects to surface water and groundwater quality are described in Section C.12 (Water Quality and Resources).

Direct and Indirect Effects Analysis

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) (Criterion H1)

Impact H-1: The Project would deplete groundwater supplies downstream of the dam.

The Project would increase the storage capacity of Littlerock Reservoir by 463 acre-feet. Water diverted to Palmdale Lake would not be available for Antelope Valley Groundwater Basin recharge in Little Rock Creek downstream of the dam. The loss of this recharge could have an adverse effect on local

groundwater levels and supplies downstream of the dam. Without implementation of the Project, PWD would need to rely more heavily on additional local groundwater pumping and water from the State Water Project.

PWD water removals can begin near the beginning of the annual runoff season, with ongoing replenishment from runoff during the winter, meaning total PWD removals can exceed the total capacity of the reservoir. As described in Section C.7.1.2, about one year in six (16 percent of all years) do not produce enough runoff to fill the reservoir. Based on USGS records, approximately 43 percent of the years (21 out of 49) do not produce sufficient inflow to Littlerock Reservoir to satisfy the PWD allotment. For these years there would be no difference between without Project and with Project conditions for downstream groundwater recharge. For the remaining 57 percent of the years with sufficient runoff to satisfy the Palmdale Water District allotment, approximately 463 acre-feet that under current conditions would annually overflow the dam spillway could be held in the reservoir for diversion to Palmdale Lake.

On average, for the entire 49 years of record, overflow volume available for infiltration to the Antelope Valley Groundwater Basin could be reduced by about 265 acre-feet annually as a result of the Project. Average annual recharge to the Antelope Valley Groundwater Basin is estimated at about 48,000 acre-feet per year (DWR, 2004). An average annual reduction of 265 acre-feet amounts to about 0.55 percent of the total overall recharge to this basin. This would be an indirect effect of the Project that would take place immediately after project completion.

The overall Project effect of about 0.55 percent reduction in water available for recharge to the Antelope Valley Groundwater Basin is expected to have minor effect on overall aquifer volume and groundwater levels, with no mitigation necessary. The Pearland subunit of the Antelope Valley Groundwater Basin, which is recharged by Little Rock Creek and Big Rock Creek, currently recovers completely from the past effects of pumping during wet years, so little or no effect is expected on groundwater levels. During dry years, there would be no change in dam overflow due to the Project, and no effect on groundwater recharge. Overall groundwater pumping by PWD would be offset by additional surface flow available from Littlerock Reservoir due to the Project, further reducing the effect of the impact.

CEQA Significance Conclusion

The Project-related reduction in Little Rock Creek water available to groundwater recharge would be minor, with little or no overall effect on aquifer volume or groundwater levels due to good recovery of the local groundwater subbasin in wet years, resulting in less than significant impacts (Class III).

Place within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in erosion or siltation on or off site (Criterion H2)

Impact H-2: The Project would alter existing flow patterns, resulting in erosion and siltation.

The Project would alter Little Rock Creek flows within the boundary of Littlerock Reservoir by excavating up to 1,165,000 cubic yards of sediment from the reservoir bed, including an additional estimated 38,000 cubic yards annually, and install an in-stream, grade-control structure with associated bank protection. Sediments within the reservoir would be disturbed by the excavation, and local hydraulic conditions altered, potentially causing the remaining sediments to be subject to erosion and downstream deposition.

The effect of Impact H-2 on erosion and siltation would be negligible. No mitigation is necessary. All activities would be conducted within the limits of the reservoir, which, when full, has very low-flow velocity even during large floods (100-year flow velocity within the Project area would average less than one foot per second). The grade control structure and associated bank protection would be at-grade and not impede or redirect in-stream flow. The Project could induce local erosion when inflow occurs when the reservoir is empty or filling, due to steepening of the bed slope downstream of the grade control structure, but this erosion would be confined to the reservoir bottom and sides below the water surface with no anticipated damage to adjacent property. Eroded sediments would be confined to the reservoir bed by Littlerock Dam. Average flow velocities approaching zero at the dam would not be sufficient to raise transported bed sediments approximately 80 feet vertically to the spillway level to be transported downstream. Wash load (very fine) sediments disturbed in the bed could be transported over the spillway if the reservoir fills very rapidly from a dry condition, but stream gage records show that this would be a very uncommon condition. Overall, sediment transported downstream would be unaffected by the Project.

SPC HYDRO-1, provided in Appendix A, would ensure that excavated material to be stockpiled on the PWD alternate disposal site not obstruct or divert flow in the ephemeral watercourse that crosses that property. Compliance with the Federal Clean Water Act would ensure no sedimentation from the stockpile during construction. No Project-related erosion in this watercourse is expected. Sedimentation from the stockpile would be minor due to compliance with existing regulations.

SPCs Applicable to Impact H-2

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

The Project-related effect on erosion and siltation would be negligible. There would be no alteration of flood flows leading to erosion or siltation except for minor alterations within the reservoir itself. With the implementation of SPC HYDRO-1, impacts would be less than significant (Class III).

Increase the rate or amount of surface runoff or impede or redirect flood flows in a manner which would result in flooding on or off site, or otherwise create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems (Criterion H3)

Impact H-3: The Project would alter Little Rock Creek flow volumes downstream of the dam, and otherwise alter stream flow characteristics, increasing the potential for flooding.

All new construction would be within the reservoir limits where induced flooding by diversion could not occur. The flow path within the reservoir would not be altered. The Project would not increase the maximum level of the reservoir. Although not specifically operated for flood control, the reservoir is emptied each year and, with a current capacity sufficient to contain the entire annual flow for approximately 16 percent of the years, the reservoir reduces the potential for downstream flooding by containing surface flows. The Project would increase the Littlerock Reservoir volume available to detain floods by 463 acre-feet (15 percent increase in volume), which would increase the flood-control capacity of the reservoir. The increase in flood control capacity would be a direct effect of the Project that would take place immediately after Project completion and be a beneficial effect on flooding downstream of the dam.

CEQA Significance Conclusion

The Project would have a reducing effect on downstream flooding, resulting in a beneficial impact (Class IV).

Result in or be subject to damage from seiche or inundation by mudflow (Criterion H4)

There is no impact under Significance Criterion H4. The Project would not alter the lake in a manner to increase the potential for seiche, nor would the Project include any structures or other above-ground structures or uses that would be subject to seiche damage. Mudflow inundation may be possible in the surrounding hills, but the Project would make no alteration of terrain that would cause mudflow or produce any structures that would be subject to mudflow. Some local earth displacement may be possible below the reservoir level, but these would be within the reservoir floor where no damage is expected.

C.7.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

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) (Criterion H1)

Impact H-1: The Project would deplete groundwater supplies downstream of the dam.

Impact H-1 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.7.4.1.

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Place within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in erosion or siltation on or off site (Criterion H2).

Impact H-2: The Project would alter existing flow patterns, resulting in erosion and siltation.

Impact H-2 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.7.4.1.

SPCs Applicable to Impact H-2

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Increase the rate or amount of surface runoff or impede or redirect flood flows in a manner which would result in flooding on or off site, or otherwise create or contribute to runoff

water which would exceed the capacity of existing or planned stormwater drainage systems (Criterion H3)

Impact H-3: The Project would alter Little Rock Creek flow volumes downstream of the dam, and otherwise alter stream flow characteristics, increasing the potential for flooding.

Impact H-3 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.7.4.1.

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, resulting in a beneficial impact (Class IV).

Result in or be subject to damage from seiche or inundation by mudflow (Criterion H4)

Alternative 1 has no impact under Significance Criterion H4 for the same reasons described for the Project in Section C.7.4.1.

C.7.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment would continue to accumulate in Littlerock Reservoir to the point where eventually the reservoir would fill with sediment and become inoperative as a water-supply reservoir. Assuming current and past accumulation rates of sediment, complete filling should occur between 90 and 128 years from the present, although it is likely the reservoir would become impractical for water supply sooner. Reservoir capacity would diminish each year, resulting in increased PWD reliance on groundwater. Sudden inflows of large amounts of sediment, as could occur after a large fire on the watershed, could dramatically and rapidly reduce the expected future lifespan of the reservoir.

At some point in the future, probably much less than the 90 to 128 years expected time to fill, PWD may need to make alterations to their outlet and conveyance system to continue to collect and convey water after the existing outlet is covered with sediment. At the time the reservoir becomes completely inoperable with the No Action Alternative, the 5,500 acre-feet maximum that PWD can divert from Littlerock Reservoir each year would likely be compensated by increased groundwater pumping and use of State Project Water unless another water source is found. State Water Project water, the third source of PWD water, faces an uncertain future due to increased population, environmental demands, and uncertain climate conditions.

CEQA Significance Conclusion

The No Action/No Project Alternative would eventually result in an increased reliance on groundwater extraction and State Project water to supply the greater Palmdale area, resulting in potential impacts associated with declines in groundwater levels from necessary additional extraction. Impact H-1 is significant and unavoidable (Class I) with the No Action/No Project Alternative. Impact H-2 would not occur with the No Action/No Project Alternative. Under the No Action/No Project Alternative, sediment accumulation and the eventual filling of Littlerock Reservoir with sediment would eventually eliminate the flood-control capacity of Littlerock Reservoir. With all water storage capacity lost, Littlerock Flows would pass over the reservoir undiminished, with a corresponding increase in the flood hazard downstream of Littlerock Dam. Impact H-3 is significant and adverse (Class I) with the No Action/No Project Alternative. The No Action/No Project Alternative has no impact under Significance Criterion H4.

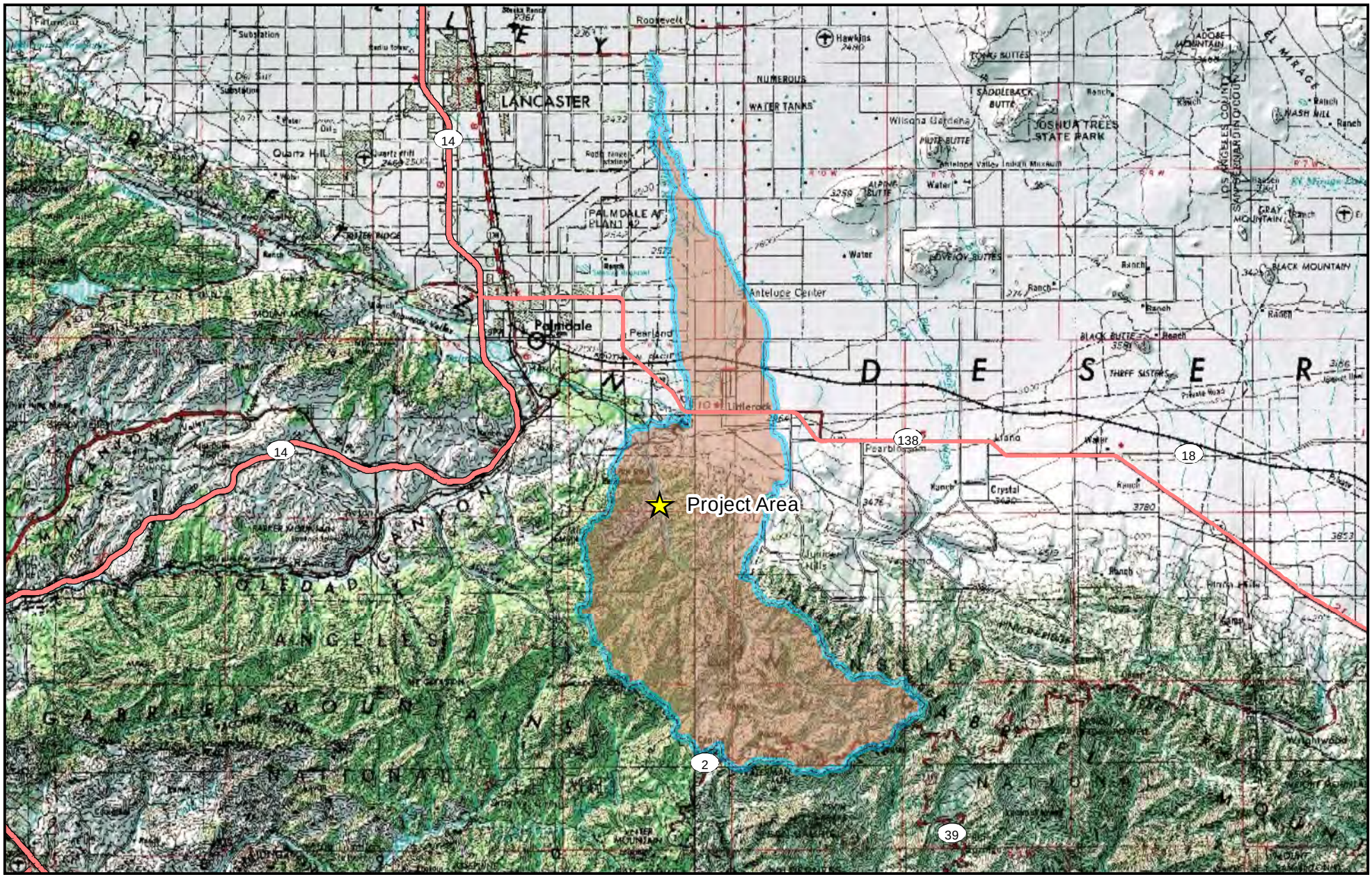
C.7.5 Impact Summary

Impacts H-1 and H-2 for the Project and Alternative 1 are adverse, but not significant (Class III), and the No Action Alternative would have no effect associated with Impact H-2. Impacts H-1 and H-3 are significant and unavoidable (Class I) with the No Action/No Project Alternative. Impact H-3 is beneficial for the Project and Alternative 1. Table C.7-3 summarizes impact significance.

Table C.7-3. Summary of Impacts and Mitigation Measures – Hydrology

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
H-1: The Project would deplete groundwater supplies downstream of the dam	Class III	Class III	Class I	No	None
H-2: The Project would alter existing flow patterns, resulting in erosion and siltation	Class III	Class III	No Impact	Yes	SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)
H-3: The Project would alter Little Rock Creek flow volumes downstream of the dam, and otherwise alter stream flow characteristics, increasing the potential for flooding.	Class IV	Class IV	Class I	Yes	None

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

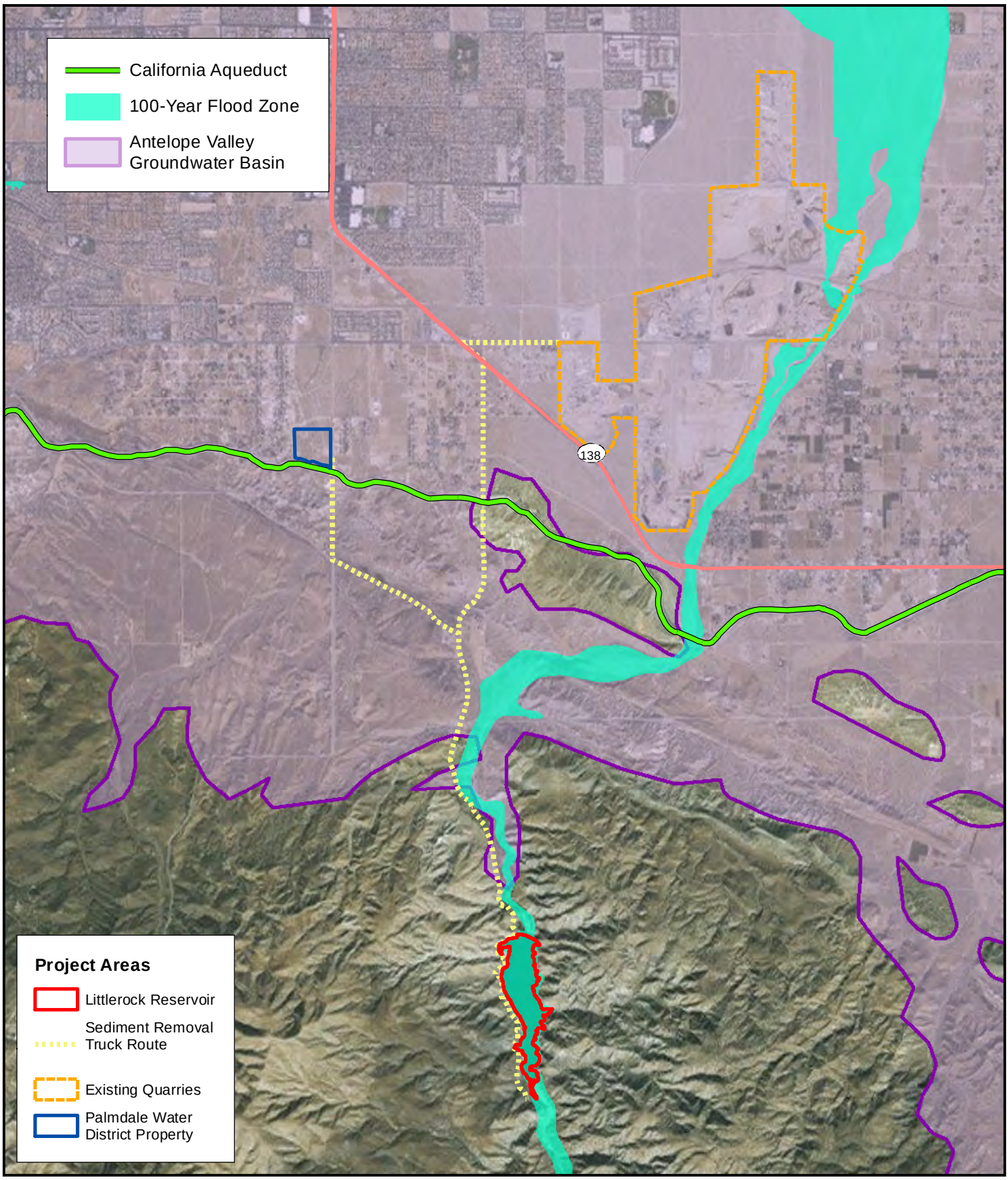


Little Rock Wash Watershed

Littlerock Reservoir Sediment Removal Project

Figure C.7-1

May 2016



0 0.5 1 Miles

100-Year Flood Hazard Zones

Littlerock Reservoir Sediment Removal Project

Figure C.7-2

May 2016



0 500 1,000 Feet

Maximum Water Level in Reservoir

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame).

Littlerock Reservoir Sediment Removal Project

Figure C.7-3

May 2016

C.8 Noise

Presented within this section is information on ambient noise conditions in the vicinity of the Littlerock Reservoir, truck haul routes, and sediment disposal locations associated with the proposed action (Project) and alternatives. Potential noise impacts associated with construction and operation of the Project is based on the evaluation of exposure of persons to or the generation of noise levels in excess of established standards. Section C.8.1 provides the existing setting, including background information on noise, the noise environment of the Project area, and sensitive receptors. Section C.8.2 describes the existing noise standards and regulations applicable to the Project.

C.8.1 Affected Environment

The potential effects of Project-related noise on wildlife are analyzed in Section C.3, Biological Resources. As discussed below in Section C.8.1.4, no sensitive receptors are located within the Reservoir or proximate to the quarry sediment disposal sites. Therefore, the area of study analyzed within this section, with respect to temporary noise or vibration generated by the Project or alternatives, is haul truck roadways and the proposed Palmdale Water District (PWD) sediment disposal/holding site. That is because these are the only Project areas containing sensitive receptors.

C.8.1.1 Fundamentals of Environmental Acoustics

The assessment of noise impacts uses specific terminology and descriptors not commonly used in everyday conversation. Therefore, to assist in a thorough understanding of the subsequent analysis, Table C.8-1 provides definitions for technical terminology utilized.

Table C.8-1. Summary of Acoustical Terms

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Level (dBA)	The sound level in decibels as measured on a sound level meter using the A weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Ambient Noise Level	The composite noise from all sources resulting in the normal, existing level of environmental noise at a given location. The Leq, as defined below, typically defines the ambient level.
Equivalent Noise Level (Leq)	The average A-weighted dB level, on an equal energy basis, during the measurement period.
Maximum Noise Level (Lmax)	The maximum noise level during a sound measurement period.
Minimum Noise Level (Lmin)	The maximum noise level during a sound measurement period.
Percentile Noise Level (Ln)	The noise level exceeded during *n* percent of the measurement period, where *n* is a number between 0 and 100 (e.g., L90)
Community Noise Equivalent Level (CNEL)	The average sound level over a 24 hour period, with a penalty of 5 dB added between 7 pm and 10 pm. and a penalty of 10 dB added for the nighttime hours of 10 pm to 7 am.

The effects of noise on people can be grouped into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects such as startling and hearing loss

In most cases, typical noise produces effects in the first two categories, being subjective effects and interference with activities only. An example of physiological effects of noise may include workers in industrial plants that might experience physiological effects of noise. No satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is due primarily to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparison with the existing or "ambient" environment to which that person has adapted.

Community noise levels are usually closely related to the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 50 dBA, moderate in the 50-65 dBA range, and high above 65 dBA (FTA, 2006).

Typical Leq daytime noise levels are:

- 35 dBA or below in a rural or wilderness area,
- 50 to 60 dBA in small towns or wooded or lightly used residential areas,
- 75 dBA in busy urban areas, and
- 85 dBA near major freeways and airports.

Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, high noise levels are nevertheless considered to be adverse to public health. In general, the more the level or the tonal (frequency) variations of a noise exceed the existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual. When comparing sound levels from similar sources (for example, changes in traffic noise levels), a 3-dBA increase is considered to be a just-perceivable difference, 5 dBA is clearly perceivable, and 10 dBA is considered a doubling in perceived loudness.

C.8.1.2 Fundamentals of Environmental Vibration

Vibration is a phenomenon related to noise, where common sources include trains, large vehicles on rough roads, and construction activities such as blasting, pile-driving, and operating heavy earth-moving equipment (FTA 2006). Vibration is defined as the mechanical motion of earth or ground, building, or other type of structure, induced by the operation of any mechanical device or equipment located upon or affixed thereto. Vibration generally results in an oscillatory motion in terms of the displacement, velocity, or acceleration of the ground or structure(s) that causes a normal person to be aware of the vibration by means such as, but not limited to, sensation by touch or visual observation of moving objects.

The groundborne energy of vibration has the potential to cause structural damage and annoyance; it can be felt outdoors, but the perceived intensity of vibration effects are much greater indoors due to the shaking of structures. Several land uses are sensitive to vibrations, and include hospitals, libraries, residential areas, schools, and churches.

C.8.1.3 Ambient Noise Conditions in the Project Area

Ambient noise at Littlerock Reservoir is primarily created by birds chirping, wind noise, and periodic noise from recreationists and concessionaire activities. At residential receptor locations, the dominant noise source along the haul truck transportation routes and PWD disposal property is roadway traffic. In general, the proposed truck route areas are predominantly open space or rural residential lands where existing noise levels are generally low.

Six short-term (15 minute) noise measurements were conducted to document and provide a reference of the ambient noise conditions of the Reservoir and at residential receptor locations near haul truck routes. The locations of these noise measurements are shown in Figure C.8-1. Four of these noise measurements were taken at the nearest residential receptors to the haul truck routes and PWD disposal property. No sensitive receptors are located proximate to quarry sites proposed for sediment disposal. The results of these measurements are shown in Table C.8-2.

Table C.8-2. Ambient Noise Measurement Results

No.	Description	Measurement					
		Time	Leq	Lmin	Lmax	L90	Notes
1	Reservoir bed at Rocky Point.	8:00 a.m. – 8:15 a.m.	22.1	11.2	29.4	22.0	Primary noise source was birds chirping.
2	Access road terminus below the dam at Palmdale Ditch/Little Rock Creek.	8:30 a.m. – 8:45 a.m.	24.0	12.6	38.3	23.7	Primary noise source was birds chirping. Secondary noise sources were distant dog barks and one helicopter pass-by.
3	East side of Cheseboro Road south of Mt. Emma Road at residential receptor 75-100' from center of nearest travel lane.	9:00 a.m. – 9:15 a.m.	41.2	22.4	55.6	36.7	Primary noise source was distant passenger vehicle traffic on Mt. Emma Road and birds chirping.
4	West side of 47th Street north of Barrel Springs Road at residential receptor 75-100' from center of nearest travel lane.	9:30 a.m. – 9:45 a.m.	43.3	26.6	60.7	41.1	Primary noise source was infrequent passenger vehicle traffic on 47th Street and Barrel Springs Road.
5	West end of PWD property on 47th Street near residential receptors.	10:10 a.m. – 10:25 a.m.	42.4	25.1	45.8	38.9	Primary noise sources were infrequent and distant traffic on 47th Street and dog barking. Secondary noise source was distant general aviation pass-by.
6	West side of Cheseboro Road north of aqueduct at residential receptor 75-100' from center of nearest travel lane.	10:35 a.m. – 10:50 a.m.	44.7	26.5	61.8	41.8	Primary noise source was infrequent passenger vehicle traffic on Cheseboro Road and dog barking.

Notes: All measurements are in dBA and were taken on Wednesday, September 17, 2014 using a Quest Technologies Model 2800 Impulse Integrating Sound Level Meter. During each measurement, the sound meter microphone was covered with a windscreen to eliminate wind noise as part of the ambient condition measurements. Due to regular strong gusts, wind noise generally exceeded the measured Leq and L90 presented. Additionally, no water inflow/outflow was occurring at locations 1 and 2 during measurements.

C.8.1.4 Sensitive Receptors

A land use survey was conducted to identify any potentially sensitive receptors (e.g., schools, residences, and recreational facilities) in the general vicinity of the Reservoir, Project truck routes, and sediment disposal locations. The surrounding area immediately adjacent to Littlerock Reservoir is recreational use

area, and does not contain any residential structures. A detailed land use inventory is provided in Section C.9 (Recreation and Land Use). Scattered single-family homes, mobile homes, and residential ranches are located along Cheseboro Road, Pearblossom Highway, and 47th Street segments of the proposed haul truck routes. In addition, residential homes are located immediately west of the PWD disposal property. No sensitive receptors are located within 0.5 mile of the quarry disposal areas. The nearest sensitive receptors sites to Project activities are reflected in Figure C.8-1, noise measurement locations 3 through 6.

The haul truck routes would traverse lands within the City of Palmdale and unincorporated Los Angeles County. Portions of the routes that are within the City of Palmdale include the following:

- Cheseboro Road (east side) approximately 1,000 feet of south of Pearblossom Highway.
- Pearblossom Highway between Cheseboro Road and Avenue T.
- Avenue T between Pearblossom Highway and Quarries.

C.8.2 Regulatory Framework

Table C.8-3 provides a list of plans and policies that are applicable to noise and includes a discussion of the Project's consistency with each plan or policy.

Table C.8-3. Consistency with Applicable Noise-Related Plans and Policies

Plan/Policy	Consistency	Explanation
Los Angeles County Noise Control Ordinance (Ordinance Title 12, Chapter 12.08)	Yes	Noise levels from Project activities would attenuate to below dBA performance standards at adjacent residential receptors and all activities would occur within allowable construction hours.
City of Palmdale General Plan NoiseElement – Policy N1.1.3	Yes	The Project does not include any temporary or permanent stationary noise sources within the City of Palmdale
City of Palmdale General Plan Noise Element – Policy N1.2.2	Yes	Annual sediment removal and restoration/maintenance activities would occur only between 7:00 a.m. to 7:00 p.m., up to 6 days a week (no activities occurring on Sundays or federal holidays)
City of Palmdale General Plan Noise Element – Policy N1.2.4	Yes	SPCs NOI-1 and NOI-2 ensure any potential conflicts of intermittent noise sources to residential locations along the Project truck route and PWD sediment storage site would be less than significant
City of Palmdale Municipal Code, Chapter 8.28, Section 8.28.030	Yes	Annual sediment removal and restoration/maintenance activities would occur only between 7:00 a.m. to 7:00 p.m., up to 6 days a week (no activities occurring on Sundays or federal holidays)

Source: Los Angeles County, 2014b; City of Palmdale, 1993; City of Palmdale, 2014

Federal

There are no federal noise standards that directly regulate environmental noise. Table C.8-4 provides a summary of recommended noise levels for protecting public health and welfare with an adequate margin of safety. With regard to noise exposure and workers, the federal Occupational Safety and Health Administration (OSHA) establishes regulations to safeguard the hearing of workers exposed to occupational noise (29 CFR Section 1910.95, Code of Federal Regulations).

Table C.8-4. Examples of Protective Noise Levels Recommended by U.S. EPA

Effect	Maximum Level 24-hour Leq	Exterior or Interior Area
Hearing loss	70 dBA	All areas.
Outdoor activity interference and annoyance	55 dBA	Outdoors in residential areas and farms and other outside areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	55 dBA	Outdoor areas where people spend limited amounts of time, such as schoolyards, playgrounds, etc.
Indoor activity interference and annoyance	45 dBA	Indoor residential areas.
	45 dBA	Other indoor areas with human activities such as schools, etc.

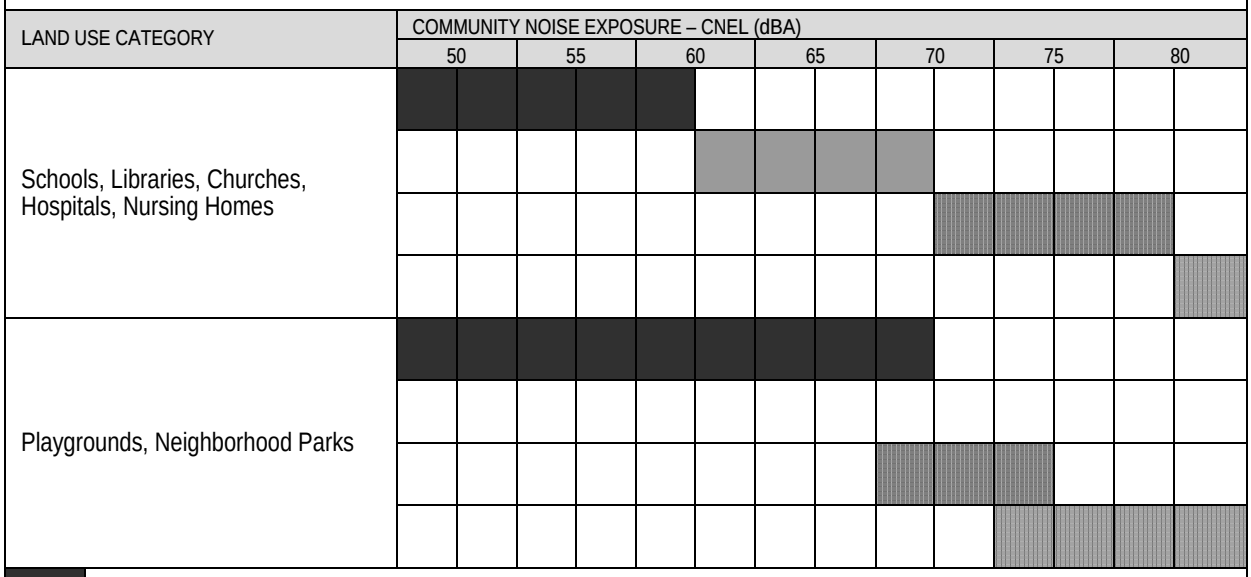
Source: USEPA, 1974.

State

California Office of Safety and Health Administration (Cal/OSHA) also regulates employee noise exposure, as mandated by Title 8 of the California Code of Regulations, Group 15, Article 105 §§ 5095-5100. 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.

The California Office of Planning and Research has developed guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. These CNEL noise recommendations are listed in Table C.8-5, but are not regulation. Instead, they are provided as a reference for local jurisdictions when creating General Plan and local noise policy (OPR, 2003).

Table C.8-5. Land Use Compatibility for Community Noise Environment Local Regulations and Standards



	Normally Acceptable Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable New construction or development generally should not be undertaken.

Source: OPR, 2003.

Local

- **County of Los Angeles General Plan.** The Los Angeles County General Plan is the foundational document for all community-based plans that serve the unincorporated areas. Both the approved General Plan (1974) and public review draft of the 2035 General Plan (2014) were reviewed for noise goals and policies applicable to the Project (County of Los Angeles 1974 and 2014a). Neither version of the General Plan contains applicable goals or policies pertaining to noise from the Project.
- **County of Los Angeles Noise Control Ordinance (Ordinance Title 12, Chapter 12.08).** The County's Noise Ordinance also includes construction noise restrictions that apply to residential and commercial properties, as presented in Table C.8-6. Furthermore, it is required that all mobile and stationary internal-combustion-engine powered equipment or machinery to be equipped with suitable exhaust and air-intake silencers in proper working order (Los Angeles County, 2014b).

Table C.8-6. County Construction Noise Limits, dBA

Time	Single-Family Residential	Multi-Family Residential	Semi-Residential/Commercial
Mobile Equipment (non-scheduled, intermittent, short-term operation – less than 10 days)			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75	80	85
Daily, 8:00 p.m. to 7:00 a.m., and all day Sunday and legal holidays	60	64	70
Stationary Equipment. Maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60	65	70
Daily, 8:00 p.m. to 7:00 a.m., and all day Sunday and legal holidays	50	55	60

Source: Los Angeles County, 2014

- As shown in Table C.8-4, the maximum noise level limits from mobile construction equipment between the hours of 7:00 a.m. and 8:00 p.m. are 75 dBA at the property line of single-family residential areas, 80 dBA at multi-family residential areas, and 85 dBA at semi-residential and commercial areas. In addition, Section 12.08.44 of the County Noise Ordinance prohibits non-emergency construction activity between the weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays.
- **City of Palmdale General Plan.** The Palmdale General Plan Noise Element is intended to comply with the State mandate and to set guidelines to prevent noise and land use conflicts. A review of the Noise Element identified the following applicant General Plan policies related to Project noise (City of Palmdale, 1994):
  - **Policy N1.1.3:** When proposed stationary noise sources could exceed an exterior noise level of 65 dBA CNEL at present, or could impact future noise sensitive land uses, require preparation of an acoustical analysis and mitigation measures to reduce noise levels to no more than 65 dBA CNEL exterior and 45 dBA CNEL interior; if the noise level cannot be reduced to these thresholds through mitigation, the new noise source should not be permitted.
  - **Policy N1.2.2:** Restrict construction hours during the evening, early morning and Sundays.

  - **Policy N1.2.4:** Where deemed appropriate based upon available information, acoustical analysis and appropriate mitigation for noise-sensitive land uses should be required in areas which may be adversely impacted by significant intermittent noise sources.

- **City of Palmdale Noise Ordinance.** The acceptable levels are presented in Table C.8-6. The City of Palmdale Municipal Code, Chapter 8.28, Section 8.28.030, specifies that construction noise shall not occur between the hours of 8:00 p.m. and 6:30 a.m. in any residential zone or within 500 feet of any residence (City of Palmdale, 2014).

C.8.3 Issues Identified During Scoping

There were no noise-related issues raised by the public or agencies during the public scoping period, refer to Appendix E.

C.8.4 Environmental Consequences

Significance Criteria. The following significance criteria for noise were derived from the applicable construction-related local noise regulations, presented above in Tables C.8-4 and C.8-5. Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion NOI1: Predicted sound levels from temporary use of mobile equipment during construction and operational activities would exceed 75 dBA at single-family residences or 85 dBA at semi-residential/commercial receptors.
- Criterion NOI2: Predicted sound levels from temporary use of stationary equipment during construction and operational activities would exceed 60 dBA at single-family residences or 70 dBA at semi-residential/commercial receptors.
- Criterion NOI3: Noise from temporary use of stationary and mobile equipment during construction and operational activities would occur outside of 7:00 a.m. to 7:00 p.m., or at any time on Sundays or holidays in Los Angeles County or between and 6:30 a.m. and 8:00 p.m. within the City of Palmdale.
- Criterion NOI4: Vibration from temporary use of stationary and mobile equipment during construction and operational activities would damage or cause significant nuisance to sensitive receptors.

Impact Assessment Methodology. Noise impacts are typically determined by compliance with all applicable noise performance standards and regulations. Because both construction and operational activities of the Project would be short-term and temporary during a calendar year (approximately 3 months), they would not result in a permanent change in ambient noise conditions. Therefore, compliance with temporary construction-related noise standards and regulations is applicable.

Noise impacts on the surrounding community are enforced through local noise ordinances, supported by nuisance complaints and subsequent investigation. It is assumed that all existing regulations to the construction and operation of the Project would be enforced. Although the PWD has pre-emptive jurisdiction over local standards and regulations as a State Water agency, local standards are used in this section to help determine the significance of noise impacts. The Occupational Safety and Health Association (Cal-OSHA in California) regulates noise standards related to on-site worker health and safety (OSHA, 2014). Therefore, an analysis of noise to workers is not required.

To determine potential impacts, the significance criteria identified above were compared against predicted noise levels of Project-related mobile and stationary equipment use in relation to the locations of sensitive receptors described in Section C.8.1.3 (Sensitive Receptors). Impacts are identified

should the applicable noise standards presented in Criteria NOI1 and NOI2 be exceeded by Project-related activities. Additionally, impacts are identified if construction noise would occur outside the allowable hours defined by Los Angeles County and the City of Palmdale in Criterion NOI3.

C.8.4.1 Proposed Action/Project

The following section describes the Project's noise impacts as determined by the thresholds of significance and, where necessary, provides mitigation measures that would serve to reduce adverse impacts.

Direct and Indirect Effects Analysis

Predicted sound levels from temporary use of mobile equipment during construction and operational activities would exceed 75 dBA at single-family residences or 85 dBA at semi-residential/commercial receptors (Criterion NOI1)

Activities within the Reservoir and Angeles National Forest (ANF) include construction of the grade control structure, annual sediment removal, and annual restoration/maintenance. Because the Reservoir would be closed to the public during these activity periods, noise within the ANF would not be proximate to any residential or recreation receptors. Additionally, as described above in Section C.8.1.4, no residential receptors are located within 0.5 mile of the quarry sediment disposal locations. Sediment disposal activities within the quarries would not expose receptors to noise. Therefore, the analysis below for Impact N-1 is focused on mobile construction noise along the haul truck routes and periodic activities occurring at the PWD sediment staging location that may impact residential receptors within unincorporated Los Angeles County and the City of Palmdale.

Impact N-1: Noise from mobile sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances

Noise impacts during annual sediment removal/disposal activities would be a function of the construction equipment, the equipment location, and the timing and duration of the noise-generating activities. Typical noise levels generated by individual pieces of mobile construction equipment utilized during Project implementation are displayed in Table C.8-7.

Table C.8-7. Noise Levels from Mobile Construction Equipment

Construction Equipment	Noise Level (Lmax dBA at 50 feet)
Grader/Spreader	85
Compacter	83
Sweeper	82
Excavator	81
Front End Loader	79
Bulldozer/Backhoe	78
Dump Truck	76
Water Truck	76

Source: FHWA, 2006

The construction noise levels presented in Table C.8-7 represent conservative worst-case Lmax conditions, in which the maximum noise level of the piece of construction equipment is generated (FHWA, 2006). These maximum noise levels would not be continuous throughout the workday at any single receptor location, but instead periodic and short-term. These maximum construction-related

noise levels would attenuate at an average rate of 6 dBA every doubling of distance depending on adjacent surfaces and noise spreading (FTA, 2006). Table C.8-8 provides estimated Lmax noise levels at different distances from the source.

Table C.8-8. Attenuation of Construction Noise Levels Away from Source

Distance (feet)	Noise Level (dBA, Lmax)
50	76 – 85
100	70 – 79
200	64 – 73
400	58 – 67
800	52 – 61

Source: FTA, 2006

- **Haul Truck Routes**. Haul (dump) trucks would travel along the Project truck routes as sediment is brought to the disposal sites. As noted in Section C.8.1.4, some residential receptors on Cheseboro Road and Pearblossom Highway are located within the City of Palmdale. However, since the City does not have any applicable exterior noise standards for temporary mobile construction noise, the County's 75 dBA threshold is utilized.

  At the closest residential uses along Cheseboro Road, Pearblossom Highway, and 47th Street, temporary haul truck noise would occur periodically 100 feet from residential structures (attenuating to 70 dBA Lmax). While residential setbacks vary along the route, field reconnaissance indicates this is the average structure setback. Therefore, intermittent construction-related Lmax noise levels at residences along the haul truck routes would not exceed the 75 dBA exterior noise threshold for mobile construction equipment noise, as designated by the County of Los Angeles. Additionally, the proposed haul routes are public roadways where daily vehicle use, including large truck trips, regularly subjects these adjacent receptors to exterior Lmax vehicle noise levels similar to that of Project related haul trips. While periodic bursts of noise from haul trucks is estimated to fall below this Lmax threshold, SPC NOI-1 is included to monitor and address any construction noise complaints (refer to Appendix A).

- **PWD Sediment Storage Site**. Residential receptors are located immediately west of the PWD sediment staging property with observed setbacks of 100 feet from the PWD property edge. It should be noted that these residential receptors are located within the City of Palmdale. However, since the City does not have any applicable exterior noise standards for temporary mobile construction noise, the 75 dBA threshold is utilized. All equipment utilized on the site for temporary sediment storage would be mobile.

  As shown in Table C.8-8, these receptors could experience periodic exterior noise levels of 70-79 dBA Lmax at the structure exterior, should mobile construction equipment be utilized at the extreme west portion of the PWD property. As discussed in Section B.2.3.2, small amounts of sediment would be stored at this location only for the short term and would always first occur in the northeast portion of the site, ensuring the greatest distance from adjacent residences. The entrance to this property and area where sediment would be stored is located immediately adjacent to 47th Street, conservatively 900 feet from the nearest residential receptor. Activities from this distance are expected to generate exterior noise levels less than 52-61 dBA Lmax at the structure exterior. Therefore, intermittent construction-related Lmax noise levels at the PWD site are not expected to exceed the 75 dBA exterior noise threshold for mobile construction equipment noise at adjacent residential receptors. To ensure this threshold is not exceeded and compliance with the City of Palmdale Municipal Code (Chapter 8.28, Section 8.28.030) is achieved, SPC NOI-2 is included (refer to Appendix A). Additionally,

SPC NOI-1 would include monitoring and addressing noise complaints from activities occurring at the PWD site.

SPCs Applicable to Impact N-1

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

With the implementation of SPCs NOI-1 and NOI-2, any potential conflicts of mobile noise sources to residential locations along the Project truck routes and PWD sediment storage site would be less than significant (Class III).

Predicted sound levels from temporary use of stationary equipment during construction and operational activities would exceed 60 dBA at single-family residences or 70 dBA at semi-residential/commercial receptors (Criterion NOI2)

Impact N-2: Noise from stationary sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances

The only stationary construction equipment utilized during the duration of the Project would be temporary use of a soil cement batch plant, rock screener, dewatering pumps, and generators during construction of the grade control structure. These activities would occur entirely within the Reservoir, which would be closed to the public during these activity periods. The grade control structure and restored/ongoing water storage capacity of the Reservoir would not generate any new permanent stationary noise.

CEQA Significance Conclusion

Temporary noise generated by stationary construction equipment would not impact any sensitive receptors. As the Reservoir would be closed during grade control structure construction and annual sediment removal, stationary construction noise would not impact park users and would be less than significant (Class III).

Noise from temporary use of stationary and mobile equipment during construction and operational activities would occur outside of 7:00 a.m. to 7:00 p.m., or at any time on Sundays or holidays in Los Angeles County or between and 6:30 a.m. and 8:00 p.m. within the City of Palmdale (Criterion NOI3)

Impact N-3: Temporary construction activities may occur outside allowable hours and substantially disturb sensitive receptors

Construction of the grade control structure would occur entirely within the ANF and is not subject to allowable construction hours specified by Los Angeles County or City of Palmdale. As described in Section B.2.2, the grade control structure is currently estimated to take approximately 20 weeks to complete with most activities typically occurring between 7:00 a.m. to 7:00 p.m., 6 days per week (no work on Sundays or federal holidays). Temporary night construction may be necessary during large soil cement pours. However, the likelihood of this occurrence is considered low. No work would be permitted outside of these normal times/days without prior written approval from the Forest Service.

As discussed in Section B.2.3, annual sediment removal and restoration/maintenance activities would occur only between 7:00 a.m. to 7:00 p.m., up to 6 days a week (no activities occurring on Sundays or federal holidays). Therefore, these activities would be in full compliance with the allowable construction hours specified by the Los Angeles County Noise Ordinance, City of Palmdale General Plan, and City of Palmdale Municipal Code.

CEQA Significance Conclusion

All construction activities would be in full compliance with the allowable construction hours specified by the Los Angeles County Noise Ordinance, City of Palmdale General Plan, and City of Palmdale Municipal Code. Any activities occurring within the ANF outside normal times/days would occur only with prior written approval from the Forest Service. Therefore, less than significant impacts would occur (Class III).

Vibration from temporary use of stationary and mobile equipment during construction and operational activities would damage or cause significant nuisance to sensitive receptors (Criterion NOI4)

Activities within the Reservoir during construction of the grade control structure, annual sediment removal, and annual restoration/maintenance would occur entirely within the ANF and would not be proximate to any residential receptors. The Reservoir would be closed to the public during these activity periods. Additionally, as described above in Section C.8.1.4, no residential receptors are located within 0.5 mile of the quarry sediment disposal locations. Therefore, the analysis below for Impact N-4 is focused on vibration from haul truck trips and periodic activities within the PWD sediment staging location that may impact residential receptors within unincorporated Los Angeles County and the City of Palmdale.

Impact N-4: Vibration from temporary construction equipment use could substantially disturb sensitive receptors

Typically, groundborne vibrations generated by man-made activities attenuate rapidly with distance from the source of the vibration. Construction-related vibration is usually confined to short distances (i.e., 500 feet or less) from the source (FTA, 2006).

Heavy truck trips could produce short-term groundborne vibration occurrences at residential receptors located along Cheseboro Road, Pearblossom Highway, and 47th Street. Due to the amount of heavy truck traffic currently occurring on Pearblossom Highway, the primary locations of concern would be residences along Cheseboro Road and 47th Street. The main cause of vibration during transport would be uneven road surfaces. The level of vibration depends upon the vehicle speed and weight. Loaded and unloaded haul truck weight would remain fairly static throughout annual sediment removal. Reducing speeds on the haul truck routes may slightly reduce the potential for vibration, but could in turn create traffic flow and safety hazards from speeds below the posted speed limit. Based on a review of the local roadway network between the Reservoir and quarries, no alternative routes offer haul trucks less sensitive roadways. Therefore, while few options are available to reduce the potential for adverse temporary vibration from haul trucks on these public roadways, SPC NOI-1 is proposed to monitor and address any vibration complaints from haul trucks and heavy equipment use.

Localized vibration may also occur within the PWD sediment storage site from haul truck ingress/egress and sediment stockpiling/removal activities. The implementation of SPC NOI-2 would ensure on-site construction equipment use within the PWD sediment storage site would not occur within 500 feet of

any residential structures. Furthermore, SPC NOI-1 is proposed to monitor complaints of any construction-related vibration within the PWD site.

SPCs Applicable to Impact N-4

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

With the implementation of SPCs NOI-1 and NOI-2, vibration impacts from Project haul trucks to residential locations along the Project truck routes and activities within the PWD sediment storage site would be less than significant (Class III).

C.8.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Predicted sound levels from temporary use of mobile equipment during construction and operational activities would exceed 75 dBA at single-family residences or 85 dBA at semi-residential/commercial receptors (Criterion NOI1)

Alternative 1 would result in identical activities within the Reservoir and the ANF as the Project. These activities would not be proximate to any residential receptors and the Reservoir would be closed to the public during these activity periods. Additionally, as described above in Section C.8.1.4, no residential receptors are located within 0.5 mile of the quarry sediment disposal locations. Therefore, the analysis below is focused on noise from haul truck trips and periodic activities occurring at the PWD sediment staging location under Alternative 1.

Impact N-1: Noise from mobile sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances

Peak noise levels during annual sediment removal along the haul truck routes and at the PWD site would be identical to that described for the Project. However, by starting the initial sediment removal period on July 1 (annually), instead of after Labor Day, the overall daily frequency of noise would be reduced through an overall reduction in the number of daily haul trips. It should be noted that while there may be a reduction in the number of daily haul trips, the overall number of days that activities would occur is increased into the months of July and August. Therefore, Alternative 1 would reduce the amount of mobile noise occurring per day, but would increase the overall number of days noise would be generated annually.

While estimated Lmax noise levels from haul truck trips would be below 75 dBA Lmax at receptors, SPC NOI-1 would also be required for Alternative 1 to monitor and address any construction noise complaints. Furthermore, SPC NOI-2 would be required to ensure intermittent construction-related Lmax noise levels at the PWD site would not exceed 75 dBA at adjacent receptors. Additionally, SPC NOI-1 would include monitoring noise complaints from activities occurring at the PWD site.

SPCs Applicable to Impact N-1

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

With the implementation of SPCs NOI-1 and NOI-2 as part of Alternative 1, any potential conflicts of mobile noise sources to residential locations along the truck route and adjacent to the PWD sediment storage site would be less than significant (Class III).

Predicted sound levels from temporary use of stationary equipment during construction and operational activities would exceed 60 dBA at single-family residences or 70 dBA at semi-residential/commercial receptors (Criterion NOI2)

Impact N-2: Noise from stationary sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances

The only stationary construction equipment utilized with Alternative 1 would be identical to that of the Project and occur entirely within the Reservoir only during construction of the grade control structure. The Reservoir would be closed to the public during these activity periods and stationary noise would not occur proximate to any residential receptors. The grade control structure and restored water storage capacity of the Reservoir under Alternative 1 would not generate any new permanent stationary noise.

CEQA Significance Conclusion

Noise generated by stationary construction equipment would not impact any sensitive receptors. As the Reservoir would be closed during Alternative 1 construction and excavation, stationary construction noise would not impact park users and would be less than significant (Class III).

Noise from temporary use of stationary and mobile equipment during construction and operational activities would occur outside of 7:00 a.m. to 7:00 p.m., or at any time on Sundays or holidays in Los Angeles County or between and 6:30 a.m. and 8:00 p.m. within the City of Palmdale (Criterion NOI3)

Impact N-3: Temporary construction activities may occur outside allowable hours and substantially disturb sensitive receptors

Alternative 1 alters the initial sediment removal period to start on July 1 (annually), instead of after Labor Day, and reduces the weekly construction schedule by one day per week. Under Alternative 1, all activities within Los Angeles County and City of Palmdale would occur between 7:00 a.m. to 7:00 p.m., 5 days per week (no work on Sundays or federal holidays). Any work occurring outside these times/days within the ANF would occur only with prior written approval from the Forest Service.

CEQA Significance Conclusion

All construction activities would be in full compliance with the allowable construction hours specified by the Los Angeles County Noise Ordinance, City of Palmdale General Plan, and City of Palmdale Municipal Code. Any activities occurring within the ANF outside normal times/days would occur only with prior written approval from the Forest Service. Therefore, less than significant impacts would occur (Class III).

Vibration from temporary use of stationary and mobile equipment during construction and operational activities would damage or cause significant nuisance to sensitive receptors (Criterion NOI4)

The analysis below for Impact N-4 is focused on mobile vibration from haul truck trips and periodic activities occurring at the PWD sediment staging location. All other activities that may generate temporary vibration would not occur proximate to any residential receptors.

Impact N-4: Vibration from temporary construction equipment use could substantially disturb sensitive receptors

Peak vibration levels under Alternative 1 during annual sediment removal along the haul truck routes and at the PWD site would be identical to that described for the Project. However, by starting the initial sediment removal period on July 1 (annually), instead of after Labor Day, the overall daily frequency of potential vibration from haul trips would be reduced. It should be noted that Alternative 1 does increase the overall number of days where temporary vibration may be generated by increasing the sediment removal period into the months of July and August.

SPC NOI-1 is proposed to monitor complaints of haul truck vibration from Alternative 1. Localized vibration may also occur within the PWD sediment storage site from haul truck ingress/egress and sediment stockpiling/removal activities. The implementation of SPC NOI-2 would ensure on-site construction equipment use within the PWD sediment storage site would not occur within 500 feet of any existing sensitive receptor structures. Furthermore, SPC NOI-1 is proposed to monitor complaints of any construction-related vibration within the PWD site.

SPCs Applicable to Impact N-4

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

With the implementation of SPCs NOI-1 and NOI-2, vibration impacts from Alternative 1 would be less than significant (Class III).

C.8.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at an annual average rate of 38,000 cubic yards per year. PWD would not undertake any activities to remove sediment. Therefore, no noise would be generated.

In the event sediment buildup led to safety issues and required demolition/removal of the Dam, construction activities (and related noise) are expected to be greater than that of the Project or Alternative 1. Demolition of the dam and restoration of the waterway would require extensive construction. Noise from such activities would be similar or greater in intensity and would likely require additional construction years. While many activities would occur within the Reservoir and not proximate to sensitive receptors, the hauling and disposal of up to 2.8 million cubic yards of sediment and dam debris would generate noise similar to, but likely greater in occurrence, than that of the Project or Alternative 1.

In the event the Reservoir became filled with sediment and the Dam was left, it is likely some sort of downstream flood-control channeling would need to be constructed. Noise from such construction activities would be temporary and similar in levels to that occurring during grade control construction.

However, depending on the location of such flood control facilities, construction may occur proximate to downstream residential receptors.

CEQA Significance Conclusion

Noise generated from eventual construction activities may not comply with all applicable Los Angeles County and City of Palmdale regulations pertaining to noise and vibration performance standards and allowable construction hours. While such a determination is speculative, the possibility exists. Therefore, noise impacts of the No Action/No Project Alternative are considered significant and unavoidable (Class I).

C.8.5 Impact Summary

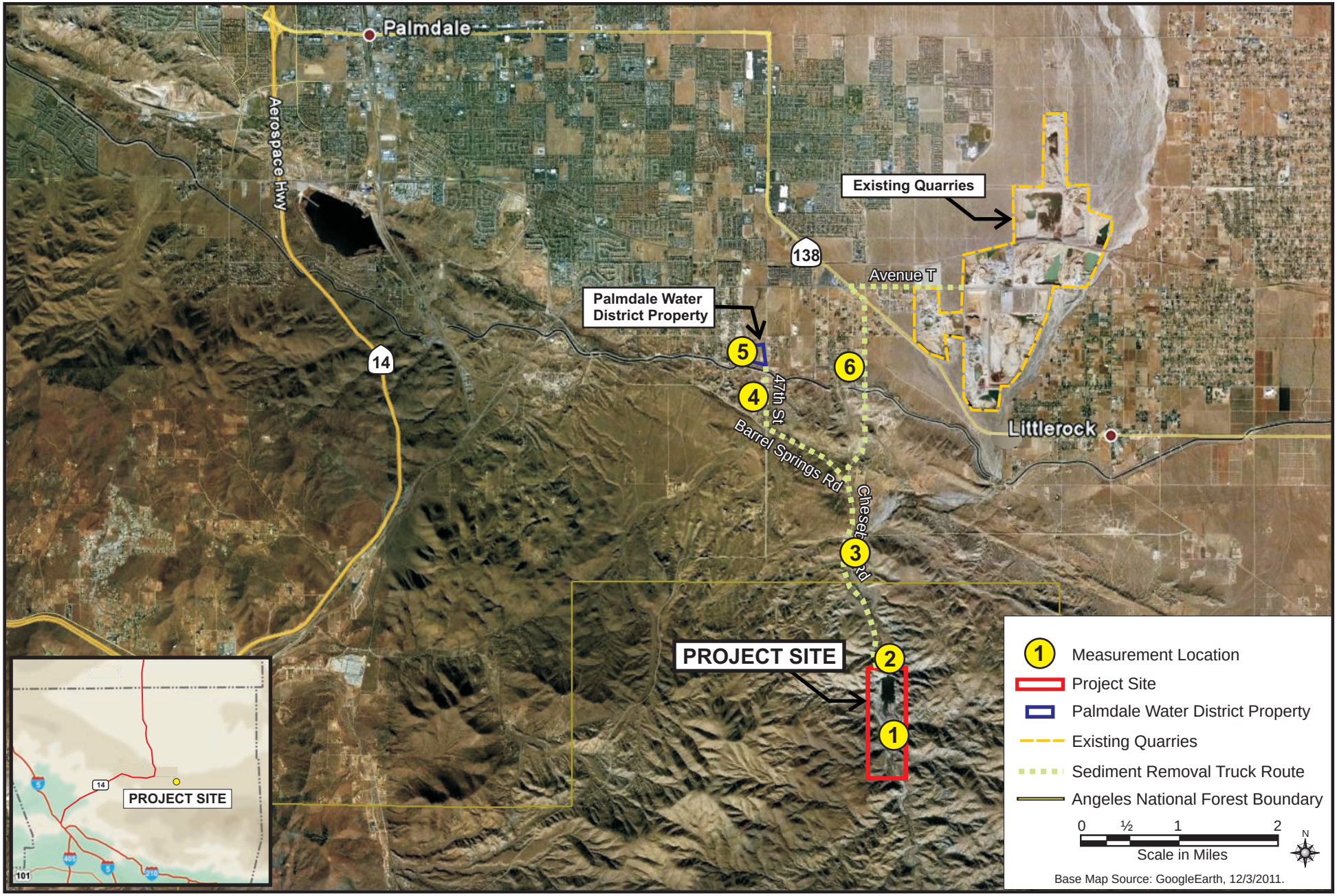
With the implementation of SPCs NOI-1 and NOI-2, potential noise and vibration impacts associated with the Project and Alternative 1 would be less than significant. While such a determination is speculative for the No Action/No Project Alternative, the possibility exists that significant and unavoidable noise impacts may occur from either necessary downstream flood control improvement construction proximate to residential receptors or significant construction from removal of Littlerock Dam if the Reservoir were allowed to fill up with sediment and Dam safety became compromised.

Table C.8-9 summarizes the direct and indirect environmental impacts of the Project and the alternatives on noise and vibration. Refer to Section C.8.4 for the entire environmental analysis and the full text of recommended mitigation measures.

Table C.8-9. Summary of Impacts and Mitigation Measures – Noise

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1, 2]	
N-1: Noise from mobile sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances	Class III	Class III	Class I	No	SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)
N-2: Noise from stationary sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances	Class III	Class III	Class I	No	None
N-3: Temporary construction activities may occur outside allowable hours and substantially disturb sensitive receptors	Class III	Class III	Class I	Yes	None
N-4: Vibration from temporary construction equipment use could substantially disturb sensitive receptors	Class III	Class III	Class I	No	SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
2 – Determination based on non-biological resource sensitive receptors.



Ambient Noise Measurement Locations

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.8-1

May 2016

C.9 Recreation and Land Use

This section describes the impacts to land use and public recreation associated with the construction and operation of the proposed action and alternatives. The EIS/EIR considers existing and proposed land uses in addition to sensitive land uses that have the potential to be affected by the Project. Sensitive land uses include the following land use types: residences, schools, hospitals, daycare centers, retirement homes, and cemeteries. Recreational resources are also defined as sensitive land uses, as they are susceptible to disturbances (e.g., noise, traffic, dust, etc.) that could decrease or eliminate the value of the recreational experience. In general, recreational facilities (parks, open space, playgrounds, play fields, etc.), recreational activities (bicycling, hiking, boating, etc.), and recreationists are considered to be sensitive receptors for purposes of this impact assessment.

C.9.1 Affected Environment

The proposed sediment removal at Littlerock Reservoir would be located within the Santa Clara/Mojave Rivers Ranger District of the Angeles National Forest (ANF). Truck routes for construction equipment and sediment removal would traverse federal and local jurisdictions that include National Forest System (NFS) lands, unincorporated Los Angeles County, and City of Palmdale (see Figure C.9-1: Jurisdictional Boundaries). The extent of the area to be analyzed for land use impacts is considered the Land Use Study Area. While other issue areas in this EIS/EIR may identify a Study Area with a different radius, the Land Use Study Area has been defined by the following:

- Land and recreation uses immediately adjacent to construction activities at Littlerock Reservoir;
- Land and recreation uses located along the sediment removal truck routes; and
- Land and recreation uses adjacent to the proposed sediment disposal sites.

To facilitate the analysis of land use and public recreation for the proposed action and alternatives, the discussion of the affected environment within the Study Area has been organized by NFS lands, truck routes, and proposed sediment disposal sites.

C.9.1.1 National Forest System Lands

The Land Management Plan (Forest Plan) for the ANF divides NFS lands into Land Use Zones, which identify appropriate management types of uses that are consistent with the desired conditions of each Place within the Forest. The Project occurs within the Backcountry[1] and Developed Area Interface[2] zones. These zones allow a variety of uses and are the two least restrictive zones described in the Forest Plan.

Figure C.9-2 (Angeles National Forest Land Use Zones) illustrates the location of the Forest Service Land Use Zones relative to the Project components. The majority of the Reservoir and the existing paved areas are located within the Developed Area Interface Land Use Zone. However, the proposed grade control structure at Rocky Point is located within the Back Country Land Use Zone.

The Littlerock Dam and Reservoir are authorized on NFS lands by a special use authorization, considered a non-recreation special-use. Although the dam and the water behind it are owned and managed by PWD,

[1] Generally undeveloped; includes network of Back Country roads that provide access for camping, hiking, biking, and OHV use.

[2] Adjacent to communities and developed sites; includes developed recreation facilities and infrastructure.

its operations are subject to a special-use authorization that is administered by the Forest Service (USFS, 2005b).

San Gabriel Mountains National Monument. On October 10, 2014, the San Gabriel Mountains National Monument was established under the President's Antiquities Act authority. The portion of the Study Area that is located on NFS lands is entirely within this National Monument.

Littlerock Reservoir Recreation Facilities. While the primary purpose of Littlerock Dam is to provide a water source to PWD, recreation facilities have been developed at the Reservoir and the surrounding area. Many of these facilities were built pursuant to PWD's agreements with DWR and the Forest Service (USFS, 2014a). These facilities include:

- Little Rock Lake Resort: Includes a general store, cafe, and boat and cabin rentals (USFS, 2014a).
- Picnic Sites: The Juniper Picnic Site, Rocky Point Picnic Site, Fisherman's Point, and Sage Picnic Site are located adjacent to the Reservoir, while the Santiago Staging Area Picnic Site is located 0.25 mile south of the Reservoir.
- Joshua Tree and Basin Campgrounds located approximately one mile south of the dam.
- OHV roads and trails located east and south of the Reservoir (currently closed at the Reservoir due to the presence of endangered species), and OHV use of the Reservoir (when water levels are lowered by PWD) between the dam and Rocky Point.

Historically, Littlerock Reservoir and the surrounding area have provided a diversity of recreational uses and opportunities. The 1997 Recreation Area Guidelines adopted by the Forest Service estimated a design capacity of 489 vehicles, or 1,252 people at one time in the developed recreation area.

There is currently little to no recreational use or potential at Littlerock Reservoir, and a number of factors have contributed to the area's current state. Impacts to Arroyo Toads required closure of Forest Road 5N04 and the campgrounds south of the Reservoir. The ongoing drought has caused PWD to virtually empty the Reservoir as early as April, leaving no "minimum pool" for water-based recreation. In non-drought years the minimum pool is maintained until Labor Day. Declining budgets and fee revenue to the Forest Service have substantially reduced available enforcement personnel and facility maintenance funds. The threat of Quagga mussels has caused the Forest Service to limit boating activities in 2011. The Forest Service has the option to permit a concessionaire to operate the resort facilities, but due to limited economic potential, no permit has been offered since the last one expired in 2013. The State of California Department of Fish and Wildlife (CDFW) no longer stocks trout due to a lawsuit over endangered species impacts, and the California Office of Environmental Health Hazard Assessment has issued a fish consumption advisory due to presence of mercury in fish tissues (LRWQCB, 2014), both limiting a once popular angling destination. One of the recreational opportunities historically available is OHV use within the Reservoir, which was last authorized in 2013. The Forest Service annually assesses OHV use at the Reservoir based on weather and water levels, and therefore it is not consistently available as an OHV area. In some years, OHV use is permitted within the Reservoir for one to two months beginning in September. In other years, the Reservoir has not been lowered to a sufficient degree to allow for OHV use. The Reservoir is currently closed to public access to protect public health and safety, but no official Forest Service Closure Order has been issued. This means the entry gate is closed and locked, but it is not illegal to enter the area.

Current management of recreation at the Reservoir faces challenges such as drought and ongoing closure to OHV use. In determining potential future recreational use, the Forest Plan specifies that existing facilities and recreational opportunities would either be maintained or would be the subject of site-

specific analysis to determine future management. It is reasonably foreseeable that the Forest Service would undertake a project to restore the recreational use and opportunities at Littlerock Reservoir over the life of the Project.

Alternative Recreation Facilities. The following recreational resources are located within 35 miles of the Reservoir, and include facilities for boating, fishing, swimming, camping, hiking, and OHV use.

- **Chilao Campground-** Approximately 11 miles south of Littlerock Reservoir, this campground is located within the ANF and includes 84 campsites (USFS, 2016).
- **Soledad Canyon RV and Camping Resort-** Approximately 11 miles southwest of Littlerock Reservoir, this facility offers camping, swimming, sports courts, bike trails, and a miniature golf course (Thousand Trails, 2016).
- **Acton/ Los Angeles North KOA-** Approximately 14 miles southwest of Littlerock Reservoir, this facility offers camping, swimming, and sports courts (KOA, 2016).
- **Rowher Flat OHV Recreation Area-** Approximately 20 miles west of Littlerock Reservoir, this 10,000-acre recreation area is managed by the Forest Service and is open year-round. It includes 60-miles of trails and areas for camping (USFS, 2011; RiderPlanet, 2015).
- **El Mirage Dry Lake Off-Highway Vehicle Recreation Area-** Approximately 28 miles northeast of Littlerock Reservoir, this recreation area is managed by the Bureau of Land Management and is open year-round. It includes 40 miles of OHV trails as well as areas for camping. Other recreational activities include hiking, rock scrambling, rock hounding and the use of ultra-light aircraft (BLM, 2016).
- **Castaic Lake Recreation Area-** Approximately 33 miles west of Littlerock Reservoir, this recreation area is operated by the County of Los Angeles Department of Parks and Recreation. Facilities include camping, fishing, boating, swimming, and hiking (Castaic Lake, 2016).

C.9.1.2 Truck Routes

The truck routes for transporting excavated sediment would utilize existing roadways along areas characterized by undeveloped land with scattered low-density residential uses. The exact truck route would depend upon the selected sediment storage or disposal site, which would include one of the following:

- **PWD-owned property route:** To access this site, trucks would travel along Cheseboro Road, Barrel Springs Road, and 47th Street. The first approximately 1.6 miles of the route along Cheseboro Road would traverse NFS lands, while the remainder 2.7 miles would be entirely within unincorporated Los Angeles County (see Figure C.9-1: Jurisdictional Boundaries). The area along this route is predominately undeveloped with a scattering of ranch-style homes. The route would cross the California Aqueduct, which is located along the southern border of this site. Water storage tanks are located along 47th Street immediately south of the aqueduct.
- **Existing quarries route:** To access the quarries, trucks would travel along Cheseboro Road and Avenue T. The first approximately 1.6 miles of the route along Cheseboro Road would traverse NFS lands, with approximately three miles across unincorporated Los Angeles County and approximately 0.6 mile across the City of Palmdale (see Figure C.9-3: Land Use Designations). The land uses along this route include scattered residences separated by large areas of undeveloped land. Residential development along Cheseboro Road is primarily located north of the California Aqueduct and south of Avenue T.

C.9.1.3 Proposed Sediment Disposal Sites

The Project would temporarily store or dispose of excavated sediment at one of two possible locations. The location of these sites and their adjacent land uses are discussed below:

- **PWD property:** This 21-acre undeveloped site is located in unincorporated Los Angeles County in an area zoned for single-family residential development (see Figure C.9-3). The property is bordered to the east and west by residential development, to the south by the California Aqueduct, and to the north by undeveloped land.
- **Existing quarries:** There are six sand and gravel pits that are located north and east of Pearblossom Highway and south and east of E Avenue S. The quarries are located in an area of the City of Palmdale that is zoned for Quarry and Reclamation Use (see Figure C.9-3: Land Use Designations).

C.9.2 Regulatory Framework

The Project and alternatives would traverse federal and local jurisdictions. The following discussion summarizes the associated laws, regulations, and standards for these jurisdictions. Table C.9-1 provides a list of standards from the Forest Service Land Management Plan, as well as local policies that are applicable to Recreation and Land Use, and includes a discussion of the Project's consistency with each policy.

C.9.2.1 USDA Forest Service

- **National Forest Management Act (NFMA).** This law requires that any site-specific project that is proposed within a national forest must be consistent with Forest Plan Standards in Part 3 of the Forest Plan. While not required by NFMA, the Project is also consistent with Forest Plan program strategies for Special Use Administration, Watershed Function, and Air Quality, and will help accomplish the Desired Conditions for Natural Areas in an Urban Context by using and restoring an existing facility instead of constructing a new one. The Project also occurs within Land Use Zones suitable for these projects and activities as discussed in Section C.9.1.1.

C.9.2.2 County of Los Angeles

- **County of Los Angeles General Plan Land Use Element (Adopted November 1980).** The County of Los Angeles is currently updating its General Plan. Although the 1980 General Plan (as amended) continues to be the official planning document for the County, the proposed 2035 General Plan was also reviewed in this Recreation and Land Use analysis to identify any policies that may be specific to the Project. At this time, there were no policies proposed in the 2035 General Plan for which the Project would be inconsistent.

  The Project would traverse the following County land use classifications: Non-Urban, Open Space, and Low Density Residential (County of Los Angeles, 1980). As described in Section C.9.1 (Affected Environment), the proposed sediment storage site on 47th Street East is zoned for single-family residential development. Per Title 22 of the County of Los Angeles' Planning and Zoning Code (Section 22.20.100), a Single-Family Residence Zone may accommodate solid fill projects (i.e., more than 1,000 cubic yards) as long as a conditional use permit (CUP) has been obtained by the County (County of Los Angeles, 2014b).

- **Antelope Valley Areawide General Plan (Adopted December 1986).** This areawide plan is a component of the County of Los Angeles General Plan and guides the County's planning efforts for the unincorporated portions of Antelope Valley. The nearest unincorporated rural community to the

Project is the community of Littlerock, which is less than one mile east of the existing quarries. The proposed truck routes for sediment disposal would not travel within the Littlerock community. Per the Antelope Valley Areawide General Plan, the Project would traverse lands classified as "Non Urban," which includes low-density residential, airports, waste disposal facilities, mining operations, and quarries (County of Los Angeles, 1986).

C.9.2.3 City of Palmdale

- **City of Palmdale General Plan (January 1993).** The Land Use Element of the City of Palmdale General Plan provides an overview of existing land uses within the City, which includes six sand and gravel mining operations located along the Little Rock Wash on the southeastern border, as well as one mining operation located on the west side of the City at 70th Street West, south of the California Aqueduct (City of Palmdale, 1993). The Project would consider disposing the excavated sediment at the exhausted mining quarries located within the City along its southeastern border. The quarries are located in an area that is currently zoned for Quarry and Reclamation Use. Any quarry operator who participates with the PWD to receive sediment from the Reservoir must apply to the City for a new CUP or for a major modification to its existing CUP, per the discretion of the City.

Table C.9-1. Consistency with Applicable Recreation and Land Use Plans and Policies

Plan/Policy	Consistency	Explanation
USDA Forest Service Land Management Plan Part 3: Design Criteria for the Southern California National Forests (September 2005)		
The following Land Management Plan Standards are applicable to the Project: • *S9/S10 - Design management activities to meet the Scenic Integrity Objectives shown on the Scenic Integrity Objectives Map* • *S11/S12 – Develop specific conservation measures for TEPCS species using Forest Plan species documents and Appendices* • *S14/S15 – Retention of snags and downed logs in and outside of RCAs* • *S18 - Protect known active and inactive raptor nest areas. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging.* • *S24 – Mitigate ongoing uses on ESA listed species* • *S31 – Design new facilities to direct public use away from ESA listed, proposed or candidate species* • *S32 - When surveys for species presence/absence are done for threatened, endangered, and proposed species, use established survey protocols, where such protocols exist* • *S47 – Riparian Conservation Area 5-Step Screening Process* • *S60 – Cultural and Historic – applies same protection and consideration to sites not yet evaluate for National Register as to those found eligible*	*Yes*	• *S9/S10 - The Project would not alter the definition of High SIO for the Reservoir, and would be consistent with the SIO of the Forest Plan, as discussed in Section C.11.2 (Visual Resources).* • *S11/S12 – Species guidance documents were used in preparing Biological Evaluations/Assessments. Mitigation is captured in SPC's for a variety of species, as discussed in Section C.3 (Biological Resources).* • *S14/S15 – Any snags that are not a safety threat would be retained. Downed logs would be retained to the extent feasible.* • *S18 - An evaluation of impacts to nesting birds and raptors was conducted in Section C.3 (Biological Resources). To ensure that the Project is consistent with the Forest's management activities, SPCs have been incorporated to avoid impacts to nesting birds.* • *S24 – Project purpose and need is to provide long term habitat protection for arroyo toad by installing a grade control structure.* • *S31 – Grade control structure will avoid impacts by serving as a boundary and barrier to areas occupied by arroyo toad.* • *S32 - The Project would comply with all applicable standards and protocols when conducting surveys for listed plants and wildlife.* • *S47 – RCA Screening Process has been applied. See Biology Section C.3.5.4 for analysis of habitat impacts including riparian areas.* • *S60 – Protection of any non-evaluated sites as eligible for the National Register is provided as applicable. See Section C.4.4 (Cultural Resources).*

Table C.9-1. Consistency with Applicable Recreation and Land Use Plans and Policies

Plan/Policy	Consistency	Explanation
• *S61 – Cultural and Historic - human remains that are not under the jurisdiction of the County Coroner shall remain undisturbed unless there is an urgent reason for their disinterment.*		• *S61 - Procedures noted in Mitigation Measure C-2 provide for the appropriate treatment in the event of an accidental discovery of human remains during Project construction. See Section C.4.4 (Cultural Resources).*
County of Los Angeles General Plan Land Use Element (November 1980)		
Policy 5: Where appropriate, promote more intensive use of industrial sites, especially in areas requiring revitalization.	Yes	Excavated sediment would be disposed at exhausted quarries located within the City of Palmdale. Prior to sediment storage at PWD-owned property on 47th Street, PWD would seek a CUP from the County to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
Policy 6: Encourage the recycling of abandoned mineral extraction sites to recreational, industrial or other productive use.	Yes	PWD will seek to recycle excavated sediment as feasible for use on District and other municipal projects. Sediment that cannot be recycled would be disposed at exhausted quarries located within the City of Palmdale.
Policy 8: Protect the character of residential neighborhoods by preventing the intrusion of incompatible uses that would cause environmental degradation such as excessive noise, noxious fumes, glare, shadowing, and traffic.	Yes	SPCs and mitigation measures have been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section C.8 (Noise), Section C.10 (Transportation and Traffic), and Section C.11 (Visual Resources).
Policy 11: Promote planned industrial development in order to avoid land use conflicts with neighboring activities.	Yes	Excavated sediment would be disposed at exhausted quarries located within the City of Palmdale. Prior to sediment storage at PWD-owned property on 47th Street, PWD would seek a CUP from the County to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
County of Los Angeles Antelope Valley Areawide General Plan (December 1986)		
Policy 32: Encourage recycling and revitalization of deteriorating urban areas by pursuing appropriate demolition, rebuilding, and/or rehabilitation.	Yes	PWD will seek to recycle excavated sediment as feasible for use on District and other municipal projects. Sediment that cannot be recycled would be disposed at exhausted quarries located within the City of Palmdale.
Policy 33: Encourage maintenance, conservation, and rehabilitation to prevent community deterioration.	Yes	Excavated sediment would be disposed at exhausted quarries located within the City of Palmdale. Prior to sediment storage at PWD-owned property on 47th Street, PWD would seek a CUP from the County to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
Policy 62: Mitigate where possible undesirable impacts of adjacent land uses (i.e., noise interruption, visual intrusion, and airborne emissions) through utilization of appropriate buffers, building codes and standards.	Yes	SPCs and mitigation measures have been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section C.8 (Noise), Section C.10 (Transportation and Traffic), and Section C.11 (Visual Resources).
Policy 155: Encourage continued cooperation among federal, state and local agencies in multiple use management of public lands — specifically recognizing recreation as a desirable use.	Yes	PWD is working jointly with the Forest Service to restore the flood control and water storage capacity of the existing Reservoir. There would be no impact to recreation areas outside of the Reservoir.

Table C.9-1. Consistency with Applicable Recreation and Land Use Plans and Policies

Plan/Policy	Consistency	Explanation
City of Palmdale General Plan Land Use Element (January 1993)		
Policy L5.2.1: Discourage encroachment of incompatible uses into or adjacent to designated industrial land, when it can be shown that such uses may ultimately impede development of industrial uses, and that such uses may be established elsewhere in the Planning Area.	Yes	Excavated sediment would be disposed at exhausted quarries within the City of Palmdale that are zoned for quarry and reclamation use. Quarry operators would obtain a new or modified CUP from the City to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
Policy L5.2.2: Assure compatibility of industrial development with adjacent uses: ▪ Adopt development standards to ensure industrial uses are compatible with adjacent uses and with aesthetic views from adjacent rights-or-way, including but not limited to standards for screening of outdoor storage, locations of loading and refuse disposal areas, height, bulk, impervious surface area, architectural enhancement, landscaping, and other appropriate measures.	Yes	Prior to sediment disposal, PWD and/or quarry operator would seek any required CUPs to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A). SPCs and mitigation measures have also been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section C.8 (Noise), Section C.10 (Transportation and Traffic), and Section C.11 (Visual Resources).
Policy L5.2.7: Adopt performance standards for noise, odors, emissions, vibrations glare, radiation, and other potential impacts of industrial development.	Yes	SPCs and mitigation measures have been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section C.8 (Noise), Section C.10 (Transportation and Traffic), and Section C.11 (Visual Resources).
Policy L7.1.6: Within the Mineral Resource Extraction Zone, ensure that future mining activities over which the City has discretionary authority are compatible with neighboring residential uses: ▪ Ancillary uses allowed on the site should be normally associated with extraction and/or processing of decomposed granite. Uses that are not directly associated (e.g., storage of vehicles/equipment not related to on-site materials extraction) are not appropriate. ▪ Ensure that measures to control noise, dust, and erosion/sedimentation are applied to on-going mining activities. ▪ Require screening from public view all equipment, stockpiles, or wastepiles. ▪ Evaluate truck access to and from the site in order to reduce impacts generated by truck traffic to nearby residents.	Yes	Prior to sediment disposal, PWD and/or quarry operator would seek any required CUPs to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A). SPCs and mitigation measures have also been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section and Section C.11 (Visual Resources).

Sources: City of Palmdale, 1993; County of Los Angeles, 1986, 1980; USDA Forest Service 2005a, 2005b, 2005c.

C.9.3 Issues Identified During Scoping

Table C.9-2 below provides a list of recreation and land use issues raised during the public scoping period for the EIS/EIR [see Appendix E (Summary of Scoping Process)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion of the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.9-2. Scoping Issues Relevant to Recreation and Land Use

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should evaluate and consider changes in reservoir management as a control measure for methylmercury production.	The Project addresses the increased sedimentation of the Reservoir, and would restore the Reservoir to its 1992 water storage and flood control capacity. Future changes in Reservoir management that are for other purposes are outside of the scope of this EIS/EIR. For a discussion of Project impacts related to water quality, please see Section C.12.
The Draft EIS/EIR should evaluate and consider reducing concentrations of inorganic mercury in reservoir sediment through remediation of historic gold and mercury mines upstream of reservoirs.	The Forest Service is not aware of any abandoned mines that have been identified as sources of mercury. Remediation of historic mines is not within the scope of this EIS/EIR. For a discussion of Project impacts related to water quality, please see Section C.12.
City of Palmdale	
The project description indicated that the sediment will be transported off-site to properties owned by the Palmdale Water District or locations accepting sediment for placement and spreading. A Temporary Use Permit for Stockpiling will be required for this activity. No undisturbed land can be used to store/stockpile of sediment, additionally any stockpiling cannot exceed three (3) feet in height of material.	Section C.9.2 discusses the need for obtaining a conditional use permit prior to the use of proposed sediment storage or disposal sites in the City of Palmdale or unincorporated Los Angeles County. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
An alternative consisting of long-term year-round closure of the Reservoir, as included within the NOP, does not specify where the sediment will be transported in order to maintain Reservoir storage capacity. The method of disposal of sediment must be discussed as part of any such alternative.	The preliminary alternatives that were considered during the scoping process have been revised; see Section B.4.6 (Description of Alternatives Eliminated from Further Consideration). The revised Alternative 1 would not require year-round closure of the Reservoir. Section B.4.5.1 (Reduced Sediment Removal Intensity Alternative [Alternative 1]) provides a full description of proposed sediment removal and disposal activities. Truck transport routes and proposed sediment storage and disposal sites under Alternative 1 are identical to the proposed action.
Regarding the disposal of sediment within existing quarries, the City wishes to note that the existing mining operations are operating under a Conditional Use Permit. Any disposal or infill of any material within the open pits will require that the selected mining operation, or operations, submit for a major modification to their CUP or that a new Conditional Use Permit application be submitted. Additionally, the Office of Mine and Reclamation will be notified of the major modification to the approved Reclamation Plan(s). The NOP also identifies the potential for an alternative utilizing \ slurry pipelines to transport the sediment to the selected quarry pit or pits. The City would like to comment that an encroachment permit will also be required for any work to be done in the public right-of-way.	The preliminary alternatives that were considered during the scoping process have been revised, with some initial alternatives (e.g., Slurry Excavation Alternative) eliminated due to issues of feasibility or fundamental disadvantages. See Section B.4.6 (Description of Alternatives Eliminated from Further Consideration) for a discussion of these alternatives. Regarding use of sediment disposal sites in the City of Palmdale, PWD would obtain a conditional use permit from the City prior to the start of Project activities to ensure compliance with local zoning requirements. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).

C.9.4 Environmental Consequences

Significance Criteria. The following significance criteria for Recreation and Land Use were derived from previous environmental impact assessments for similar projects, agency thresholds, and from the CEQA Guidelines (Appendix G, Environmental Checklist Form, Section IX). Impacts of the Project or alternatives would be considered significant and would require mitigation if they:

- Criterion LU1: Conflict with applicable adopted local, State, or federal land use or recreation plans, goals, policies, or regulations.

- Criterion LU2: Preclude a permitted use on nearby property or create a disturbance that would diminish the function of a particular land use.
- Criterion LU3: Contribute to the long-term loss or degradation of the recreational value of an established, designated, or planned recreational use area.

Impact Assessment Methodology. The impact analysis for Recreation and Land Use begins with a survey of existing land uses and recreational resources within the Project area through the use of site visits, aerial maps, discussions with jurisdictional agencies (i.e., Palmdale Water District, Forest Service, City of Palmdale, and County of Los Angeles), and review of applicable planning and policy documents. These baseline conditions for the Project area are described in Sections C.9.1 (Affected Environment) and C.9.2 (Regulatory Framework).

C.9.4.1 Proposed Action/Project

Direct and Indirect Effects Analysis

Conflict with applicable adopted local, State or federal land use or recreation plans, goals, policies, or regulations (Criterion LU1)

The implementation of the Project is consistent with the Land Use Zones, Strategies, and Desired Conditions in the 2005 Forest Service's Land Management Plan. The Project complies with all applicable Forest Plan Standards listed in Table C.9-1. As described in Section C.9.2, the Project is consistent with Forest Plan program strategies for Special Use Administration, Watershed Function, and Air Quality, and will help accomplish the Desired Conditions for Natural Areas in an Urban Context by using and restoring an existing facility instead of constructing a new one.

As a State water agency, PWD has pre-emptive jurisdiction over local plans, policies, and regulations. However, the Project is anticipated to comply with the plans and policies of the City of Palmdale and the County of Los Angeles. Appendix A describes the SPCs that would limit noise and emissions from construction equipment and dump trucks, and Sections C.2 (Air Quality and Climate Change) and C.8 (Noise) include additional mitigation measures to ensure that Project-related noise and emissions are within acceptable levels to local jurisdictions.

The Project would also comply with local zoning requirements regarding sediment disposal. Prior to any movement of excavated sediment, PWD would either: (1) work with the County of Los Angeles to obtain a CUP for sediment storage at the property on 47th Street East; and/or (2) coordinate with participating quarry operators in the City of Palmdale to ensure that sediment disposal occurs only at sites that have been granted a new CUP or a modification to an existing CUP. This commitment to comply with local zoning requirements at the sediment storage and disposal sites has been incorporated into the Project as SPC LAND-1 (Obtain Necessary Conditional Use Permits). See Appendix A for the full text of the Project's SPCs.

Given that the Project is subject to the discretionary review and approval of the Forest Service, and that PWD is coordinating with the County of Los Angeles and the City of Palmdale to meet their permitting and zoning requirements, the Project would be consistent with applicable plans, policies, and regulations.

Preclude a permitted use on nearby property or create a disturbance that would diminish the function of a particular land use (Criterion LU2)

PWD is working jointly with the Forest Service to restore the flood control and water storage capacity of the Reservoir. These proposed restoration activities would neither expand existing facilities nor convert

NFS lands outside of the Study Area. The existing designation and use of NFS lands would not be affected by the Project.

Outside of NFS lands, no existing recreation facilities, parks, or trails were identified along the proposed truck routes that would be disrupted by sediment hauling activities. The truck routes would utilize existing roadways that would not affect adjacent trail facilities or trail use in Los Angeles County or City of Palmdale.

As discussed in Section C.9.1.1, the Reservoir and surrounding area is currently closed to physical entry. However, this closure is not permanent and the Forest Service may decide to allow recreational use of the Reservoir at any time during the life of the Project. The Forest Plan specifies that the primary recreational facilities and uses be retained or studied on a site-specific basis for retention. Recreational opportunities are currently very limited, but may be adversely affected if the Project were to reduce future recreational opportunities and/or conflict with the ability of the Forest Service to implement the Forest Plan.

If the Reservoir were to be re-opened to public use, Project activities (i.e., construction and excavation) would continue to temporarily preclude the recreational use of the Reservoir and surrounding area (Impact L-1). Sediment storage and disposal may also preclude future land use at the proposed disposal sites (Impact L-2). The following discussion describes these potential impacts and the mitigation measures that are proposed to minimize these impacts to the degree feasible.

Impact L-1: Project construction and excavation would preclude or disturb existing recreational resources.

Grade Control Structure

Construction of the grade control structure and the initial excavation and removal of sediment from the Reservoir bottom at the Project site would begin in July 2017 and extend until seasonal water refill of the Reservoir (between mid-November to January). Historically the Reservoir has provided recreational opportunities, primarily in the form of water-based recreation (i.e., boating and fishing). However, this recreational resource has been affected by the current drought, which has caused PWD to virtually empty the Reservoir as early as April, leaving no “minimum pool” for water-based recreation. Other forms of recreation such as OHV use have been intermittently allowed by the Forest Service within the Reservoir.

As discussed in Section C.9.1, the Reservoir is currently closed to public access to protect public health and safety. Construction of the grade control structure would require PWD to lower the Reservoir water level in July to allow for construction at Rocky Point, and the Reservoir would be closed to the public during this time to ensure safety. However, construction of the grade control structure is not expected to result in a substantial effect on recreation use, because it would occur during 2017 when the potential for recreational use is expected to continue to be very low. In addition, the Reservoir may continue to be closed to the public during that time. Although the Reservoir and surrounding area are currently closed to public use, this closure may be lifted by the Forest Service at any time during the life of the Project. Mitigation Measure L-1a (Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer) is recommended to ensure that all Project-related activities are coordinated with the Forest Service.

Initial Annual Sediment Removal- Restore to 1992 Design Capacity

Once the grade control structure is complete, initial sediment removal (lasting 7 to 12 years) would only occur annually during a timeframe when PWD is permitted to remove water from the Reservoir for beneficial use (all sediment removal activities would be scheduled from Labor Day to mid-November to

January). The Reservoir would be closed to the public during this time to ensure safety. Under current operating conditions, during this timeframe, PWD is permitted to obtain water from the Reservoir as necessary for a potable water source. Therefore, water-based recreational activities are not considered available during this period and would not be affected. However, the temporary closure of the Reservoir during sediment removal would preclude OHV use of the Reservoir floor when it may otherwise be available. Mitigation Measure L-1a (Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer) is recommended to ensure that all Project-related activities are coordinated with the Forest Service. Future recreational use and opportunities at the developed recreation sites would also be impacted by temporary closure of the Reservoir for initial sediment removal. Mitigation Measure L-1b (Provide Compensation to Forest Service for Lost Recreational Opportunity) is recommended to ensure this impact is reduced.

Ongoing Annual Sediment Removal – Operation and Maintenance

After initial sediment removal has occurred and the Reservoir is restored to 1992 design storage capacity, the potential for future water-based recreational opportunities would be limited by maintaining the increased storage capacity of the Reservoir, thereby maintaining the increase in the amount of water necessary to fill the Reservoir to minimum pool. Filling the Reservoir to minimum pool would require approximately ten days to two weeks longer than under current conditions (due to increased capacity); however, this would typically occur between January and March when seasonal rain and snowmelt occurs and refills the Reservoir to minimum pool depths. There would be no effect on the typical water-based recreation season of 95 days (June until Labor Day); however, there may one or two years over the life of the Project where the Reservoir would not reach minimum pool. Mitigation Measure L-1b (Provide Compensation to Forest Service for Lost Recreational Opportunity) would minimize this impact by compensating for any lost recreational opportunity. As the Reservoir is not currently listed for recreational fish stocking by CDFW, the removal of non-native fish would eliminate what remains of a historic recreational fishery. However, no historical recreational use data specific to fishing at the Reservoir is available that would allow quantification of this impact.

During the ongoing sediment removal phase of the Project (operation and maintenance), sediment removal would occur for the life of the Reservoir to maintain its storage capacity. These operation and maintenance activities would occur in a manner identical to that described above for initial sediment removal (between Labor Day to mid-November to January).

In order to ensure that sediment removal and grading of the Reservoir bottom would occur in a manner that could allow the Reservoir to continue as a feasible OHV area, SPC LAND-2 (Design Grading to Accommodate OHV Access) would be included as part of the Project. As described in Appendix A, SPC LAND-2 would require the Project grading plan to consider future safety and access for OHVs. To further reduce recreational impacts to the extent feasible, Mitigation Measure L-1a (Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer) is recommended to ensure that all Project-related activities are coordinated with the Forest Service. Future long-term recreational use and opportunities at the developed recreation sites would be impacted by temporary closure of the Reservoir for ongoing sediment removal. Mitigation Measure L-1b (Provide Compensation to Forest Service for Lost Recreational Opportunity) is recommended to ensure this impact is reduced.

Mitigation for Impact L-1

L-1a **Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer**. PWD shall develop the Project construction schedule and coordinate construction with the Forest Service's Authorized Officer. Coordination efforts shall ensure the following occurs unless otherwise approved by the Forest Service's Authorized Officer:

- Construction and maintenance activities are scheduled to avoid heavy recreational use periods (including major holidays) as determined by the Forest Service's Authorized Officer;
- Staging areas for Project activities are located so as to minimize the need to temporarily close developed recreation facilities;
- Timetables for the required period of use will attempt to limit the need for and duration of temporary closures to the greatest extent feasible; and
- The Forest Service and PWD will meet annually prior to Labor Day to discuss these measures and reach consensus. The Forest Service retains final discretion over any temporary closures.

L-1b **Provide Compensation to Forest Service for Lost Recreational Opportunity.** The recreational impacts of the Project during construction could vary widely in any given year. PWD and the Forest Service agree as part of an annual meeting to assess the likely duration of closures and jointly determine the number of days of lost recreation opportunities directly attributable to the Project during the construction time period. Any areas that remain closed to recreation for other factors not associated with the construction of the Project will not be considered. PWD shall compensate the Forest Service based on long term historical records of revenue generated per day kept prior to start of construction of the Project, and also an agreed upon value of public recreation, as determined by literature or studies. Compensation may be any form allowable under current agreement authorities, including cash, equipment, supplies, or in-kind labor. Contributions may be made to a third party, or applied off-site if agreed to by the parties. The goal is for PWD and the Forest Service to build a partnership that provides and enhances recreation fairly and commensurate with Project impacts.

SPC Applicable to Impact L-1

SPC LAND-2 (Design Grading to Accommodate OHV Access)

CEQA Significance Conclusion

After the initial construction and excavation activities proposed throughout the summer and fall of the Project's first year (2017), the proposed action would not preclude recreational use of the Reservoir during the peak summer months until after Labor Day, assuming that the Reservoir is opened for public use during the life of the Project. The implementation of Mitigation Measure L-1a would ensure that ongoing annual excavation and sediment removal is scheduled to avoid closure of the Reservoir during the peak recreational period. The implementation of Mitigation Measure L-1b ensures the Forest Service is compensated for lost recreational opportunity at the Reservoir. The incorporation of SPC LAND-2 would also ensure that grading activities would not permanently preclude OHV use within the Reservoir. With the implementation of these measures, potentially significant recreation impacts would be reduced to a less than significant level (Class II).

Impact L-2: Sediment transport and disposal would preclude or disturb existing uses along the truck route and disposal sites.

As proposed, the Project would transport excavated sediment along existing roadways and temporarily store and/or dispose of sediment at one of two sites. The PWD-owned site on 47th Street East is undeveloped, although existing and possibly future residential development borders the property to the east and west. Existing residences are also adjacent to the sand and gravel quarries in the City of Palmdale along Avenue T. The numerous dump truck trips (maximum of 480 per day) that would be required during the first seven to 12 years of sediment removal, followed by the truck trips during operation and maintenance of the Reservoir, would create nuisance impacts to nearby residences. Residents along the truck routes or disposal sites would be disturbed by the increased truck traffic along roadways, as well as by the noise and emissions from the trucks.

SPCs Applicable to Impact L-2

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ- (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

Transport of sediment during the initial excavation period, as well as during subsequent operation and maintenance phases, would create nuisance impacts that would be significant and unavoidable. SPCs AQ-1 through AQ-5, NOI-1, and NOI-2 would minimize the disturbance to nearby residences to the degree feasible. However, given the length of time that the disturbance would occur (i.e., initial activities over seven to 12 years plus continued annual excavation), and the proximity of existing residences to the truck routes and sediment storage/disposal sites, the impacts to residential land uses cannot be mitigated to a level that is less than significant (Class I).

Contribute to the long-term loss or degradation of the recreational value of an established, designated, or planned recreational use area (Criterion LU3)

As described in Section C.9.1 (Affected Environment), the Project would restore the existing Reservoir to its 1992 design, which would increase the capacity of the Reservoir. By extending the life of the Reservoir as a functional waterbody, the Project would enhance water-based recreational opportunities offered at the Reservoir. The Project would not contribute to the long-term loss or degradation of recreational resources within the Study Area.

C.9.4.2 Alternative 1: Reduced Sediment Removal Intensity

Direct and Indirect Effects Analysis

Conflict with applicable adopted local, State or federal land use or recreation plans, goals, policies, or regulations (Criterion LU1)

Alternative 1 differs from the Project primarily in regards to the schedule for construction and excavation activities. The components of the alternative, including the location of proposed grade control construction, sediment excavation, and staging areas; dump truck routes; and the proposed sediment storage and disposal sites would be identical to the Project. Alternative 1 would also incorporate SPC LAND-1 (Obtain Necessary Conditional Use Permits), which would ensure that this alternative would comply with local zoning requirements (see Appendix A). Therefore, Alternative 1 would be the same as the Project in that it would comply with and support the goals of the 2005 Forest Service's Land Management Plan, and would meet the permitting and zoning requirements of the City of Palmdale and the County of Los Angeles. Alternative 1 would be consistent with applicable plans, policies, and regulations.

Preclude a permitted use on nearby property or create a disturbance that would diminish the function of a particular land use (Criterion LU2)

Impact L-1: Project construction and excavation would preclude or disturb existing recreational resources.

Alternative 1 would be identical to the Project in that it would not alter the designation or use of NFS lands. However, this alternative would reduce the weekly construction schedule to five days per week (instead of six days per week under the Project), and would begin the annual excavation activities for initial sediment removal on July 1st instead of after Labor Day. The extended schedule for proposed construction and excavation activities would preclude water-based recreational use of the Reservoir, assuming that the Reservoir is opened to the public during the life of the Project and PWD does not lower the Reservoir water level during the summer months (as it is permitted to do during drought years). Impacts to recreational resources at the Reservoir would be increased (i.e., impacting water-based recreational use) and would be more prolonged than under the proposed Project, given that the closure of recreational facilities under Alternative 1 would occur during the heaviest use periods. Implementation of the following measures and commitments would reduce impacts to the extent feasible: Mitigation Measure L-1a would ensure that all Project-related activities are coordinated with the Forest Service. Mitigation Measure L-1b would ensure the Forest Service is compensated for lost recreational opportunity at the Reservoir. The incorporation of SPC LAND-2 would ensure that grading activities would not permanently preclude OHV use within the Reservoir.

Mitigation for Impact L-1

L-1a (Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer)

L-1b (Provide Compensation to Forest Service for Lost Recreational Opportunity)

SPC Applicable to Impact L-1

SPC LAND-2 (Design Grading to Accommodate OHV Access)

CEQA Significance Conclusion

Compared with the Project, Alternative 1 would double the number of years that the Reservoir would be closed to the public as a result of construction and excavation activities. Assuming that the Forest Service re-opens the Reservoir to future public access, recreational use of the Reservoir during the peak summer period would continue to be precluded for a minimum of 13 years. The Forest Service and PWD would continue to annually review the construction schedule and assess future recreation opportunities (see Mitigation Measure L-1a), and the Forest Service would be compensated for lost recreational opportunity (see Mitigation Measure L-1b). However, due to the extended closure, impacts to this popular recreational resource would be significant and unavoidable (Class I).

Impact L-2: Sediment transport and disposal would preclude or disturb existing uses along the truck route and disposal sites.

The dump truck routes and the proposed sediment storage and disposal sites for Alternative 1 would be identical to the Project. However, this alternative includes a reduced weekly construction schedule, which would reduce air quality emissions and the number of daily truck trips. Nuisance impacts to residences adjacent to these sites and truck routes would be reduced in intensity (e.g., less daily truck traffic, reduced daily air quality emissions) in comparison to the Project. The total number of years over which disturbance would occur to residential uses in the Project area would double under Alternative 1. SPCs AQ-1 through AQ-5, NOI-1, and NOI-2 would be incorporated into Alternative 1 and would minimize adverse effects on nearby residents to the degree feasible.

SPCs Applicable to Impact L-2

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

Similar to the Project, transport of sediment during the initial excavation period, as well as during subsequent operation and maintenance phases, would create nuisance impacts that would be significant and unavoidable under Alternative 1. A reduced construction schedule as well as proposed SPCs AQ-1 through AQ-5, NOI-1, and NOI-2 would lessen the daily disturbance to nearby residences in comparison to the Project. However, given the length of time that disturbance would occur (i.e., initial activities over 13 years plus continued annual excavation), and the proximity of existing residences to the truck routes and sediment storage/disposal sites, the impacts to residential land uses cannot be mitigated to a level that is less than significant (Class I).

Contribute to the long-term loss or degradation of the recreational value of an established, designated, or planned recreational use area (Criterion LU3)

Alternative 1 would be identical to the Project in that it would restore the existing Reservoir to its 1992 design capacity. By extending the life of the Reservoir as a functional waterbody, this alternative would enhance water-based recreational opportunities offered at the Reservoir. Alternative 1 would not contribute to the long-term loss or degradation of recreational resources within the Study Area.

C.9.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under Alternative 2, the Reservoir would continue to accumulate sediment until it no longer functioned as a viable water storage facility. Littlerock Dam currently operates under an ANF Special Use Permit as a designated potable water source, and the inability of the Reservoir to operate as a storage facility would require the demolition of the Dam per the conditions identified in the Special Use Permit. As the future management and possible removal of the Dam and the Reservoir would be determined by the review authority of the Forest Service and DWR, Alternative 2 would not conflict with applicable State or federal plans, policies, or regulations. Removal of the Dam would also require the removal of approximately 2.8 million cubic yards of sediment and dam concrete, which would be transported and disposed of in a manner that was consistent with local planning requirements. Alternative 2 would be consistent with applicable plans, policies, and regulations.

Under Alternative 2, there would be no construction of a grade control structure at the Reservoir and management of the Reservoir would not include excavation of sediment. Alternative 2 would not create short-term impacts to a recreational resource, and Impact L-1 (Project construction and excavation would preclude or disturb existing recreational resources) would not occur under this alternative. The potential for Alternative 2 to permanently preclude recreational use of the Reservoir is discussed below under Impact L-3.

In the event that continued sedimentation of the Reservoir under Alternative 2 would compromise the long-term integrity of the Dam, future No Action/No Project activities may include demolishing the Dam and removing approximately 2.8 million cubic yards of sediment and dam concrete. Given that the amount of sediment to be removed under Alternative 2 is more than twice the volume as the Project, the number of dump truck trips and the length of the excavation schedule would be of a greater intensity. Alternative 2 would create a severe disturbance to residences along the truck routes and near the disposal sites (Impact L-2).

Impact L-3: Increased sedimentation of the Reservoir would contribute to the long-term degradation of a recreational resource.

Neither the proposed Project nor Alternative 1 would contribute to the long-term loss or degradation of the recreational value of Littlerock Reservoir (Criterion LU3). However, continued sediment accumulation under Alternative 2 would result in the annual reduction of Reservoir capacity, which would limit the future water-based recreational opportunities within the Study Area. In the event that DWR determined that the Reservoir no longer functioned as a viable water storage facility, the Dam could be demolished and the Reservoir would be permanently closed. The loss of this recreational resource would be irreversible.

CEQA Significance Conclusion

Future removal of the Dam, which may be required under Alternative 2, would involve the excavation and transport of more than twice the volume of sediment as the Project. Such activities would create disturbances to residences along the dump truck routes and disposal sites that would be significant and unavoidable (Class I). Eventual demolition of the Dam, which may occur per the authority of the DWR, would create a significant and irreversible impact (Class I) from the loss of this recreational resource.

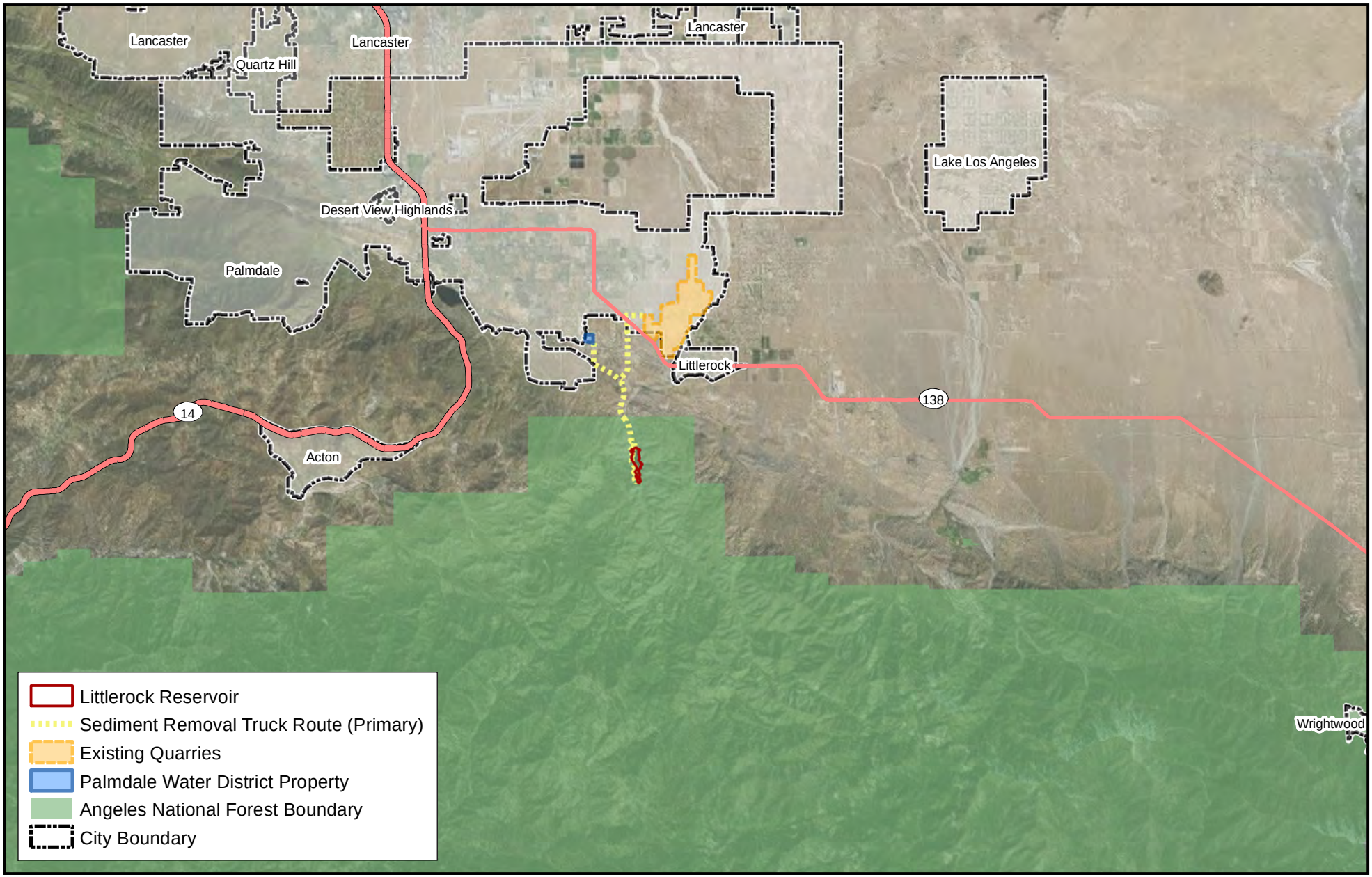
C.9.5 Impact Summary

Table C.9-3 summarizes the direct and indirect environmental impacts of the Project and the alternatives on recreation and land use. Refer to Section C.9.4 for the entire environmental analysis and the full text of recommended mitigation.

Table C.9-3. Summary of Impacts and Mitigation Measures – Recreation and Land Use

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
L-1: Project construction and excavation would preclude or disturb existing recreational resources.	Class II	Class I	NA	Yes	Mitigation Measure L-1a: Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer Mitigation Measure L-1b: Provide Compensation to Forest Service for Lost Recreational Opportunity SPC LAND-2 (Design Grading to Accommodate OHV Access)
L-2: Sediment transport and disposal would preclude or disturb existing uses along the truck route and disposal sites.	Class I	Class I	Class I	No	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)
L-3: Increased sedimentation of the Reservoir would contribute to the long-term degradation of a recreational resource.	NA	NA	Class I	Yes	None

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
NA = Not Applicable

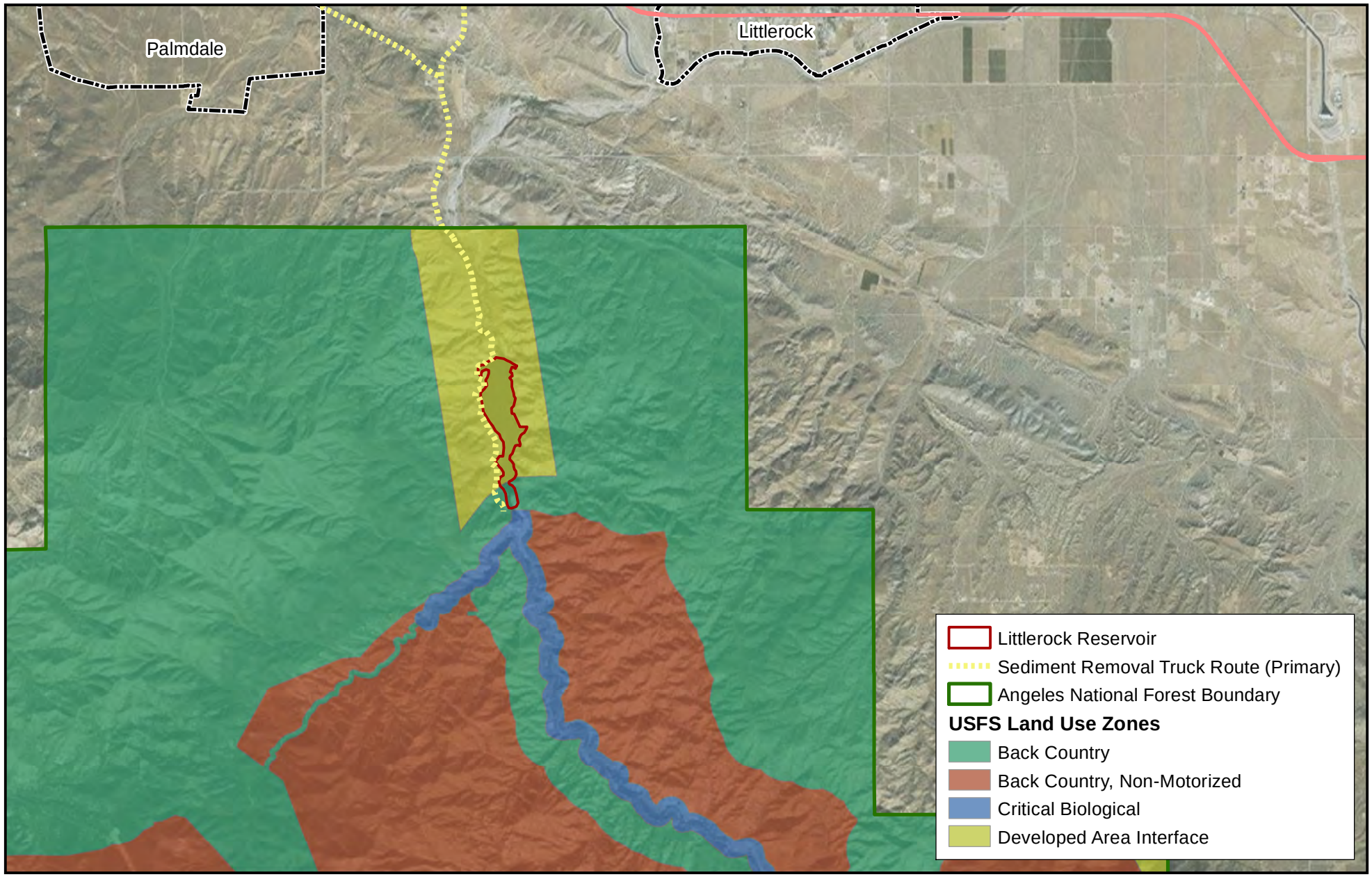


Jurisdictional Boundaries

Littlerock Reservoir Sediment Removal Project

Figure C.9-1

May 2016



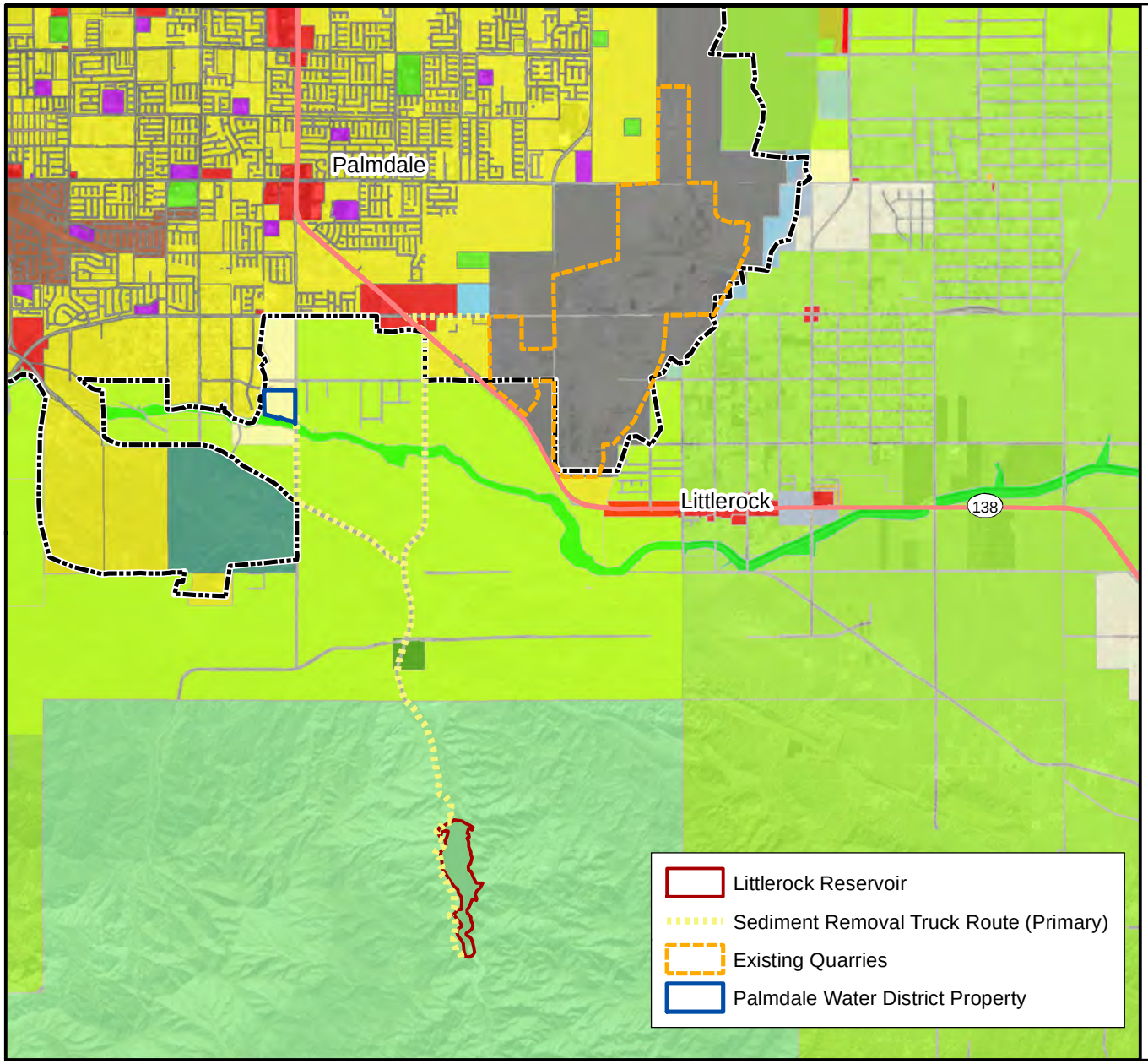
0 0.5 1 Miles

Angeles National Forest Land Management Plan
Land Use Zones

Littlerock Reservoir Sediment Removal Project

Figure C.9-2

May 2016



Los Angeles County Land Use Designations (All Areas Outside City of Palmdale)

- R-1 - Single-family residence
- R-3-()U - Limited multiple residence
- R-A - Residential agriculture
- A-1 - Light agriculture
- A-2 - Heavy agriculture
- C-1 - Restricted business
- C-2 - Neighborhood commercial
- C-3 - Unlimited commercial
- CPD - Commercial planned development
- M-1 - Light manufacturing
- M-1.5 - Restricted heavy manufacturing
- M-2 - Heavy manufacturing
- R-R - Resort and recreation
- W - Watershed
- O-S - Open space

City of Palmdale Land Use Designations

- City Boundary
- BP - Business Park
- CC - Community Commercial
- CM - Commercial Manufacturing
- LDR - Low Density Residential
- MFR - Multifamily Residential
- MR - Medium Residential
- NC - Neighborhood Commercial
- OC - Office Commercial
- OS - Open Space
- PF - Public Facility
- PF-C - Public Facility-Cemetery
- PF-S - Public Facility-School
- RC - Regional Commercial
- SFR-1 - Single Family Residential 1
- SFR-2 - Single Family Residential 2
- SFR-3 - Single Family Residential 3
- Foothill Ranch Specific Plan
- Joshua Hills Specific Plan
- Quarry and Reclamation Specific Plan

N

0 1 2 Miles

Land Use Designations: Los Angeles County and City of Palmdale

Littlerock Reservoir Sediment Removal Project

Figure C.9-3

May 2016

C.10 Transportation and Traffic

This section focuses only on the proposed action (Project) potential to adversely impact capacity of the existing street system, impede the flow of emergency service vehicles, and damage roadways during construction of the Project. Potential impacts related to changes in air traffic patterns, and adopted policies, plans, or programs supporting alternative transportation were found to not require analysis in this EIS/EIR.

C.10.1 Affected Environment

The affected environment for the Project includes roadways and parking areas within the Angeles National Forest (ANF) accessing the Reservoir, as well as public roadways utilized by construction workers and the hauling of sediment materials to the disposal site(s). Haul truck travel routes and roadways that provide access to the Project site are shown in Figure B-1. A description of these roadways follows:

- **Cheseboro Road from ANF boundary to Pearblossom Highway**. Cheseboro Road is a two lane north-south roadway that extends south from Pearblossom Highway to the Angeles National Forest entrance. It continues south into the Angeles National Forest to provide access to Littlerock Reservoir. The posted speed limit along Cheseboro Road is 55 miles per hour and no passing is allowed along most of the roadway. This stretch of Cheseboro Road contains a bridge crossing of the California Aqueduct.
- **Pearblossom Highway between Cheseboro Road and Avenue T**. Pearblossom Highway is a four lane east-west roadway located approximately four miles north of Littlerock Reservoir. At its intersection with Fort Tejon Road, Pearblossom Highway turns to the southeast and becomes a part of State Route 138. The intersection of Pearblossom Highway and Cheseboro Road is unsignalized.
- **Avenue T between Pearblossom Highway and Quarries**. Avenue T is a two lane east-west roadway. The intersection of Avenue T and Pearblossom Highway is signalized with a dedicated right turn lane from westbound Pearblossom Highway onto Avenue T. The posted speed limit on Avenue T is 55 miles per hour.
- **Barrel Springs Road between Cheseboro Road and 47th Street**. Barrel Springs Road is a two lane roadway that intersects with Cheseboro Road approximately two miles north of Littlerock Reservoir and runs in a northwesterly direction to Pearblossom Highway. The posted speed limit on Barrel Springs Road is 55 miles per hour and passing is allowed.
- **47th Street between Barrel Springs Road and PWD sediment disposal property**. 47th Street East is a two lane north-south roadway that runs generally parallel to Cheseboro Road approximately one mile to the west of Cheseboro Road. The posted speed limit on 47th Street Road is 45 miles per hour and passing is allowed. This stretch of 47th Street contains a bridge crossing of the California Aqueduct.

The existing roadway characteristics and traffic conditions for each of the study area roadways are summarized in Table C.10-1. The data in this table were obtained from field reconnaissance, the traffic volume websites of Caltrans and the Los Angeles County Department of Public Works, and the City of Palmdale's "Traffic Volume Map." This data represents the most currently available traffic volume data and is considered representative of current traffic conditions on study area roadways.

Table C.10-1. Roadway Characteristics and 2006 Traffic Volumes

Roadway	Jurisdiction	Lanes	Average Daily Traffic Volume
Cheseboro Road	Los Angeles County City of Palmdale (north of Ave T-8) U.S. Forest Service (inside Angeles National Forest)	2	1,400 – north of Mt. Emma Rd 380 – south of Mt. Emma Rd
Pearblossom Highway	Caltrans	4	19,600 – south of Ave T
Avenue T	City of Palmdale	2	14,400
Barrel Springs Road	Los Angeles County	2	1,140
47th Street East	Los Angeles County	2	430

Source: Los Angeles County Department of Public Works, Caltrans Traffic Census, City of Palmdale's "Traffic Volume Map"

There are four key intersections in the study area that could potentially be affected by the Project. These intersections and the type of traffic control currently in place at each intersection are listed below:

- Cheseboro Road at Barrel Springs Road (stop sign on Barrel Springs Road)
- Cheseboro Road at Pearblossom Highway (stop sign on Cheseboro Road)
- Pearblossom Highway at Avenue T (4-way signal with a dedicated right turn lane from westbound Pearblossom Highway to eastbound Avenue T)
- Barrel Springs Road at 47th Street East (stop signs on 47th Street East)

The levels of service (LOS) at these intersections for the morning and afternoon peak hours were determined using the intersection capacity utilization (ICU) methodology. LOS is a qualitative indicator of an intersection's operating conditions that is used to represent various degrees of congestion and delay. It is measured from LOS A (excellent conditions) to LOS F (extreme congestion), with LOS A through D considered to be acceptable. The level of service is based on the ICU value, which is a comparison of the traffic volumes passing through the intersection to the overall capacity of the intersection. The relationship between the ICU value and the level of service at an intersection is shown in Table C.10-2.

Table C.10-2. Relationship Between ICU Values and Levels of Service

ICU Value	LOS
0.00 to 0.60	A
> 0.60 to 0.70	B
> 0.70 to 0.80	C
> 0.80 to 0.90	D
> 0.90 to 1.00	E
> 1.00	F

Source: FHWA, 2014

These four study area intersections were analyzed to determine their existing operation conditions during the morning and afternoon peak hours. Based on the existing peak hour traffic volumes, the turning movement counts, and the existing number of lanes at each intersection, the LOS has been determined at each intersection, as summarized in Table C.10-3. As shown, all study area intersections currently operate at LOS A during the peak periods.

Table C.10-3. Existing Intersection LOS

Intersection	ICU Value & LOS	
	A.M. Peak Hour[1]	P.M. Peak Hour[2]
Cheseboro Road/Barrel Springs Road	0.182 – A	0.176 – A
Cheseboro Road/Pearblossom Highway	0.302 – A	0.481 – A
Pearblossom Highway/Avenue T	0.640 – B	0.738 – A
Barrel Springs Road/47th Street East	0.209 – A	0.175 – A

Source: Garland Associates, 2014
Notes:
1 - 7:00 a.m. to 9:00 a.m.
2 - 4:00 p.m. to 6:00 p.m.

C.10.2 Regulatory Framework

The roadway network within the study area that would serve as an access system for the Project is within the jurisdiction of four public agencies: the U.S. Forest Service, Caltrans, Los Angeles County, and the City of Palmdale. These agencies are responsible for the operation and maintenance of the study area roadways. Table C.10-4 provides a list of plans and policies that are applicable to surface transportation, and includes a discussion of the Project's consistency with each plan or policy. The Project's consistency with the Forest Plan is discussed in Section C.9.2 (Recreation and Land Use).

Table C.10-4. Consistency with Applicable Transportation Plans and Policies

Plan/Policy	Consistency	Explanation
California Vehicle Code		
California Vehicle Code (CVC), division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15 (DMV 2014) includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways.	Yes	SPC TRA-1 requires preparation of a Traffic Control Plan, which shall identify the need for any oversize vehicle, weight restriction, or encroachment permits.
Los Angeles County 2035 Draft General Plan Mobility Element		
Policy M 4.7: Maintain a minimum LOS D, where feasible; however, allow LOS below D on a case by case basis in order to further other General Plan goals and policies, such as those related to environmental protection, infill development, and active transportation.	Yes	As discussed in Section C.10.4, LOS D would be maintained during Project activities at all study area intersections utilizing the utilizing the ICU Methodology.
City of Palmdale General Plan Circulation Element		
Policy C1.4.1: Strive to maintain a Level of Service (LOS) C or better to the extent practical; in some circumstances, a LOS D may be acceptable for a short duration during peak periods.	Yes	As discussed in Section C.10.4, LOS D would be maintained during Project activities at all study area intersections utilizing the utilizing the ICU Methodology. The LOS at the intersection of Cheseboro Road and Pearblossom Highway is LOS with and without the Project. Furthermore, adverse impacts to without project LOS conditions would occur only temporarily (during annual sediment removal period only) and during the afternoon peak period.

Source: DMV, 2014; County of Los Angeles, 2014; City of Palmdale, 1994

C.10.2.1 Federal

- **Title 49, Code of Federal Regulations (CFR).** Title 49, CFR, Subtitle B governs the transportation of oversize vehicles, those transporting the types of materials defined as hazardous, and the marking of the transportation vehicles. Any operations oversize vehicles and those transporting hazardous materials would be required to comply with the regulations, including guidelines set forth by the Federal Motor Carrier Safety Administration.

C.10.2.2 State

- **California Vehicle Code (CVC).** CVC, division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15 (DMV, 2014) includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.

- **Caltrans Guide for the Preparation of Traffic Impact Studies (TIS).** The following criteria are a starting point in determining when a TIS is needed (Caltrans, 2002):
  - Generates over 100 peak hour trips assigned to a State highway facility.
  - Generates 50 to 100 peak hour trips assigned to a State highway facility – and, affected State highway facilities are experiencing noticeable delay; approaching unstable traffic flow conditions (LOS "C" or "D").
  - Generates 1 to 49 peak hour trips assigned to a State highway facility – and, affected State highway facilities are experiencing significant delay; unstable or forced traffic flow conditions (LOS "E" or "F").

C.10.2.3 Local

- **County of Los Angeles General Plan.** Both the approved General Plan (1974) and public review draft of the 2035 General Plan (2014) were reviewed for transportation goals and policies applicable to the Project (County of Los Angeles 1974 and 2014a). The 2035 Draft General Plan contains the following applicable policy pertaining to LOS performance standards (County of Los Angeles, 2014):
  - **Policy M 4.7:** Maintain a minimum LOS D, where feasible; however, allow LOS below D on a case by case basis in order to further other General Plan goals and policies, such as those related to environmental protection, infill development, and active transportation.
- **City of Palmdale General Plan.** A review of the Palmdale General Plan Circulation and Environmental Resources Elements identified the following applicant General Plan policies pertaining to LOS performance standards (City of Palmdale, 1994):
  - **Policy C1.4.1:** Strive to maintain a Level of Service (LOS) C or better to the extent practical; in some circumstances, a LOS D may be acceptable for a short duration during peak periods.

C.10.3 Issues Identified During Scoping

Table C.10-5 below provides a list of transportation and traffic-related issues raised during the public scoping period for the EIS/EIR [see Appendix E (Scoping Summary Report)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.10-5. Scoping Issues Relevant to Transportation and Traffic

Comment	Consideration in the EIS/EIR
County of Los Angeles Department of Public Works	
Requests submittal of a traffic impact analysis to Public Works for review and approval, which should include Traffic Index calculations for all proposed haul routes.	Section C.10.4 provides a quantitative traffic analysis for review utilizing the ICU Methodology, Highway Capacity Manual Unsignalized Intersection Methodology, and against the applicable Congestion Management Plan
City of Palmdale	
A traffic impact study is required to: • Address the impacts of additional trips from this project on the City street network, which has the potential for severe wear and tear of City streets; • Address the level of service of those intersections along each proposed delivery route and mitigate impacts as necessary; and • Address and mitigate any impacts on the structural sections of the existing roads along the proposed delivery routes.	Section C.10.4 provides a quantitative traffic analysis for review utilizing the ICU Methodology, Highway Capacity Manual Unsignalized Intersection Methodology, and against the applicable Congestion Management Plan. Impact Criterion TRA3 (and Impact T-3) analyzes the potential for significant damage to public roadways. Mitigation Measures are proposed, as applicable, within Section C.10.4 and Standard Project Commitments related to traffic and road damage are provided in Appendix A.

C.10.4 Environmental Consequences

Significance Criteria. The following significance criteria for transportation and traffic were derived from applicable regulations and performance standards identified in Section C.10.2 (Regulatory Framework) and knowledge of the proposed haul truck routes utilized during sediment removal. Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion TRA1: Exceed, either individually or cumulatively, a level of service objective or other roadway performance standard established by Caltrans, Los Angeles County, or City of Palmdale for study area roadway segments and intersections.
- Criterion TRA2: Impede emergency vehicle access.
- Criterion TRA3: Result in significant damage to public roadways.

Impact Assessment Methodology. The general objective of the traffic impact analysis is to evaluate the impacts of the Project on the roadways necessary to access the Reservoir and those proposed as routes for sediment disposal. The traffic analysis addresses the temporary increase in vehicle trips on Cheseboro Road, Pearblossom Highway, Barrel Springs Road, 47th Street East, and Avenue T generated by annual temporary Project activities.

During construction of the grade control structure, vehicle trips will primarily be from initial delivery of equipment and daily trips from construction workers. During the initial and ongoing excavation of sediment, a number of vehicles would be traveling to and from the Project site, including trucks delivering equipment to the site, trucks transporting sediment away from the Reservoir, and construction worker commute trips to and from the site. The traffic volumes associated with initial sediment activities were estimated and then added to the existing traffic volumes of the utilized roadway network. With and without project scenarios are compared to applicable Caltrans, Los Angeles County, and City of Palmdale performance standards for utilized roadway segments and critical intersections. This phase of the Project is utilized for analysis because it represents worst-case traffic volumes of the Project.

C.10.4.1 Proposed Action/Project

Direct and Indirect Effects Analysis

Exceed, either individually or cumulatively, a level of service objective or other roadway performance standard established by Caltrans, Los Angeles County, or City of Palmdale for study area roadway segments and intersection (Criterion TRA1)

During construction of the grade control structure, vehicle trips will primarily be from initial delivery of equipment and daily trips from construction workers. During the initial and ongoing excavation of sediment, a number of vehicles would be traveling to and from the Project site, including trucks delivering equipment to the site, trucks transporting sediment away from the site, and construction workers' vehicles commuting to and from the site. The traffic volumes associated with these activities were estimated for each phase of Project activities. These estimated volumes were then added to the baseline traffic volumes and the impacts on the utilized roadway network were evaluated. Similarly, the traffic volumes associated with the annual sediment removal program were estimated for peak activity levels and the traffic impacts were evaluated.

The trip generation characteristics are based on work force estimates and quantities of material that would be transported to and from the site on a typical day of construction during times of peak

construction activity. Project generated traffic was added to the existing and projected future baseline traffic volumes on the affected roadways and a comparative analysis was conducted of traffic volumes and levels of service with and without the Project. The analysis addresses existing traffic conditions and two future baseline scenarios: 2022 and 2027. The year 2022 represents the mid-point of the initial sediment removal phase (which is expected to occur from 2017 to 2027), while the year 2027 represents the initial year of the ongoing operation and maintenance sediment removal activities. The before-and-after traffic conditions are evaluated for each of these analysis scenarios.

Trip Generation. The following represents the maximum daily trip generation of the Project for each activity:

- During construction of the grade control structure, it is estimated that the construction activities would generate a total of 30 employee trips per day and six (6) truck trips per day (also shown in Table B-1).
- During the initial sediment excavation phase, activities would generate approximately 70 employee trips per day and 480 truck trips per day (also shown in Table B-2). As the sediment excavation activities would generate substantially more traffic than the construction of the grade control structure, the traffic impact analysis is based on the levels of traffic that would be generated by the excavation activities.
- During ongoing operation and maintenance (O&M), sediment excavation and other O&M activities would generate approximately 180 truck trips per day (also shown in Table B-3).

The levels of Project-generated traffic during the initial excavation phase are summarized in Table C.10-6. For the employee commuter trips, it has been assumed that each of the 30 employees would generate one inbound trip and that five outbound trips would also occur during the morning peak hour. The outbound trips account for drop-offs and other miscellaneous trips during the peak hour. For the afternoon peak hour it was assumed that there would be five inbound trips and 30 outbound trips. It was also assumed that there would be 10 additional auto/light-duty vehicle trips throughout the day.

Table C.10-6 indicates that the Project would generate a total of 560 vehicle trips per day, 75 trips during the morning peak hour (50 inbound and 25 outbound), and 75 trips during the afternoon peak hour (25 inbound and 50 outbound). It was assumed for the analysis that total truck trips per day would be spread out evenly over a 12-hour working day.

Table C.10-6. Project-Generated Traffic During Initial Sediment Removal Phase

	Project Generated Traffic		
Time Period	**Trucks**	**Autos/Light-Duty Vehicles**	**Total**
Daily Traffic			
Round Trips	240	40	280
One-way Trips	480	80	560
AM Peak Hour			
Inbound	20	30	50
Outbound	20	5	25
Total	40	35	75
PM Peak Hour			
Inbound	20	5	25
Outbound	20	30	50
Total	40	35	75

To quantify the increases in traffic that would occur on each affected roadway segment and at each study area intersection as a result of the Project, the site-generated traffic was geographically distributed onto the roadway network using the following assumptions.

- The distribution for the automobile/light-duty vehicle traffic would be 20 percent on Barrel Springs Road, 35 percent on Pearblossom Highway, 35 percent on State Route 138, and 10 percent on 47th Street East. All automobile/light-duty vehicles accessing the Reservoir would utilize Cheseboro Road.
- The truck route to and from the sediment disposal site would run along Cheseboro Road, Pearblossom Highway, and Avenue T. During annual sediment removal, 94 percent of haul truck trips would utilize this route (450 total daily trips, or 225 round trips).
- Based on a maximum limit of 10,000 cubic yards of sediment transported to the PWD site per year, only 6 percent of annual haul truck traffic would travel along Barrel Springs Road and 47th Street East (30 total daily trips, or 15 round trips) to access this site.

Using the generated traffic volumes shown in Table C.10-6 and the geographical distribution assumptions outlined above, the volumes of Project traffic on each access street and at each study area intersection were determined for the traffic impact analysis.

The levels of Project-generated traffic during the ongoing operation and maintenance (O&M) sediment removal phase are summarized in Table C.10-7.

Table C.10-7. Project-Generated Traffic During Ongoing O&M Sediment Removal Phase

	Project Generated Traffic		
Time Period	Trucks	Autos/Light-Duty Vehicles	Total
Daily Traffic			
Round Trips	90	15	105
One-way Trips	180	30	210
AM Peak Hour			
Inbound	8	10	18
Outbound	8	2	10
Total	16	12	28
PM Peak Hour			
Inbound	8	2	10
Outbound	8	10	18
Total	16	12	28

Baseline Traffic Volumes. The existing traffic volumes represent peak hour traffic counts that were taken at the study area intersections in September, 2014. The year 2022 traffic volumes were projected by applying an expansion factor of 17.4 percent to the existing traffic volumes and the year 2027 traffic volumes were projected by applying an expansion factor of 24.8 percent to the existing traffic volumes. These expansion factors were derived from Exhibit D-1, "General Traffic Volume Growth Factors," of the Los Angeles County Congestion Management Program (Los Angeles County Metropolitan Transportation Authority, 2010).

Impact T-1: Exceed, either individually or cumulatively, an established level of service standard for roadways, highways, and intersections utilized by the Project

Los Angeles County Intersection Capacity Utilization (ICU) Methodology. Based on the Los Angeles County "Traffic Impact Analysis Report Guidelines" (Los Angeles County Department of Public Works, January 7, 1997), an impact is considered adverse if the Project related increase in the volume/capacity

ratio or ICU value equals or exceeds the thresholds shown below in Table C.10-8. If the Project's contribution would exceed these values, then the Project would result in an increase in traffic which would be substantial in relation to the existing traffic load and capacity of the street system.

Table C.10-8. Significance Criteria for Intersections

Pre-Project		Project Increase
LOS	ICU Value	In ICU Value
C	0.71 to 0.80	0.04 or more
D	0.81 to 0.90	0.02 or more
E/F	0.91 or more	0.01 or more

Source: Los Angeles County, 1997

Initial Sediment Excavation Phase. The before-and-after ICU values and levels of service at the four study area intersections are shown in Table C.10-9 for the morning and afternoon peak hours for the existing conditions scenario for the initial sediment excavation phase.

Table C.10-9. Project Impact on Intersection Levels of Service – Existing Conditions as Baseline

Intersection	Existing Conditions (2014)	Existing Plus Project	Increase in ICU
Cheseboro Road/Barrel Springs Road			
AM Peak Hour	0.182 – A	0.227 – A	0.045
PM Peak Hour	0.176 – A	0.210 – A	0.034
Cheseboro Road/Pearblossom Highway			
AM Peak Hour	0.302 – A	0.346 – A	0.044
PM Peak Hour	0.481 – A	0.531 – A	0.050
Pearblossom Highway/Avenue T			
AM Peak Hour	0.640 – B	0.644 – B	0.004
PM Peak Hour	0.725 – C	0.756 – C	0.031
47th Street E/Barrel Springs Rd			
AM Peak Hour	0.209 – A	0.214 – A	0.005
PM Peak Hour	0.175 – A	0.176 – A	0.001

It should be noted that the traffic volumes and level of service calculations summarized in Table C.10-9 would be temporary (after Labor Day to approximately December 15) and incorporate the assumption that the sediment hauling trucks would have a passenger car equivalency (PCE) factor of 2.0. This adjustment factor accounts for the assumption that a haul truck would utilize the same amount of intersection capacity as two automobiles (passenger cars). The PCE factors are applied to trucks in the ICU calculations because trucks are physically larger than automobiles and have slower acceleration rates.

As shown in Table C.10-9, none of the intersections would be adversely impacted by temporary annual Project traffic during the initial sediment excavation phase for the existing conditions scenario.

The ICU values and levels of service at the four study area intersections are shown in Table C.10-10 for the morning and afternoon peak hours for the year 2022 scenario with and without the Project for the initial sediment excavation phase.

Table C.10-10. Project Impact on Intersection Levels of Service – Year 2022 as Baseline

Intersection	2022 Without Project	2022 With Project	Increase in ICU
Cheseboro Road/Barrel Springs Road			
AM Peak Hour	0.195 – A	0.240 – A	0.045
PM Peak Hour	0.188 – A	0.223 – A	0.035
Cheseboro Road/Pearblossom Highway			
AM Peak Hour	0.335 – A	0.381 – A	0.046
PM Peak Hour	0.548 – A	0.597 – A	0.049
Pearblossom Highway/Avenue T			
AM Peak Hour	0.732 – C	0.737 – C	0.005
PM Peak Hour	0.835 – D	**0.864 – D**	**0.029**
47th Street E/Barrel Springs Rd			
AM Peak Hour	0.229 – A	0.234 – A	0.005
PM Peak Hour	0.189 – A	0.191 – A	0.002

Note: **Bold** represents an adverse impact

As shown in Table C.10-10, one intersection would be adversely impacted by temporary annual Project traffic during the initial sediment excavation phase for the year 2022 scenario. The intersection of Pearblossom Highway at Avenue T would operate at an ICU value of 0.835 and LOS D during the afternoon peak hour without the Project and at an ICU value of 0.864 and LOS D during the afternoon peak hour with the Project. As the Project-related increase in the ICU value would be 0.29, the Project's impacts would be adverse according to the Los Angeles County guidelines. Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period) would be utilized, as feasible, to reduce this impact.

Ongoing Operations and Maintenance Sediment Removal. The Project's impacts during the annual maintenance activities would be less when compared to the impacts described above for the initial sediment excavation phase. The volume of traffic would be less (180 daily truck trips versus 480 during the initial excavation phase) and the duration of impacts would be shorter.

The ICU values and levels of service at the four study area intersections are shown in Table C.10-11 for the morning and afternoon peak hours for the year 2027 scenario with and without the Project. The impact analysis for this scenario is based on the traffic volumes generated during the ongoing operation and maintenance phase of the Project.

Table C.10-11. Project Impact on Intersection Levels of Service – Year 2027 as Baseline

Intersection	2027 Without Project	2027 With Project	Increase in ICU
Cheseboro Road/Barrel Springs Road			
AM Peak Hour	0.201 – A	0.218 – A	0.017
PM Peak Hour	0.192 – A	0.207 – A	0.015
Cheseboro Road/Pearblossom Highway			
AM Peak Hour	0.352 – A	0.373 – A	0.021
PM Peak Hour	0.576 – A	0.594 – A	0.018
Pearblossom Highway/Avenue T			
AM Peak Hour	0.772 – C	0.774 – C	0.002
PM Peak Hour	0.881 – D	0.891 – D	0.010
47th Street E/Barrel Springs Rd			
AM Peak Hour	0.236 – A	0.239 – A	0.003
PM Peak Hour	0.193 – A	0.194 – A	0.001

As shown in Table C.10-11, none of the intersections would be adversely impacted by temporary annual Project-generated traffic during the ongoing operation and maintenance sediment removal phase.

The Los Angeles County "Traffic Impact Analysis Report Guidelines" (LACDPW, 1997) have significance criteria for the analysis of two-lane roadways. The criteria show the acceptable percentage increase thresholds for peak hour traffic volumes on the affected roadways. The criteria are applicable only to two-lane roadways that operate at LOS C, D, E, and F. If the roadways operate at LOS A or B, then the significance thresholds are not applicable. The two-lane roadway segments in the study area are Cheseboro Road, Barrel Springs Road, 47th Street E, and Avenue T, all of which operate at LOS A based on the two-lane roadway capacity values (as opposed to the intersection LOS values). The Project would not, therefore, have an adverse impact based on the two-lane roadway criteria.

Highway Capacity Manual Unsignalized Intersection Methodology. While the LOS analysis summarized in Tables C.10-9, C.10-10, and C.10-11 indicates that the Project would not result in an adverse impact at the intersection of Cheseboro Road and Pearblossom Highway, this conclusion is based on ICU and LOS values that represent the physical capacity of the intersection as a whole. While this methodology is consistent with the Los Angeles County guidelines for traffic impact studies, it does not account for the types of traffic control that are in place at each intersection; i.e., traffic signals or stop signs. Additional analysis has been conducted, therefore, to determine if the intersections that are controlled by stop signs could adequately accommodate the projected truck movements without excessive delays.

The analysis indicated that the delays at the stop sign on Cheseboro Road at Pearblossom Highway would be excessive because the vehicles waiting at the stop sign to turn left from northbound Cheseboro Road onto Pearblossom Highway would operate at LOS F during the afternoon peak period. During the afternoon peak hour, vehicles at the stop sign (including the Project-generated traffic) would have an average delay of 350 seconds for the year 2022 scenario, which is greater than five minutes per vehicle, and 190 seconds for the year 2027 scenario, which is greater than three minutes per vehicle. This calculation is based on the unsignalized intersection methodology from the *Highway Capacity Manual* (TRB, 2010). As the Project would result in LOS F conditions at this intersection, the impact would be adverse. The other unsignalized intersections along the haul routes would operate at acceptable levels of service and the Cheseboro Road/Pearblossom Highway intersect would operate at acceptable levels of service during the morning peak hour.

As traffic conditions at the Pearblossom Highway/Cheseboro Road intersection would be unacceptable, the Project would result in an adverse impact at this location unless mitigation were incorporated. Although the installation of a traffic signal would alleviate the traffic delays, signalization would not be warranted or feasible in conjunction with the Project. Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period**)** would be utilized, as feasible, to reduce this impact.

Congestion Management Program: The "Guidelines for CMP Transportation Impact Analysis," which is Appendix D of the Congestion Management Program for Los Angeles County (Los Angeles County Metropolitan Transportation Authority, 2010), indicate that a traffic analysis shall address all CMP arterial monitoring intersections where the Project would add 50 or more trips during the weekday peak hour and any mainline freeway monitoring locations where the Project would add 150 or more trips in either direction during the peak hour. The CMP arterial roadway nearest to the Project site is State Route 138, which runs along Fort Tejon Road and Pearblossom Highway, and the intersection of Pearblossom Highway at Avenue T is a designated CMP arterial monitoring intersection. As summarized above, the Project would not result in a change in the LOS values during the morning or afternoon peak hours as the intersection would remain at LOS B, C, or D for the various analysis scenarios. The CMP guidelines indicate that an intersection would be significantly impacted if a project would result in an increase in the ICU value of 0.02 or greater at an intersection that is projected to operate at LOS F. The Project would not,

therefore, result in a significant impact at this intersection according to the CMP guidelines because the LOS values would remain at LOS B, C, or D.

With regard to freeways, the nearest freeway is the Antelope Valley Freeway (State Route 14). As the Project would generate a maximum of 75 vehicle trips during the peak hours, the Project would not add 150 or more trips to a freeway segment. As the Project's impacts are well below the thresholds cited above, the Project would not exceed a level of service standard established by the county congestion management agency.

Mitigation for Impact T-1

MM T-1 **Restrict Haul Truck Movements during PM Peak Period.** Implement a haul truck schedule that requires trucks to avoid traveling along the Cheseboro Road–Pearblossom Highway–Avenue T haul route during the afternoon peak period, i.e., from 4:00 to 6:00 p.m., to the extent feasible. The alternative route to be utilized is Cheseboro Road, Barrel Springs Road, 47th Street E, Pearblossom Highway, and Avenue T.

SPCs Applicable to Impact T-1

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

The primary conclusions of the transportation and traffic analysis is that initial sediment removal (to restore the Reservoir design capacity) would result in a significant impact at the intersection of Cheseboro Road and Pearblossom Highway during the afternoon peak hours using both the ICU Methodology and unsignalized intersection methodology from the *Highway Capacity Manual*. This impact could be mitigated by prohibiting/limiting truck hauling activities during the afternoon peak periods. The impact would be reduced to the maximum extent feasible with the incorporation of Mitigation Measure T-1 and SPC TRA-1. While a significant impact would occur if trucks utilize this section of the proposed haul route during the afternoon peak period, the implementation of this mitigation and SPCs would result in less than significant impacts at this study area intersection (Class II).

Impede emergency vehicle access (Criterion TRA2)

Impact T-2: Result in inadequate emergency response

The Project could potentially result in impacts relative to emergency access because the presence of large trucks along the haul routes. The impacts would be adverse if trucking activities would restrict access to adjacent land uses or along travel routes with no suitable alternative access. These impacts would be less than significant because of the implementation of SPC TRA-1, which is described in Appendix A. Furthermore, while the Project would generate traffic resulting in unacceptable levels of service and delays at the intersection of Cheseboro Road and Pearblossom Highway during the afternoon peak period (slowing down emergency access flow during this peak period only), this impact would be mitigated to the extent feasible by Mitigation Measure T-1.

Mitigation for Impact T-2

MM T-1 (Restrict Haul Truck Movements during PM Peak Period)

SPCs Applicable to Impact T-2

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Potential impacts to emergency access would be less than significant with the implementation of SPC TRA-1 and Mitigation Measure T-1 as part of the Project (Class II).

Result in significant damage to public roadways (Criterion TRA3)

Impact T-3: Project truck trips result in significant damage to public roadways

The repetitive movement of dump trucks along the roadways that would be used as haul routes between the reservoir and the sediment disposal sites could potentially result in pavement damage on the affected roadways. As discussed in Section B.2.5.1, at the completion of grade control structure construction and annual sediment removal activities, PWD would restore all internal Reservoir access roads, parking areas, and travel paths to equal or better conditions as they existed prior to activity commencement. SPC TRA-2 ensures any roadway damage within the ANF is corrected immediately following all activities.

Public roadways that would be used as haul routes are as follows:

- Cheseboro Road between the Angeles National Forest boundary and Pearblossom Highway
- Pearblossom Highway between Cheseboro Road and Avenue T
- Avenue T between Pearblossom Highway and the mining pits/quarries to the east
- Barrel Springs Road between Cheseboro Road and 47th Street E
- 47th Street E between Barrel Springs Road and PWD property north of the California Aqueduct
- Additional route segment of 47th Street E between PWD property and Pearblossom Highway and Pearblossom Highway to Avenue T during the afternoon peak period (under implementation of Mitigation Measure T-1)

The trucking activities could result in pavement damage such as ruts, cracks, potholes, etc., which would require pavement maintenance and rehabilitation to restore the roadways to their pre-Project condition. SPC TRA-2 ensures any roadway damage within public roads is corrected immediately following all activities.

SPCs Applicable to Impact T-3

SPC TRA-2 (Pavement Rehabilitation – Public or National Forest Roadways)

CEQA Significance Conclusion

Roadway damage, both within the ANF and along the haul routes on public roadways, would occur with implementation of the Project. With the implementation of SPC TRA-2, these impacts would be less than significant (Class III).

C.10.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Exceed, either individually or cumulatively, a level of service objective or other roadway performance standard established by Caltrans, Los Angeles County, or City of Palmdale for study area roadway segments and intersection (Criterion TRA1)

Impact T-1: Exceed, either individually or cumulatively, an established level of service standard for roadways, highways, and intersections utilized by the Project.

With regard to the traffic/transportation impacts of Alternative 1 as compared to the Project, Alternative 1 would generate fewer truck trips on a daily basis and during the peak periods for the initial sediment removal activities; however, the duration of this phase would be extended to an estimated 13 years (as compared to 7 to 12 years for the Project). The number of dump trucks hauling the sediment would be reduced to six trucks, as compared to 16 trucks for the Proposed action, and the maximum number of truck trips per day would be reduced to 180 trips (90 round trips), as compared to 480 trips (240 round trips) for the Proposed action.

The comparative levels of traffic that would be generated during the initial excavation phase for the Project and Alternative 1 are summarized in Table C.10-12.

Table C.10-12. Comparison of Generated Traffic During Initial Sediment Removal Phase

	Generated Traffic – Alternative 1 vs. Project		
Time Period	**Trucks**	**Autos/Light-Duty Vehicles**	**Total**
Daily Traffic			
Round Trips	90 (240)	15 (40)	105 (280)
One-way Trips	180 (480)	30 (80)	210 (560)
AM Peak Hour			
Inbound	11 (20)	**10 (30)**	21 (50)
Outbound	11 (20)	**2 (5)**	13 (25)
Total	22 (40)	12 (35)	34 (75)
PM Peak Hour			
Inbound	11 (20)	**2 (5)**	13 (25)
Outbound	11 (20)	**10 (30)**	21 (50)
Total	22 (40)	12 (35)	34 (75)

The impacts of Alternative 1 on the levels of service at the study area intersections would be less than what was shown for the Project in Table C.10-10 during the initial sediment removal phase because of the reduced volumes of site-generated traffic. The traffic analysis for the Project indicates no significant adverse impact at any of the intersections during the morning peak hour and an adverse impact at one intersection during the afternoon peak hour based on the ICU analysis methodology. The adverse impact at the intersection of Pearblossom Highway and Avenue T for the Project would not occur for Alternative 1 because the increase in the ICU value would be below the significance threshold. Although the Project's impacts on traffic delay at the stop sign on northbound Cheseboro Road at Pearblossom Highway would be reduced for Alternative 1 as compared to the Project, this alternative would still result in an adverse delay compared to baseline conditions during the afternoon peak period.

The traffic impacts for the ongoing annual O&M sediment removal activities would be the same for Alternative 1 as that of the Project, as shown in Table C.10-11.

Mitigation for Impact T-1

MM T-1 (Restrict Haul Truck Movements during PM Peak Period)

SPCs Applicable to Impact T-1

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Alternative 1 impacts at the intersection of Pearblossom Highway and Avenue T would be less than significant. While a significant impact would occur on northbound Cheseboro Road at Pearblossom Highway during the afternoon peak period, the implementation of this mitigation and SPCs would result in less than significant impacts at this study area intersection (Class II).

Impede emergency vehicle access (Criterion TRA2)

Impact T-2: Result in inadequate emergency response

The reduction in daily traffic volumes of large trucks along the haul routes would reduce impacts relative to emergency access. However, Alternative 1 increases the duration of sediment removal every year by starting in July. The impacts would remain adverse if trucking activities would restrict access to adjacent land uses or along travel routes with no suitable alternative access. These impacts would be less than significant because of the implementation of SPC TRA-1, which is described in Appendix A. Furthermore, while the Project would continue to generate traffic volumes resulting in unacceptable delays at the intersection of Cheseboro Road and Pearblossom Highway during the afternoon peak period (slowing down emergency access flow during this peak period only), this impact would be mitigated to the extent feasible by Mitigation Measure T-1 and SPC TRA-1.

Mitigation for Impact T-2

MM T-1 (Restrict Haul Truck Movements during PM Peak Period)

SPCs Applicable to Impact T-2

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Potential impacts to emergency access would be less than significant with the implementation of SPC TRA-1 and Mitigation Measure T-1 as part of Alternative 1 (Class II).

Result in significant damage to public roadways (Criterion TRA3)

Impact T-3: Project truck trips result in significant damage to public roadways

While the number of trucks would be reduced on an annual basis, the total number of truck trips needed to restore the Reservoir to design capacity would be the same. Therefore, Alternative 1 merely slows the potential for roadway damage during this phase by extending the initial sediment removal phase over more years. The trucking activities of Alternative 1 could result in identical pavement damage such as ruts, cracks, potholes, etc., when compared to the Project, which would require pavement

maintenance and rehabilitation to restore the roadways to their pre-Project condition. SPC TRA-2 ensures any roadway damage within public roads is corrected immediately following all activities.

SPCs Applicable to Impact T-3

SPC TRA-2 (Pavement Rehabilitation – Public or National Forest Roadways)

CEQA Significance Conclusion

Roadway damage, both within the ANF and along the haul routes on public roadways, would occur with implementation of Alternative 1. With the implementation of SPC TRA-2, these impacts would less than significant (Class III).

C.10.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at an annual average rate of 38,000 cubic yards per year. PWD would not undertake any activities to remove sediment. Therefore, no traffic would be generated by any activities proposed under either the Project or Alternative 1.

In the event sediment buildup led to safety issues and required demolition/removal of the Dam, construction activities (and related truck trips) are expected to be greater than that of the Project or Alternative 1. Truck trips involved with the removal of 2.8 million cubic yards of sediment and dam debris would be greater in intensity and would likely require many additional years when compared to the Project or Alternative 1.

In the event the Reservoir became filled with sediment and the Dam/Reservoir were left untouched, it is likely some downstream flood-control channeling would need to be constructed. If necessary, minor traffic volumes would be generated during temporary construction activities that likely would be similar in levels to that occurring during grade control construction.

CEQA Significance Conclusion

Under a scenario where 2.8 million cubic yards of sediment and the Dam debris would need to be removed, traffic generated during construction activities would likely result in significant unavoidable impacts. While such a determination is speculative, the possibility exists. Therefore, traffic impacts of the No Action/No Project Alternative are considered significant and unavoidable for this scenario (Class I). During such a scenario, measures similar to SPC TRA-1 would be required to ensure emergency vehicle access and flow to result in less than significant impacts (Class III). Furthermore, the movement of 2.8 million cubic yards of sediment and debris would likely damage public roadways requiring extensive repaving mitigation similar to SPC TRA-2 to result in less than significant impacts (Class III).

C.10.5 Impact Significance Summary

Table C.10-13 summarizes the direct and indirect environmental impacts of the proposed Action and the alternatives on transportation and traffic. Refer to Section C.10.4 for the entire environmental analysis and the full text of recommended mitigation measures.

Table C.10-13. Summary of Impacts and Mitigation Measures – Transportation and Traffic

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
T-1: Exceed, either individually or cumulatively, an established level of service standard for roadways, highways, and inter-sections utilized by the Project	Class II	Class II	Class I (sediment removal scenario) Class III (no sediment removal scenario)	No	Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period) SPC TRA-1 (Prepare Traffic Control Plan)
T-2: Result in inadequate emergency response	Class II	Class II	Class III	Yes	Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period) SPC TRA-1 (Prepare Traffic Control Plan)
T-3: Project truck trips result in significant damage to public roadways	Class III	Class III	Class III	Yes	SPC TRA-2 (Pavement Rehabilitation – Public or National Forest Roadways)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.11 Visual Resources

The Visual Resources section describes the scenic and aesthetic impacts to the landscape that are associated with the construction and operation of the Project or alternatives. Situated in northeastern Los Angeles County, the Project would construct a grade control structure and remove sediment from the Littlerock Reservoir annually. The study area for the visual resource analysis was defined by view-points located within the Reservoir's public recreational areas and from public view of the Palmdale Water District (PWD) sediment disposal/holding site on 47th Street.

C.11.1 Visual Resource Descriptors

The consideration of visual resources and general aesthetics utilizes resource-specific quantitative and qualitative terminology. The following terms are utilized within this section to describe visual resources:

- **Viewshed:** The landscape that can be directly seen under favorable atmospheric conditions, from a particular point/area or along a transportation corridor.
  - Foreground View: 0 to 1 mile.
  - Middleground View: 1 to 3 miles.
  - Background View: 3 to 5 miles.
- **Visual Quality:** The relative value of a landscape from a visual perception point of view.
- **Visual sensitivity:** The concern by viewers with changes to visual quality. Visual sensitivity is generally higher in natural or unmodified landscapes.
- **Visual Contrast:** Opposition or unlikeness of different forms, lines, colors, or textures in a landscape. Generally, increased visual contrast within foreground distances would be more noticeable to viewers than increased visual contrast within background distances.

C.11.2 Affected Environment

The Reservoir would be closed to the public during construction of the grade control structure and annual sediment excavation/removal. Therefore, no public viewpoints would be affected on National Forest System (NFS) lands during these periods. However, the grade control structure may be partially visible to the public when the Reservoir is not temporarily closed for sediment removal (if the Reservoir water level does not cover). Therefore, the Rocky Point recreation area of the Reservoir is part of the visual study area. The viewsheds from this location were coordinated with the land use and recreation analyses.

While the Project includes haul truck travel routes within public rights-of-way (ROWs) under the jurisdiction of Los Angeles County and the City of Palmdale, due to the temporary and mobile nature of activities along these routes, visual impacts are not considered along public road ROWs for mobile construction vehicles. Sediment deposition inside existing quarries would not be visible to the public. These locations are exhausted mining pits that are below surface grade, setback from public ROWs, and surrounded by security fencing. Therefore, these locations are not included within the visual study area. However, the PWD property proposed for sediment storage/deposition would be visible from public ROWs and residences. Therefore, this site is part of the visual study area.

The visual resource analysis included a combination of information review, Forest Service consultation and methodology, field reconnaissance, seen area analysis, on-site photography, and data evaluation. Viewsheds were analyzed for their potential to display typical or worst-case visual effects of the Project

to the scenic and existing aesthetic landscape. From public observer positions, four locations were selected as viewsheds from within the Reservoir and one location was selected at the PWD disposal property for analysis within the visual study area.

C.11.2.1 Reservoir Site

The Littlerock Reservoir is a man-made feature formed by the impoundment of water by the Littlerock Dam. The Reservoir is located on Little Rock Creek in the northeastern foothills of the San Gabriel Mountains on the western edge of the Mojave Desert. Little Rock Creek, which supplies water to the reservoir, is an intermittent stream supported by annual rainfall and snowmelt, and flows north from its headwaters located on the slope of nearby Mount Williamson. Therefore, the size of the Reservoir water basin fluctuates based on yearly precipitation conditions. Photographs of the Reservoir were taken to document the visual character of the site during times the water level was below Rocky Point. Figure C.11-1 identifies the locations of the photographs, while Figure C.11-2 shows the photographs.

As shown in Figure C.11-2, Picture 1 shows views from inside the recreation area across the Reservoir (under minimum pool conditions) consist primarily of the Reservoir water surrounded by rolling hills covered in desert scrub in the middleground and background. Picture 2 shows the boat ramp, parking areas, and recreation use structures located at the edge of the basin along higher elevation peaks at the Reservoir edge. Park facilities include deciduous shade trees, picnic tables with grills, restrooms, drinking fountains, a concession stand, boat launch, and multiple paved parking lots. As shown in Photo 3, surrounding hills and the skyline are prominent foreground views across the Reservoir from park user viewsheds. Photo 4 shows the view from Rocky Point picnic area where fencing is installed within the Reservoir to restrict upstream access.

On NFS lands, the visual analysis compares visual conditions with the Scenic Integrity Objectives (SIOs) in the 2005 Angeles National Forest Land Management Plan (Forest Plan) and Scenery Management System (SMS). These methodologies are further described below in Section C.11.5. Scenic integrity is defined as the state of naturalness or, conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation from the existing landscape character. Existing visual conditions within the Reservoir are identified below consistent with the SMS:

Visual Quality: moderate-to-high. The predominant visual elements across the Reservoir are existing small trees and scrub creating coarse visual textures, set in a horizontal plane of dirt surface, in front of hillsides mottled with low, green shrubs and tan grasses. The skyline beyond the foreground hills is a focal point, drawing the viewer's eye to the curving lines of the horizon. This park landscape exhibits a moderately high degree of intactness and coherence of form and character with substantial visual variety. However, this harmony of form and character is punctuated by the difference in dry season views and wet season (full Reservoir or minimum pool conditions) views. While the park facilities contain built features with inherent industrial character that diminish the scenic integrity of the existing landscape, these facilities and the drying of the Reservoir lead to a reduction of visual quality. Furthermore, recent tree removal along the Reservoir banks has led to an overall decline in natural landscape.

Viewer Concern: moderate. Visitors can enjoy open space, water elements, and rolling hillside views. The character of the Reservoir contrasts from a reduction in Reservoir water level, reducing the natural feel and panoramic open-space landscape. Viewers may perceive any increase in industrial character visible from the park or blockage of views as an adverse visible change.

Viewer Exposure: low. Due to recent tree removal along the Reservoir bank, there is minimal vegetative screening limiting views of the Reservoir from park visitors. The Reservoir bottom is uniform and visible when

the water level is lowered for beneficial water supply. The duration of Reservoir bottom views would be limited, based on annual water inflow and for users who would be expected to visit the park in late winter months. The number of potential viewers would be low, however, leading to a limited viewer exposure.

Overall Visual Sensitivity: low to moderate. For visitors to the area, the moderate visual quality, moderate viewer concern, and low viewer exposure lead to a low to moderate overall visual sensitivity of the visual setting and viewing characteristics.

C.11.2.2 Palmdale Water District Site

As discussed in Section B.2.3.2, a 21-acre site owned by PWD and located within unincorporated Los Angeles County would be used for sediment storage, allowing for future use (recycling) of removed sediment material. Photos of this site were taken from a public viewpoint at the California Aqueduct. The locations of these photographs are shown on Figure C.11-3, with the photos documenting existing visual conditions shown on Figure C.11-4.

As shown in Photos 1 through 4, the predominant visual elements across the PWD site are horizontal plane views of a desert floor showing existing Joshua Trees and desert scrub intermixed within the dirt surface in the foreground, rooftops and cityscape features with a steady tree greenbelt in the middleground, and distant mountains in the background. Views of an elevated dirt pad, vehicle access, and winding natural dirt paths create a focal point in the foreground throughout the site from 47th Street, accentuating that the site is not totally undisturbed. Adjacent to the site are the aqueduct, water storage facilities, residences, and 47th Street, which all contribute to a somewhat urbanized character that diminish the scenic integrity of the existing landscape. Furthermore, unauthorized trash dumping within the site has led to an overall decline in visual quality. While non-passive recreationists were observed from this location at the aqueduct, the viewshed primarily provides low sensitivity with the focal point on the overall background views of Palmdale and the desert floor.

C.11.3 Regulatory Framework

The following discussion summarizes the associated laws, regulations, and standards for the jurisdictions traversed by the Project. Table C.11-1 provides a list of plans and policies that are applicable to visual resources, and includes a discussion of the Project's consistency with each plan or policy.

C.11.3.1 Federal

The Reservoir is located on NFS lands. Section C.9 (Recreation and Land Use) contains an evaluation of policies within the Forest Service Land Management Plan that are applicable to visual resources.

C.11.3.2 State

There are no applicable statewide plans or policies pertaining to the regulation or analysis of visual resource impacts. Each jurisdiction's General Plan regulates designated State Scenic Highways, as discussed under local plans and policies below.

C.11.3.3 Local

- **County of Los Angeles General Plan.** The Los Angeles County General Plan is the foundational document for all community-based plans that serve the unincorporated areas. Both the approved General Plan (1974) and public review draft of the 2035 General Plan (2014) were reviewed for noise goals and policies applicable to the Project (County of Los Angeles 1974a and 2014). The General

Plans do not identify any haul truck travel routes as being a designated scenic road or highway (County of Los Angeles 1974b and 2014). The following applicant General Plan policies related to visual resources were identified:

- **Approved General Plan, Conservation and Open Space Element, Policy 16:** Protect the visual quality of scenic areas including ridgelines and scenic views from public roads, trails, and key vantage points.
- **2035 Draft General Plan, VII Scenic Resources, Policy C/NR 13.4:** Encourage developments to be designed to create a consistent visual relationship with the natural terrain and vegetation.
- **2035 Draft General Plan, VII Scenic Resources, Policy C/NR 13.5:** Encourage required grading to be compatible with the existing terrain.

City of Palmdale General Plan. Review of the City of Palmdale General Plan Environmental Resources Element identifies both Barrel Springs Road and Pearblossom Highway as designated scenic highways (City of Palmdale, 1994). However, because the Project does not include any development (beyond temporary haul truck trips) along these scenic highways, no policies related to scenic highways were found applicable.

Table C.11-1. Consistency with Applicable Visual Resource Plans and Policies

Plan/Policy	Consistency	Explanation
Approved Los Angeles County General Plan		
Conservation and Open Space Element, Policy 16: Protect the visual quality of scenic areas including ridgelines and scenic views from public roads, trails, and key vantage points.	Yes	The visual contrast of temporary sediment storage would be limited to the appearance of expanding the existing at-grade cleared surface on 47th Street northward. Sediment would be only temporarily stored within depressions on the northeastern portion of the site in a manner to not extend above existing grade of 47th Street. Therefore, the temporary storage of sediment within the PWD site located in unincorporated Los Angeles County would not significantly alter existing form, line, color, or texture of the site landscape or character.
Draft Los Angeles County 2035 General Plan		
VII Scenic Resources, Policy C/NR 13.4: Encourage developments to be designed to create a consistent visual relationship with the natural terrain and vegetation.	Yes	The visual contrast of temporary sediment storage would be limited to the appearance of expanding the existing at-grade cleared surface on 47th Street northward. The color of stored sediment would be similar or identical to the existing site surface. While some vegetation would be removed and not replanted within the actual sediment storage area, this activity would not significantly alter existing form, line, color, or texture of the site landscape or character.
VII Scenic Resources, Policy C/NR 13.5: Encourage required grading to be compatible with the existing terrain.	Yes	Sediment would be only temporarily stored on the PWD site within depressions on the northeastern portion of the site in a manner to not extend above existing grade of 47th Street.

Source: Los Angeles County, 1974; Los Angeles County, 2014

C.11.4 Issues Identified During Scoping

There were no visual resource issues identified during the public scoping period. See Appendix E (Scoping Summary Report) for a summary of issues relevant to the entire Project that were raised during the scoping process.

C.11.5 Environmental Consequences

Significance Criteria. The following significance criteria for visual resources were derived from the Forest Service Scenic Management System and by considering potential aesthetic impacts occurring at the proposed sediment disposal locations (not on NFS lands). Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion VIS1: Have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of the affected area.
- Criterion VIS2: Conflict with adopted city, county, State, or federal plans, policies, regulations, or standards applicable to the protection of visual resources.

Impact Assessment Methodology. The Forest Service Scenery Management System (SMS) is intended to attain the highest possible quality of landscape aesthetics and scenery commensurate with other appropriate public uses, costs, and benefits (USFS, 2014). In 2005, the Forest Service implemented the SMS by adopting Scenic Integrity Objectives (SIOs) for its lands in the Forest Plan. The purpose of the SMS is to methodically inventory, manage and monitor aesthetic and scenic resources on NFS lands. In the Angeles National Forest (ANF), the visual resource analysis uses this Forest Service methodology to evaluate Project activities within NSF lands and its effects on landscape aesthetics. The Project was analyzed using the SMS to ascertain compliance with the Land Management Plan. These guidelines are identified in Table C.11-2.

Table C.11-2. General Guidance for Review of Visual Impact Significance Under Forest Service SMS

Visual Sensitivity	Visual Change				
	Low	Low to Moderate	Moderate	Moderate to High	High
Low	Not Significant[1]	Not Significant	Adverse but Not Significant[2]	Adverse but Not Significant	Adverse but Not Significant
Low to Moderate	Not Significant	Adverse but Not Significant	Adverse but Not Significant	Adverse but Not Significant	Adverse and Potentially Significant[3]
Moderate	Adverse but Not Significant[2]	Adverse but Not Significant	Adverse but Not Significant	Adverse and Potentially Significant	Adverse and Potentially Significant
Moderate to High	Adverse but Not Significant	Adverse but Not Significant	Adverse and Potentially Significant	Adverse and Potentially Significant	Significant[4]
High	Adverse but Not Significant	Adverse and Potentially Significant[3]	Adverse and Potentially Significant	Significant[4]	Significant

1 - Not Significant – Impacts may or may not be perceptible but are considered minor in the context of existing landscape characteristics and view opportunity.
2 - Adverse but Not Significant – Impacts are perceived as negative but do not exceed environmental thresholds.
3 - Adverse and Potentially Significant – Impacts are perceived as negative and may exceed environmental thresholds depending on project and site-specific circumstances.
4 - Significant – Impacts with feasible mitigation may be reduced to levels that are not significant or avoided all together. Without mitigation, significant impacts would exceed environmental thresholds.

An adverse visual impact occurs when: (1) a proposed action perceptibly changes existing or desired features of the physical environment so that they no longer appear to be fitting in the characteristic landscape; or (2) a proposed action introduces new features in the physical environment that are perceptibly uncharacteristic of, and discordant with, the subject landscape. Changes that seem uncharacteristic are those that appear out of place, discordant, or distracting, and do not repeat form, line, color, texture, pattern, or scale common to the valued landscape character being viewed. The degree of the visual impact depends upon how noticeable the adverse change may be, that is, the magnitude and extent of deviations from the existing visual conditions, or deviations from the Forest Service SIOs at the Reservoir. The noticeability of a visual impact is a function of the visual characteristics of Project features, as compared to existing visual conditions, degree of visual contrast, and viewing conditions (distance, duration of view, angle of view, public access to viewshed, etc.).

C.11.5.1 Proposed Action/Project

Direct and Indirect Effects Analysis

Have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of the site and its surroundings (Criterion VIS1)

Activities at the Reservoir within the ANF include construction of the grade control structure, annual sediment removal, and annual restoration/maintenance activities. Because the Reservoir would be closed to the public during these activity periods, visual impacts within the ANF would be limited to times when these activities are completed. Additionally, sediment disposal within quarry disposal locations would not be visible to the public. This is because the quarry properties are large disturbed areas, setback from public viewsheds. Furthermore, sediment would be disposed within exhausted pits, which are large depressions below existing grade. Therefore, the analysis below for Impact V-1 is focused on Project-related visual changes at the Reservoir when open to the public and from activities occurring at the PWD sediment staging location visible from public vantage points within unincorporated Los Angeles County and the City of Palmdale.

Impact V-1: Project implementation would have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of a location and its surroundings

Littlerock Reservoir. Because the Reservoir would be closed to the public during annual Project activity periods, visitors would view changes to the Reservoir landscape only before or after these activity periods. Furthermore, as the Reservoir would typically be submerged by water during times open to the public, Project-related visual changes would be greatest during dry season conditions.

Views of the grade control structure would be most prominent from the Rocky Point picnic area. Because this location is also the upper extent of the Reservoir, it would be last submerged by seasonal water inflow and impoundment. Figure C.11-5 shows existing visual conditions of this location and a visual simulation with the grade control structure in place, under dry conditions. As shown, the grade control structure would be flush with or slightly above the Reservoir bottom, and would not result in a structure with a height that could obstruct views across the Reservoir or block background views of surrounding hillsides.

While the grade control structure would cause a slight increase in the prominence of non-natural features and industrial character, the visual contrast compared to existing conditions would be minimal and would not substantially alter the existing landscape. Because the grade control structure is a soil cement structure utilizing excavated sediment, the color would be similar to existing Reservoir sedi-

ment. As shown in Figure C.11-5, under existing conditions, temporary orange fencing is in place at Rocky Point to prohibit upstream activity into Arroyo Toad habitat. While not shown in the visual simulation, similar restriction fencing would likely continue to be in place after construction of the grade control structure. This would reduce visual contrast of the structure.

The greatest visual contrast of the grade control structure would come from soil cement bank protection, which would occur only up to 9 feet above the Reservoir bed extending downstream 40 feet from Rocky Point (refer to Figure C.11-5). While this bank stabilization would introduce industrial contrast, it would mimic the color and shape of the existing Reservoir bank. Therefore, the visual change of the grade control structure and bank protection is considered low and would not significantly alter existing form, line, color, or texture of the Reservoir landscape or character.

Under dry conditions, grading and sediment excavation/removal would also result in visual changes to the Reservoir floor topography. Visible changes would be limited to periods when the Reservoir water level is low. The removal of sediment would simply lower the Reservoir bottom when compared to existing conditions and would not change surface appearance, color, or substantially alter the visual character of the Reservoir. When water storage design capacity of the Reservoir is restored, the Reservoir bottom would be approximately 20 feet lower nearest the Dam and taper to existing grade near Rocky Point. The deepest excavation, nearest the Dam, would be first covered by water impoundment. Therefore, sediment removal would not significantly alter existing form, line, color, or texture of the Reservoir landscape or character.

When compared to the General Guidance for Review of Visual Impact Significance Under Forest Service SMS presented in Table C.11-2, visual impacts of Project activities within the Reservoir and ANF are considered adverse but not significant. Therefore, the Project would not adversely affect this scenic area or substantially degrade the existing visual character of the Reservoir.

PWD Sediment Storage Site. Temporary visual impacts would result from the presence of equipment and sediment stored within this site. Permanent visual changes would also result from the minor alteration of landform and removal of vegetation within the northeast portion of this site (where sediment would be temporarily stored for later reuse). As discussed in Section B.2.3.2, sediment would be stored at this location only for the short term. As shown in Figure C.11-4, the PWD site contains an existing area of disturbance providing an at-grade vehicle access pad on 47th Street (refer to Figure C.11-3 and C.11-4, photo 4). The amount of excavated sediment stored north of this disturbance area would likely vary from year to year, but would be stored in a manner to not extend above the existing grade of 47th Street.

Vehicles, equipment, workers, and stockpiled sediment would be temporarily visible, primarily limited to motorists travelling on 47th Street and residences west of the site (approximately 1,100 feet west of the storage location). Once the sediment storage location is cleared, all staging, vehicle parking, and material storage activities would occur in previously disturbed areas. View contrast from temporary use of equipment would not result in a permanent change to existing views of the site. Ground-disturbing activity, primarily clearing the sediment storage area, has the potential to partially disturb natural vegetative patterns of the site's visual landscape. However, although emergent riparian vegetation is present in isolated areas of the site (refer to Figure C.11-4), the visual focus of the site remains desert sand tone with scattered vegetation. The color of sediment would be similar to that of the site surface under existing conditions. Therefore, the visual contrast of temporary sediment storage would create the appearance of expanding the existing at-grade cleared surface on 47th Street northward (refer to Figure C.11-4, photo 4). This visual change of the site is not considered to significantly alter existing form, line, color, or texture of the site landscape or character.

CEQA Significance Conclusion

The grade control structure bank protection would introduce a new industrial character to views from Rocky Point. Furthermore, temporary sediment storage and activities within the PWD site would expand the existing disturbed and un-vegetated portion of the site north along 47th Street. However, these changes would not significantly alter the existing visual landscape of the sites, as the overall composition of viewsheds at these locations would be largely unaltered. While Project activities would result in some visual contrast over existing conditions, the magnitude of visual change is considered less than significant (Class III).

Conflict with adopted city, county, State, or federal plans, policies, regulations, or standards applicable to the protection of visual resources (Criterion VIS2)

Impact V-2: Project implementation would conflict with applicable plans, policies, regulations, or standards for the protection of visual resources

Scenic Integrity Objectives on NFS Lands. As the Reservoir is located within NFS lands, the key factors considered in determining the degree of visual impact are compliance and consistency with the SIOs. The Forest Service SMS uses Desired Landscape Character (DLC) and SIOs to evaluate, manage, and monitor landscape aesthetics and scenery. DLC expresses the highest quality goal for a given landscape. The DLC represents the sustainable image pursued by the Forest Service for each landscape place. SIO represents the minimum acceptable visual quality that is achieved by the maximum level of acceptable change.

In order to define the degrees of deviation from the natural landscape character that may occur at any given time, the Forest Service uses SIOs to represent the minimum levels of scenic integrity to which landscapes are to be managed. All land management activities, including the Project, must ensure that these minimum levels are achieved. This level of scenic integrity is to be used for inventory purposes only, and is never used as a management objective. This level of scenic integrity is useful for inventorying existing visual conditions or for predicting future scenic conditions of proposed projects.

Littlerock Reservoir is located in the Mojave Front Country Place, which has a designated High SIO. Under the Forest Service SMS, High SIOs are defined as landscapes where the valued landscape character “appears” intact. Visual deviations (human-made structures) may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident. Human-caused deviations may be present but must repeat the form, line, color, texture, and pattern common to the natural landscape character so completely and at such a scale that they are not evident.

Changes to the Reservoir bottom as a result of sediment removal would be visible only for brief periods until the Reservoir is refilled with water. Because the Project would change only the low form topography of the Reservoir bottom and of the same color/form, sediment removal is not considered to result in an adverse change to existing views and sensitivity at the Reservoir.

As discussed in detail under Impact V-1, the visual change of the grade control structure and bank protection is considered low and would not significantly alter existing form, line, color, or texture of the Reservoir landscape or character. The grade control structure would be flush with the topography and only visible during dry conditions. Bank protection at Rocky Point would result in minimal industrial character as the color and shape would mimic existing bank conditions. When compared to the General Guidance for Review of Visual Impact Significance Under Forest Service SMS presented in Table C.11-2, the impact is considered adverse but not significant. Therefore, the Project would not alter the

definition of High SIO for the Reservoir, and would be consistent with the SIO of the NFS as outlined in the 2005 Forest Service Land Management Plan.

Los Angeles County General Plan. Policies within the General Plan seek to protect visual quality of scenic areas, including ridgelines and scenic views from public roads, trails, and key vantage points. They also encourage developments to be designed to create a consistent visual relationship with the natural terrain and vegetation. As discussed in detail within Impact V-1, the visual contrast of temporary sediment storage would be limited to expanding the appearance of an existing at-grade disturbed area on 47th Street northward. As discussed in Section B.2.3.2, sediment would be stored within depressions on the northeastern portion of the site in a manner to not extend above existing grade of 47th Street. Therefore, the temporary storage of sediment within this site would not significantly alter existing form, line, color, or texture of the site landscape or character. The Project would be consistent with applicable policies of the Los Angeles County General Plan pertaining to visual quality of the PWD site.

City of Palmdale General Plan. Review of the City of Palmdale General Plan Environmental Resources Element identifies both Barrel Springs Road and Pearblossom Highway as designated scenic highways (City of Palmdale, 1994). However, because the Project does not include any development (beyond temporary haul truck trips) along these scenic highways, no policies related to the management or quality of scenic highways were found applicable.

CEQA Significance Conclusion

The Project is found consistent with visual management policies of the 2005 Forest Service Land Management Plan, Los Angeles County General Plan, and the City of Palmdale General Plan. Less-than-significant impacts would occur with respect to compliance with applicable visual related plans and policies (Class III).

C.11.5.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of the site and its surroundings (Criterion VIS1)

Alternative 1 results in identical activities as the Project, but would instead start the sediment removal period on July 1 (annually), instead of after Labor Day, until water storage design capacity of the Reservoir is restored. Visual impacts from the grade control structure, bank protection at Rocky Point, and annual sediment removal would be identical for Alternative 1 as those described for the Project. Therefore, the grade control structure and bank protection, as well as temporary storage of sediment within the PWD site, would not significantly alter existing form, line, color, or texture of the Reservoir and PWD site landscape or character. The Project would not adversely affect any scenic area or substantially degrade the existing visual character of these locations.

CEQA Significance Conclusion

While Alternative 1 activities would result in some visual contrast over existing conditions, the magnitude of visual change is considered less than significant (Class III).

Conflict with adopted city, county, State, or federal plans, policies, regulations, or standards applicable to the protection of visual resources (Criterion VIS2)

As discussed above for Criterion VIS1, visual impacts from Alternative 1 would be the same as those described for the Project. Alternative 1 would not substantially alter existing form, line, color, or texture

of the characteristic landscape of the Reservoir. When compared to the General Guidance for Review of Visual Impact Significance Under Forest Service SMS presented in Table C.11-2, the impact is considered adverse but not significant. Therefore, Alternative 1 would not alter the definition of High SIO for the Reservoir, and would be consistent with the SIO of the NFS as outlined in the 2005 Forest Service Land Management Plan. Furthermore, the temporary storage of sediment within the PWD site would be consistent with applicable policies of the Los Angeles County General Plan pertaining to visual quality of the PWD site.

CEQA Significance Conclusion

Alternative 1 is found consistent with visual management policies of the 2005 Forest Service Land Management Plan, Los Angeles County General Plan, and the City of Palmdale General Plan. Less-than-significant impacts would occur with respect to compliance with applicable visual related plans and policies (Class III).

C.11.5.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate behind Littlerock Dam and within the Reservoir at an annual average rate of 38,000 cubic yards per year. PWD would not undertake any activities to remove sediment. At full capacity, sediment accumulated behind the dam would be approximately 7.4 million cubic yards.

While 7.4 million cubic yards of sediment would accumulate within the Reservoir, demolition of the Dam is estimated to only require a one-acre staging area downstream of the Dam and require the removal of approximately 2.8 million cubic yards of sediment and dam concrete. Such activities would result in a project similar to, but larger than, the Project. Upon completion of the extensive construction period necessary under this scenario, it is assumed the Reservoir would be restored to natural conditions. Thus, no water impoundment would occur and Little Rock Creek would free flow through the ANF. This scenario could also include the removal of some or all existing recreational facilities and access roads. It is assumed that absent the Reservoir, current recreation facilities would be removed or altered. A determination of visual compliance with the SIO of the NFS as outlined in the 2005 Forest Service Land Management Plan would be speculative for such a scenario under the No Action/No Project Alternative. This is primarily because a different Land Management Plan would be in place at that time. It is unknown what the SIO of the Reservoir location would be at the time. Because this scenario is assumed to include full restoration of the Reservoir to natural conditions allowing flow of the Little Rock Creek waterway, unknown but not adverse visual impacts would be expected.

In the event the Reservoir became filled with sediment and the Dam was left in place, visual quality of the Reservoir would be similar to existing conditions with the exception of no water impoundment. However, the visible build-up of sediment behind the dam may appear extrinsic and eliminate existing views of the Reservoir banks. Without water impoundment, Little Rock Creek would free flow through the ANF and cascade over the existing dam. A stream channel would likely develop within the central portion of the Reservoir. This scenario would likely require some sort of downstream flood-control channel or protection to be constructed. Depending on the location of such flood control facilities, these could result in visual contrast and adverse visual impacts.

A determination of visual compliance with the SIO of the NFS as outlined in the 2005 Forest Service Land Management Plan would be speculative for either scenario under the No Action/No Project Alternative. This is primarily because a different Land Management Plan would be in place at that time. It is

unknown what the SIO of the Reservoir location would be at the time. Furthermore, unknown necessary infrastructure, like new flood control facilities, may be required and not in compliance with the Forest Service Land Management Plan or Los Angeles County plans/policies applicable at the time

CEQA Significance Conclusion

A determination of visual impacts under the No Action/No Project Alternative is somewhat speculative and several scenarios are possible. Regardless of the scenario, it is assumed water would eventually not impound and Little Rock Creek would free flow through the ANF. Under this Alternative, natural conditions at the Reservoir and Little Rock Creek are assumed to eventually be restored. Such an event would result in visual change, but not significant visual contrast as the Reservoir already contains a natural character. Therefore, visual quality impacts of the No Action/No Project Alternative are considered less than significant (Class III).

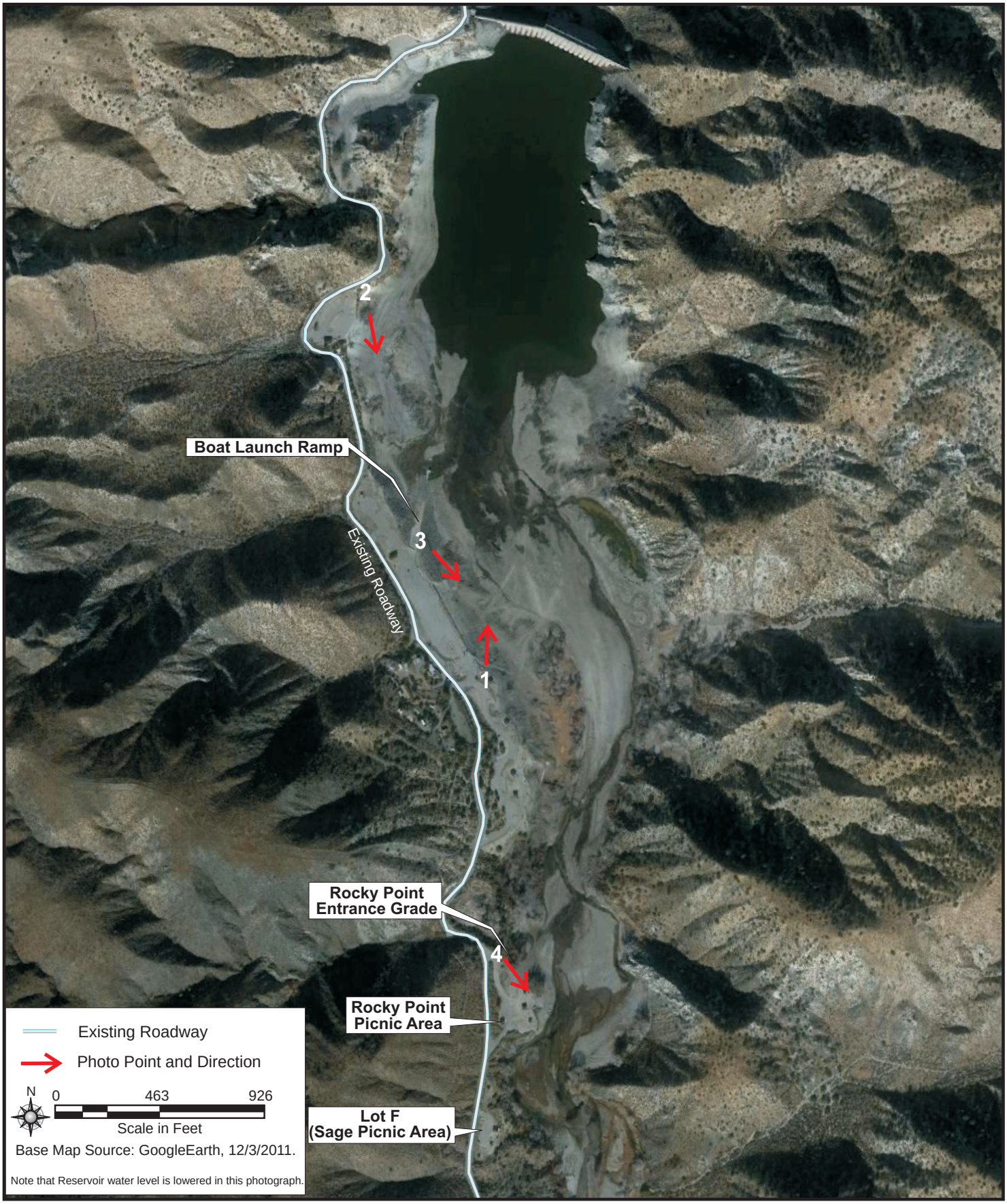
C.11.6 Impact Summary

Table C.11-3 summarizes the direct and indirect environmental impacts of the proposed action and the alternatives on visual resources. Refer to Section C.11.5 for a complete discussion of the environmental analysis.

Table C.11-3. Summary of Impacts and Mitigation Measures – Visual Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
V-1: Project implementation would have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of a location and its surroundings	Class III	Class III	Class III	Yes	None
V-2: Project implementation would conflict with applicable plans, policies, regulations, or standards for the protection of visual resources	Class III	Class III	Class III	Yes	None

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.



Littlerock Reservoir
Photo Key

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.11-1

May 2016









Littlerock Reservoir
Photographs

LITTLEROCK RESERVOIR
SEDIMENT REMOVAL PROJECT

Figure C.11- 2

May 2016



0 225 450 Feet

Palmdale Water District Site Photo Key

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.11-3

May 2016









Palmdale Water District Site
Photographs

LITTLEROCK RESERVOIR
SEDIMENT REMOVAL PROJECT

Figure C.11- 4

May 2016



Existing View



Simulated View

Existing and Simulated Views
From Rocky Point Picnic Area

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.11-5

May 2016

C.12 Water Quality and Resources

This section describes the existing conditions and objectives related to surface water quality and groundwater quality within the proposed action (Project) area. Surface water and groundwater hydrology are described in Section C.7.

C.12.1 Affected Environment

Baseline data were collected from several sources, including: U.S. Geological Survey (USGS), USDA Forest Service (Forest Service), Lahontan Regional Water Quality Control Board (Regional Board), California Department of Water Resources (DWR), and Palmdale Water District (PWD).

C.12.1.1 Topography and Climate

The Project study area includes Littlerock Reservoir and dam, and the potential gravel pit and PWD disposal areas shown in Figure B-1. Additionally, because of the possibility for downstream or down-gradient transport of pollutants, receiving waters downstream of the study area are included in this analysis. The Project area is located at the border of the Antelope Valley and the foothills of the San Gabriel Mountains, southeast of the City of Palmdale. Littlerock Reservoir is located within the Angeles National Forest, and Little Rock Wash (downstream of the reservoir) flows beyond the forest boundary onto the valley floor. The study area is located entirely within the Little Rock Wash Watershed, as defined by the USGS Watershed Boundary Dataset (WBD). The watershed is bounded by Mount Emma Ridge and Pacifico Mountain to the west; Kratka Ridge, Mount Hillyer, and Waterman Mountain to the south; and Mount Williamson, Pallett Mountain, and Pleasant View Ridge to the east. The watershed drains to the north along Little Rock Wash, and typically all runoff infiltrates or evaporates before reaching Rosamond Lake, north of the City of Lancaster. (USGS, 2014)

The Project area lies within the South Lahontan Hydrologic Region, one of ten hydrologic regions in California established by the DWR for management purposes. This HR is also called the South Lahontan Hydrologic Basin Planning Area by the Regional Board. The Project is subject to the water quality standards of the Water Quality Control Plan for the Lahontan Region (Basin Plan) as well as Forest Service water quality management objectives and strategies. The South Lahontan Hydrologic Basin Planning Area is further divided into Hydrologic Units (HU) and Hydrologic Areas (HA). The Project area lies within the Antelope HU. Littlerock Reservoir and all of the upstream contributing area, as well as both potential disposal sites, fall within the Rock Creek HA, while Little Rock Wash (downstream of the reservoir and dam) traverses both the Rock Creek HA and the Lancaster HA. (LRWQCB, 1995)

Climate in the Project area is generally hot and dry in the summer and mild in the winter. Annual average precipitation in the Antelope Valley ranges from 4 to 8 inches, and can exceed 12 inches in the foothills of the San Gabriel Mountains. (PRISM, 2013)

C.12.1.2 Surface Water Quality

Littlerock Reservoir is fed by Little Rock Creek, which is joined by South Fork Little Rock Creek and several unnamed tributaries upstream of the reservoir. The largest unnamed tributary flows through Santiago Canyon and joins Little Rock Creek just upstream of the reservoir. None of these upstream water resources would be affected by the Project or alternatives. However, they are included in this analysis because they contribute to the existing water quality conditions in the Littlerock Reservoir. Downstream of Littlerock Reservoir and dam, Little Rock Creek becomes Little Rock Wash, which starts

out with a fairly well-defined channel and quickly becomes a broad alluvial fan that runs south to north along the Antelope Valley floor, towards Rosamond Lake. Just south of State Route 138, Little Rock Wash crosses an undergrounded segment of the California Aqueduct, but these two waterbodies do not interact.

The Basin Plan for the Lahontan Region "sets forth water quality standards for the surface and ground waters of the Region, which include both designated beneficial uses of water and the narrative and numerical objectives which must be maintained or attained to protect those uses." The designated beneficial uses for surfaces waters within the Project area are listed below in Table C.12-1. Each beneficial use is accompanied by a water quality objective as defined in the Basin Plan. In order to achieve these water quality objectives, the Basin Plan defines effluent limitations for point and non-point sources of pollution. (LRWQCB, 1995)

Table C.12-1. Designated Beneficial Uses for Surface Waters within the Project Area

Hydrologic Unit/Subunit Surface Water Feature	Beneficial Uses													
	MUN	AGR	IND	GWR	FRSH	REC-1	REC-2	COMM	WARM	COLD	SAL	WILD	WQE	FLD
Antelope Hydrologic Unit														
Little Rock Creek	X			X		X	X	X		X		X		
Littlerock Reservoir	X	X	X	X		X	X	X		X		X		
Minor Surface Waters[1]	X	X		X		X	X	X	X	X		X		
Minor Wetlands[1]	X	X		X	X	X	X		X			X	X	X
Lancaster Hydrologic Area														
Rosamond Dry Lake[2]				X			X		X		X	X		

1 - The beneficial uses listed for minor surface waters and minor wetlands within the Antelope Hydrologic Unit are the same for minor surface waters and minor wetlands within the Lancaster and Rock Creek Hydrologic Areas, and therefore those surface water features are not repeated in this table.

2 - During rare periods of heavy rainfall, Rosamond Dry Lake can receive runoff from Little Rock Wash, and therefore is included in this analysis as downstream receiving water. The SAL use does not apply to tributaries of Rosamond Dry Lake.

X Existing or Potential Beneficial Use

MUN Municipal and Domestic Supply – Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

AGR Agricultural Supply – Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.

IND Industrial Service Supply – Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

GWR Ground Water Recharge – Uses of waters used for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

FRSH Freshwater Replenishment – Uses of water used for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

REC-1 Water Contact Recreation – Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

REC-2 Non-contact Water Recreation – Uses of water for recreational activities involving proximity to water but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

COMM Commercial and Sportfishing – Uses of waters used for commercial or recreational collection of fish or other organisms including, but not limited to, uses involving organisms intended for human consumption.

WARM Warm Freshwater Habitat – Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

COLD Cold Freshwater Habitat – Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

SAL Inland Saline Water Habitat – Uses of waters that support inland saline water ecosystems including, but not limited to, preservation and enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.

WILD Wildlife Habitat – Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

WQE Water Quality Enhancement – Uses of water that support natural enhancement or improvement of water quality in or downstream of a water body including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, streambank stabilization, maintenance of channel integrity, and siltation control.

FLD Flood Peak Attenuation/Flood Water Storage – Uses of riparian wetlands in floodplain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.

Narrative and numerical water quality objectives for numerous constituents apply to all surface waters in the Lahontan Region and are defined in the Basin Plan. Compliance with these water quality objectives serves to protect the beneficial uses listed above, and to prevent degradation of existing water quality conditions. Section 303(d) of the Clean Water Act requires the identification of waterbodies that do not meet, or are not expected to meet, water quality standards. These impaired waterbodies are prioritized in the 303(d) list and the development of a Total Maximum Daily Load (TMDL) is required. No TMDLs have been developed within the study area. However, Littlerock Reservoir does not meet water quality standards for the MUN beneficial use and a TMDL is required but not yet complete. The reservoir is currently listed as impaired by metals (manganese). The source of this impairment is unknown. In addition, the Regional Board is considering listing Littlerock Reservoir as impaired by mercury and PCBs. (LRWQCB, 2014)

C.12.1.3 Groundwater Quality

The Project area lies along the southern boundary of the very large Antelope Valley Groundwater Basin. Littlerock Reservoir itself is not underlain by any groundwater basins, but nearly the entire length of Little Rock Wash (beginning just downstream of Littlerock Reservoir dam) is underlain by the Antelope Valley Groundwater Basin. Please see Section C.7 (Hydrology) for a description of the hydrology and hydrogeology of the Basin. Beneficial uses for the basin, as defined above, include: MUN, AGR, IND, and FRSH. Narrative and numerical water quality objectives, as defined in the Basin Plan, apply to all ground waters in the Lahontan Region for the following constituents: bacteria, chemical constituents, radioactivity, taste, and odor.

Groundwater in this basin is typically calcium bicarbonate in character near the surrounding mountains and is sodium bicarbonate or sodium sulfate in character in the central part of the basin. Total dissolved solids in the basin averages 300 mg/L, and ranges from 200 to 800 mg/L. High levels of boron and nitrates have been observed in the basin. (DWR, 2004)

C.12.2 Regulatory Framework

This section provides an overview of the regulatory framework for surface water and groundwater quality. Surface water and groundwater hydrology is addressed in Section C.7.

Table C.12-2 provides a list of plans and policies that are applicable to surface water and groundwater quality, and includes a discussion of the Project's consistency with each plan or policy. Section C.9 (Recreation and Land Use) contains an evaluation of policies within the Forest Service Land Management Plan that are applicable to surface water and groundwater quality.

C.12.2.1 Federal

U.S. Environmental Protection Agency

- **Clean Water Act (CWA).** The CWA was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. The Project would be applicable to Sections 401, 402, 404, and 303(d) of the CWA. Discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (Sections 401 and 402 of the CWA). Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredge or fill material to the waters of the U.S. and adjacent wetlands. Section 303(d) of the CWA requires states to identify "impaired" water bodies as those that do not meet water quality standards.
- **Safe Drinking Water Act (SDWA).** The SDWA is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. SDWA authorizes the United States Environmental Protection Agency (USEPA) to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water. The USEPA, states, and water systems then work together to make sure that these standards are met.

C.12.2.2 State

State Water Resources Control Board

In California, NPDES permitting authority is delegated to, and administered by, the nine RWQCBs. For the Project, NPDES permits would be delegated to the Lahontan Regional Board. Projects that disturb one or more acres are required to obtain NPDES coverage under the California General Permit for Discharges of Storm Water Associated with Construction Activity. The Construction General Permits require the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP describes Best Management Practices (BMPs) the discharger will use to prevent stormwater runoff from leaving the site.

- **Porter Cologne Water Quality Control Act.** The Porter Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the State Water Resources Control Board and the nine Regional Boards 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.
- **California Water Code §13260.** California Water Code §13260 requires that any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the State, other than into a community sewer system, must submit a report of waste discharge to the applicable Regional Board. Any actions related to the Project that would be applicable to California Water Code §13260 would be reported to the Lahontan Regional Board.

C.12.2.3 Local

County of Los Angeles

- **County of Los Angeles General Plan.** The County of Los Angeles General Plan General Goals and Policies, Conservation and Open Space Element, and Water and Waste Management Element contain goals and policies to conserve water resources, protect surface and ground water quality, and to ensure proper disposal of waste so that water quality is not degraded.
- **Antelope Valley Areawide General Plan.** The Antelope Valley Areawide General Plan includes policies to conserve natural resources through control of groundwater recharge and to protect the viability of surface water as a habitat for fish and other water-related organisms as well as an important environmental component for land-based plants and animals.

City of Palmdale

- **City of Palmdale General Plan.** The City of Palmdale General Plan contains objectives and policies to protect surface and ground water quality, including water conservation measures, the preservation of natural drainage courses, the protection of groundwater recharge, and the requirement for new development to connect to a sanitary sewer system.

Table C.12-2. Consistency with Applicable Water Quality Plans and Policies

Plan/Policy	Consistency	Explanation
Clean Water Act Sections 401, 402, and 404		
Section 401 - State Certification of Water Quality **Section 402** - National Pollutant Discharge Elimination System **Section 404** - Establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands.	Yes	All required certifications and permits would be obtained prior to construction of the Project.
Safe Drinking Water Act		
The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.	Yes	Drinking water quality would not be impacted by this Project. No wells would be installed, and no contaminants would be introduced into the groundwater aquifer.
California Water Code §13260		
Requires an agency to file with the appropriate regional board a report of the discharge, containing the information that may be required by the regional board	Yes	A report of waste discharge would be filed with the Lahontan Regional Board prior to the discharge of any waste to waters of the State.
County of Los Angeles General Plan, Antelope Valley Areawide General Plan, and City of Palmdale General Plan Water Quality Policies.		
Various goals and policies to conserve water resources, protect surface and ground water quality, and to ensure proper disposal of waste so that water quality is not degraded.	Yes	The Project improves the potential for water conservation through increased reservoir storage capacity. Additionally, existing water quality for surface and ground waters would be maintained.

C.12.3 Issues Identified During Scoping

Table C.12-3 below provides a list of water quality issues raised during the public scoping period for the EIS/EIR [see Appendix E (Scoping Summary Report)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.12-3. Scoping Issues Relevant to Water Quality and Resources

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should evaluate the known Hg and PCB concentrations found at Littlerock Reservoir, determine (to the extent possible) the source(s) of Hg and PCBs, and consider and disclose how each of the alternatives may either exacerbate or ameliorate the levels of Hg and PCBs in surface waters, sediments, and fish tissue.	Fish tissue and sediment samples were collected to analyze Hg and PCB content. The source of these contaminants is currently unknown. The potential effect of each alternative on levels of Hg and PCBs in surface waters, sediments, and fish tissue is analyzed in Section C.12.4.
Consider using the State Water Board's website for its "Statewide Mercury Program" as an information source: http://www.swrcb.ca.gov/water_issues/programs/mercury/	Reviewed State Water Board's website and Fact Sheet for Statewide Mercury Control Program for Reservoirs. Information about the likely sources of methylmercury and potential control options was incorporated into this analysis in Section C.12.4.
The Draft EIS/EIR should identify the water quality standards that could potentially be violated by the alternatives and use these standards when evaluating thresholds of significance for impacts (per Chapter 3 of the Basin Plan).	Beneficial uses for all waterbodies in the Project area are listed in in Table C.12-1. Impaired and assessed waterbodies in the Project area are analyzed in Section C.12.4. Water quality objectives are discussed where applicable.
The Project is located within the Rock Creek Hydrologic Area of the Antelope Hydrologic Unit 626.00 and overlies the Antelope Valley Groundwater Basin No. 6-44. The Draft EIS/EIR should identify the beneficial uses of the water resources (per Chapter 2 of the Basin Plan) within the Project area, and include an analysis of the potential impacts to water quality with respect to these resources.	Beneficial uses for waters within the Project area have been identified, and an analysis of the potential impacts to water quality was conducted in Section C.12.4.
Analysis should include a discussion that the Lahontan Regional Water Board recommended the inclusion of Littlerock Reservoir onto the Clean Water Act Section 303(d) list of impaired water bodies (June 19, 2014) due to elevated levels of mercury and PCBs in fish tissue. The State Water Board intends to adopt the 303(d) list within the next few months.	The Lahontan Regional Water Board's recommendation for 303(d)-listing of Littlerock Reservoir for mercury and PCBs is discussed in Section C.12.1.
The Draft EIS/EIR should identify an alternative and define mitigation measures to ensure that concentrations of Hg and PCBs in surface waters, sediments, and fish tissue are not increased by the Project and are decreased to the extent feasible.	Reservoir management alternatives (such as pH adjustment, nutrient addition, oxygenation, and stocking practices) to reduce methylmercury production are not part of the Project. Measures are included as part of the Project to ensure that contaminated sediments would not be mobilized or otherwise allowed to enter the aquatic ecosystem.

C.12.4 Environmental Consequences

Significance Criteria. Appropriate significance criteria have been identified based on the CEQA Appendix G Environmental Checklist, significance threshold guidance from the County of Los Angeles (County of Los Angeles, 1987), and relevance to this analysis based on local conditions and the project description. For purposes of the CEQA analysis in this report, water quality impacts are considered significant if the Project would:

- Criterion WQ1: Violate any water quality standard or waste discharge requirement, or otherwise degrade water quality, including through providing substantial additional sources of polluted runoff or through mobilization of contaminated sediments.
- Criterion WQ2: Degrade groundwater quality through the introduction or mobilization of pollutants.

Impact Assessment Methodology. This impact analysis is based on an assessment of baseline conditions relevant to the site, including ambient water quality, beneficial uses identified in the Lahontan Regional Board's Basin Plan, and existing impairments to waterbodies as listed on the CWA 303d list of impaired and threatened waters that have been identified and reported to the USEPA, which are presented in Section C.12.1. These baseline conditions were evaluated based on their potential to be affected by construction activities as well as operation and maintenance activities related to the Project and alternatives. Potential impacts were then identified based on the predicted interaction between construction, operation, and maintenance activities with the affected environment. Standard Project commitments, described in Appendix A, were considered as Project features in the impact analysis.

Impacts are described in terms of location, context and intensity, and identified as being either short- or long-term, and direct or indirect in nature. Beneficial as well as adverse impacts are identified, with a discussion of the effect and risk to public health and safety, and potential violation of environmental laws.

C.12.4.1 Proposed Action/Project

This section describes the direct and indirect effects of the Project on surface and ground water quality. Direct and indirect effects on surface and ground water hydrology are described in Section C.7.

Direct and Indirect Effects Analysis

Violate any water quality standard or waste discharge requirement, or otherwise degrades water quality, including through providing substantial additional sources of polluted runoff or through mobilization of contaminated sediments (Criterion WQ1)

Impact WQ-1: The Project would violate water quality standards or waste discharge requirements, or otherwise degrade water quality.

The Project includes construction of a subterranean grade control structure within the reservoir, excavation of accumulated sediment to restore 1992 design water storage and flood control capacity, ongoing annual sediment removal to maintain reservoir design capacity, and maintenance or improvement of the roadbed along the sediment disposal haul route to prevent or repair damage to affected roadways. None of these activities would affect water quality upstream of the reservoir. The only waterbodies that could be impacted by the Project are Littlerock Reservoir, Little Rock Wash (downstream of the reservoir and dam), and any unnamed streams along the sediment disposal haul route.

Project activities that could impact water quality include soil disturbance, the accidental release of hazardous materials, and the discharge of contaminated water associated with dewatering activities.

The excavation of accumulated sediment is by definition a soil-disturbing activity. Soil disturbance can lead to increased erosion and sedimentation, and can mobilize pollutants that may have attached to the sediment. All excavation work would occur during the dry season and within the reservoir. Any loose or stockpiled soil not immediately removed to a disposal site would be naturally redistributed along the bed of the reservoir. This sediment would be confined by Littlerock Dam. If soil disturbance associated with excavation were followed by a series of very large storm events that overtopped the dam, an

increased amount of fine sediments could be transported downstream. However, this rapid overtopping would be a rare event and would have a negligible effect on sediment transport downstream. Prior to excavation and off-site transport of any accumulated sediments, a sediment testing program would be implemented to identify any potential contaminants. Any sediment that is discovered to be contaminated would be transported to an approved hazardous material storage facility for disposal. No contaminated sediment would be discharged to any waterbody.

Sediments and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. Fifteen samples, including 11 sediment samples and 4 fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. For chlorinated pesticides (including DDT), no analyte was detected at or above the method detection limit. For PCB congeners, one analyte (PCB138) was detected in three of the 11 samples. However, the amount of PCB138 that was detected is extremely small. The three sample results range from 1.1 to 1.9 parts per billion (ppb). The method detection limit for this analyte is 1.0 ppb, and the reporting limit (RL) is 5.0 ppb. All 11 sediment samples tested positive for the presence of mercury. Mercury was analyzed as total mercury (Hg), and the element was not speciated in this analysis. Therefore, it is unknown what percentage of this mercury is organic mercury versus methylmercury. The sample results range from 0.0032 to 0.0213 parts per million (ppm). The Agency for Toxic Substances and Disease Registry reports that normal levels of mercury in soil range from 0.02 to 0.625 ppm (ATSDR, 1999). All but one of the sediment sample results fall below the lower value of this range, and the one result that falls within this range lies at the extreme lower end of the range. The sampling results, presented in Appendix C, show that the sediment in Littlerock Reservoir is mostly free of contaminants, and that in cases where a contaminant was detected, the level of contamination is extremely low.

Disposal of clean sediment would occur at the PWD property or in abandoned mining pits shown on Figure B-1. Although one small, ephemeral stream crosses the PWD property, sediment would be placed and graded so that it would not enter the stream channel through subsequent erosion and sedimentation. No mounding of sediment above adjacent grades would occur. If an abandoned mining pit is chosen as the preferred disposal site, all disposal would occur substantially below the surrounding grade, and no sediment would leave the site or enter any waterbody.

SPC HYDRO-1, provided in Appendix A, would ensure that excavated material to be stockpiled on the PWD alternate sediment storage site would not obstruct or divert flow in the ephemeral watercourse that crosses that property. Compliance with the Federal Clean Water Act would ensure no sedimentation from the stockpile during construction. No Project-related erosion in this watercourse is expected. Sedimentation from the stockpile would be minor due to compliance with existing regulations.

Construction of the grade control structure would also result in soil disturbance. However, this disturbance would also occur only within the reservoir, and any loose or stockpiled soil would similarly be confined by Littlerock Dam. Road maintenance and improvement along the sediment disposal haul route could also lead to soil disturbance. However, the haul routes follow paved roads, and any soil disturbance related to maintenance or improvement of the roadways would be minimal and short-term. No new roads would be created, and no paved surfaces would be converted to bare soil conditions.

Excavation and disposal of accumulated sediments, construction of the grade control structure, and maintenance and improvement of haul route roadways would involve the operation of heavy machinery and construction vehicles. The operation of these vehicles and machinery could result in a spill or accidental release of hazardous materials, including fuel, engine oil, engine coolant, and lubricants. Project activities would occur during the dry season and therefore the chance that any spilled or accidentally

released hazardous materials could be carried by runoff into receiving waters would be minimal. Additionally, any spill or accidental release within the reservoir would be contained by Littlerock Dam and would be prevented from entering any other waterbody. Hazardous materials could be spilled or accidentally released along the haul route, either during sediment disposal or roadway maintenance. However, because these activities would occur during the dry season, and due to the generally arid nature of the Project area, the likelihood that any hazardous material would enter a waterbody would be negligible. Additionally, the implementation of SPC WQ-1, which requires the preparation of a Spill Response Plan, would further reduce the potential for any adverse impact to water quality.

Construction of the grade control structure may require dewatering or diversion of stream flow. However, this dewatered or diverted water would be contained by the Littlerock Dam, downstream of the grade control structure. No dewatered or diverted water would be discharged to any receiving water. The excavation and removal of accumulated sediment may require dewatering of the excavation site. In the event that this water would need to be discharged to Little Rock Wash, downstream of Littlerock Dam, all required dewatering and discharge permits would be obtained prior to any discharge. In conformance with dewatering and discharge permit requirements, any dewatered or diverted water would be tested and treated (if necessary) prior to discharge downstream of Littlerock Dam.

SPCs Applicable to Impact WQ-1

SPC WQ-1 (Prepare Spill Response Plan)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

The implementation of SPCs WQ-1 and HYDRO-1 would ensure this impact is less than significant (Class III).

Degrade groundwater quality through the introduction or mobilization of pollutants (Criterion WQ2)

Impact WQ-2: The Project would degrade groundwater quality through the introduction or mobilization of pollutants.

No groundwater resources would be utilized for the Project, and no new wells would be constructed. Therefore, no new pathways for groundwater contamination would be introduced as a result of the Project. Project activities could degrade groundwater quality if pollutants were introduced either through infiltration of polluted discharge or infiltration of a spilled hazardous material. Littlerock Reservoir sits on bedrock and is not underlain by any groundwater basin. Water contained in the reservoir does not directly interact with groundwater resources. However, water discharged to Little Rock Wash (downstream of Littlerock Dam) could infiltrate into the Antelope Valley Groundwater Basin. Excavation and removal of accumulated sediments could require dewatering activities that would result in a discharge of water to Little Rock Wash. If this water carried pollutants, those pollutants could infiltrate into the groundwater basin. However, conformance with required dewatering and discharge permits would ensure that no contaminated water would be discharged to Little Rock Wash and that no pollutants would infiltrate into the groundwater basin.

Project activities could result in a spill or accidental release of hazardous materials within the reservoir or along the haul route. However, because these activities would occur during the dry season, and due to the generally arid nature of the Project area, the likelihood that any hazardous material would infiltrate into the groundwater would be negligible. The use of herbicides within the Weed Control Plan,

including the control methods to be used, would be prepared consistent with the Forest Service's *Plan for Invasive Plants, Angeles National Forest and San Gabriel Mountains National Monument Environmental Assessment (EA)* (September 2015). Control of weeds would be important to ensure successful establishment of native vegetation along the Reservoir and to prevent new infestations along the access roads. However, manual treatments and herbicide use could result in indirect impacts to water quality both at the Reservoir and at the PWD property potentially used for temporary sediment storage unless appropriate precautions are implemented, as outlined in the *Plan for Invasive Plants EA*. Any herbicide use would conform to the FS's *Plan for Invasive Plants EA*, including formulations to be used and the methods of application. Adhering to this existing FS guidance on weed control would ensure that any mechanical or chemical weed control implemented as part of the proposed Project would not result in secondary impacts to water quality.

CEQA Significance Conclusion

The potential for spilled or accidentally released hazardous materials to infiltrate into the groundwater basin would be very small due to the generally dry conditions of the Project area during the proposed work schedule resulting in less than significant impacts (Class III).

C.12.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Violate any water quality standard or waste discharge requirement, or otherwise degrades water quality, including through providing substantial additional sources of polluted runoff or through mobilization of contaminated sediments (Criterion WQ1)

Impact WQ-1: The Project would violate water quality standards or waste discharge requirements, or otherwise degrade water quality.

Project activities under this alternative related to Impact WQ-1 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. The potential for a spill or accidental release of hazardous materials to enter receiving waters would remain the same, and would be minor. Impact WQ-1 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.12.4.1.

SPCs Applicable to Impact WQ-1

SPC WQ-1 (Prepare Spill Response Plan)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

The implementation of SPCs WQ-1 and HYDRO-1 would ensure this impact is less than significant (Class III).

Degrade groundwater quality through the introduction or mobilization of pollutants (Criterion WQ2)

Impact WQ-2: The Project would degrade groundwater quality through the introduction or mobilization of pollutants.

Project activities under this alternative related to Impact WQ-2 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer

period each season for a greater number of years. The potential for a spill or accidental release of hazardous materials to infiltrate into the groundwater basin would remain the same, and would be negligible. Impact WQ-2 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.12.4.1.

CEQA Significance Conclusion

The potential for spilled or accidentally released hazardous materials to infiltrate into the groundwater basin would be very small due to the generally dry conditions of the Project area during the proposed work schedule resulting in less than significant impacts (Class III).

C.12.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. This lost capacity could be addressed either by breaching the dam and allowing the natural flow of Little Rock Creek to overtop the dam, or by demolishing the dam and removing approximately 2.8 million cubic yards of sediment and dam concrete. Whether the dam was breached or demolished, it is likely that substantial downstream erosion and sedimentation would result. Dewatering activities will likely be required. Hazardous materials will be used during demolition and excavation, and could be spilled into waterways (Impact WQ-1). It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from degradation. Therefore, this alternative would result in a direct and adverse impact.

Project activities under this alternative related to Impact WQ-2 would be similar to those described under the Project. Demolition and excavation of the accumulated sediment would require a larger number of dump trucks and other construction equipment. However, the potential for a spill or accidental release of hazardous materials to infiltrate into the groundwater basin would remain the same, and would be negligible. Impact WQ-2 impacts and CEQA significance for Alternative 2 are the same as those described for the Project. See Section C.12.4.1.

CEQA Significance Conclusion

It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from degradation, resulting in significant and unavoidable impacts (Class I). The potential for a spill or accidental release of hazardous materials to infiltrate into the groundwater basin would remain the same as that under the proposed Project and Alternative 1, resulting in less than significant impacts (Class III).

C.12.5 Impact Summary

Impact WQ-1 for the Project and Alternative 1 is adverse, but not significant (Class III). Impact WQ-1 is significant and unavoidable under the No Action Alternative (Class I). Impact WQ-2 for the Project, Alternative 1, and Alternative 2 is adverse, but not significant (Class III). Table C.12-4 summarizes impact significance.

Table C.12-4. Summary of Impacts and Mitigation Measures – Water Quality

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
WQ-1: The Project would violate water quality standards or waste discharge requirements, or otherwise degrade water quality	Class III	Class III	Class I	Yes	SPC WQ-1 (Prepare Spill Response Plan) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)
WQ-2: The Project would degrade groundwater quality through the introduction or mobilization of pollutants	Class III	Class III	Class III	Yes	None

1 - Indicates whether this impact is applicable to National Forest System lands.

C.13 Wildfire Prevention and Suppression

This section describes effects on wildfire prevention and suppression that would be caused by implementation of the Project. The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for the alternatives, and recommends measures to reduce or avoid adverse impacts anticipated from the components of the Project or alternatives. In Section C.13.2, existing laws and regulations relevant to wildfire prevention and suppression are also described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project.

C.13.1 Affected Environment

The Wildfire Study Area is defined for the purposes of this report as the following:

- The direct and indirect protection zones that encompass the Reservoir, as determined by the Forest Service on NFS lands; and
- The dump truck routes and sediment storage/disposal sites that are located in Fire Zone 4 and Areas of High Fire Hazard, as defined by Los Angeles County.

The following discussion provides further detail on these zones.

C.13.1.1 Forest Service Protection Zones

In 2003, the Healthy Forests Restoration Act was enacted in order to expedite the preparation and implementation of hazardous fuels reduction projects on federal land. This act established the designation of Wildland/Urban Interface zones within national forests, which is defined as a variable width up to 1.5 miles from communities at risk or as defined in individual community fire protection plans (USFS, 2005c).

In order to apply the act to NFS lands within the ANF, the Forest Service's 2005 Land Management Plan identifies Wildland/Urban Interface (WUI) Defense Zones and WUI Threat Zones, which when combined are designed to make most structures more defendable:

WUI Defense Zone is defined as the area directly adjoining structures and evacuation routes that is converted to a less-flammable state to increase defensible space and firefighter safety. The minimum widths for this zone are determined by general vegetation type (i.e., grass, chaparral, or forest) (USFS, 2005c).

> ***Chaparral:*** *The Project Area on NFS land is characterized by desert scrub vegetation, which can be categorized as chaparral for the purposes of the WUI Defense Zone classifications. Generally, a width of 100 to 300 feet is sufficient in some chaparral conditions to provide community safety objectives. On steep slopes, a defense zone width of over 300 feet may be required. Defense Zone management activities take precedence over all other management activities within the Defense Zone, and Standard 8 (see Table C.13-1) would apply.*

WUI Threat Zone is defined as an additional strip of vegetation modified to reduce flame heights and radiant heat. This zone generally extends 1.25 miles out from the Defense Zone boundary, although the actual extent is based on fire history, local fuel conditions, weather, topography, existing and proposed fuel treatments, natural barriers to fire, and community protection plans. The object is to complete enough tree thinning and surface fuel management over time to reduce the potential for stand replacing fires. In vegetation types such as grass and chaparral, there may be no need to conduct extensive treatments in this zone (USFS, 2005c).

C.13.1.2 County of Los Angeles Fire Hazard Zones

The Safety Element of the County of Los Angeles General Plan (1990) describes the County as being at high risk of wildfires due to wet year-dry year climatic cycles, Santa Ana weather conditions (marked by hot, dry desert air), types of vegetation supported by Mediterranean climate, and the extreme inaccessibility posed by steep mountainous topography adjacent to developed areas.

The County identifies two high fire hazard areas that extend across multiple jurisdictions (e.g., city and federal) within the perimeter of the County. These areas are defined as the following:

Fire Zone 4 - This encompasses high fire hazard brush and woodland areas, areas of steep topography and little or no development. This area requires management strategies to enforce stringent fire enforcement measures including fire-resistive construction materials, brush clearance, fire breaks, and fuel load management requirements (County of Los Angeles, 1990b).

Additional Brush Fire Hazards Areas – This encompasses wildland areas outside of Fire Zone 4 that are within the jurisdiction of incorporated cities and have features similar to Fire Zone 4 (County of Los Angeles, 1990b).

The Wildfire Study Area is within both of these County high fire hazard zones. The Project components that occur south of the California aqueduct (i.e., grade control construction, sediment excavation, southern portion of the dump truck route) are located within a designated Fire Zone 4 (County of Los Angeles, 1990c). The Project components that occur north of the California aqueduct (i.e., northern portion of the dump truck route, sediment storage, and disposal) are located within an Additional Brush Fire Hazards Area (County of Los Angeles, 1990c).

C.13.2 Regulatory Framework

The Project and alternatives would traverse federal and local jurisdictions. The following discussion summarizes the associated laws, regulations and standards for these jurisdictions. Table C.13-1 provides a list of the specific policies that are applicable to wildfire prevention and suppression, and includes a discussion of the Project's consistency with each policy. An evaluation of applicable policies from the Forest Service Land Management Plan is included in Section C.9 (Recreation and Land Use).

Federal

- **National Fire Plan.** In 2000, the Secretaries of the USDA and the Department of the Interior (DOI) were directed to prepare a report recommending how to respond to severe, ongoing fire activity, reduce impacts of fires on rural communities and the environment, and ensure sufficient firefighting resources in the future. The report was the foundation for the National Fire Plan, which addresses the following five key points in wildfire management: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability.
- The USDA and the DOI have continued to work with federal, state, local, and tribal governments, and non-governmental partners and public stakeholders to further develop a coordinated strategy to address wildland fire threats. In 2009, Congress passed the Federal Land Assistance, Management, and Enhancement Act (FLAME Act) that mandated the development of a national cohesive wildland fire management strategy. As directed by the FLAME Act, the USDA and the DOI established the Wildland Fire Leadership Council, which is an intergovernmental committee tasked with completing a three-phased planning and analysis process referred to as the Cohesive Strategy effort. The culmination of this effort was the creation of the following:

- **The National Strategy:** The Final Phase in the Development of the National Cohesive Wildland and Fire Management Strategy. The National Strategy describes how strategic investments across the nation can be focused to reduce the effects of wildfire on high risk areas. However, the guidance is not prescriptive in deciding which options to apply regionally or locally (USDA and DOI, 2014a). This document describes the following four challenges in wildfire management: (1) Managing vegetation and fuels; (2) Protecting homes, communities, and other values at risk; (3) Managing human-caused ignitions; and (4) Safely, effectively, and efficiently responding to wildfire.
- **National Action Plan**: This plan is a framework for implementing the National Strategy. For each of the four challenges outlined in the National Strategy, the National Action Plan describes a range of management options and the implementation planning guidance that is applicable at all levels of planning (USDA and DOI, 2014b).

- While the Wildland Fire Leadership Council will continue to coordinate national wildfire issues, implementing the National Strategy and National Action Plan at a regional and local level is subject to the stakeholders' participation and the effectiveness of wildland fire management in local communities.
- **Angeles National Forest Fire Management Plan (2009).** The Angeles National Forest Fire Management Plan (2009) is a fundamental strategic document that guides the full range of fire management-related activities within the Angeles National Forest.

Local

- **County of Los Angeles General Plan Safety Element (Adopted 1990).** Section 3.4 of the County of Los Angeles Safety Element describes the wildland fire hazards within the County, which include the dry climate, Santa Ana weather conditions, and steep topography. The high fire hazard areas delineated on the Wildland and Urban Fire Hazards Map (County of Los Angeles, 1990c) indicate portions of the County that require innovative strategies to enforce stringent fire enforcement measures including fire-resistive construction materials, brush clearance, fire breaks, and fuel-load management requirements (County of Los Angeles, 1990b). Table C.13-1 lists the goals and actions from the County of Los Angeles Safety Element that are applicable to wildfire.
- **City of Palmdale General Plan (January 1993).** There are two City of Palmdale General Plan elements that discuss high fire risk areas and fire protection services: the Safety Element and the Public Services Element, respectively. The City's fire protection services are provided by the Los Angeles County Fire Department, which has three stations located within the Palmdale Planning Area and five additional stations serving the outlying areas (City of Palmdale, 1993a). The Los Angeles County Fire Department also receives aid from the USDA Forest Service in firefighting resources. The City of Palmdale General Plan objectives and policies that are applicable to wildfire are listed in Table C.13-1.

Table C.13-1. Consistency with Applicable Wildfire Plans and Policies

Plan/Policy	Consistency	Explanation
County of Los Angeles General Plan Safety Element (December 1990)		
Goal 18: Expand and improve vegetation management efforts in wildland fire hazard areas.	Yes	The Project would restore disturbed vegetation with native seed mixes. With the incorporation of SPCs BIO-1a and BIO-2, Project activities would not affect the local vegetation, nor would they alter the fuel vegetation matrix at the Reservoir or along truck routes.

Table C.13-1. Consistency with Applicable Wildfire Plans and Policies

Plan/Policy	Consistency	Explanation
Goal 19: Promote improved watershed management practices to reduce the risk of damaging runoff and debris movement into urban areas.	Yes	The Project would restore the existing Reservoir to its 1992 design, which would improve its water storage capacity and reduce the risk of dam overflow.
Action 15.1: Continue to review all development projects proposed in Fire Zone 4 for availability of adequate emergency access and water supply for firefighting purposes. Improve the enforcement of the Water Code, including provision for periodic inspection of water utilities to verify compliance with code requirements.	Yes	The Project would not introduce new development into Los Angeles County. Use of County lands for sediment transport and temporary storage would not require designated emergency access or water supply.
Action 15.3: Continue to require property owners to undertake fuel load management practices such as brush clearance, erosion control, slope stabilization, and flammable rubbish removal. Also, continue to review development projects to ensure proper brush clearance, adequate requirements for emergency ingress and egress, and adequate fire flows for fire suppression.	Yes	The Project would not introduce new development into Los Angeles County. Use of the PWD-owned property on 47th Street for temporary sediment storage would require a conditional use permit from the County. Onsite activities would adhere to County requirements regarding brush clearance, erosion control, slope stabilization, and flammable rubbish removal.
Action 18.4: Improve wildland fire hazards assessment and rating to establish priority areas for the reduction of fire hazard to tolerable levels. Give consideration to such factors as vegetation type, slope, aspect, and proximity to development. Expand vegetation management activities to reduce fuel loading of highly flammable vegetation.	Yes	The Project would restore disturbed vegetation with native seed mixes. With the incorporation of SPCs BIO-1a and BIO-2, Project activities would not affect the local vegetation, nor would they alter the fuel vegetation matrix at the Reservoir or along truck routes.
Action 19.1: Continue to improved watershed management efforts in coordination with federal, state, and local agencies to reduce the frequency, size, and intensity of wildland fires and their related watershed damage. This includes the maintenance of fire and fuel breaks, the review of wildland fire events for potential erosion impacts, and the provision of emergency revegetation where appropriate.	Yes	The Project would not alter the amount of developed land or the designated use of the land at the Reservoir. Activities would be consolidated in paved or previously disturbed areas at the Reservoir, and would not alter established high fire hazard areas or the WUI Defense Zones and Threat Zones surrounding the Reservoir. The Project would restore disturbed vegetation with native seed mixes, and would incorporate SPCs BIO-1a and BIO-2.
Los Angeles County Code (Ordinance 2014-0040)		
Title: 32 (Fire Code), Section 4908.1: Fuel modification plan in high hazard severity zones A fuel modification plan shall be submitted and approved prior to any subdivision of land, or prior to issuing a permit for any permanent structure used for habitation, that is within a fire hazard severity zone.	Yes	Project use of the Palmdale Water District (PWD)-owned property on 47th Street for temporary sediment storage would be subject to a conditional use permit from the County. The Project would adhere to County requirements that are associated with permit approval, such as a fuel modification plan if required.
City of Palmdale General Plan Safety Element (January 1993)		
Objective S1.3: Ensure compatible development in areas within or adjacent to natural high risk fire areas (urban-wildland interface), and other high risk fire areas.	Yes	The Project would not alter the amount of developed land or the designated use of the land at the Reservoir. Project activities would be consolidated in paved or previously disturbed areas at the Reservoir, and would not alter established high fire hazard areas or the WUI Defense Zones and Threat Zones surrounding the Reservoir.

Source: City of Palmdale, 1993b; County of Los Angeles, 1990a, 1987.

C.13.3 Issues Identified During Scoping

There were no wildfire prevention and suppression issues identified during the public scoping period. See Appendix E for a summary of issues relevant to the entire Project that were raised during the scoping process.

C.13.4 Environmental Consequences

Significance Criteria. The following significance criteria for Wildfire Prevention and Suppression were derived from previous environmental impact assessments for similar projects, agency thresholds, and from the CEQA Guidelines (Appendix G, Environmental Checklist Form, Section IX). Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion WF1: Project-related activities adversely affect fire prevention and suppression activities.
- Criterion WF2: Project-related activities or the presence of the Project expose communities, fire-fighters, personnel, and/or natural resources to an increased risk of wildfire.
- Criterion WF3: Project-related activities create a fuel vegetation matrix with an increased ignition potential and rate of fire spread.

Impact Assessment Methodology. The first step for this impact analysis is to establish baseline conditions for the affected environment (as described in Section C.13.1), including a summary of wildland fuels, climate, topography, high fire hazard areas, and fire protection zones. The biophysical, historical, and management characteristics of the Project area are defined by the ANF Fire Management Plan and the Los Angeles County Municipal Code (see discussion of applicable wildfire policies and fire hazard zones in Section C.13.2). The Project area is then evaluated based on its potential to be affected by design features or construction, operation, and maintenance activities related to the Project and alternatives.

C.13.4.1 Proposed Action/Project

Direct and Indirect Effects Analysis

Project-related activities adversely affect fire prevention and suppression activities (Criterion WF1)

Impact WF-1: Construction and excavation equipment and dump trucks would interfere with wildfire suppression activities.

The use and temporary storage of Project construction and excavation equipment would be consolidated within the paved and previously disturbed areas at the Reservoir. The closure of the Reservoir and the presence of Project-related equipment would not affect fire prevention activities or fire suppression work within the ANF outside of the Study Area.

Sediment removal operations may require traffic control along Forest Service roadways, specifically at the gated entrance to the Reservoir on Cheseboro Road and near the Reservoir's boat ramp. While these roadways would be closed to the public during the annual closure period, the presence of the equipment and trucks could create an obstacle for emergency fire crews in the event of a wildfire near the Study Area. The numerous dump truck trips (maximum of 945 per day) that would be required during the first 7 to 12 years of sediment removal, followed by the truck trips during operation and maintenance of the Reservoir, would also create an obstacle to wildfire crews accessing NFS lands along

public roadways near the Reservoir. The implementation of SPC FIRE-1, as provided in Appendix A, would avoid Project-related conflicts with wildfire suppression.

SPCs Applicable to Impact WF-1

SPC FIRE-1 (Curtailment of Activities)

CEQA Significance Conclusion

Implementation of SPC FIRE-1 (curtailment of activities) would avoid potential conflicts with fire suppression efforts in the event of a fire or during very high or extreme weather conditions, resulting in less than significant impacts (Class III).

Project-related activities or the presence of the Project expose communities, firefighters, personnel, and/or natural resources to an increased risk of wildfire (Criterion WF2)

Impact WF-2: Construction activities or personnel could inadvertently start a vegetation fire.

The Project would be located in a Fire Zone 4 and an Additional Brush Fire Hazards Area due to the chaparral vegetation that characterizes the site, the region's wet year-dry year climatic cycles, and the frequent Santa Ana weather conditions. High fire hazard zones require specific management strategies to minimize the risk of wildfire.

While historically, industrial operations in forests, rangelands, and watersheds have not resulted in an unusual number of wildfires compared to other causes, several large fires have been caused by operation of machinery (NWCG, 1999). Potential causes of wildfire from machine use include exhaust sparks, hot exhaust manifolds and pipes, fuel leaks, overheating, track and blade sparks, short circuits, brakes, belts and pulleys, accumulated debris, and broken hydraulic line spilling on hot engine parts (NWCG, 1999). A number of standards and practices that are effective in preventing wildfires have been identified by fire agency and operating company personnel, many of which have become requirements by law, regulation, or contract clause. Additional requirements to avoid a Project-related wildfire would be incorporated into the Project as SPCs FIRE-1 through FIRE-3.

SPCs Applicable to Impact WF-2

SPC FIRE-1 (Curtailment of Activities)

SPC FIRE-2 (Preparation of a Fire Plan)

SPC FIRE-3 (Spark Arrester Requirements)

CEQA Significance Conclusion

The implementation of SPC FIRE-1 (Curtailment of Activities), FIRE-2 (Preparation of a Fire Plan), and FIRE-3 (Spark Arrester Requirements) would establish protocols for equipment inspection and maintenance, permitted activities within the Project area, and procedures for detecting and reporting wildfires, thereby ensuring that potential impacts would be less than significant (Class III).

Project-related activities create a fuel vegetation matrix with an increased ignition potential and rate of fire spread (Criterion WF3)

Impact WF-3: Project activities could alter the fuel vegetation matrix, thereby contributing to an increased fire risk.

Following the excavation and removal of sediment from the Reservoir, areas that contain vegetation disturbed during the Project would be restored with native seed mixes and live plant material. In areas where any persistent native vegetation is removed for proposed activities, the area would be revegetated and restored to its previous state. Noxious weed controls including washing of ground disturbing equipment and removal of weeds prior to disturbance would be implemented to ensure that restored areas are not colonized by invasive plants. In addition, with the incorporation of SPCs BIO-1a and BIO-2, Project-related activities would not alter the fuel vegetation matrix within the Study Area, nor would it affect the local vegetation in a manner that would contribute to an increased ignition potential or rate of fire spread.

SPCs Applicable to Impact WF-3

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

CEQA Significance Conclusion

With implementation of SPCs BIO-1a and BIO-2, potential impacts to the fuel vegetation matrix would be less than significant (Class III).

C.13.4.2 Alternative 1: Reduced Sediment Removal Intensity

Direct and Indirect Effects Analysis

Project-related activities adversely affect fire prevention and suppression activities (Criterion WF1)

Impact WF-1: Construction and excavation equipment and dump trucks would interfere with wildfire suppression activities.

Alternative 1 would be identical to the Project in regards to the use and temporary storage of construction and excavation equipment, which would be consolidated within the paved and previously disturbed areas at the Reservoir. The closure of the Reservoir and the use of proposed equipment would not affect fire prevention activities or fire suppression work within the ANF outside of the Study Area.

Sediment removal operations that would occur under Alternative 1 would differ from the Project only in regards to the weekly construction schedule. The use of trucks and equipment along Forest Service and public roadways would create an obstacle to wildfire crews in the event of an emergency fire response that would be identical to the Project. The implementation of SPC FIRE-1 would avoid conflicts with wildfire suppression under Alternative 1.

SPCs Applicable to Impact WF-1

SPC FIRE-1 (Curtailment of Activities)

CEQA Significance Conclusion

Potential conflicts with fire suppression efforts would be identical to the Project, and implementation of SPC FIRE-1 is recommended to minimize these conflicts. With the application of SPC FIRE-1, impacts to wildfire suppression activities would be less than significant (Class III).

Project-related activities or the presence of the Project expose communities, firefighters, personnel, and/or natural resources to an increased risk of wildfire (Criterion WF2)

Impact WF-2: Construction activities or personnel could inadvertently start a vegetation fire.

The setting for Alternative 1 would be identical to the Project. As described in Section C.13.1, construction activities would be located in a Fire Zone 4 and an Additional Brush Fire Hazards Area, which require specific management strategies to minimize the risk of wildfire.

The type of construction activities and equipment that would be used for Alternative 1 is the same as for the Project, and the standards and practices for preventing wildfires that apply to the Project would also apply to this alternative. To avoid a construction-related wildfire, SPCs FIRE-1 through FIRE-3 would be incorporated into Alternative 1.

SPCs Applicable to Impact WF-2

SPC FIRE-1 (Curtailment of Activities)

SPC FIRE-2 (Preparation of a Fire Plan)

SPC FIRE-3 (Spark Arrester Requirements)

CEQA Significance Conclusion

The application of clearly defined standards and practices to avoid accidental vegetation fires (i.e., SPCs FIRE-1 through FIRE-3 would ensure that potential impacts would be less than significant (Class III).

Project-related activities create a fuel vegetation matrix with an increased ignition potential and rate of fire spread (Criterion WF3)

Impact WF-3: Project activities could alter the fuel vegetation matrix, thereby contributing to an increased fire risk.

Restoration activities under Alternative 1 would be identical to those activities under the Project. Following the excavation and removal of sediment from the Reservoir, areas in which vegetation was disturbed would be restored with native seed mixes and live plant material. In areas where any persistent native vegetation is removed for proposed activities, the area would be revegetated and restored to its previous state. Implementation of noxious weed controls (e.g., washing of ground-disturbing equipment, removal of weeds prior to disturbance) would ensure that restored areas are not colonized by invasive plants. SPCs BIO-1a and BIO-2 would also minimize the alternative's effects on native flora. As described for the Project, construction-related activities under Alternative 1 would not alter the fuel vegetation matrix within the Study Area, nor would the alternative affect the local vegetation in a manner that would contribute to an increased ignition potential or rate of fire spread.

SPCs Applicable to Impact WF-3

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

CEQA Significance Conclusion

With implementation of SPCs BIO-1a and BIO-2, potential impacts to the fuel vegetation matrix would be less than significant (Class III).

C.13.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, no construction or excavation activities would occur at the Reservoir should it be allowed to fill with sediment. Without these activities, the No Action/No Project Alternative would not impact or create a conflict with fire prevention and suppression activities. However, in the event the dam must eventually be removed for safety reasons, such a project would require the use of equipment and dump trucks at the Reservoir and along Forest Service and public roadways similar or greater than the proposed action and Alternative 1. Such a project would be greater in scale than the proposed action or Alternative 1. Under this scenario, Alternative 2 would likely introduce a larger temporary workforce that would need to be trained in fire prevention behavior and protocols. These activities at the Reservoir may result in an increased potential for wildfire risk when compared to the proposed action and Alternative 1. Therefore, under this Alternative 2 scenario, mitigation similar to that described for the proposed action would be required to reduce the potential for increasing the ignition potential and rate of fire spread within the Study Area.

CEQA Significance Conclusion

Should the Reservoir be allowed to fill with sediment and left alone, no impacts would occur. At some point in the future, should the dam be removed for safety reasons, potential impacts from the use of machinery in high fire hazard zones could be slightly greater under Alternative 2 as it would be for the Project. Through the application of clearly defined standards and practices to avoid accidental vegetation fires (i.e., SPCs FIRE-1 through FIRE-3; SPC BIO-1a, SPC BIO-2), the likelihood of a vegetation fire from construction-related activities would be minimized, thereby ensuring that potential impacts would be less than significant (Class III).

C.13.5 Impact Summary

Table C.13-2 summarizes the direct and indirect environmental impacts of the Project and the alternatives on wildfire prevention and suppression. Refer to Section C.13.4 for the entire environmental analysis and the full text of recommended mitigation measures.

Table C.13-2. Summary of Impacts and Mitigation Measures – Wildfire Prevention/Suppression

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt.1	Alt.2: No Action	NFS Lands[1]	
WF-1: Construction and excavation equipment and dump trucks would interfere with wildfire suppression activities.	Class III	Class III	No Impact or Class III	Yes	SPC FIRE-1 (Curtailment of Activities)
WF-2: Construction activities or personnel could inadvertently start a vegetation fire.	Class III	Class III	No Impact or Class III	Yes	SPC FIRE-1 (Curtailment of Activities) SPC FIRE-2 (Preparation of a Fire Plan) SPC FIRE-3 (Spark Arrester Requirements)
WF-3: Project activities could alter the fuel vegetation matrix, thereby contributing to an increased fire risk.	Class III	Class III	No Impact or Class III	Yes	SPC BIO-1a (Provide Restoration/ Compensation for Impacts to Native Vegetation Communities) SPC BIO-2 (Prepare and Implement a Weed Control Plan)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.14 Comparison of Alternatives

This section discusses the environmental impacts for each alternative associated with a particular issue area. The summary of alternatives comparisons in Sections C.14.1 through C.14.12 draw on the detailed discussions of the affected environment and environmental consequences of the alternatives in Section C, as well as the technical studies and other material in the appendices. The following alternative impact summaries are also presented in Table C.14-1, which identifies the key issues or concerns that distinguish each alternative.

C.14.1 Air Quality and Climate Change

C.14.1.1 Air Quality

Air Quality impacts associated with the proposed action (Project) and Alternative 1 would be identical during construction of the grade control structure, and also during operation and maintenance excavation activities when both the Project and Alternative 1 are forecast to have those activities. While Alternative 1 would reduce the number of daily truck trips and reduce the daily and annual air pollutant emissions during the excavation construction phase, the total number of days that activities would generate air pollutants is increased each year (into the months of July and August), and the number of years of the excavation construction phase would increase from the proposed 7 to 12 year period to a minimum of 13 years. Both the Project and Alternative 1 would have the same project commitments to reduce air pollutant emissions, and neither would require mitigation to reduce adverse impacts. The No Action/No Project Alternative, while having somewhat unknown construction specifics, would likely result in eventual demolition and removal of the Dam, which would generate air pollutant emissions similar to, but likely greater in quantity, than that of the Project or Alternative 1.

C.14.1.2 Greenhouse Gases

Greenhouse gas (GHG) emissions impacts associated with the proposed Project and Alternative 1 would be identical during construction of the grade control structure, and also during operation and maintenance excavation activities when both the Project and Alternative 1 are forecast to have those activities. While Alternative 1 would reduce the number of daily truck trips and reduce the daily and annual GHG emissions during the excavation construction phase, the total Project-life GHG emissions are forecast to be marginally higher for Alternative 1. Both the Project and Alternative 1 would have the same project commitments to reduce GHG emissions, and neither would require mitigation to reduce adverse impacts. The No Action/No Project Alternative, while having somewhat unknown construction specifics, may result in increased direct GHG emissions impacts during eventual demolition and removal of the Dam when compared to both the Project and Alternative 1. Further, the loss of the Reservoir under the No Action/No Project Alternative would not comply with GHG emissions reductions policies that seek to maximize local water resources and reduce the GHG emissions associated with long distance water importing.

C.14.2 Biological Resources

The proposed Project and Alternative 1 would have similar impacts for most of the biological resources present in the Project area. Alternative 1 would result in greater impacts to nesting birds because sediment removal activities would commence during the nesting season. Alternative 1 would also have greater impacts to aquatic species including arroyo toads, southwestern pond turtle, and two-striped garter snake than the Project because of the need to drain the Reservoir in June rather than after Labor

Day. Project activities conducted during July for Alternative 1 would also increase impacts to sensitive mammals. Impacts to sensitive biological resources that occur on the 47th Street East sediment removal site would be identical for the proposed Project and Alternative 1.

Implementation of the No Action/No Project Alternative would result in fewer impacts to biological resources compared to the proposed Project or Alternative 1. The No Action/No Project Alternative may benefit biological resources, over time, through the accumulation of sediment and the establishment of native riparian communities. The transition of the Reservoir to a more natural stream channel would reduce the presence of non-native fish and may increase habitat that would support arroyo toad. This assumes the Dam would not become unstable and require demolition. In the event the Dam and accumulated sediment must be removed, the extensive nature of the project (i.e., removal of approximately 2.8 million cubic yards of sediment and dam concrete) would contribute to greater impacts to native vegetation above and below the Dam compared to either the proposed Project or Alternative 1.

C.14.3 Cultural Resources

As noted above, impacts to cultural resources would be the same for the proposed Project and Alternative 1. The only potential for the proposed Project and Alternative 1 to have direct impacts to cultural resources is from unanticipated or inadvertent cultural resource discoveries. However, if such resources are encountered, impacts would be minimized through the implementation of SPC CUL-1 (Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed) and SPC CUL-2 (Unidentified Cultural Resource Discovery Procedures). No formal cemeteries or human remains are known to be located within the APE of the proposed Project and Alternative 1. However, there is always the possibility that unmarked burials may be unearthed during construction. In the unlikely event of an accidental discovery of any human remains, the procedures and provisions in SPC CUL-3 (Unidentified Human Remains Discovery Procedures) would be implemented.

Finally, under the No Action/No Project Alternative, the Project would not be implemented. Therefore, the impacts associated with the proposed Project and Alternative 1 would not occur and the Project would have no impacts to cultural resources. In the event sediment buildup led to safety issues and required demolition/removal of the Dam, it is likely similar procedures and provisions as SPCs CUL-1, CUL-2, and CUL-3 would be necessary to address inadvertent discoveries and provide detail on how these activities would be implemented.

C.14.4 Geology and Soils

The proposed Project and Alternative 1 both would have a direct and minor potential to expose construction workers to seismic and geologic hazards, such as landslide and liquefaction. This potential would be reduced through implementation of SPC GEO-1 (Geotechnical Investigation). No other adverse impacts associated with seismic hazards would occur. Under the No Action/No Project Alternative, future demolition of the Dam and earth movement on or near steeper slopes could expose construction workers to risks associated with liquefaction and landslide. The geotechnical safeguards for this potential demolition and excavation work are unknown, and therefore the No Action/No Project Alternative could result in a direct, adverse impact.

Both the proposed Project and Alternative 1 would have a direct but negligible potential to increase erosion and expose construction workers to unstable slopes. This potential would be reduced through implementation of SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels). Under the No Action/No Project Alternative, it is likely that substantial downstream erosion and

sedimentation would result in the event the Dam was breached or demolished. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from erosion and sedimentation. Therefore, this alternative would result in a direct and adverse impact.

C.14.5 Hazards and Public Safety

The proposed Project and Alternative 1 would have a direct and minor potential to contaminate water resources or endanger public health through the use and transport of hazardous materials. This potential would be reduced through implementation of SPC WQ-1 (Prepare Spill Response Plan). Under the No Action/No Project Alternative, future demolition of the Dam and sediment excavation would require the use of hazardous materials (e.g., vehicle fuels, oils, and other vehicle maintenance fluids). As standard project commitments regarding the handling, disposal, and spill response for hazardous materials under this alternative are unknown, the No Action/No Project Alternative could result in a direct and adverse impact.

Both the proposed Project and Alternative 1 would have a negligible potential to degrade the safety and stability of Littlerock Dam, and neither alternative is expected to result in Dam failure. Similarly, the proposed Project, Alternative 1, and the No Action/No Project Alternative would have a negligible potential to increase exposure of the public to Valley Fever or to high levels of mercury in fish caught for human consumption. Impacts to highway safety from the proposed Project, Alternative 1, and the No Action/No Project Alternative would be negligible.

C.14.6 Hydrology

The proposed Project and Alternative 1 would have an indirect and minor potential for reducing groundwater levels in the Antelope Valley Groundwater Basin that would be offset by reduced need for groundwater extraction by PWD. By comparison, the No Action/No Project Alternative would, over a period of decades (possibly shorter if catastrophic sedimentation occurs in the reservoir due to fire or other watershed changes), substantially increase reliance on groundwater for local municipal use.

The Project and Alternative 1 would both reduce downstream flooding by increasing reservoir storage capacity, and maintaining that capacity for the future. The No Action/No Project Alternative would, over time, result in reduced reservoir capacity with a corresponding increase in downstream flood potential.

C.14.7 Noise

Noise impacts associated with the proposed Project and Alternative 1 would be similar. While Alternative 1 would reduce the number of daily truck trips and an overall reduction in temporary noise occurrences, the total number of days that activities would generate noise is increased (into the months of July and August). Both the Project and Alternative 1 would implement SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) and SPC NOI-2 (PWD Site Buffer Requirements) to minimize adverse impacts. The No Action/No Project Alternative, while having somewhat unknown construction specifics, would likely result in increased noise impacts when compared to both the Project and Alternative 1.

C.14.8 Recreation and Land Use

The proposed Project, Alternative 1, and the No Action/No Project Alternative would comply with applicable federal, State, and local land use or recreation plans, goals, policies, or regulations. This

includes consistency with the 2005 Forest Service's Land Management Plan as well as local zoning requirements for storage or disposal of excavated sediment.

Neither the proposed Project nor the alternatives would expand existing recreational facilities nor would they convert NFS lands. However, the Project and Alternative 1 would temporarily preclude existing recreational resources at the Reservoir (Impact L-1). Under the Project and Alternative 1, the Reservoir and surrounding area would be closed annually for several months each year, but would generally be open to the public during the winter and spring months assuming that the Forest Service re-opens the Reservoir for public access. Compared with the proposed Project, Alternative 1 may double the number of years that the Reservoir would be closed to the public, and would include annual closures during the peak summer period. The No Action/No Project Alternative would not involve any construction or sediment excavation as part of the proposed management of the Reservoir, and therefore would not create a short-term disturbance of recreational resources within the Study Area.

The proposed Project, Alternative 1, and the No Action/No Project Alternative would disturb existing land uses along the dump truck routes and disposal sites (Impact L-2). Approximately 480 truck trips per day would be required under the Project, while the reduced construction schedule under Alternative 1 would require a smaller number of 180 truck trips per day. A removal of the Dam and accumulated sediment, which may be required under the No Action/No Project Alternative, could involve excavation of up to 2.8 million cubic yards of sediment and Dam concrete, which is almost twice the amount of sediment to be excavated than under the Project.

The Project and Alternative 1 would restore the Reservoir to its 1992 design capacity, and consequently would not contribute to the long-term loss or degradation of recreation at the Reservoir. The No Action/No Project Alternative would limit the future water-based recreational opportunities within the Study Area due to the reduction of Reservoir capacity from annual sediment accumulation, and may result in the permanent closure of the Reservoir if the Dam were to be removed (Impact L-3).

C.14.9 Transportation and Traffic

The proposed Project would create an adverse impact at the intersection of Pearblossom Highway and Avenue T during the afternoon peak hour. Traffic impacts associated with Alternative 1 would be less than the proposed Project, because traffic delays at the stop sign on the northbound intersection of Cheseboro Road at Pearblossom Highway would be reduced under Alternative 1. While Alternative 1 would reduce the number of daily truck trips and reduce the afternoon peak period impact at the intersection of Pearblossom Highway and Avenue T compared to the proposed Project, the delay at this intersection would remain significant when compared to baseline operating conditions. Both the proposed Project and Alternative 1 would require identical mitigation to reduce adverse impacts. The No Action/No Project Alternative, while having somewhat unknown construction specifics, could result in increased traffic impacts when compared to both the proposed Project and Alternative 1 in the event that 2.8 million cubic yards of sediment and Dam debris would need to be removed.

C.14.10 Visual Resources

Visual resource impacts associated with the proposed Project and Alternative 1 would be identical. Both the Project and Alternative 1 would not result in adverse impacts. The No Action/No Project Alternative, because it results in unknown compliance with future SOI determination of the Reservoir by the Forest Service and would result in somewhat unknown construction specifics, is considered to result in increased visual resource impacts when compared to both the proposed Project and Alternative 1.

C.14.11 Water Quality and Resources

The proposed Project and Alternative 1 would have a direct and minor potential to introduce hazardous materials to receiving waters. This potential would be minimized through implementation of SPC WQ-1 (Prepare Spill Response Plan) and SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels). No other adverse impacts to surface water quality would occur. Under the No Action/No Project Alternative, a future Dam breach or demolition would result in substantial downstream erosion and sedimentation. As it is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from degradation, the No Action/No Project Alternative would result in a direct and adverse impact.

The proposed Project, Alternative 1, and the No Action/No Project Alternative would have a negligible potential to introduce hazardous materials to the groundwater basin, and none of the alternatives are expected to degrade groundwater quality.

C.14.12 Wildfire Prevention and Suppression

The components of the proposed Project and Alternative 1 that could affect wildfire prevention and suppression are similar enough to result in identical impacts. Both the Project and Alternative 1 would utilize equipment staging areas at the Project Area, and would transport excavated sediment along Forest Service and public roadways. In order to avoid accidental fire ignition or interference with wildfire suppression activities, both the proposed Project and Alternative 1 would implement SPC FIRE-1 (Curtailment of Activities), SPC FIRE-2 (Preparation of a Fire Plan), and SPC FIRE-3 (Spark Arrester Requirements).

Restoration activities that are proposed under the proposed Project and Alternative 1 are also identical. With the implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-2 (Prepare and Implement a Weed Control Plan) to minimize the effects of construction activities on native flora, neither the Project nor Alternative 1 would create a fuel vegetation matrix with an increased ignition potential and rate of fire spread.

Under the No Action/No Project Alternative, future Dam removal would require a greater construction effort than the proposed action or Alternative 1. Under this scenario, the No Action/No Project Alternative would likely introduce a larger temporary workforce that would need to be trained in fire prevention behavior and protocols. These activities at the Reservoir may result in an increased potential for wildfire risk when compared to the proposed Project and Alternative 1

Table C.14-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
Air Quality and Climate Change	Average daily PM10 emissions would exceed the AVAQMD emissions thresholds during excavation (Impact AQ-2). Operation air pollutant emissions estimates are below the AVAQMD emissions thresholds (Impact AQ-3). GHG emissions are below AVAQMD GHG emission thresholds (Impact GHG-1).	All construction and operation air pollutant emissions estimates are below the AVAQMD emissions thresholds (Impacts AQ-2 and AQ-3). GHG emissions are below AVAQMD GHG emission thresholds, but would be slightly higher than for the proposed action due to the higher efficiencies associated with the proposed action's higher daily volume sediment hauling (Impact GHG-1).	Air pollutant emissions from eventual Dam removal construction activities may exceed AVAQMD emissions thresholds. The hauling and disposal of sediment and Dam debris that may result from dam removal would generate GHG emissions similar to, but likely greater in quantity, than that of the proposed action or Alternative 1.	Yes
Biological Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects on: • Riparian habitat or other sensitive natural community (Criterion BIO1); • Fully protected, endangered, or threatened species (Criterion BIO2); • Candidate, sensitive, or special-status species (Criterion BIO3); • Federally protected wetlands (Criterion BIO4); and • Migratory species or wildlife corridors (Criterion BIO5).	Extended construction schedule would increase the likelihood of disturbing nesting birds and disturbing pupping season for ringtail (Criterion BIO2). Draining the Reservoir earlier in the season may have greater impacts to arroyo toads (Impact BIO-6).	Eventual removal of sediment and demolition of the Dam would involve an intensive construction effort that would create greater impacts to biological resources above and below the Dam (i.e., native vegetation, wildlife, jurisdictional resources) than would occur from the proposed action or Alternative 1.	Yes
Cultural Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects on cultural resources (Impacts C-1 and C-2).	Alternative 1 would incorporate identical SPCs as the proposed action, and would avoid and/or minimize adverse effects on cultural resources (Impacts C-1 and C-2).	In the event that removal of sediment and demolition of the Dam were to occur, it is likely that SPCs similar to the proposed action would be implemented to avoid and/or minimize adverse effects on cultural resources.	Yes
Geology and Soils	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects due to seismic or geologic hazards (Impact G-1), or from soil erosion, slope instability, or slope failure (Impact G-2).	Fewer workers would be exposed to risks associated with unstable slopes than under the proposed action, but risks would occur over a longer period of time (Impact G-1). Soil disturbance would be less than under the proposed action, but would occur over a longer period of time (Impact G-2).	Demolition of the Dam and sediment removal would involve more earth movement than under the proposed action, and may require working on or near steeper slopes. Direct impacts to soils and risks to construction workers may be greater than under the proposed action or Alternative 1.	Yes
Hazards and Public Safety	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects to public health, including risk from hazardous material spills (Impact HAZ-1) or unsafe highway conditions (Impact HAZ-5).	Fewer workers would be exposed to risks associated with hazardous materials, but risks would occur over a longer period of time (Impact HAZ-1). Fewer disposal trucks would be utilized, which	Excavation and demolition of the Dam would require the use of hazardous materials that may contribute to soil, groundwater, or surface water contamination. As the degree to which SPCs would be incorporated into this future	Yes

Table C.14-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
		could lead to a slight reduction in unsafe highway conditions (Impact HAZ-5).	project is unknown, impacts may be greater than under the proposed action or Alternative 1.	
Hydrology	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects associated with groundwater supply, erosion and siltation, or flooding (Criteria H1 through H3).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize adverse effects associated with groundwater supply, erosion and siltation, or flooding (Criteria H1 through H3).	May contribute to a decline in groundwater levels from a greater reliance on alternative water sources (i.e., groundwater and State Water Project) (Impact H-1). Loss of water storage capacity in the Reservoir would increase the risk of flood hazard downstream of the Dam (Impact H-3).	Yes
Noise	The proposed action would incorporate SPCs to avoid and/or minimize adverse noise impacts from mobile and stationary sources (Impacts N-1 and N-2), and to minimize impacts to sensitive receptors (Impacts N-3 and N-4).	Reduction in daily truck trips would reduce the amount of mobile noise occurring per day, but would increase the overall number of days per year that noise is generated (Impact N-1). Reduction in daily truck trips would reduce the overall daily frequency of potential vibration, but would increase the number of days where temporary vibration may be generated (Impact N-4).	Excavation and demolition of the Dam would generate construction noise. As the degree to which SPCs would be incorporated into this future project is unknown, impacts may be greater than under the proposed action or Alternative 1.	Yes
Recreation and Land Use	After the Project's initial construction and excavation during the summer and fall of the first year, annual closure of the Reservoir would occur after Labor Day until mid-November to January, for a minimum of 7 years up to 12 years (Impact L-1). Truck trips would create nuisance impacts to nearby residences (Impact L-2).	Construction and excavation would require annual closure of the Reservoir during the peak summer period (beginning July 1st of each year until mid-November to January) for a minimum of 13 years (Impact L-1). Reduction in daily truck trips would lessen the daily nuisance impacts to nearby residences, but would lengthen the time that disturbances would occur (Impact L-2).	Future excavation and demolition of the Dam would require an intensive construction effort that would create greater disturbances to residences along the truck routes and disposal sites than under the proposed action or Alternative 1 (Impact L-2). Removal of the Dam would result in the irreversible loss of a recreational resource (Impact L-3).	Yes
Transportation and Traffic	Number of truck trips would be 480 trips (240 round trips). Truck traffic under the proposed action would adversely affect the intersection of Pearblossom Highway and Avenue T (Impact T-1). The proposed action would create excessive traffic delays at the stop sign on northbound Cheseboro Road at Pearblossom Highway (Impact T-1).	Number of truck trips would be reduced to 180 trips (90 round trips). No adverse impact would occur at the intersection of Pearblossom Highway and Avenue T (Impact T-1). Traffic delays at the stop sign on northbound Cheseboro Road at Pearblossom Highway would still occur, but impacts would be reduced (Impact T-1).	Future excavation and demolition of the Dam would require an intensive construction effort that would involve a greater number of truck trips than under the proposed action or Alternative 1.	Yes

Table C.14-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
Visual Resources	The proposed action would not greatly alter the existing visual landscape and would avoid adverse effects on visual resources (Criteria VIS1 and VIS2).	Alternative 1 would be identical to the proposed action in that it would not greatly alter the existing visual landscape and would avoid adverse effects on visual resources (Criteria VIS1 and VIS2).	In the event that the Reservoir became filled with sediment, construction of a downstream flood-control channel may be required. Future flood control facilities could result in visual contrast and adverse visual impacts.	Yes
Water Quality and Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects associated with waste discharge and hazardous material spills (Impacts WQ-1 and WQ-2).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize adverse effects associated with waste discharge and hazardous material spills (Impacts WQ-1 and WQ-2).	In the event that the Dam would be breached or demolished, downstream erosion and sedimentation would occur. As the degree to which SPCs would be incorporated into this future project is unknown, impacts may be greater than under the proposed action or Alternative 1.	Yes
Wildfire Prevention and Suppression	The proposed action would incorporate SPCs to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	In the absence of construction or excavation activities, no impacts or conflicts with fire prevention and suppression activities would occur. However, In the event that the Dam would be demolished, Alternative 2 would incorporate identical SPCs as the proposed action to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	Yes

C.15 Conclusion

C.15.1 NEPA Environmentally Preferred Alternative

This section utilizes the detailed discussions of the existing environmental conditions and the analysis of the environmental consequences of the alternatives in Sections C.2 through C.13 of this Draft EIS/EIR, as well as the technical studies and other material in the Appendices.

In accordance with NEPA requirements, the "preferred alternative" is a preliminary indication of the federal responsible official's preference of action, which is chosen from among the proposed action and alternatives. The preferred alternative may be selected for a variety of reasons (such as the priorities of the particular lead agency) in addition to the environmental considerations discussed in a Draft EIS. In accordance with NEPA (40 CFR Section 1502.14(e)), the Forest Service will consider the conclusions of the Draft EIS as well as public and agency comments in order to identify its preferred alternative in the Final EIS.

In addition to the preferred alternative, the federal lead agency is also required to identify an "environmentally preferable alternative" in the Record of Decision for the EIS (40 CFR Section 1505.2(b)). In contrast to the preferred alternative, the environmentally preferable alternative is the alternative that will promote the purposes expressed in NEPA's Section 101. Typically, this is the alternative that would cause the least environmental damage as well as preserve natural resources related to cultural and historical values. Therefore, the preferred alternative identified in a Final EIS may not be the same as the environmentally preferable alternative identified in the ROD. The NEPA environmentally preferable alternative is subject to all mitigation measures applicable to NFS lands identified in Section C (Affected Environment and Environmental Consequences).

Proposed Action. The proposed action was developed to meet the project objectives while avoiding biological resource impacts that were identified in the 1991/1992 Littlerock Dam and Reservoir Restoration Project EIS/EIR, for which sediment excavation was proposed but never implemented due to the presence of the federally-endangered arroyo toad at the Reservoir. The proposed action includes the construction of a grade control structure to preserve arroyo toad habitat by preventing sediment loss and headcutting upstream of Rocky Point, where critical arroyo toad habitat has been identified. The proposed action would also incorporate SPCs to minimize and/or avoid the impacts identified in Sections C.2 through C.13 (refer to Appendix A (Standard Project Commitments) for a complete list of SPCs). Resources that would be adversely impacted by the proposed action during temporary annual activities include air quality (i.e., daily PM10 emissions), traffic (i.e., number of truck trips and associated traffic delays), and recreation and land use (i.e., closure of recreation facilities and nuisance impacts to adjacent residences) (see Table C.14-1). These impacts would similarly occur under Alternative 1, although Alternative 1 includes a modification to the sediment removal schedule to lessen the severity of temporary air quality, traffic, and noise impacts (see Alternative 1 discussion below). Compared to the proposed action, the No Action/No Project Alternative would not result in short-term impacts to air quality, traffic, recreation, and land use. However, the No Action/No Project Alternative could lead to the eventual removal of the Dam, which would likely result in a more intense construction effort and greater impacts than the proposed action or Alternative 1 (see No Action/No Project discussion below).

No Action/No Project Alternative. The No Action/No Project Alternative would not involve sediment removal activities, avoiding the resource impacts identified for the proposed action and Alternative 1 over the short-term. However, sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by

approximately 23.6 acre-feet annually. As the Reservoir becomes filled with sediment against the existing Dam, a future project may be required to remove the existing Dam for safety reasons and construct new downstream levee improvements. Such a project is expected to involve sediment removal in quantities greater than or similar to the proposed action or Alternative 1. Such a project would not occur slowly on an annual basis (such as the proposed action and Alternative 1), requiring a more intense construction effort and likely resulting in greater impacts than the other alternatives over the long-term (see Table C.14-1).

Alternative 1. The Reduced Sediment Removal Intensity Alternative (Alternative 1) was expressly developed as a modification to the proposed action's annual sediment removal schedule in order to reduce the intensity of daily construction activities by extending the annual sediment removal period. By doing this, it would:

- Reduce daily PM10 emissions during excavation and construction;
- Reduce the number of daily truck trips on public roadways; and
- Reduce the frequency of periodic truck trip noise to receptors along the haul routes and allow for a more flexible construction effort (e.g., less rigid schedule, use of smaller haul trucks) to potentially reduce periodic vibration from loaded haul trucks travelling on public roadways.

Compared with the proposed action and the No Action/No Project Alternative, Alternative 1 would extend the duration of impacts to wildlife species from an extended annual construction schedule that could overlap with nesting bird periods. However, as discussed in Section C.3 (Biological Resources), the adverse effects under Alternative 1 would be reduced and/or avoided through the incorporation and implementation of SPCs. Alternative 1 would also extend the annual closure period of the Reservoir and surrounding recreation facilities during a portion of the peak summer period, which would result in a slightly greater recreational impact when compared to the other alternatives. However, as discussed in Section C.9 (Recreation and Land Use), recreational opportunities at the Reservoir have not been consistently available to the public during the additional weeks proposed for closure under Alternative 1, and currently the Reservoir is closed to public access. In addition, during drought conditions (such as the one currently occurring throughout the State), PWD is allowed to divert water from the Reservoir below the minimum pool level starting in July. Ongoing drought conditions may prevent any use of the Reservoir for water-based recreational activities during the additional weeks proposed for closure under Alternative 1. The adverse effects to recreation from slightly extending public closure of the Reservoir during the annual sediment removal period that are specific to Alternative 1 were considered less important than the reduction of the air quality, traffic, and noise impacts that are associated with this alternative.

Based on the analysis in this Draft EIS/EIR the environmentally preferable alternative would be the Reduced Sediment Removal Intensity Alternative (Alternative 1). In accordance with NEPA (40 CFR Section 1502.14(e)), the Forest Service will identify its preferred alternative (likely to be the same as the environmentally preferred alternative) in the Final EIS/EIR.

C.15.2 CEQA Environmentally Superior Alternative

In accordance with CEQA requirements, an "environmentally superior alternative" must be identified among the alternatives analyzed in an EIR or EIR/EIS. The environmentally superior alternative is the alternative found to have an overall environmental advantage compared to the other alternatives based on the impact analysis in the EIR. If the environmentally superior alternative is the No Project

alternative, State CEQA Guidelines Section 15126.6(e)(2) requires the EIR to identify an environmentally superior alternative from among the other alternatives.

In the case of the Littlerock Reservoir Sediment Removal Project, the No Action/No Project Alternative may result in the need for a future project requiring the removal of the existing Dam. Such a project would require sediment removal in quantities greater than or similar to the proposed Project. In addition, such a project would require a more intense construction effort resulting from Dam removal activities that may result in greater impacts than the proposed Project (see Table C.14-1). Due to the potential scale of such a project, the No Action/No Project Alternative could result in as many as 17 significant and unavoidable impacts (Class I), and 26 significant impacts (Class II) that can be reduced to a less than significant level through feasible mitigation (see Table ES-2).

The Reduced Sediment Removal Intensity Alternative (Alternative 1) was expressly developed as a modification to the proposed Project's annual sediment removal schedule in order to reduce the intensity of daily construction activities by extending the annual sediment removal period. By doing this, it would reduce the severity of impacts associated with air quality, traffic, and noise. Alternative 1 is feasible and would reasonably achieve the objectives of the proposed Project. Alternative 1 would be environmentally superior to the proposed Project because it would:

- Reduce daily PM10 emissions during excavation and construction;
- Reduce the number of daily truck trips on public roadways; and
- Reduce the frequency of periodic truck trip noise to receptors along the haul routes and allow for a more flexible construction effort (e.g., less rigid schedule, use of smaller haul trucks) to potentially reduce periodic vibration from loaded haul trucks travelling on public roadways.

In selecting the environmentally superior alternative, consideration was given to resources that may be affected by greater impacts under Alternative 1 when compared to the proposed Project, specifically biological resources and recreation. Biological resource impacts would include adverse effects to species from an extended annual construction period that could overlap with nesting periods and/or would extend the duration of impacts within certain habitats. However, as discussed in Section C.3 (Biological Resources), these adverse effects under Alternative 1 would be reduced and/or avoided through the incorporation of SPCs. Overall impacts to biological resources would be less than significant (Class III) under Alternative 1.

Alternative 1 would result in a slightly greater recreational impact when compared to the proposed Project, as it would extend the annual closure period of the Reservoir and surrounding recreation facilities during the peak summer period. However, as discussed in Section C.9 (Recreation and Land Use), recreational opportunities at the Reservoir have not been consistently available to the public during the additional weeks proposed for closure under Alternative 1, and currently the Reservoir is closed to public access. In addition, during drought conditions (such as the one currently occurring throughout the State), PWD is allowed to divert water from the Reservoir below the minimum pool level starting in July. Ongoing drought conditions may prevent any use of the Reservoir for water-based recreational activities during the additional weeks proposed for closure under Alternative 1. As such, the adverse impacts to recreation from slightly extending public closure of the Reservoir during the annual sediment removal period that are specific to Alternative 1 were considered less important than the reduction of the air quality, traffic, and noise impacts.

PWD has identified the Reduced Sediment Removal Intensity Alternative (Alternative 1) as the CEQA Environmentally Superior Alternative.