

Final Environmental Assessment

Big Tujunga Dam

County of Los Angeles Department of Public Works

FEMA-1008-DR-CA, HMGP #1008-3182

April 2006



FEMA

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Contract No. EMW-2000-CO-0247
Task Order 385

15702385.00900

FINAL ENVIRONMENTAL ASSESSMENT

FOR

**BIG TUJUNGA DAM SEISMIC REHABILITATION
COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
(FEMA-1008-DR-CA, HMGP #1008-3182)**

**Prepared for
Federal Emergency Management Agency**

**Prepared by
URS Corporation**

April 2006

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Appendix B	U.S. Fish and Wildlife Service Letter of December 14, 2005	
Appendix C	State of California Office of Historic Preservation Letter of November 30, 2005	

ac-ft	acre-feet
BA	Biological Assessment
BE	Biological Evaluation
BMPs	best management practices
CDFG	California Department of Fish and Game
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
DSOD	Division of Safety of Dams
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
HMGP	Hazard Mitigation Grant Program
LADPW	Los Angeles County Department of Public Works
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NPDES	National Pollution Discharge Elimination System
OES	Office of Emergency Services
RWQCB	Regional Water Quality Control Board
SCAQMD	South Coast Air Quality Management District
SHPO	State Historic Preservation Officer
SMMA	Standard Mitigation Measures Agreement
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

The Los Angeles County Department of Public Works (LADPW) proposes to make improvements to the Big Tujunga Dam and related facilities, which are located in Big Tujunga Canyon, Los Angeles County, California. The LADPW has requested funding for the proposed project through the State of California Governor's Office of Emergency Services (OES) and the Federal Emergency Management Agency (FEMA) under the Hazard Mitigation Grant Program (HMGP).

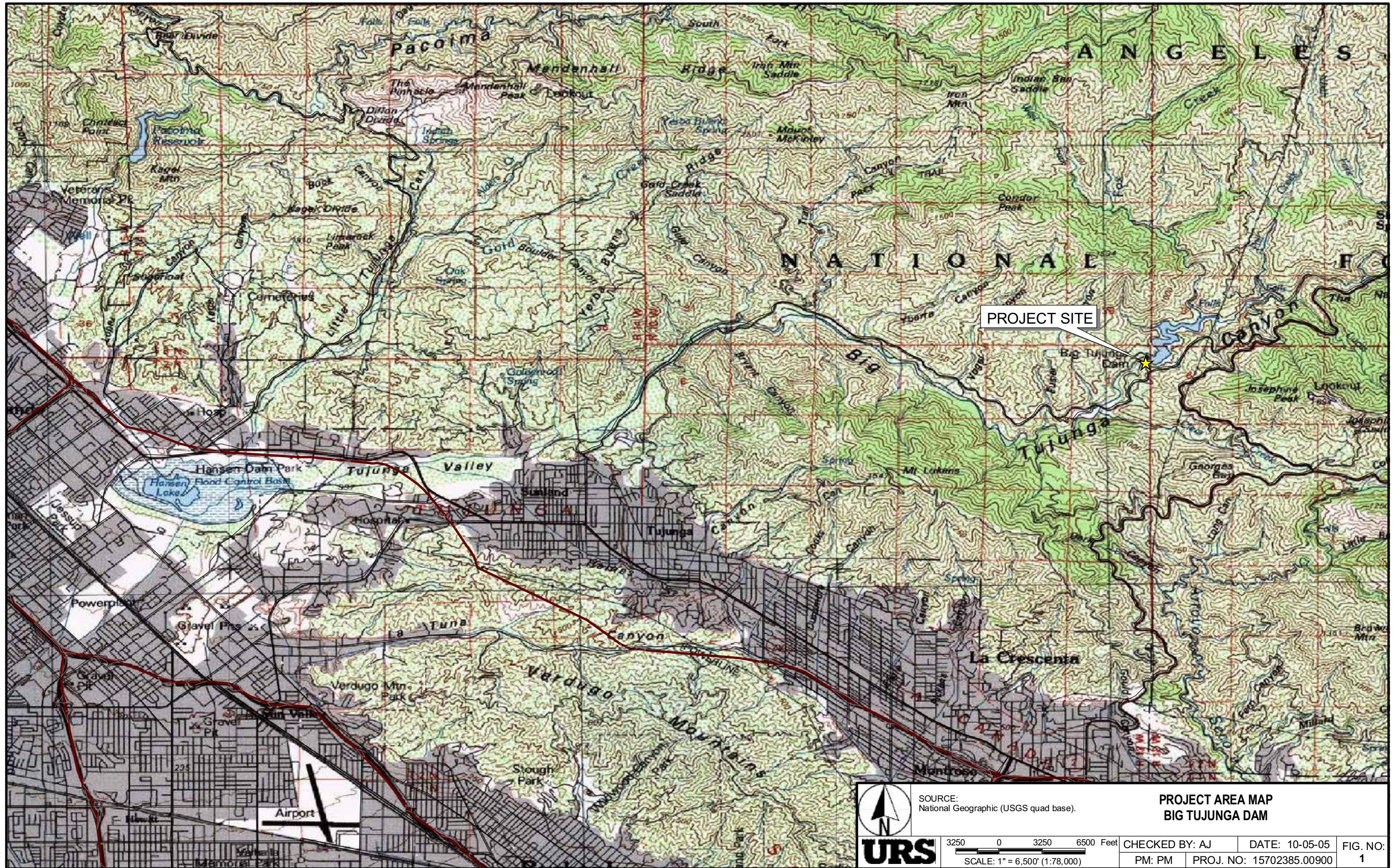
This Environmental Assessment (EA) evaluates alternatives to the project, documents existing conditions, identifies potential impacts of the proposed alternatives on the environment, and summarizes mitigation measures to avoid or reduce environmental impacts. Information for this EA is partially derived from studies and analysis conducted for an Initial Study / Mitigated Negative Declaration (URS 2006a), which addressed compliance with the California Environmental Quality Act; a Biological Assessment (BA) (URS 2005), which addressed Federally threatened and endangered species; and a Biological Evaluation (BE) (URS 2006b), which addressed U.S. Forest Service (USFS) sensitive species.

1.1 BACKGROUND

Big Tujunga Dam is located at the base of the San Gabriel Mountains, near the community of Sunland (Figure 1). Big Tujunga Dam was constructed in the early 1930s to control floods and to conserve water. The dam protects an estimated 4,600 people living in an inundation area of approximately 3.5 square miles. The dam is located in a seismically active area, and the potential for earthquake damage is high. The closest cities are Hidden Springs, which is located to the north on Big Tujunga Canyon Road, and the foothill communities of Sunland and Tujunga, which are located to the south, along Big Tujunga Canyon Road near Interstate 210.

The dam currently has a storage capacity of 5,960 acre-feet (ac-ft) at the spillway and has a minimum pool elevation of 2,205 feet (1,210 ac-ft) to protect the outlet works from sediment and debris. In 1976, DSOD imposed a seismic restriction on the dam that limits the long-term storage of water to an elevation of 2,213 feet (1,484 ac-ft of storage). However, this seismic constraint allows for the temporary storage of storm inflows to the capacity of the reservoir, with the water level to be returned to an elevation of 2,213 feet as soon as practicable after each storm event.

The seismic restriction has required Big Tujunga Dam to maintain the reservoir between the elevations of 2,205 feet and 2,213 feet, a storage difference of 275 ac-ft. Inflow into the reservoir is the primary factor that determines the amount of the water that needs to be released in order to maintain the elevation level within the required range. Between the years of 1932 and 2001, peak inflow into the reservoir ranged from 17 cubic feet per second (cfs) to 32,940 cfs. Because the inflow is uncertain, it is not possible to establish a fixed-release rate for the dam. During winter months when storms are more likely to occur, releases above 125 cfs are quite common. For example, during the El Nino (1997-98) water year, inflows reached 8,000 cfs during a February 1998 storm event. Releases of up to 700 cfs were made until the elevation reached the spillway. At spillway elevation, a maximum outflow of approximately 4,000 cfs occurred. After that storm, seasonal inflow during May 1998 ranged from 77 to 425 cfs, and June inflows remained well above 60 cfs. By contrast, during drier water years, inflow during the months of May and June can be as little as 0 to 4 cfs.



PROJECT SITE



SOURCE:
National Geographic (USGS quad base).



3250 0 3250 6500 Feet
SCALE: 1" = 6,500' (1:78,000)

**PROJECT AREA MAP
BIG TUJUNGA DAM**

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1.2 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

FEMA is the lead Federal agency for conducting the National Environmental Policy Act of 1969 (NEPA) compliance process for the rehabilitation and modification of Big Tujunga Dam. The USFS manages the public land on which Big Tujunga Dam is located and is a Federal cooperating agency for the project. FEMA and USFS have entered into a Memorandum of Understanding (MOU), pursuant to Title 44 of the Code of Federal Regulations (CFR), 44 CFR Part 10, 36 CFR Part 215, Forest Service Handbook 1909.15 (Environmental Policy and Procedures Handbook), the Council on Environmental Quality (CEQ) guidelines, 40 CFR Parts 1500 through 1508, and 50 CFR Part 402, to establish principles of organization and coordination in the scoping, preparation, public participation, review, and approval of the EA. The MOU has been amended twice. Amendment Number 2 of the MOU is included as Appendix A.

It is the goal of the lead agency to expedite the preparation and review of NEPA documents and to be responsive to the needs of LADPW, while meeting the spirit and intent of NEPA and complying with all NEPA provisions, including public involvement. To meet this objective, LADPW hosted interagency meetings on a monthly or bimonthly basis to discuss the project status, design, impacts, and mitigation. These meetings were regularly attended by FEMA, USFS, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG). Public comments on the project were sought by providing a Notice of Availability of a Draft EA to local media outlets, distributing copies of the Draft EA to interested parties, and posting the Draft EA on FEMA's website. FEMA circulated the Draft EA for a 2-week period to allow the public to review and comment on the project and the Draft EA. FEMA received no comments from the public regarding this project.

1.3 SUMMARY OF REGULATORY REQUIREMENTS

NEPA was enacted by the U.S. Congress to require Federal agencies to consider the environmental impacts of their actions as part of the decision-making process. The CEQ developed regulations that specify how Federal agencies must implement NEPA. These CEQ Regulations for Implementing the Procedural Provisions of NEPA are codified in 40 CFR Parts 1500 through 1508. The CEQ regulations require Federal agencies to conduct an investigation and evaluation of alternatives as part of the environmental impact analysis process, prior to making decisions that may impact the environment. FEMA's regulations for implementing NEPA are promulgated at 44 CFR Part 10, titled Environmental Considerations.

This EA process was conducted in accordance with NEPA, as well as the CEQ and FEMA implementing regulations. According to NEPA and its implementing regulations, an EA is prepared to determine whether or not a Finding of No Significant Impact (FONSI) sufficiently documents the consequences of a proposed action. When an EA supports a FONSI, the EA and its associated FONSI satisfy the proponent's need to comply with NEPA. When the EA does not support a FONSI, a Notice of Intent is prepared and the EA facilitates preparation of an Environmental Impact Statement. Therefore, if this study concludes that no significant impacts would occur from implementation of the proposed action, a FONSI would be prepared and the action would be permitted to occur. If this study finds that significant impacts are expected to occur as a result of the proposed action, then either an Environmental

Impact Statement would be prepared or mitigation measures would be implemented to reduce all impacts to insignificant levels.

1.4 PURPOSE AND NEED

The objectives of FEMA's HMGP are to reduce the loss of life and property due to natural disasters and to enable long-term hazard mitigation measures to be implemented during the recovery and immediately after a disaster. Through the HMGP, FEMA provides grants to state and local governments to implement long-term hazard mitigation measures after the declaration of a major disaster. The purpose of the project is to provide HMGP funding to LADPW.

Big Tujunga Dam is necessary for water storage and conservation within the canyon. Dam failure would lead to downstream flooding, human injury, potential loss of life, property damage, and damage to the habitat of protected species. Therefore, LADPW has identified the need to remove the threat of failure during a significant seismic event.

2.1 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Initially, LADPW considered four alternatives, which were evaluated against the following criteria:

- Satisfy the seismic safety criteria established by California Division of Safety of Dams (DSOD) for Big Tujunga Dam;
- Optimize the flood control and water conservation functions of the dam; and
- Minimize potential downstream adverse effects to people, property, and fish and wildlife habitat.

Alternatives considered by LADPW included:

- Taking no action;
- Decommissioning the dam;
- Lowering the dam elevation; and
- Rehabilitating the dam and modifying the spillway.

2.1.1 Decommission Alternative

With this alternative, LADPW would decommission the dam, removing the dam and existing facilities. With the removal of the structure, the water storage and flood control features of the dam would be lost. Because Big Tujunga Dam provides needed flood control for areas located downstream from the dam, decommissioning the dam would not meet the purpose and need for the project. Therefore, decommissioning of the dam was not considered to be a viable alternative and was eliminated from further consideration.

2.1.2 Lower Dam Elevation

Another alternative considered by LADPW was lowering the dam's elevation. Lowering the dam to an elevation of 2,227 feet would remove the seismic operating restriction. This would involve removing 9,500 cubic yards of concrete, constructing an enlarged spillway at the lower elevation, incorporating downstream erosion control measures, and adding new discharge valves.

By implementing this alternative, the dam would have a storage capacity of only 2,039 ac-ft, which would be 3,921 ac-ft less than the dam's original operating capacity. This reduction in storage capacity of the dam would severely reduce the flood control capability of the dam and would provide only limited opportunity to conserve water. Therefore, lowering the elevation of the dam would not satisfy the purpose and need of the project, and the alternative was eliminated from further consideration.

2.2 ALTERNATIVES RETAINED FOR FURTHER CONSIDERATION

2.2.1 No Action Alternative

With the No Action Alternative, LADPW would not modify the design of Big Tujunga Dam and the seismic operational restrictions would continue to be in place. Because the State of California would not allow the dam to operate under existing restrictions indefinitely, the No Action Alternative is not a desired alternative. However, as per NEPA guidance, the No Action Alternative was retained as it provides a basis for comparing impacts (both beneficial and adverse) associated with identified action alternative(s).

2.2.2 Dam Rehabilitation and Spillway Modification (Proposed Action)

Under this alternative, LADPW would reinforce the dam; modify the spillway, dam crest, and appurtenant structures; and put in a place a new dam control system so that the dam functions can be restored to operate safely at its original capacity of 5,960 ac-ft.

The area surrounding the dam and its operational buildings (referred to as the project area throughout this document) consists of several distinct locations:

- Dam facilities from the dam crest to the southern limits of the plunge pool;
- Maple Canyon Sediment Placement Site;
- Storage and staging areas;
- Two water lines that follow existing access roads; and
- The area from the southern limits of the plunge pool to the low-flow culvert crossing but only in the areas where the bypass pipe and mitigation areas would be located.

The following subsections provide a description of the proposed activities within each of these locations:

2.2.2.1 *Dam Modifications*

The new concrete section would have a crest thickness of 12 feet, a downstream slope of 0.25 to 1 (horizontal to vertical), and a base thickness of approximately 66 feet. Since, the thickness of the existing dam base is 73 feet, the base thickness of the new thick-arch dam would be approximately 140 feet. The base-to-height ratio would be approximately 0.6. A concrete access pad would be included at the base of the thick-arch.

The existing parapet walls at the dam's crest and the abutments would be raised to contain and safely direct flood flows to the existing spillway and over the new thick-arch dam section. The existing gunite along the sides of the plunge pool would be restored with structural reinforced gunite for erosion protection and slope stability.

The downstream area beyond the toe of the dam would have a reinforced concrete splash-pad and stilling basin to dissipate outlet and spillway flood flows. The stilling basin would also serve a dual purpose as a sediment-settling basin during normal valve discharge releases and reservoir draining.

The existing outlet structures would be extended through the new thick-arch dam section. A partially embedded valve-house to house the new valves would be constructed on the section's downstream face for valve access and overtopping protection. An access gallery and elevator shaft would be constructed within the thickened section of the dam for valve and downstream access from the crest. Also, a drainage gallery would be constructed within the new section to capture and direct seepage flows downstream.

2.2.2.2 Maple Canyon Sediment Placement Site

Materials excavated as part of project activities would be transported to and disposed of at the Maple Canyon Sediment Placement Site, approximately 1 mile southwest of the dam. Traffic controls would be employed where material would be transported across Big Tujunga Canyon Road. Access to the dam would be maintained during construction to allow for dam maintenance and operations.

2.2.2.3 Storage and Staging Areas

Three construction staging areas are proposed for the project (see Figure 2). As shown, these areas would be located on the left abutment parking area, the right abutment to the south of the helipad and upstream of the existing spillway, and the downstream end of the existing plunge pool. On completion of construction, the staging areas near the abutments would be reseeded with native vegetation.

2.2.2.4 Water Lines

The existing 2-inch water line between the abutments and across the dam crest would be replaced. This water line connects the two existing water towers.

2.2.2.5 Access Road and Culvert Upgrade

The proposed access road along the side of the plunge pool is approximately 400 feet in length and 15 feet wide (0.15 acre). The proposed access road would be concrete and extend from the access pad on the easterly side of the plunge pool to the existing access road on the downstream end of the plunge pool. In addition, the culvert associated with the low water crossing would be modified so that it would be able to accommodate the weight associated with the construction equipment.

The project proposes to use the upstream side of the culvert crossing as an emergency sediment basin. Gravel sandbags and plywood sheets would be stockpiled at the crossing and used in the event of an accidental materials release. The plywood would be placed to block flow through the culverts, and the sandbags would be used to contain the in-stream flow and support the plywood flush with the culvert crossing headwall. The sandbags would be placed on the existing concrete slab approach to the culvert inlet and on the native gravel bottom of the creek. The barrier location supports minimal vegetation. The emergency sediment trap would be removed at the end of construction.



SOURCE: AirphotoUSA (March 2003 aerial), Los Angeles County, Department of Public Works (existing and proposed facilities 2005).

URS

250 0 250 500 Feet
SCALE: 1" = 500' (1:6000)

**SITE MAP
BIG TUJUNGA DAM
EXISTING AND PROPOSED CONDITIONS**



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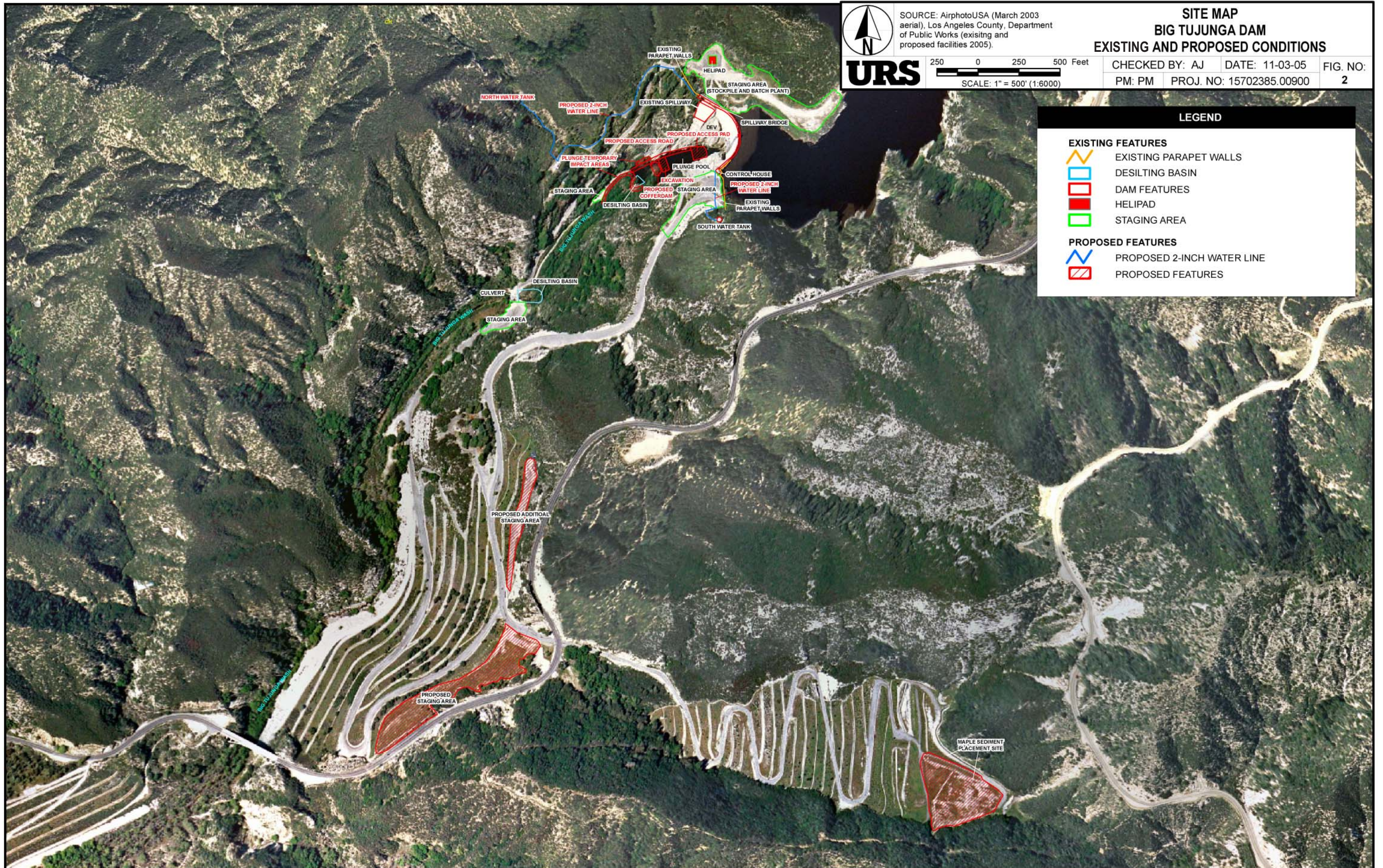
LEGEND

EXISTING FEATURES

-  EXISTING PARAPET WALLS
-  DESILTING BASIN
-  DAM FEATURES
-  HELIPAD
-  STAGING AREA

PROPOSED FEATURES

-  PROPOSED 2-INCH WATER LINE
-  PROPOSED FEATURES



Construction is expected to occur over a 2-year period but may be extended to 3 years. The schedule is based on a standard work week; however, certain activities, such as concrete pouring or other time-restricted actions, may require 24-hour workdays.

During construction, water released from the reservoir would bypass the plunge pool work area through a temporary pipeline. The pipe would be routed along the existing plunge pool stream-bank and would discharge into the existing stream channel downstream of the work area. This procedure would maintain the existing discharge operations regiment.

During construction, the reservoir would be lowered to the elevation of the lowest existing discharge valve (elevation 2,160 feet, reservoir storage 182 ac-ft) to minimize foundation seepage and construction dewatering. Erosion control measures and best management practices (BMPs) (such as silt fences, gravel bags, and/or settling ponds) would be employed downstream, as necessary, to minimize potential sedimentation or impacts from construction-related activities. LADPW's contractor would be required to submit a dewatering plan for the plunge pool and the bypass piping system for conveying water downstream past the construction site during construction. The contractor would be required to coordinate with LADPW for necessary reservoir drawdown in preparation for construction and any necessary reservoir releases during construction.

After environmental and regulatory approvals are obtained for the planned actions, the plunge pool would be dewatered for the duration of the construction phase. The plunge pool would be dewatered by a mechanical pump equipped with a screen to prevent injury to or mortality of aquatic species. A qualified biologist and native fish specialist would monitor the process and all native aquatic species, including the arroyo chub (a USFS sensitive species), would be netted and relocated downstream of the dam discharge area. The area of the plunge pool that would be filled in by the thick-arch and an access pad is approximately 120 feet in length and 100 feet wide (0.28 acre). The proposed access road, access pad, and thick-arch would result in a total permanent decrease in the plunge pool surface area of approximately 0.43 acre. The existing gunite along the sides of the plunge pool would be restored with structural reinforced gunite for erosion protection and slope stability. The bottom of the pool would be returned to its current condition before the end of construction activities. Upon completion of the project, the plunge pool would be rewatered and riparian vegetation downstream of the plunge pool would be allowed to reestablish.

To the extent possible, vegetation clearing would occur outside of the breeding seasons of the special-status species. Pre-construction spring surveys for least Bell's vireo and southwestern willow flycatcher would be conducted by qualified biologists to confirm that those species are not present. In addition, one complete survey for slender-horned spinyflower would be conducted during the blooming period and one complete follow-up survey within 4 weeks of the initial survey would also be conducted to confirm the presence or absence of slender-horned spinyflower individuals. Qualified wildlife biologists would also be present during vegetation clearing. Light shields for night work would be used to focus light on the construction area and away from wildlife habitat. Noise shields would be used for any generators employed during construction activities. If least Bell's vireo or southwestern willow flycatcher are detected at anytime during the project life, noise impacts would be further mitigated, as described in the Initial Study for this project (URS 2006a), and LADPW would notify FEMA, which would consult with USFWS. No night delivery of materials or night construction travel is planned as

part of the work schedule. The project would also comply with USFS invasive weed control and abatement mitigation that includes cleaning equipment prior to delivering to the site.

Figure 2 defines the specific locations of the project area that would be directly affected by the proposed project. Portions of the project area that are outside of the specified locations are not considered part of the project and would not be permitted for take of special-status species by the USFWS.

LADPW plans to eventually modify long-term operations of the dam in order to satisfy the management goals of the Big Tujunga Dam Operations Plan. However, because the revised operations plan would be based on the design specifications of the dam rehabilitation and spillway modification, it would be the subject of subsequent NEPA review. Additional analysis for the revised operations plan would be tiered from this EA, in accordance with 40 CFR Part 1508.28. Until the revised operations plan is completed and approved, LADPW would maintain current operating standards. As specified in Amendment Number 2 of the MOU, USFS would serve as the lead Federal agency for the NEPA compliance review of the revised operations plan.

SECTION THREE **Affected Environment and Environmental Consequences**

This section presents information on the existing natural and human-made environments, and the anticipated environmental consequences associated with the alternatives identified in Section 2.2.

3.1 **BIOLOGICAL RESOURCES**

Effects to biological resources resulting from construction-related activities in the project area are discussed in this section. Biological resources addressed in this section include vegetation, wildlife, and aquatic resources that are not Federally listed as threatened or endangered, proposed for Federal listing as threatened or endangered, or USFS sensitive species. Federally listed threatened and endangered species, species proposed for these categories, and USFS sensitive species are discussed in Section 3.2.

3.1.1 **Affected Environment**

Figures 3A and 3B depict the proposed project activities with the existing vegetation communities. Vegetation types within the general project area includes chaparral, scrub oak/chaparral, coast live oak woodland, nonnative grassland, riparian forest, and areas previously disturbed that contain nonnative plant species (weeds). The existing environmental settings of the areas that have the potential to be affected by the proposed action are described below.

3.1.1.1 *Staging and Storage Areas*

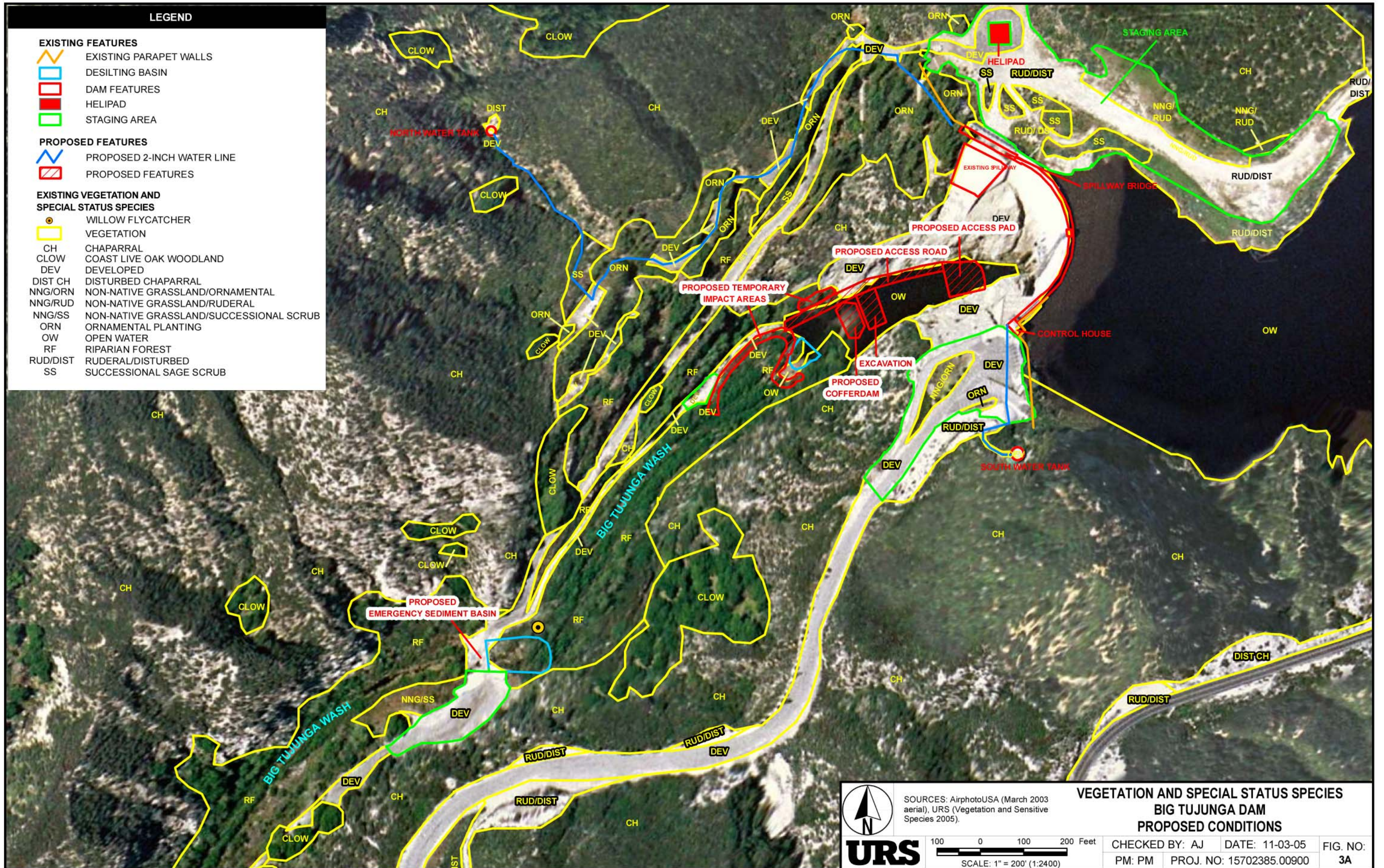
The project proposes to use two previously disturbed areas and a third area downstream from the plunge pool for construction staging and storage of materials. The two previously disturbed sites are located on the upper terraces of existing fill locations within the project limits.

The first existing site is located on the north side of the existing site access road. This 1-acre site is currently used for materials storage and is paved with asphalt or oil and gravel; a concrete v-ditch occurs on the east side of this area.

The second site is located south of the existing paved access road and parallels Big Tujunga Canyon Road. This 4-acre area is the upper terrace of a sediment deposition site from previous dam reservoir cleanout projects. The site is vegetated with nonnative annual species and discrete plantings of native trees. The nonnative species include black mustard, wild oat, foxtail, and Russian thistle. The native tree species include coast live oak, California sycamore, and Coulter pine. The trees were planted by USFS, are generally less than 6 feet tall, and have trunks that are less than 4 inches in diameter. No supplemental irrigation system or fencing exists. The soil consists of compacted gravel and granite sediment.

The third area is located downstream of the plunge pool and includes areas that have been disturbed previously, as well as native vegetation. The native vegetation includes riparian forest and oak woodland.

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LEGEND

EXISTING FEATURES

- EXISTING PARAPET WALLS
- DESILTING BASIN
- DAM FEATURES
- HELIPAD
- STAGING AREA

PROPOSED FEATURES

- PROPOSED 2-INCH WATER LINE
- PROPOSED FEATURES

EXISTING VEGETATION AND SPECIAL STATUS SPECIES

- WILLOW FLYCATCHER
- VEGETATION
- CH CHAPARRAL
- CLOW COAST LIVE OAK WOODLAND
- DEV DEVELOPED
- DIST CH DISTURBED CHAPARRAL
- NNG/ORN NON-NATIVE GRASSLAND/ORNAMENTAL
- NNG/RUD NON-NATIVE GRASSLAND/RUDERAL
- NNG/SS NON-NATIVE GRASSLAND/SUCCESSIONAL SCRUB
- ORN ORNAMENTAL PLANTING
- OW OPEN WATER
- RF RIPARIAN FOREST
- RUD/DIST RUDERAL/DISTURBED
- SS SUCCESSIONAL SAGE SCRUB



SOURCES: AirphotoUSA (March 2003 aerial), URS (Vegetation and Sensitive Species 2005).

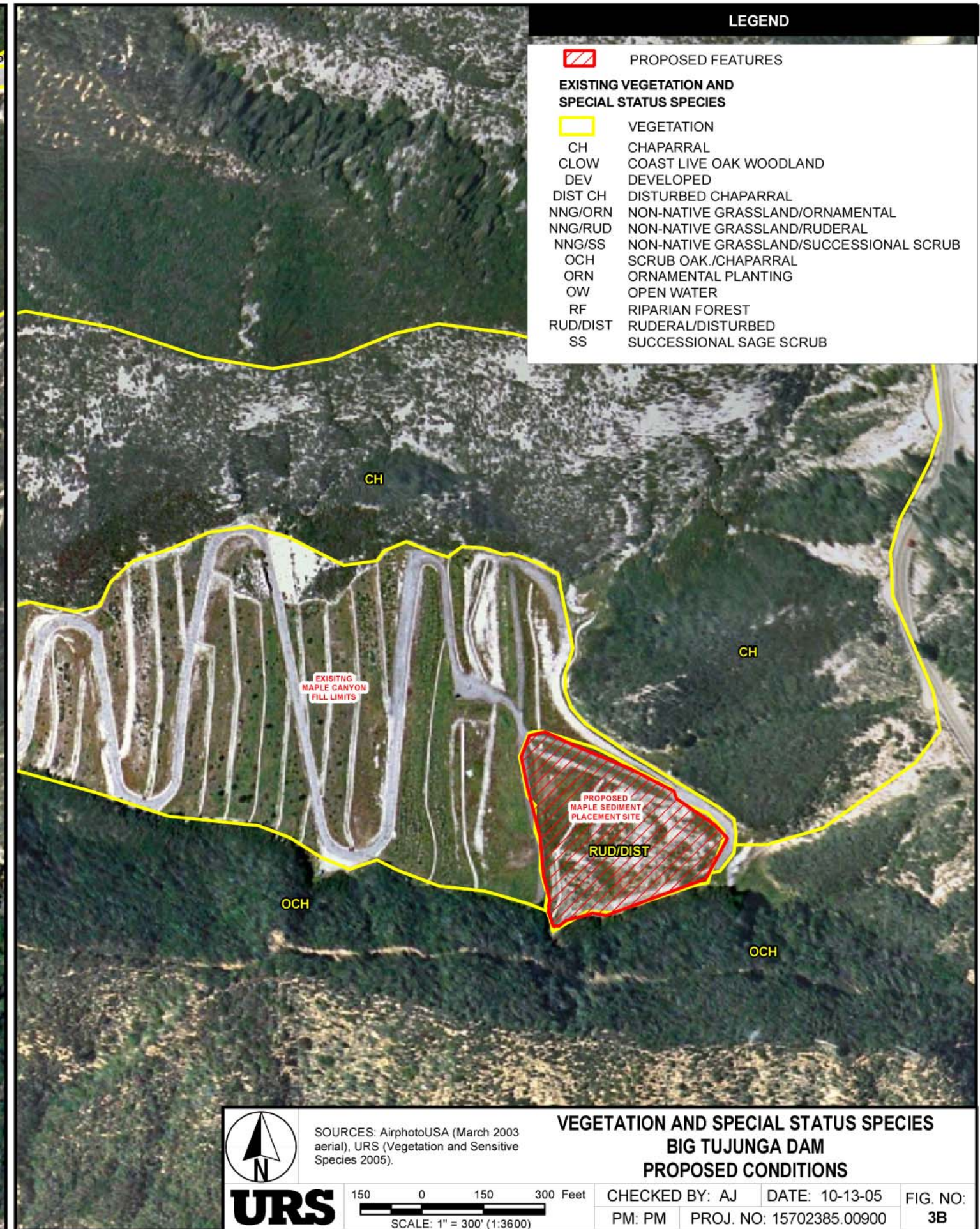
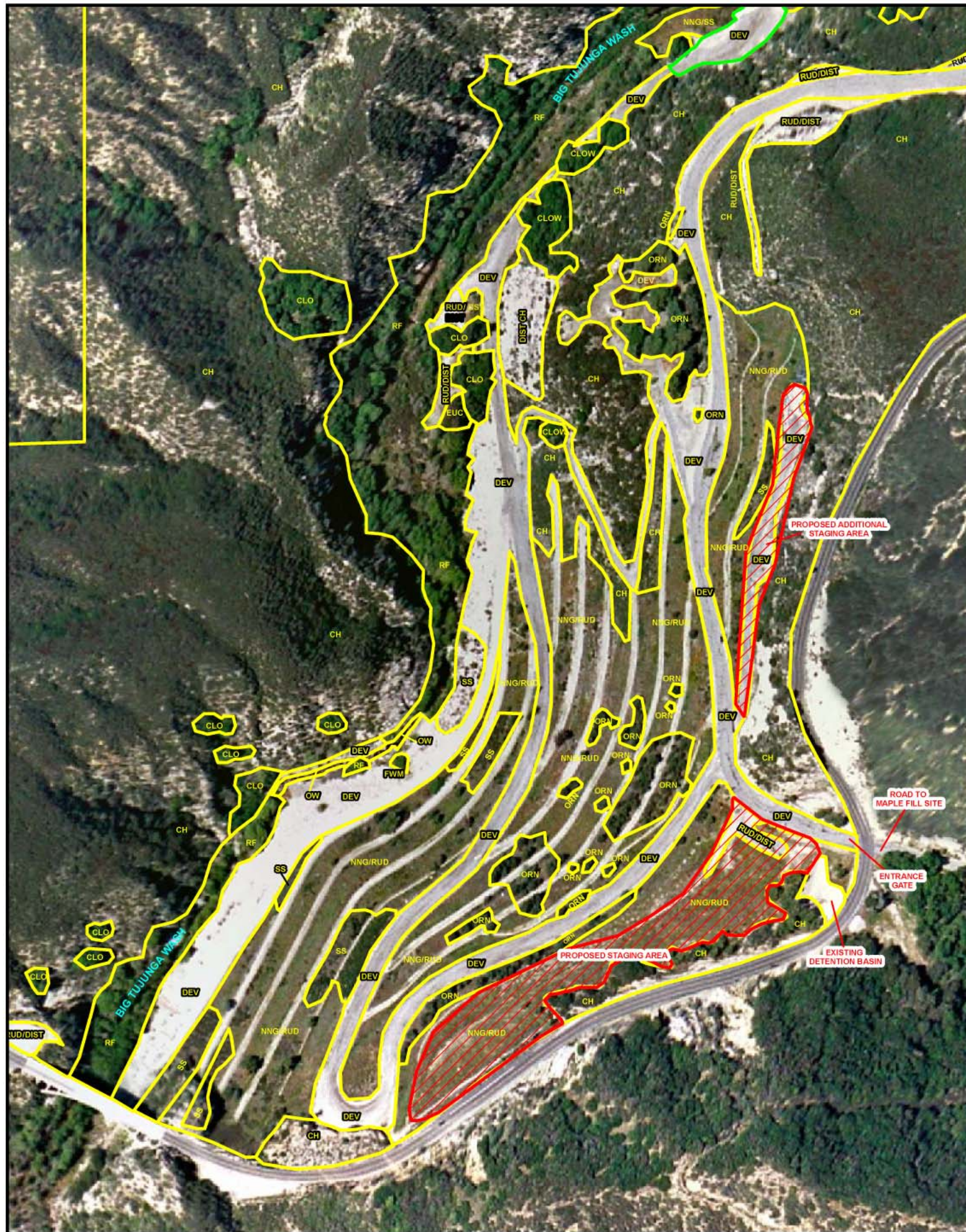


100 0 100 200 Feet
SCALE: 1" = 200' (1:2400)

**VEGETATION AND SPECIAL STATUS SPECIES
BIG TUJUNGA DAM
PROPOSED CONDITIONS**

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LEGEND	
	PROPOSED FEATURES
EXISTING VEGETATION AND SPECIAL STATUS SPECIES	
	VEGETATION
CH	CHAPARRAL
CLOW	COAST LIVE OAK WOODLAND
DEV	DEVELOPED
DIST CH	DISTURBED CHAPARRAL
NNG/ORN	NON-NATIVE GRASSLAND/ORNAMENTAL
NNG/RUD	NON-NATIVE GRASSLAND/RUDERAL
NNG/SS	NON-NATIVE GRASSLAND/SUCCESSIONAL SCRUB
OCH	SCRUB OAK./CHAPARRAL
ORN	ORNAMENTAL PLANTING
OW	OPEN WATER
RF	RIPARIAN FOREST
RUD/DIST	RUDERAL/DISTURBED
SS	SUCCESSIONAL SAGE SCRUB

**VEGETATION AND SPECIAL STATUS SPECIES
BIG TUJUNGA DAM
PROPOSED CONDITIONS**

 SOURCES: AirphotoUSA (March 2003 aerial), URS (Vegetation and Sensitive Species 2005).	150 0 150 300 Feet SCALE: 1" = 300' (1:3600)	CHECKED BY: AJ PM: PM	DATE: 10-13-05 PROJ. NO: 15702385.00900	FIG. NO: 3B
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SECTION THREE **Affected Environment and Environmental Consequences**

3.1.1.2 Maple Canyon Sediment Placement Site

This site is an existing approved fill site located to the east of the dam entrance gate on the east side of Big Tujunga Canyon Road. Vegetation surveys were performed at this site in August 2005. The 3.1-acre site is currently void of native vegetation on the slope terrace. The slope faces support native vegetation, including California buckwheat and California broom with a few nonnative forb species. The north-facing slope on the south side of the site supports chaparral scrub and mature scrub oak with scattered toyon. Coast live oak woodland is present on the far western end of the south side of the site. The opposite, south-facing slope supports chaparral scrub dominated by chemise. The dam has held an existing-use permit for this site.

3.1.1.3 Replacement of the Water Tank Supply Line

The new line would be installed on the west side of the existing paved access road on the west side of the dam. No native vegetation exists along the existing paved road. From the existing dam storage yard, the planned alignment would be directed to the west, up the adjacent slope to the existing metal water tank. The east-facing slope supports chaparral scrub and sage scrub habitat dominated by toyon, laurel sumac, California buckwheat, scrub oak, and yerba buena. A footpath is used to access the water tank.

3.1.1.4 Access Road and Culvert Upgrade

The existing access road crosses the creek approximately 1,000 feet downstream of the plunge pool. Currently, a grouted, corrugated steel culvert crossing has been installed for dry crossing of the creek. The crossing includes approximately five 48-inch-diameter pipes. The habitat at this location consists of open water, riparian forest, and native streambed habitat.

3.1.1.5 Discharge Bypass and Plunge Pool Dewatering

The habitat at this location consists of open water, riparian forest, and native streambed habitat.

3.1.2 Environmental Consequences

Biological resources addressed in this section include vegetation, wildlife, and aquatic resources that are not Federally listed as threatened or endangered, proposed for Federal listing as threatened or endangered, or USFS sensitive species. Impacts to Federally listed threatened and endangered species, species proposed for these categories, and USFS sensitive species are discussed in Section 3.2.2.

3.1.2.1 No Action Alternative

Under this action, there would be no direct or indirect environmental impacts to biological resources.

SECTION THREE **Affected Environment and Environmental Consequences**

3.1.2.2 Dam Rehabilitation and Spillway Modification

Staging and Storage Areas

Up to 5.7 acres of land would be affected within the staging and storage areas. One of the staging areas (1 acre in size) does not currently contain any vegetation. Therefore, up to 4.7 acres of vegetation could be affected by this alternative. Impacts on vegetation within the staging and storage sites would be temporary; once construction has been completed, the staging and storage areas would be reseeded with native vegetation.

Maple Canyon Sediment Placement Site

The area where excavated material would be deposited within the Maple Canyon Sediment Placement Site only has sparse vegetative cover. Once the excavated material has been deposited and leveled, the disposal area would be allowed to revegetate.

Replacement of the Water Tank Supply Line

Replacement of the water line would only disturb approximately 0.1 acre of native vegetation along the slope from the storage yard to the water tank. The associated impacts would be temporary as the native vegetation would be allowed to revegetate the area disturbed by the placement of the new water line.

Access Road and Culvert Upgrade

Approximately 6.4 acres of land would be disturbed by the construction of the access road and upgrading the culvert stream crossing. Most of the areas that would be disturbed by these activities have been disturbed previously, and native vegetation within these areas is limited to riparian forest that is located downstream from the plunge pool. Construction of the access road would represent permanent changes in vegetation, and vegetation affected by the upgrade of the culvert would be temporary as vegetation regrowth would be encouraged.

Discharge Bypass and Plunge Pool Dewatering

During construction, reservoir releases would bypass the plunge pool work limits through a temporary pipeline. The contractor would be expected to route the pipe along the existing plunge pool stream bank and discharge the effluent downstream of the work limits into the native streambed. This procedure would maintain the existing discharge operations during construction. An access road would be constructed in this area as well (Figures 3A and 3B). These actions may result in temporary impacts of up to 0.22 acre in the riparian forest habitat at the downstream end of the plunge pool. Upon completion of the project, the riparian vegetation downstream of the plunge pool would be allowed to reestablish.

Permanent changes to the plunge pool would result from increasing the dam thick-arch and from constructing an access road along the north side of the plunge pool. These changes would result in a total permanent decrease in open water habitat of approximately 0.43 acre. The existing gunite along the sides of the plunge pool would be restored with structural reinforced gunite for erosion protection and slope stability. The bottom of the pool would be returned to its current

SECTION THREE **Affected Environment and Environmental Consequences**

condition before the end of construction activities. Temporary impacts of 0.7 acre would occur to the open water habitat of the plunge pool as a result of the dewatering process. Upon completion of the project, the plunge pool would be rewatered, and the vegetation downstream of the plunge pool would be allowed to reestablish.

Dewatering of the plunge pool would be completed in a manner that would prevent entrainment of aquatic organisms including fish larger than 0.5 inch into the pump. In addition, to prevent and/or reduce potential impacts on native fish species, a qualified fishery biologist would be present during dewatering to net or otherwise catch native fish as they become stranded by the dewatering. All captured native fish species would be released back to the creek downstream from the plunge pool. Isolated nonnative aquatic species would be captured and extirpated from the stream. The carcasses of nonnative aquatic species would be buried or used for scientific research.

Summary

The project would affect 15.3 acres of existing vegetation communities. The majority of these communities consist of bare or previously disturbed areas supporting nonnative vegetation. A total of 2.0 acres of the affected area would be native communities. Of the 2.0 acres of impacts to native habitats, 1.6 acres are temporary impacts located in the water line construction, plunge pool, riparian forest downstream of the plunge pool, and staging areas. The project would also comply with USFS's invasive weed control and abatement mitigation, which includes cleaning all equipment prior to its delivery to the project site.

Affecting 0.4 acre of native vegetation permanently and 1.6 acres of native vegetation and 13.3 acres of nonnative vegetation temporarily would have a negligible adverse impact to local wildlife populations. However, if vegetation clearing is slated to occur during breeding season of migratory birds, surveys would be conducted to determine if migratory birds have nests within the area to be cleared. If nests are discovered, vegetation clearing would be delayed until the young birds have fledged and left their nests.

With the mitigation procedures that would be implemented to avoid and/or mitigate impacts on native fish species located in the plunge pool during the dewatering of the plunge pool, the proposed action would not have an adverse impact on any native aquatic species present in Big Tujunga Creek downstream from the dam.

3.2 THREATENED, ENDANGERED, AND USFS SENSITIVE SPECIES

Section 7 of the Endangered Species Act (ESA) requires Federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of Federally threatened, endangered, or proposed species or cause destruction or adverse modification of their critical habitats. In response to this requirement, a BA was prepared for this project and submitted to the USFWS (URS 2005). FEMA determined that the project is not likely to adversely affect or would not affect any Federally threatened, endangered, or proposed species or critical habitat. USFWS concurred with FEMA's determination by letter of December 14, 2005 (Appendix B). Thus, the project complies with Section 7 of the ESA.

In addition, the USFS is required to assess the potential effects of actions on USFS sensitive species. This requirement is accomplished through the preparation of a BE for all USFS sensitive

SECTION THREE Affected Environment and Environmental Consequences

species and their habitat that has the potential to occur in the vicinity of the project area. In response to this requirement, a BE was prepared for the proposed project and submitted to the USFS (URS 2006b).

Information in the BA and BE supplied most of the affected environment information presented in this section, and the two documents were the basis for the determination of the effects on addressed species. Both documents are incorporated herein by reference and summarized.

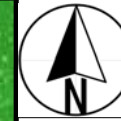
3.2.1 Affected Environment

In consultation with USFWS, USFS, and CDFG, FEMA determined that the project area potentially contains habitat for the following Federally threatened or endangered species:

- Southwestern willow flycatcher (*Empidonax traillii extimus*), a Federally endangered species;
- Least Bell's vireo (*Vireo bellii pusillus*), a Federally endangered species;
- Southwestern arroyo toad (*Bufo californicus*), a Federally endangered species;
- Santa Ana sucker (*Catostomus santaanae*), a Federally threatened species with critical habitat designated in the project area (see Figure 4);
- California red-legged frog (*Rana aurora draytonii*), a Federally threatened species with critical habitat designated in the project area (see Figure 4);
- Braunton's milk-vetch (*Astragalus brauntonii*), a Federally endangered species;
- Nevin's barberry (*Berberis nevinsii*), a Federally endangered species;
- Slender-horned spineflower (*Dodecahema leptoceras*), a Federally endangered species;
- Thread-leaved brodiaea (*Brodiaea filifolia*), a Federally threatened species; and
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *Fernandina*), a candidate for Federal listing.

USFS determined that the project area potentially contains habitat for the following USFS sensitive species:

- Kusche's sandwort (*Arenaria macradenia* var. *kuschei*);
- Crested milk-vetch (*Astragalus bicristatus*);
- San Antonio milk-vetch (*Astragalus lentiginosus* var. *antoni*);
- Scalloped moonwort (*Botrychium crenulatum*);
- Palmer's Mariposa lily (*Calochortus palmeri* var. *palmeri*);
- Plummer's Mariposa lily (*Calochortus plummerae*);
- Alkali Mariposa lily (*Calochortus striatus*);
- Pygmy poppy (*Canbya candida*);
- Mt. Gleason's paintbrush (*Castilleja gleasonii*);



SOURCES: AirphotoUSA
(March 2003 aerial), USFWS (California
RedleggedFrog Critical Habitat 2002;
Santa Ana Sucker Critical Habitat 2004).





250 0 250 500 Feet
SCALE: 1" = 500' (1:6000)

CRITICAL HABITATS BIG TUJUNGA DAM EXISTING AND PROPOSED CONDITIONS






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CRITICAL HABITATS




-  Santa Ana Sucker Critical Habitat
-  California Redlegged Frog Critical Habitat

LEGEND



EXISTING FEATURES

-  EXISTING PARAPET WALLS
-  DESILTING BASIN
-  DAM FEATURES
-  HELIPAD
-  STAGING AREA

PROPOSED FEATURES

-  PROPOSED 2-INCH WATER LINE
-  PROPOSED FEATURES
-  PROPOSED STAGING AREA

EXISTING VEGETATION AND SPECIAL STATUS SPECIES

-  WILLOW FLYCATCHER
-  VEGETATION
- CH CHAPARRAL
- CLOW COAST LIVE OAK WOODLAND
- DEV DEVELOPED
- DIST CH DISTURBED CHAPARRAL
- NNG/ORN NON-NATIVE GRASSLAND/ORNAMENTAL
- NNG/RUD NON-NATIVE GRASSLAND/RUDERAL
- NNG/SS NON-NATIVE GRASSLAND/SUCCESSIONAL SCRUB
- ORN ORNAMENTAL PLANTING
- OW OPEN WATER
- RF RIPARIAN FOREST
- RUD/DIST RUDERAL/DISTURBED
- SS SUCCESSIONAL SAGE SCRUB

SECTION THREE Affected Environment and Environmental Consequences

- Peirson's spring beauty (*Claytonia lanceolata* var. *peirsonii*);
- San Gabriel Mountain dudleya (*Dudleya densiflora*);
- Many-stemmed dudleya (*Dudleya multicaulis*);
- Southern alpine buckwheat (*Eriogonum kennedyi* var. *alpigonum*);
- Johnston's buckwheat (*Eriogonum microthecum* var. *johnstonii*);
- Pine green gentian (*Frasera neglecta*);
- San Gabriel bedstraw (*Galium grande*);
- Lemon lily (*Lilium parryi*);
- San Gabriel linanthus (*Linanthus concinnus*);
- Hall's monardella (*Monardella macrantha* ssp. *Hallii*);
- Rock monardella (*Monardella viridis* ssp. *Saxicola*);
- Baja navarretia (*Navarretia peninsularis*);
- Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*);
- Rock Creek broomrape (*Orobanche valida* ssp. *Valida*);
- Northern goshawk (*Accipiter gentilis*);
- Swainson's hawk (*Buteo swainsoni*);
- California spotted owl (*Strix occidentalis occidentalis*);
- Peregrine falcon (*Falco peregrinus*);
- Pallid bat (*Antrozous pallidus*);
- Townsend's big-eared bat (*Corynorhinus townsendii*);
- Western red bat (*Lasiurus blossevillii*);
- White-eared pocket mouse (*Perognathus alticolus alticolus*);
- Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*);
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*);
- Yellow-blotched salamander (*Ensatina eschscholtzii croceater*);
- San Gabriel Mountain slender salamander (*Batrachoseps gabrieli*);
- Foothill yellow-legged frog (*Rana boylei*);
- Southwestern pond turtle (*Clemmys marmorata pallida*);
- San Diego horned lizard (*Phrynosoma coronatum blainvillii*);
- California legless lizard (*Anniella pulchra*);
- San Bernardino ringneck snake (*Diadophis punctatus modestus*);

SECTION THREE **Affected Environment and Environmental Consequences**

- Southern rubber boa (*Charina bottae umbratica*);
- Coastal rosy boa (*Lichanura trivirgata roseofusca*);
- San Bernardino Mountain kingsnake (*Lampropeltis zonata parvirubra*);
- Two-striped garter snake (*Thamnophis hammondi*);
- Arroyo chub (*Gila orcutti*); and
- Santa Ana speckled dace (*Rhinichthys osculus*).

3.2.2 Environmental Consequences

3.2.2.1 *No Action Alternative*

Since there would be no construction activities and no operational changes of the dam, no Federally threatened or endangered species or USFS sensitive species or their habitats would be affected by this alternative.

3.2.2.2 *Dam Rehabilitation and Spillway Modification*

Federally Listed and Proposed Threatened and Endangered Species

No Federally threatened or endangered plant species were detected during the surveys performed in the project area. Therefore, the proposed project is unlikely to adversely affect Federally threatened or endangered plant species, specifically Braunton's milk-vetch, slender-horned spineflower, Nevin's barberry, thread-leaved brodiaea, and San Fernando Valley spineflower. Suitable habitat for Braunton's milk-vetch and Nevin's barberry and potentially suitable habitat for slender-horned spineflower occur in the project area; however, these species were not detected during 2 years of surveys. Because further confirmation of the absence of slender-horned spineflower is necessary, LADPW would conduct one complete survey for slender-horned spineflower during the blooming period and one complete follow-up survey within 4 weeks of the initial survey for this species. Therefore, the proposed project is not likely to affect slender-horned spineflower and would not affect other Federally threatened or endangered plant species. It is also not likely that the proposed project would jeopardize the continued existence of any Federally threatened or endangered plant species.

No Federally threatened or endangered avian species were confirmed in the project area, and none are expected to occur. One southwestern willow flycatcher was detected in potentially suitable habitat in the project area; however, this individual was not identified as the protected sub-species and was not nesting. No least Bell's vireo was detected during protocol surveys. Nonetheless, because riparian habitat would be affected by the project, protocol surveys would be conducted during the least Bell's vireo and southwestern willow flycatcher breeding seasons throughout the project construction to confirm the absence of this species. Should either species be found to occupy the site at the time of construction, the clearing of vegetation would be conducted before the breeding season of the detected species. No impacts are expected to least Bell's vireo or southwestern willow flycatcher from noise because these species were not detected during focused surveys. Furthermore, mitigation measures are in place, as described in

SECTION THREE **Affected Environment and Environmental Consequences**

Section 4, that would minimize noise impacts from construction equipment should one or both of these species arrive during construction. Thus, the proposed project may affect but is not likely to adversely affect least Bell's vireo and southwestern willow flycatcher. Also, the project is not likely to jeopardize the continued existence of these species or adversely modify their designated critical habitats.

No Federally threatened or endangered aquatic species were detected in the project area, and none are expected to occur. Critical habitat for Santa Ana sucker and California red-legged frog may be affected by the project; however, the habitat in the project area is neither occupied by nor suitable for these species. Thus, the proposed project may affect but is not likely to adversely affect the critical habitats of Santa Ana sucker or California red-legged frog. Also, the project is not likely to jeopardize the continued existence of these species or adversely modify their designated critical habitats.

USFS Sensitive Species

No USFS sensitive plant species were detected during the surveys performed in the project area. Therefore, the proposed project is unlikely to adversely affect USFS sensitive plant species. Based on the field surveys, literature, and reviewed data, it was determined that the proposed project would not affect the following USFS sensitive plant species because suitable habitat is not present within or adjacent to the project limits: Kusche's sandwort, crested milk-vetch, San Antonio milk-vetch, scalloped moonwort, Palmer's Mariposa lily, alkali Mariposa lily, pygmy poppy, Mt. Gleason's paintbrush, Peirson's spring beauty, many-stemmed dudleya, southern alpine buckwheat, Johnston's buckwheat, pine green gentian, lemon lily, San Gabriel linanthus, Baja navarretia, short-joint beavertail, and Rock Creek broomrape.

The proposed project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the following USFS sensitive plant species: San Gabriel bedstraw, Plummer's Mariposa lily, San Gabriel Mountain dudleya, Hall's monardella, and rock monardella. The project would not cause the extinction of any of these species or directly result in the demise of known populations. These species may be directly affected by grading and excavation. They may also be affected by foot traffic within the project area when setting survey limits, performing general construction activity, and conducting project inspection and monitoring. It is not expected that the project would extirpate any entire population that may occur because of the limited amount of undisturbed native habitat that would be permanently affected by the project. Indirect effects potentially include the accidental introduction of invasive species, which would be mitigated against as described in Section 4.

The project has the potential to affect USFS sensitive animal species. Of the potential animal species that may occur, only arroyo chub is known to be present within the project limits. Based on the field surveys, literature, and reviewed data, it is determined that the proposed project would not affect the following USFS sensitive animal species because suitable habitat or other conditions to support breeding and foraging is not present within or adjacent to the project limits: Santa Ana speckled dace, Swainson's hawk, northern goshawk, California spotted owl, San Gabriel Mountain slender salamander, yellow-blotched salamander, foothill yellow-legged frog, southwestern pond turtle, desert tortoise, San Bernardino ringneck snake, southern rubber boa, San Bernardino Mountain kingsnake, Los Angeles pocket mouse, white-eared pocket mouse, and Tehachapi pocket mouse.

SECTION THREE **Affected Environment and Environmental Consequences**

The proposed project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the following USFS sensitive animal species: arroyo chub, peregrine falcon, pallid bat, Townsend's big-eared bat, western red bat, San Diego horned lizard, California legless lizard, coastal rosy boa, and two-striped garter snake. These species were not observed during field surveys but suitable habitat is present within or adjacent to the project limits. The project would not cause the extinction of any of these species or directly result in the demise of known populations.

The project may directly affect arroyo chub during the dewatering of the plunge pool, installation of the bypass dissipater, and bypass release of water. It is expected that through capture and relocation some individuals would die. Additionally arroyo chub may be affected by the placement of rock riprap or other dissipater devices for the bypass outlet and by the discharge at the temporary location. This species may be indirectly affected by increased competition at relocation sites and have reduced habitat and foraging area in the reconfigured plunge pool. However, nonnative invasive predatory species would be removed during the dewatering, which would mitigate for potential temporary effects to the arroyo chub. As described in Section 4, mitigation would be implemented to reduce the potential for uptake of individual arroyo chub in the water pump.

Peregrine falcon may be indirectly affected by temporary disturbance from construction activity. Noise and light may disrupt potential foraging in the project area, but these effects would be mitigated against as described in Section 4. No direct effects would occur.

Townsend's big-eared bat, pallid bat, and western red bat may be indirectly affected by temporary disturbance from construction activity. Noise and light may disrupt potential foraging in the project area; mitigation measures for these impacts are described in Section 4. Prey source may be decreased with the temporary removal of the water in the plunge pool. No direct effects would occur.

Two-striped garter snake and coastal rosy boa may be directly affected by construction activity in and around the plunge pool. California legless lizard and San Diego horned lizard may be directly affected by construction activity in the upland habitat. Potential direct impacts include individuals being killed or injured by vehicles, equipment, and general project actions and by ground excavation leading to entrapment, which could lead to death or injury. Indirect impacts could include noise and vibration disturbance leading to displacement or modified behavior, removal or modification of cover or foraging habitat, modified habitat or displacement of individuals leading to an increased risk of predation, and, for individuals moved from the project area, being subject to increased competition with individuals already occupying adjacent habitats. A potential beneficial impact is that vegetation cleared for the water supply tank line could create additional foraging opportunities for the San Diego horned lizard since they are known to frequently forage next to openings.

It is determined that the proposed project would not result in the extirpation of any of the above USFS sensitive species that may be directly or indirectly affected by the proposed project. The proposed project would not result in the listing of any of these identified species.

SECTION THREE **Affected Environment and Environmental Consequences**

3.2.3 **Cumulative Effects**

Actions that could accumulate with the proposed project to affect Federally threatened or endangered species or USFS sensitive species include, but are not limited to, reservoir cleanout and sediment removal, invasive species removal, road maintenance, fuel reduction, sediment disposal, utility activity, recreational use, and water developments. Cumulative impacts also take into account the historic natural and accidental fire history of the area and natural flood events, although these are not private or public activities. These acts occur at periodic intervals and intermittently affect habitat quality and dependent foraging and breeding behavior of wildlife. These events also promote the health of the natural community of the project area. The proposed project would not adversely affect these natural occurrences by increasing the frequency, intensity, or recovery time of these natural events.

The proposed project involves rehabilitation of the dam and the construction of a permanent access road. The water releases from the dam would continue within the same range after the seismic upgrade process as they were before the proposed project. Any changes to the water release regime would require further study, at which time the effects and resulting mitigation measures would be determined. During and after construction, the reservoir would only be filled to the historically normal maximum level that is allowed by the current USFS conditional use permit held by LADPW, thereby preventing potential upstream effects associated with additional water storage in the reservoir. The proposed project in combination with other projects in the region could contribute to cumulative effects to Federally threatened or endangered species or USFS sensitive species as a result of disturbance of habitat suitable for breeding, foraging, and dispersal in the project area. The habitat disturbance resulting from the proposed project would contribute on a minor but incremental basis to the cumulative effects on a regional basis.

3.3 **WATER RESOURCES**

3.3.1 **Hydrology**

3.3.1.1 *Affected Environment*

Several small secondary drainages flow into Big Tujunga Wash upstream from Big Tujunga Dam. The LADPW has determined that upstream from the dam, flow in the Big Tujunga Wash during a 100-year and 500-year flood event would be approximately 46,700 cfs and 120,000 cfs, respectively. Although flows in Big Tujunga Wash upstream of Big Tujunga Dam are perennial, during the low flow period (dry summer season) flows are usually less than 10 cfs.

3.3.1.2 *Environmental Consequences*

No Action Alternative

The No Action Alternative would have no impact on the hydrology of the Big Tujunga Wash.

SECTION THREE **Affected Environment and Environmental Consequences**

Dam Rehabilitation and Spillway Modification

As discussed in Section 2.2.2, during construction the reservoir would be lowered to an elevation of 2,160 feet and would be maintained at this level to the extent that inflows and permitted discharges would allow. The reduction in the ability to store water in the dam during construction would reduce the ability of the dam to make water conservation releases to the stream downstream from the dam. This represents a short-term adverse impact on the hydrology of the stream downstream of the dam.

After the proposed activities have been completed, the dam would continue to be operated as per the current operation plan. During this period of time, the alternative would have no effect on the hydrology of the stream or amount of water stored in the reservoir.

3.3.2 **Water Quality**

The U.S. Environmental Protection Agency's National Pollution Discharge Elimination System (NPDES) Program requires all construction activities that disturb more than 1 acre to receive a permit. In California, the NPDES Program is administered by the California Regional Water Quality Control Board (RWQCB).

3.3.2.1 *Affected Environment*

Water quality (primarily turbidity) in Big Tujunga Wash and Big Tujunga Reservoir is affected by major precipitation events, short-term storage of flood flows within the reservoir, and the subsequent release of nonconservation water from the reservoir. These factors contribute to elevated turbidity levels in both the stream and reservoir following major precipitation events within the watershed.

3.3.2.2 *Environmental Consequences*

No Action Alternative

With the No Action Alternative, the operation of the reservoir would not be changed. Therefore, the alternative would have no impact on the water quality of the stream (upstream or downstream of the dam) or the reservoir. Turbidity levels in both would continue to be elevated during and following major precipitation events in the watershed.

Dam Rehabilitation and Spillway Modification

Pursuant to the Clean Water Act, the project construction would occur within a stream considered to be "waters of the United States." Since proposed activities with this alternative would disturb more than 1 acre, the LADPW would need to obtain a construction NPDES Permit from the RWQCB prior to the initiation of any construction activities.

Under this alternative, the project could result in higher sediment levels due to runoff associated with construction-related activities. As stated previously, LADPW's contractor would employ BMPs to prevent and/or reduce soil erosion within areas disturbed during construction and the movement of sediment into the stream or reservoir. In addition, any construction-related residual

SECTION THREE **Affected Environment and Environmental Consequences**

impacts (direct or indirect) on water quality would be temporary and would not represent a significant change in the water quality of the stream or reservoir.

Post-construction, the alternative would not have an effect (adverse or beneficial) on water quality as LADPW would maintain current operating standards.

3.3.3 Groundwater

The No Action Alternative does not involve any construction activities, and the Dam Rehabilitation and Spillway Modifications Alternative only involves modifications to the dam and ancillary facilities. Therefore, neither alternative has the potential to affect groundwater resources within or in the vicinity of the project area.

3.3.4 Floodplain Management (Executive Order 11988)

Executive Order (EO) 11988, Floodplain Management, requires Federal agencies to determine the effects of their actions upon the natural and beneficial values of floodplains. The intent of EO 11988 is to minimize occupancy and modification to floodplains. To satisfy the intent of the EO, FEMA employs the Eight-Step Decision-Making Process when evaluating projects that have features located within a 100-year floodplain.

3.3.4.1 Affected Environment

The Big Tujunga Dam is a flood control and water conservation structure that provides a limited amount of flood protection for an area of approximately 3.5 square miles located downstream of the dam. The floodplain associated with the Big Tujunga Wash runs essentially east to west from the mountains down into the community of Sunland, California.

3.3.4.2 Environmental Consequences

By its very nature, the NEPA compliance process involves essentially the same basic decision-making process to meet its objective, as does the Eight-Step Decision-Making Process. Therefore, the Eight-Step Decision-Making Process has been applied through the implementation of the NEPA process.

No Action Alternative

The No Action Alternative does not involve the construction of any structures and involves no changes in hydrology within the watershed. Therefore, the alternative would not affect any floodplains.

Dam Rehabilitation and Spillway Modification

During the construction period, the water elevation in the reservoir would be maintained at an elevation that is substantially lower than the lowest elevation during normal operation. Therefore, if a flood event were to occur during this period, a limited amount of additional storage would be available in the reservoir. This could have a minor beneficial effect on flooding downstream of the dam.

SECTION THREE **Affected Environment and Environmental Consequences**

Flood storage capacity of the dam would not be changed with this alternative. Therefore, post-construction, the alternative would have no effect on the magnitude of flooding that would occur downstream of the dam. Thus, the proposed project complies with EO 11988.

3.4 PROTECTION OF WETLANDS (EO 11990)

EO 11990 requires Federal agencies to take action to minimize the destruction or modification of wetlands by considering both direct and indirect impacts to wetlands that may result from Federally funded actions.

3.4.1 Affected Environment

Site surveys were conducted in the project area for the purpose of identifying existing conditions. No wetlands are located within the general project area.

3.4.2 Environmental Consequences

Since no wetlands are located in the general project area, neither alternative has the potential to affect any wetland areas. Thus, the proposed project complies with EO 11990.

3.5 TRAFFIC

3.5.1 Affected Environment

Roadways within the vicinity of the project area are limited due to the rugged terrain. Big Tujunga Canyon Road is a two-lane paved roadway with shoulders that runs up Big Tujunga Canyon toward the dam from the communities of Sunland and Tujunga. It runs along the southern edge of the Big Tujunga Reservoir and continues in an eastward direction, joining Angeles Forest Highway east of the Reservoir. Angeles Forest Highway is also a two-lane, paved roadway with shoulders that approaches the reservoir from the southeast before turning eastward. Prior to its junction with Big Tujunga Canyon Road, Angeles Forest Highway is also known as County Road N 3. This segment of roadway joins Angeles Crest Highway (State Highway 2) approximately 3 miles southeast of the reservoir.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

No construction activities would occur with this alternative; therefore, the No Action Alternative would not have any impacts on traffic within the project area.

3.5.2.2 Dam Rehabilitation and Spillway Modification

The ingress and egress of construction equipment and materials would have a temporary, short-term negative impact on local traffic in the vicinity of the reservoir. The large equipment and heavy trucks required for the project would not be able to travel at the same rate of speed as the general public and would cause temporary traffic backups on Big Tujunga Canyon Road,

SECTION THREE **Affected Environment and Environmental Consequences**

Angeles Forest Highway, and any of the smaller unnamed roadways near the reservoir. The traffic impacts would be expected to last for the duration of the project, as trucks would be moving from staging areas to the dam site and back throughout construction. Traffic controls would be employed as necessary to maximize traffic safety and minimize delays. Once construction activities have been completed, traffic near the reservoir would return to normal.

3.6 GEOLOGY AND SOILS

3.6.1 Affected Environment

The project area lies within the southwestern portion of the San Gabriel Mountain Range. The San Gabriel Mountains occupy the central part of the Transverse Ranges (east-west orientation) at the northern margin of the Los Angeles Basin and Pomona Valley and are the dominant mountains in Los Angeles County. This topographically steep range rises, at its maximum, to an elevation of more than 9,000 feet at Mt. San Antonio (Mount Baldy) (CSULB 2006). However, most peaks lie below 5,000 feet with the gradients in the principal canyons ranging from 150 to 850 feet per mile (LADPW 2006). The average gradient is approximately 41 feet per mile.

The San Gabriel Mountain range is bounded to the north by the seismically active right-lateral San Andreas fault, which separates the San Gabriels from both the Mojave Desert to the north and the San Bernardino Mountains to the east. On the south, a series of active left-lateral reverse faults, notably the Cucamonga and Sierra Madre faults, have been responsible for much of the ongoing uplift of the range (CSULB 2006). To the west, the San Gabriel Mountains lie next to the Castaic Block, which shares a common basement adjacent to the range. To the southwest, south of the San Gabriel fault, lie the Ventura Basin and the western Transverse Ranges (CSULB 2006). The faults are discussed in more detail in Section 3.7.

San Gabriel Mountain rock formations include most major rock types in great variety, ranging from Precambrian igneous and metamorphic rocks to Holocene (recent) alluvium (Oakeshott 1971). However, the soils within San Gabriel Mountains consist of decomposed granite and exposed bedrock. The soil layer is thin due to the steep slopes, which accelerate erosion of the fine material (LADPW 2006).

3.6.2 Environmental Consequences

3.6.2.1 *No Action Alternative*

The No Action Alternative would have no impact on geology or soils within the project area.

3.6.2.2 *Dam Rehabilitation and Spillway Modification*

The proposed project would not impact geology or soil within the project area.

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3.7 **SEISMICITY**

3.7.1 **Affected Environment**

The project area is located in a seismically active area with several inactive and active faults located throughout the San Gabriel Mountain range. The inactive faults include the Vincent thrust, the Black Belt Mylonite zone, the Punchbowl-Nadeau, the Fenner, the San Gabriel, and the San Antonio. The active faults include the San Andreas, the San Jacinto, the Cucamonga, the Sawpit, the Sierra Madre, the Raymond, the Verduge, and the San Fernando. The San Andreas fault is the best-known active fault in the conterminous 48 states. A 47-mile-long segment of this 620-mile-long fault passes along the northern margin of the San Gabriel Mountains (CSULB 2006). The San Jacinto fault trends into the eastern San Gabriel Mountains and is part of the San Andreas system. It appears to now be the most active strand of the San Andreas system in southeastern California (CSULB 2006). The Sierra Madre fault zone comprises a series of discontinuous reverse faults extending about 12 miles from the northeast end of the Santa Susana fault on the west to the Rowley fault across Big Tujunga Canyon on the east (Oakeshott 1971). The other active faults mentioned above are left-lateral faults that bound the southern margin of the San Gabriel Mountains (CSULB 2006). Geologic studies suggest that earthquakes are frequent along these faults and will recur periodically in the vicinity of the San Gabriel Mountains.

Seismic Zones are based on the compilation of historical earthquake data. These data are used to provide an indication of where the next earthquake would most likely strike. Seismic Zones range from 1 to 4, with the higher number indicating a greater likelihood of an earthquake. The proposed project area is located in an area projected as Seismic Zones 3 and 4 (Disaster Center 2006). In 1976, the DSOD limited the storage capacity of the Big Tujunga Canyon dam due to concerns regarding the dam's ability to withstand a large seismic event at full capacity.

3.7.2 **Environmental Consequences**

3.7.2.1 *No Action Alternative*

The No Action Alternative would have no impact on seismic activity within the project area nor would it impact the Big Tujunga Canyon Dam's ability to withstand future seismic activity. The potential for property damage and injury or loss of life from a catastrophic dam failure would remain.

3.7.2.2 *Dam Rehabilitation and Spillway Modification*

This action would bring the dam and its associated structures into compliance with current DSOD criteria for dam safety related to seismicity. This would reduce the likelihood of a catastrophic dam failure during future seismic events and would have a long-term positive impact on property and human life downstream from the dam.

This alternative would require a certificate of approval from the DSOD before water could be stored in the reservoir following completion of the project activities.

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3.8 **AIR QUALITY**

The National Ambient Air Quality Standards established by the U.S. Environmental Protection Agency define the allowable concentrations of pollutants that may be reached but not exceeded in a given time period to protect human health (primary standard) and welfare (secondary standard) with a reasonable margin of safety. These standards include maximum concentrations for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, and particulate matter with a diameter of 10 micrometers (microns) or less.

3.8.1 **Affected Environment**

The Los Angeles Basin, which is located west of the project area, is known for its smog conditions. Air quality within the basin varies by season, time of day, and location. Heavy smog may be present during the warmer months of the year due to smoke from wildfires. Smog is generally concentrated in the basin and along the interface between the San Gabriel Mountains and the Los Angeles Basin. Since the project area is located several miles into the mountains, it is less frequently affected by poor air quality.

3.8.2 **Environmental Consequences**

3.8.2.1 *No Action Alternative*

No construction or other equipment use would be associated with the No Action Alternative. Therefore, the alternative would have no effect on air quality within and adjacent to the project area.

3.8.2.2 *Dam Rehabilitation and Spillway Modification Alternative*

Heavy diesel-powered equipment would be used during construction, which would result in emissions of nitrogen oxides, volatile organic compounds, particulate matter less than 10 microns in size, sulfur oxides, and carbon monoxide.

The South Coast Air Quality Management District (SCAQMD) has established thresholds of significance for emissions of these pollutants from construction equipment (Table 1). These emission thresholds are based on the SCAQMD's plan for attaining ambient air quality standards in the South Coast Air Basin. Construction projects with emissions below these thresholds are too small to impact the SCAQMD's ability to achieve attainment of air quality standards on the SCAQMD's planned schedule.

Exhaust emissions from off-road construction equipment were calculated using emissions factors from SCAQMD. Since emission factors vary per year, the maximum emission factor over the construction period was used in the calculations. In addition, two of the vehicles were modeled using on-road vehicle emission factors from the California Air Resources Board's EMFAC2002 emission factor model (version 2.2). The emission factors were used in conjunction with the following construction data and assumptions:

- Equipment expected to be used in the construction of the proposed project include a concrete saw, a pile driver, an excavator, a crane, a backhoe/loader, a generator/compressor, a soil

SECTION THREE **Affected Environment and Environmental Consequences**

compactor, an aggregate mixer, a sweeper, a water truck, two supply trucks, two hauler/dumper trucks, and a cement truck.

- The average velocity of the vehicles traveling on the site would be 15 miles per hour.
- The working schedule would be 8 hours/day for 22 days/month (176 working hours/month).
- The equipment utilization factor was assumed to be 50 percent. This assumes that each piece of equipment would be operated or in idle mood for 50 percent of the working hours or 88 hrs/month for the entire construction period. This is a conservative, worst-case assumption since most equipment would operate for only a small portion of the entire construction period.

The calculated monthly and daily construction emissions are presented in Table 1. These values assume that all of the equipment would be used during the month. Realistically, the equipment usage would change depending on the phase of the construction. Comparing the results provided in Table 1 indicates that expected construction emissions would be below the significance thresholds established by the SCAQMD.

Table 1
Air Quality Thresholds and Emissions Estimates

Pollutant	SCAQMD Mass Daily Thresholds (pounds/day)	Mass Daily Estimates (pounds/day)
Nitrogen oxides	100	83
Volatile organic compounds	75	8
Particulate matter less than 10 microns	150	4
Sulfur oxides	150	14
Carbon monoxide	550	27

3.9 HAZARDOUS MATERIALS

3.9.1 Affected Environment

Limited amounts of propane, gasoline, oils, and other lubricants needed to heat facilities and maintain and operate machinery at the dam are currently stored on-site. Many of these items are stored in a small utility building located near the boat launching area. There are no other known hazardous substances or materials at the project site. No hazardous waste spill or disposal area(s) are known to be located within or in the vicinity of the project areas.

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3.9.2 **Environmental Consequences**

3.9.2.1 *No Action Alternative*

No new activities would be associated with the No Action Alternative, and this alternative would not have any effect on hazardous materials within the project area. The storage use of propane, gasoline, oils, and other lubricants would continue.

3.9.2.2 *Dam Rehabilitation and Spillway Modification*

Under this alternative, hazardous materials (propane, gasoline, diesel fuel, oils, and other lubricants) required for the operation of the construction equipment would be transported to the project area. To minimize the potential risk of having hazardous materials leaks or spills, especially within and adjacent to water resources, LADPW's contractor would implement the following BMPs:

- Equipment fueling areas would be located at least 100 feet from drainages and areas with riparian vegetation;
- A site-specific refueling plan would be prepared and implemented by LADPW for any equipment within the streambed that cannot be readily moved for refueling;
- All hazardous material spills and contaminated soil would be excavated or covered immediately upon discovery to minimize the potential of wildlife being poisoned or otherwise harmed; and
- LADPW's contractor would maintain hazardous materials spill control, containment, and cleanup kits of adequate size and materials for potential on-site accidental instream releases.

With these BMPs in place, the presence and use of hazardous materials would not constitute a substantial risk of releases to the environment.

3.10 **NOISE**

3.10.1 **Affected Environment**

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are designated as noise. Noise events that occur during the night (10 p.m. to 7 a.m.) are more annoying than those that occur during normal waking hours (7 a.m. to 10 p.m.). Currently, noise within the project vicinity is associated with climatic conditions (e.g., wind and thunder), transportation (e.g., traffic on roads and airplanes), operation of equipment (e.g., gravel pumping), and "life sounds" (e.g., people talking). Climatic and transportation noises are the predominant sources within the project area.

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3.10.2 **Environmental Consequences**

3.10.2.1 *No Action Alternative*

Existing noise levels within and adjacent to the project area would not be affected by the No Action Alternative.

3.10.2.2 *Dam Rehabilitation and Spillway Modification*

Rehabilitation work at the dam would cause temporary increases in ambient noise levels due to the use of heavy equipment and other construction-related activities. The construction activities would not take place in the vicinity of sensitive receptors to noise, such as schools, hospitals, or medical facilities. The nearest residence is more than 1 mile downstream from the dam. In addition, the topography in the vicinity of the dam would confine noise associated with this alternative to the area within the canyon downstream from the dam and only to a limited reach of the canyon. Generally, construction activities would be limited to daylight hours and a normal workweek. With elevated noise levels occurring only during the construction period and being confined to a relatively short reach of the canyon, increases in noise levels are expected to be negligible.

3.11 **PUBLIC HEALTH AND SAFETY**

3.11.1 **Affected Environment**

In 1976, the DSOD determined that Big Tujunga Dam, if operated per its design, had the potential to fail during a major seismic event. At that time, DSOD imposed a seismic restriction on the operation of the dam. The restriction limited the long-term impoundment of water only to an elevation of 2,213 feet (1,484 ac-ft of storage, which is approximately 25 percent of the original design). During major runoff events, the reservoir is allowed to temporarily store up to the design capacity (5,960 ac-ft), which provides a limited amount of flood control. This operational constraint remains on the dam (in excess of 29 years).

3.11.2 **Environment Consequences**

3.11.2.1 *No Action Alternative*

No direct impacts on public safety would occur with the No Action Alternative. However, without any action to rehabilitate the dam, the risk remains that the dam could fail during a seismic event. If the dam was temporarily storing floodwater when the seismic event occurred, failure of the dam could put people living along Big Tujunga Creek in harm's way. In addition, such an event would be expected to flood Big Tujunga Canyon Road, which would constrain first emergency responders from obtaining access to the areas affected by the floodwaters.

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3.11.2.2 *Dam Rehabilitation and Spillway Modification*

This alternative would increase the number of vehicles (trucks transporting equipment and construction materials) and workers traveling to the job site. This increased traffic could result in delays to first responders reacting to an emergency in the watershed. During rehabilitation of the dam, there would be no lane or road closures. The rehabilitation work at the dam would not reduce access to areas beyond or below the dam.

Workers at the dam would address and resolve issues and concerns associated with occupational health and safety for the project. Existing roads in and around the dam are inaccessible to the public, and the public would not be allowed to access any of work areas. Therefore, impacts to public health and safety would be negligible.

3.12 **CULTURAL RESOURCES**

In addition to review under NEPA, consideration of impacts to cultural resources is mandated under Section 106 of the National Historic Preservation Act (NHPA). Requirements include identifying significant historic properties and districts that may be affected by a Federal undertaking and mitigating adverse effects to those resources.

3.12.1 **Affected Environment**

The Big Tujunga Canyon has been inhabited since long before the Spanish moved north into what is now California. It was home to one of the largest Indian villages in the Southland and, later, home to many Spanish missionaries. The area eventually became part of a Mexican land grant. The canyon also provided hideouts for robbers and banditos who preyed on the early settlements of Los Angeles. At the turn of the 20th century, the region became a resort destination for well-heeled hunters and, later, the source of famous olives served at the White House in Washington, D.C. Big Tujunga Dam was completed and dedicated in May 1931.

3.12.2 **Environmental Consequences**

3.12.2.1 *No Action Alternative*

There would be no impacts to properties listed on, or eligible for listing on, the National Register of Historic Places (NRHP) under this alternative.

3.12.2.2 *Dam Rehabilitation and Spillway Modification*

FEMA, in consultation with the California State Historic Preservation Officer (SHPO), LADPW, and OES, determined that the Big Tujunga Dam was eligible for the NRHP and executed a Standard Mitigation Measures Agreement (SMMA) in July 2000. The SMMA required Historic American Engineering Record (HAER) documentation of the dam, which FEMA provided to the SHPO and the National Park Service in November 2000. The SMMA was satisfactorily terminated in March 2001. Subsequent to the SMMA's termination, LADPW refined the scope of work associated with the project. As a result of the proposed new work, FEMA reconsulted with SHPO, LADPW, OES, USFS, and Native American groups identified by the California Native American Heritage Commission. FEMA conducted a record search, which identified no

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known archaeological sites within the area of potential effects. FEMA also conducted a pedestrian archaeological survey of the area of potential effects. No sites potentially eligible to the NRHP were located during this survey. FEMA documented the results of the record search, consultation with Native American groups, and pedestrian survey in a Cultural Resources Technical Report (FEMA 2005b). On November 15, 2005, FEMA transmitted the Cultural Resources Technical Report to the SHPO with a request for concurrence with a determination of “no historic properties affected.” The SHPO concurred with FEMA’s determination by letter of November 30, 2005 (Appendix C). Thus the project complies with Section 106 of the NHPA.

3.13 SOCIOECONOMICS

3.13.1 Affected Environment

No detailed socioeconomic data are available for the communities of Sunland or Tujunga, and there is no population center closer to Big Tujunga Dam. Therefore, the socioeconomic discussion for the project area is based on Los Angeles County. According to the 2000 Census, Los Angeles County is composed of over 9.5 million people. The population of persons 25 years and over is approximately 5.8 million. Approximately 70 percent of the county’s population have graduated from high school and 25 percent have a bachelor’s degree or higher. The labor force (population 16 years and over) contains approximately 4.3 million people (Census 2000).

The median household income (in 1999 dollars) was approximately \$43,000. There are approximately 1.3 million single-family owner-occupied homes in the county, with the median value of these homes being approximately \$200,000 (Census 2000).

3.13.2 Environmental Consequences

3.13.2.1 No Action Alternative

The No Action Alternative would have no impact on socioeconomics in the area unless the dam were to fail. Dam failure would result in a negative social and economic impact on the local communities due to property damage, potential human injury and loss of life, and the financial commitment for disaster recovery.

3.13.2.2 Dam Rehabilitation and Spillway Modification

This alternative would have a short-term positive economic impact on the local economy due to the purchase of goods and services related to the project. The duration of this positive impact would be limited to the duration of construction.

3.14 ENVIRONMENTAL JUSTICE (EO 12898)

EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) directs Federal agencies to ensure that their programs, policies, and activities do not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations. This EO also tasks Federal agencies with

SECTION THREE **Affected Environment and Environmental Consequences**

ensuring that public notification regarding environmental issues is concise, understandable, and readily accessible.

3.14.1 Affected Environment

Los Angeles County is composed of approximately 49 percent Whites, 10 percent African-Americans, 12 percent Asians, and 29 percent some other race (Census 2000). The largest ethnic group is Hispanics or Latinos at approximately 45 percent of the population. Approximately 14 percent of the families and 18 percent of the individuals in Los Angeles County live below the poverty level (Census 2000).

3.14.2 Environmental Consequences

3.14.2.1 No Action Alternative

The No Action Alternative would impact all populations (race, ethnic, and economic) equally; therefore, this alternative would not have a disproportionate adverse impact on low-income or minority persons.

3.14.2.2 Dam Rehabilitation and Spillway Modification

The proposed action would have a long-term positive impact on all populations residing and working within the local community. Therefore, this alternative would not have a disproportional adverse impact on low-income or minority populations. Thus, the project complies with EO 12898.

3.15 PUBLIC SERVICES AND UTILITIES

3.15.1 Affected Environment

An overhead power line provides electricity for dam operations. The operations facilities are heated with propane; therefore, there are no buried natural gas lines within the project area. Potable water is delivered to the operations facilities via buried water lines.

3.15.2 Environmental Consequences

3.15.2.1 No Action Alternative

The No Action Alternative has the potential to impact local utilities at the dam and within downstream communities. If the No Action Alternative results in dam failure, utilities downstream of the dam would suffer an interruption of service due to the inundation of electrical substations and buried water and natural gas lines downstream from the dam.

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3.15.2.2 Dam Rehabilitation and Spillway Modification

The proposed action would not impact any utilities within the project area. During the rehabilitation and modification of the existing dam, no utilities would be interrupted or require relocation. Once completed, the proposed action would have a long-term positive impact on downstream utilities by minimizing the likelihood of damage due to dam failure.

3.16 LAND USE

3.16.1 Affected Area

The land uses within Big Tujunga Canyon and the surrounding area primarily include, but are not limited to, water storage and conservation, recreational activities, scattered residential dwellings, and roadways. The project area is located within the Angeles National Forest.

3.16.2 Environmental Consequences

3.16.2.1 No Action Alternative

The No Action Alternative would have no impact on land use within the project and surrounding areas.

3.16.2.2 Dam Rehabilitation and Spillway Modification

The proposed action would not impact land use within the project area or the canyon. The project area is used primarily for water storage and conservation, and this use would continue post-project. Similarly, none of the proposed project activities would change downstream land use within the canyon or along the creek.

LADPW would be responsible for implementing the following mitigation measures and monitoring activities for the proposed project.

- 1) If construction activities start between March 15 and August 30, a qualified biologist would survey the project limits prior to construction for active raptor nests in riparian areas within 500 feet of all construction activities. Active nests would be avoided or LADPW would request a take permit, if available, from USFWS. It is expected that observed active nests would be protected in place until chicks have fledged or the nest is naturally abandoned. If nesting birds are listed or proposed for listing under the ESA, LADPW would notify FEMA, which would consult with USFWS.
- 2) A qualified biologist would perform raptor nesting surveys once, 30 days prior to the start of construction activities, if work is to begin between February and August. LADPW would avoid work that may disturb the nest or cause chick abandonment within 500 feet of the nest as determined by a qualified biologist. LADPW would also comply with CDFG regulations for raptors.
- 3) LADPW would implement BMPs to minimize project sediment runoff and deposition and comply with NPDES permit requirements.
- 4) LADPW would direct the temporary construction bypass outlet pipe into a dissipater device to minimize streambed and bank erosion. Rock material would be sufficient in size so as to not be displaced by varying outlet velocity. Rock would be natural rock (3 feet plus or to engineered specification). Efforts would be made to remove dissipater rock upon completion of construction and operation of the bypass pipe. An alternative dissipater may include a manufactured device that is temporarily placed within the limits of permitted impact.
- 5) LADPW would comply with CDFG, Army Corps of Engineers, and RWQCB permit requirements to minimize impacts to native vegetation, rare plants, wildlife, and water quality.
- 6) LADPW would maintain hazardous materials spill control, containment, and cleanup kit of adequate size and materials for potential on-site accidental instream releases.
- 7) LADPW would use the culvert crossing immediately downstream of the plunge pool to create an emergency detention basin to capture accidental instream releases. The basin could be created with plywood or other sheeting to close the culvert inlet and contain contaminated water. Gravel or clean sandbags would be stored near the culvert crossing and used to create a temporary check dam and close the culverts on an as needed basis. Materials would not be left in the stream during seasonal flows or when there is a chance of them being washed downstream of the crossing.
- 8) If vegetation would need to be removed between March 15 and September 15, pre-disturbance surveys would be conducted to determine whether birds are nesting within the disturbance area and active nests are present. As appropriate, CDFG and USFWS would be contacted and consulted for concurrence to proceed prior to the start of new activity if active nests of bird species are discovered during vegetation removal. If nesting birds are listed or proposed for listing under the ESA, LADPW would notify FEMA, which would consult with USFWS.

- 9) During dewatering of the plunge pool, in compliance with environmental regulatory permit conditions, a qualified biologist with the participation of a qualified native fish specialist would monitor the construction and identify and handle any native species captured. The mechanical pump used for dewatering would be equipped with a screen to prevent injury or mortality to aquatic species. If aquatic species are listed or proposed for listing under the ESA, LADPW would notify FEMA, which would consult with USFWS. Native aquatic species would be captured by net as the water level within the plunge pool drops. Captured individuals would be temporarily held in insulated containers and then relocated downstream of the crossing culvert at the downstream limits of the project. No native species would be relocated upstream of the dam. Nonnative invasive species would be captured and collected for scientific study. Nonnative species would not be released to other locations.
- 10) No work would occur outside of the defined project limits.
- 11) A biological monitor would monitor construction activity at biweekly intervals to confirm compliance with permit conditions and mitigation measures to minimize potential impacts. The biological monitor would provide a monthly monitoring report and keep a log of each site visit observations and notes. A minimum of two visits would be conducted each month during active construction.
- 12) Personnel on-site would not be permitted to hunt or have unleashed dogs, cats, or other domesticated or wild pets while on-site.
- 13) Smoking would be restricted to areas of bare soil to minimize the potential of starting a wildfire.
- 14) All welding or grinding that produces sparks or has the potential to cause wildfire would be monitored by construction personnel. This fire monitor would have an extinguisher suitable for the conditions, shovel, or other means of extinguishing stray sparks.
- 15) All trash would be contained and regularly removed from the site. Containers would be sealed to prevent opening by wildlife.
- 16) All hazardous material spills and contaminated soil would be excavated or covered immediately upon discovery to minimize the potential for wildlife from being poisoned or otherwise harmed. Equipment fueling areas would be at least 100 feet from drainages and riparian habitats. The contractor would prepare and implement a site-specific refueling plan for any equipment within the streambed that cannot be readily moved for refueling. The refueling plan would be reviewed by LADPW and its biological monitor.
- 17) Native trees would be avoided to the extent practicable. Small trees would be enclosed with fencing to protect the drip zone. Some trees of adequate size (less than 4 inches in diameter at breast height) and health can be relocated in planned work areas such as the storage and staging yards. Any relocated tree would be artificially watered until it is established or as directed by the biological monitor for the project.
- 18) The project would comply with USFS Project Activity Level requirements for fire safety. The LADPW or its contractor would obtain variance or comply with fire safety work restrictions.

- 19) LADPW or its representative would provide construction staff with environmental awareness information to facilitate efforts to minimize and avoid direct effects to USFS sensitive species and all wildlife and native habitat that may occur within and adjacent to the project and is not permitted for impact.
- 20) LADPW would ensure that excavation does not create situations where reptiles may fall into an opening and become trapped. Until backfilled, excavated areas need to include escape ramps or be fitted with drift fences. Before backfilling, the biological monitor would check excavated areas to ensure that no wildlife species are present in the opening. If any individuals are present, the biological monitor would remove them before backfilling.
- 21) LADPW would limit disturbance of native habitat. LADPW would monitor areas disturbed by construction activity but not regularly redisturbed for germination of USFS sensitive species that are disturbance adapted. If sensitive species are observed, then efforts would be made to avoid vegetative growth and allow individual plants to produce seeds.
- 22) Upon completion of construction activities, disturbed areas would be stabilized to minimize erosion and limit growth of nonnative invasive species. Riparian areas temporarily affected are expected to produce new growth from the preserved seed bank and protected roots and trunks of cut material. Depending on the use of disturbed upland areas, a native seed installation plan may be required. USFS would have the opportunity to review and provide comment on a seeding plan if prepared for the project.
- 23) Light shields for night work would be used to focus light on the construction area and away from wildlife habitat.
- 24) Noise shields would be used for any generators employed during construction activities.
- 25) Pre-construction protocol surveys for least Bell's vireo and southwestern willow flycatcher would occur annually during the breeding seasons of each species until construction is complete. If either species is identified during these surveys, LADPW would notify FEMA, which would consult with USFWS.
- 26) One complete survey for slender-horned spineflower would be conducted during the blooming period, and one complete follow-up survey within 4 weeks of the initial survey would also be conducted to confirm the presence or absence of this species. If slender-horned spineflower is identified during these surveys, LADPW would notify FEMA, which would consult with USFWS.
- 27) LADPW would implement the USFS Invasive Plant Control program. All vehicles and equipment would be washed before and after entering all project sites. Washing would include wheels, undercarriages, bumpers, and all parts of the vehicles. All tools such as chainsaws, hand clippers, and pruners would also be washed before and after entering the project sites. All washing would take place where rinse water is collected and disposed of in either a sanitary sewer or a landfill. When vehicles and equipment are washed, a daily written log would be kept. All written logs would be turned into the USFS Botanist weekly. The written log would follow the example in Project Construction, Invasive Plant Control Mitigations (FSM 2081.03).

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Appendix A

**Amendment Number 2, FS Agreement No. 3-MU-11050100-054,
FEMA No. HMGP-1008-3182**

AMENDMENT NUMBER 2
FS AGREEMENT NO. 3-MU-11050100-054 FEMA NO. HMGP-1008-3182
to the

MEMORANDUM OF UNDERSTANDING
between the

UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE
ANGELES NATIONAL FOREST
and the

FEDERAL EMERGENCY MANAGEMENT AGENCY
for

THE BIG TUJUNGA DAM SEISMIC REHABILITATION
AND SPILLWAY MODIFICATION PROJECT

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This **Amendment Number 2 FS Agreement No. 3-MU-11050100-054 FEMA No. HMGP-1008-3182** (hereinafter referred to as Amendment No. 2) hereby modifies the Memorandum of Understanding (hereinafter referred to as the MOU) between the United States Department of Agriculture Forest Service Angeles National Forest (hereinafter referred to as the Forest Service) and the Federal Emergency Management Agency (hereinafter referred to as FEMA) for the Big Tujunga Dam Seismic Rehabilitation and Spillway Modification Project.

- A. **PURPOSE:** The purpose of this Amendment No. 2 is to modify previously agreed upon principles of organization and coordination between the Forest Service and FEMA for National Environmental Policy Act (hereinafter referred to as NEPA) compliance and establish agreed upon principles of organization and coordination between the Forest Service and FEMA for Endangered Species Act (hereinafter referred to as ESA) and National Historic Preservation Act (hereinafter referred to as NHPA) compliance for the Big Tujunga Dam Seismic Rehabilitation and Spillway Modification Project.

The Los Angeles County Department of Public Works (hereinafter referred to as LADPW) proposes to acquire FEMA funding to perform seismic rehabilitation and spillway modification of the Big Tujunga Dam (hereinafter referred to as Rehabilitation) with the intent of modifying the operations of Big Tujunga Dam in the future. FEMA and the Forest Service executed the MOU for Rehabilitation on 18 September 2003. Subsequent to the execution of the MOU, LADPW agreed to operate the Big Tujunga Dam during and after Rehabilitation in the same manner as it currently operates Big Tujunga Dam until it prepares and implements an approved revised operations plan for Big Tujunga Dam (hereinafter referred to as Operations). Based on this information, FEMA, the Forest Service, LADPW, the U.S. Fish and Wildlife Service (hereinafter referred to as USFWS), and the California Department of Fish and Game have reached a consensus resolution that

Rehabilitation and Operations constitute two separate projects for the purposes of NEPA and ESA compliance. FEMA and the Forest Service have reached a consensus resolution that Rehabilitation and Operations constitute two separate projects for the purposes of NHPA compliance.

B. STATEMENT OF MUTUAL BENEFIT AND INTERESTS: FEMA is identified as the NEPA, ESA, and NHPA Lead Agency for Rehabilitation. The Forest Service will serve as a Cooperating Agency for Rehabilitation. The Forest Service is identified as the NEPA, ESA, and NHPA Lead Agency for Operations. This Amendment No. 2 is limited to the preparation of documents related to NEPA, ESA, and NHPA compliance.

C. THE FOREST SERVICE SHALL:

1. Be responsible for overall NEPA, ESA, and NHPA compliance for Operations.
2. Manage the preparation of documents supporting NEPA, ESA, and NHPA compliance associated with Operations, though the Forest Service may task LADPW with the preparation of the aforementioned documents.
3. Assure that the environmental review process meets its regulatory and procedural guidelines as set out in Title 36 of the Code of Federal Regulations Part 215 and Forest Service Handbook 1909.15 for Operations.
4. Provide comments to FEMA concerning the following, as associated with Rehabilitation: the public scoping process, issue formulation, development of alternatives including the no action alternative, environmental impact analysis, Draft and Final Environmental Assessments, Finding of No Significant Impact (hereinafter referred to as the FONSI), Draft and Final Biological Assessments, consultation with USFWS, Draft and Final Cultural Resources Technical Reports, and consultation with the State Historic Preservation Officer (hereinafter referred to as the SHPO).

D. FEMA SHALL:

1. Be responsible for overall NEPA, ESA, and NHPA compliance for Rehabilitation.
2. Manage the preparation of documents supporting NEPA, ESA, and NHPA compliance associated with Rehabilitation and serve as contract administrator for any consulting contracts for the preparation of the aforementioned documents.
3. Ensure that the Forest Service has the opportunity to review and comment on the following, as associated with Rehabilitation: the public scoping process, issue formulation, development of alternatives including the no action alternative, environmental impact analysis, Draft and Final Environmental Assessments, the FONSI, Draft and Final Biological Assessments, consultation with USFWS, Draft and Final Cultural Resources Technical Reports, and consultation with the SHPO.


4. Assure that the environmental review process meets its regulatory and procedural guidelines as set out in Title 44 of the Code of Federal Regulations Part 10 for Rehabilitation.

E. IT IS MUTUALLY AGREED AND UNDERSTOOD BY ALL PARTIES THAT:

All terms and conditions of the MOU not modified herein by this Amendment No. 2 will remain in place for the duration of the MOU.

THE PARTIES HERETO have executed this instrument:

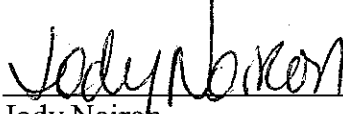
FEDERAL EMERGENCY
MANAGEMENT AGENCY
Region IX



Alessandro Amaglio
Environmental Officer

Aug. 19, 2005
Date

UNITED STATES DEPARTMENT OF
AGRICULTURE FOREST SERVICE
Angeles National Forest



Jody Noiroh
Forest Supervisor

8/24/05
Date

Appendix B

U.S. Fish and Wildlife Service Letter of December 14, 2005



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92008

In Reply Refer To:
FWS-LA-3546.2

DEC 14 2005

Alessandro Amaglio
U.S. Department of Homeland Security
Federal Emergency Management Agency
1111 Broadway, Suite 1200
Oakland, California 94607-4052



Subj: Request for Section 7 Informal Consultation Regarding the Proposed Big Tujunga Dam Seismic Rehabilitation Project, Los Angeles County, California

Dear Mr. Amaglio:

This letter responds to your request and biological assessment dated November 22, 2005, and received on November 23, 2005, regarding the potential effects of the proposed Big Tujunga Dam Seismic Rehabilitation project on the federally endangered Braunton's milk-vetch (*Astragalus brauntonii*), Nevin's barberry (*Berberis nevinii*), slender-horned spineflower (*Dodecahema leptoceras*), arroyo toad (*Bufo californicus*), southwestern willow flycatcher (*Empidonax traillii extimus*), unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), California condor (*Gymnogyps californianus*), mountain yellow-legged frog (*Rana muscosa*), and least Bell's vireo (*Vireo bellii pusillus*); the federally threatened thread-leaved brodiaea (*Brodiaea filifolia*), Santa Ana sucker (*Catostomus santaanae*), bald eagle (*Haliaeetus leucocephalus*), coastal California gnatcatcher (*Polioptila californica californica*), and California red-legged frog (*Rana aurora draytonii*); and designated critical habitat for the Santa Ana sucker and California red-legged frog. In your biological assessment, you concluded that the proposed Big Tujunga Dam Seismic Rehabilitation project is not likely to adversely affect or will not affect these species or critical habitat and requested our concurrence with these determinations in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

The proposed project involves the placement of concrete on the downstream face of the existing arch dam to create a thick-arch. The project also includes additional modifications, such as raised parapet walls (including breakaway walls and/or railings at the dam crest), the modification of the dam crest as an auxiliary spillway, a new elevator, new lighting, new dam controls system, a new controls house, new valves (including a 5 cubic-foot per second low-flow valve), a new valve house with a crane, new instrumentation, a boat dock, the raising of a new aboveground diesel tank for an emergency generator, the replacement of a 2-inch diameter waterline between both of the dam water tanks and across the dam crest, erosion protection measures (including re-armoring the sides of the plunge pool), and the grading and paving of a

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permanent access road. Construction is expected to occur over 2-3 years. Light shields for night work will be used to focus light on the construction area and away from wildlife habitat. Noise shields will be used for any generators employed during construction activities. Dam operations will not change during or after dam rehabilitation activities until section 7 consultation with the U.S. Fish and Wildlife Service (Service) occurs. Foundation excavation spoils from the plunge pool and canyon walls will be transported to the Maple Canyon Sediment Placement Site. Construction staging areas will be located on the left abutment parking area, the two adjacent areas on either side of the main entrance gate, the downstream end of the existing plunge pool, and the right abutment to the south of the helipad and upstream of the existing spillway. On completion of construction, the staging area adjacent to the front gate will be re-seeded with native vegetation.

Overall, the proposed project activities directly affect about 15.3 acres, mostly within existing disturbed areas. Approximately 13.9 acres will be temporarily affected by the proposed project including 0.21 acres of chaparral, 0.47 acres of successional sage scrub, 0.22 acres of riparian forest, 0.21 acres of non-native grassland, 4.23 acres of non-native grassland/ruderal habitat, 0.7 acres of open water, 2.6 acres of developed land, 5.2 acres of ruderal/disturbed land, and 0.08 acres of ornamental vegetation. Approximately 1.4 acres will be permanently affected including 0.43 acres of open water, 0.94 acres of developed land, and 0.02 acres of ornamental vegetation. The plunge pool below the dam will be permanently smaller by approximately 0.43 acres due to an increase in the dam thick arch and the construction of the access road.

Prior to construction, the plunge pool below the dam will be dewatered by a mechanical pump equipped with a screen to prevent injury or mortality to aquatic species during the dewatering process. Also, a qualified biologist and native fish specialist will monitor this process and native species will be netted and relocated downstream of the dam discharge area. The instream water will be discharged back to the existing stream from the downstream end of the plunge pool at the same intensity as the current discharge regime at a distance of 50 to 100 feet from the existing discharge location. Protocol-level surveys for the least Bell's vireo and southwestern willow flycatcher will occur each year of the project activities. Surveys will occur for the slender-horned spineflower in 2006 including two visits within four weeks of each other during the blooming period of this species.

Based on our review of the proposed Big Tujunga Dam Seismic Rehabilitation project, we concur that the proposed action is not likely to adversely affect listed species or their critical habitats. We concur for the following reasons:

Braunton's milk-vetch and Nevin's barberry-The project area is not near known occurrences of these species; portions of the project area are subject to periodic disturbance, which is conducive to locating Braunton's milkvetch; and surveys did not detect these species.

Slender-horned spineflower-The project area is not near known occurrences of slender-horned spineflower, previous surveys did not detect this species, and additional surveys will occur in 2006, prior to project activities.

Thread-leaved brodiaea-The project area is not near known occurrences of thread-leaved brodiaea, surveys have not detected this species, and habitat conditions are not suitable for this species in the project area due to the lack of clay soils.

Mountain yellow-legged frog and California red-legged frog and its critical habitat- Multiple years of surveys above and below the dam on the Angeles National Forest have failed to detect these species (Carlsbad Fish and Wildlife Office, survey files). Further, the plunge pool contains non-native predatory species, including bullfrogs (*Rana catesbeiana*) and has been subject to periodic high flows from the dam. Also, prior to implementing construction activities, the project proponents will drain the plunge pool. During draining of the plunge pool, a biologist will be present to monitor, identify, and handle any native species captured. If a federally-listed species is detected during this process that could be adversely affected by the proposed action, consultation with the Service will occur prior to implementing further actions. The proposed project permanently affects 0.43 acres of the 14.45 acre plunge pool which is within the approximately 73,500 acre Big Tujunga Unit of California red-legged frog designated critical habitat. However, due to the limited nature of the potential effects to habitat conditions and the lack of known occurrences of California red-legged frogs in the unit; the function of the Big Tujunga Unit of designated critical habitat in providing for the breeding, feeding, dispersal and recovery of the California red-legged frog should not be affected.

Arroyo toad-In addition to the reasons described above for the mountain yellow-legged frog and California red-legged frog, the plunge pool does not represent suitable habitat for the arroyo toad. It is deep water habitat that contains non-native predatory species. The project area also lacks an open, sandy channel. Multiple years of surveys below the dam have failed to detect this species (Carlsbad Fish and Wildlife Office, survey files).

Southwestern willow flycatcher and least Bell's vireo-Focused surveys did not detect these species in 2004. Protocol-level surveys for these species will occur every year during project activities. The proposed action includes the potential disturbance of 0.22 acres of riparian habitat. If disturbance of riparian habitat occurs during the breeding season, a monitor will be present to verify that no nesting activity is occurring.

Santa Ana sucker and its critical habitat-Habitat assessment and survey work did not document this species occurring within the project area and indicates that several barriers likely preclude the movement of Santa Ana sucker into the project area (Camm Swift 2002¹). The Santa Ana sucker has been identified about one mile downstream from the project area. During draining of

¹ Swift, C.C. 2002. Fish Survey of Big Tujunga Creek below Big Tujunga Dam No. 1 with Special Reference to Santa Ana Sucker. Unpublished report prepared for the Los Angeles County Department of Public Works.

the plunge pool, a biologist familiar with native species will be present to monitor for and handle any native species captured. If a Santa Ana sucker is detected during this process that could be adversely affected by the proposed action, consultation with the Service will occur prior to implementing further actions. The proposed project permanently affects 0.43 acres of the 14.45 acre plunge pool which is within the approximately 2,540 acre Big Tujunga Unit of Santa Ana sucker designated critical habitat. However, due to the limited nature of the potential effects to habitat conditions, the lack of stream habitat in the project area, and the lack of known occurrences of Santa Ana sucker in the project area; the function of the Big Tujunga Unit of designated critical habitat in providing for the breeding, feeding, dispersal and recovery of the Santa Ana sucker should not be affected.

California condor, bald eagle, and coastal California gnatcatcher-The proposed activities are of a relatively short duration and occur in a small, targeted area. These species have not been found to concentrate in or near the area of the proposed activities. The area surrounding the project site is dominated by chaparral species.

Unarmored threespine stickleback-This species has not been located within the Los Angeles basin since before 1942 (45 FR 76012).

Should the project plans change, or if additional information is found on the distribution of listed species within the project area, these determinations should be reconsidered. Should you have any questions regarding this letter, or your responsibilities under the Act, please contact Fish and Wildlife Biologist Jesse Bennett of my staff at (760) 431-9440.

Sincerely,



K Karen A. Goebel
Assistant Field Supervisor

cc:

Jody Noiron, Angeles National Forest, Arcadia, California

Sterling Klippel, Los Angeles Department of Public Works, Alhambra, California

Appendix C

State of California Office of Historic Preservation Letter of November 30, 2005

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov



2005 DEC -2 PM 1:59

RECEIVED

November 30, 2005

Mr. Allesandro Amaglio, AIA
Federal Emergency Management Administration
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

Dear Mr. Amaglio:

Re: Big Tujunga Dam Seismic Rehabilitation, Los Angeles County, Department of Public Works, FEMA-1008-DR-CA, HMGP # 1008-3182

I received your letter of November 15, 2005, regarding the subject Hazard Mitigation Grant Program undertaking. As you note, the bulk of the work associated with this undertaking has been dealt with in a Standard Mitigation Measures Agreement, executed between FEMA and this office in July, 2000. That SMMA addressed recordation of the dam itself, which is eligible for listing in the National Register of Historic Places. In December 2003, you wrote to this office, seeking comments of the State Historic Preservation Officer regarding refined aspects of the undertaking, reflecting work not known or anticipated in the July 2000 correspondence. The SHPO responded on December 22, 2003, with recommendations for treatment of three project elements: archaeological work on a landfill; HAER recordation of additional elements of the dam; and coordination with the Forest Service, on whose land the bulk of the work will occur.

Your most recent correspondence transmits a *Cultural Resources Technical Report. Big Tujunga Dam*, prepared by URS Corporation and dated November 2005. Your letter and the Technical Report summarize record searches from the SCCIC and the Angeles National Forest, as well as field survey conducted for this undertaking by URS, dealing with ancillary construction sites for the undertaking, specifically staging areas A and B and incidental water line relocations. The findings of the record search and field survey were negative, i.e. identified no properties that meet the criteria for listing in the National Register.

You seek my concurrence in a finding of **"no historic properties affected."** I concur.

Thank you for consulting with me on this undertaking. If you have further questions, please contact Stephen Mikesell, the Deputy State Historic Preservation Officer at (916) 653-7113.

Sincerely,

A handwritten signature in cursive script, appearing to read "Stephen Mikesell for". The signature is written in dark ink on a light-colored background.

Milford Wayne Donaldson, FAIA
State Historic Preservation Office