

Appendix B – Draft Mitigation Monitoring Program

**SACRAMENTO MUNICIPAL UTILITY DISTRICT'S
UPPER AMERICAN RIVER PROJECT
(FERC NO. 2101)**

**Draft Mitigation Monitoring and Reporting Program
including Construction and Operation of the
Iowa Hill Pumped-storage Development**

Prepared by:
CH2M HILL
Sacramento, California

Prepared for:
Sacramento Municipal Utility District
Sacramento, California

APRIL 2008

Draft Mitigation Monitoring and Reporting Program

Introduction

The Federal Energy Regulatory Commission (FERC), pursuant to the Federal Power Act (FPA) and the U.S. Department of Energy Organization Act, is authorized to issue licenses for up to 50 years for the construction and operation of non-federal hydroelectric developments in the United States. As such, the Upper American River Project (UARP) relicensing, which includes the proposed construction and operation of the Iowa Hill Pumped-storage Development, will ultimately be governed by the new FERC-issued license. The license will contain environmental measures deemed appropriate by FERC, as well as mandatory conditions prescribed by the USDA Eldorado National Forest under section 4(e) of the FPA and by the California State Water Resources Control Board (SWRCB) under section 401 of the Clean Water Act.

In compliance with the National Environmental Policy Act (NEPA), FERC and the U.S. Forest Service prepared the Final Environmental Impact Statement for Hydropower License, Upper American River Project, FERC Project No. 2101-084, California, and Chili Bar Hydroelectric Project, FERC Project No. 2155-024, California (Final EIS). As described in the Sacramento Municipal Utility District's (SMUD's) Draft CEQA Supplement to FERC/USFS Final Environmental Impact Statement for Hydropower License, and Analysis of Iowa Hill Joint Advisory Committee Comments (Supplemental Analysis), the California Environmental Quality Act (CEQA) states that state and local agencies shall rely on an EIS that is prepared before an Environmental Impact Report (EIR) would otherwise be required and the EIS complies with CEQA. To comply with CEQA, an EIS 1) should analyze feasible alternatives or feasible mitigation measures available that would substantially lessen the significant environmental effects of the project, and 2) shall mitigate or avoid the significant effects on the environment of projects that it carries out whenever it is feasible to do so. (Cal. Pub. Res. Code §§ 21002, 21002.1.) CEQA also requires adopting a Mitigation Monitoring and Reporting Program (MMRP) for the changes made to the project or conditions of project approval adopted to mitigate or avoid significant effects on the environment. The purpose of the MMRP is to ensure compliance with all proposed changes and mitigation measures during project implementation. (*Id.* § 21081.6.)

Mitigation monitoring and reporting for the UARP relicensing will be provided in part through the new license and in part through the February 2007 Settlement Agreement for the Upper American River Project. Once the new license is issued by FERC and accepted by SMUD, the license will govern SMUD's operation of the UARP. Many of the license conditions are intended to mitigate for the potentially

significant environmental effects of UARP operations, and to that end will state intended objectives, contain specific performance criteria and schedules, and require consultations with resource agencies and other parties. In addition, SMUD and several fish and wildlife agencies, land management agencies, and interest groups and businesses, collaboratively developed a series of environmental measures applicable to the UARP and the Iowa Hill Development. These measures were formalized in a Settlement Agreement submitted to FERC for inclusion in the project's environmental review under NEPA. Like the EIS, the Settlement Agreement provides additional conditions, performance criteria and schedules, and consultation requirements intended to address the environmental effects of the UARP. Thus, under their own terms, the license conditions and the Settlement Agreement would suffice as an MMRP.

The Supplemental Analysis proposes to add specific elements to these measures to avoid or mitigate for certain potential significant effects related to the Iowa Hill Development. Thus, these changes and measures must be addressed in an MMRP.

The following MMRP, provided in Table B-1, identifies each potential significant impact of relicensing the UARP, lists the project changes or mitigation measures that are proposed to avoid the impact or reduce it to below the level of significance, and describes the monitoring and reporting measures SMUD will undertake to ensure the project changes and mitigation measures are implemented as proposed. By way of creating a single document that provides a thorough record of the project's mitigation and monitoring requirements, this MMRP also includes the measures contained in the Final EIS and the Settlement Agreement, and the specific elements detailed in the Supplemental Analysis.

Program Implementation

SMUD will retain primary responsibility for implementing the mitigation measures and monitoring the implementation process. Individual measures contain specified timelines for implementation, consultation with resource agencies, and reporting requirements to FERC and other parties. SMUD will also be responsible for implementing and reporting on mitigation measures contained in the SWRCB 401 Water Quality Certificate and other permits required for construction purposes.

SMUD will designate specific personnel who will be responsible for monitoring the implementation of the mitigation measures that will occur during UARP operation, including Iowa Hill Development construction and operation. The designated personnel will be responsible for submitting all documentation and reports to SMUD in a timely manner necessary for demonstrating compliance with mitigation requirements. SMUD will ensure that the designated personnel have authority to require implementation of mitigation requirements and will be capable of

terminating project activities found to be inconsistent with mitigation objectives or project approval conditions.

SMUD will be responsible for demonstrating compliance with other agency permit conditions to the appropriate regulatory agency. It will also be responsible for ensuring that project personnel understand their responsibilities for adhering to the performance requirements of the mitigation monitoring program and other contractual requirements related to the implementation of mitigation as part of all construction activities. In the case of outside contractors, implementation includes ensuring that any required actions are included in bid documents and contracts as part of the design/build process for the Iowa Hill Development and the monitoring implementation process for ongoing activities at the UARP. Design/build contractors associated with the Iowa Hill Development construction will be required by SMUD to include specified mitigation activities in plans and specifications for construction.

For each potential environmental impact and prescribed mitigation measure, Table B-1 lists the corresponding mitigation implementation and monitoring requirements, and the party responsible for ensuring implementation of the mitigation measure and monitoring effort.

Mitigation Enforcement

SMUD, and ultimately, FERC will be responsible for enforcing all mitigation measures. If alternative mitigation measures are identified that would be equally effective in mitigating the identified impacts, the implementation of these alternative measures will not occur until agreed upon by SMUD, and in certain instances, fish and wildlife agencies, and approved by the FERC.

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Geology and Soils					
Upland erosion and sediment sources	Implement Proposed Article 1-30 Transportation System Management Plan to control project-related erosion during construction of road improvements and road maintenance.	<p>One-time: Develop and file a USFS-approved Plan with FERC within 1 year after license issuance.</p> <p>Ongoing: Implement Plans throughout project construction and operation; every 5 years, develop and file a USFS-approved 5-year Plan for road maintenance and reconstruction needs with FERC.</p>	Ongoing: Throughout project construction. Update every 5 years.	Construction Contractor during construction; SMUD during operation	SMUD
Sediment deposition in rivers and creeks	Implement Proposed Article 1-2 Pulse Flows.	<p>One-time: Provide pulse flows after new minimum stream flows are established and not before 3 months after license issuance.</p> <p>Ongoing: Throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-5 Monitoring Program to monitor reaches for geomorphology changes.	Ongoing: Implement the Program after license issuance and throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-7 Gerle Creek Channel Stabilization.	<p>One-time: Develop a Plan within 2 years after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Sediment deposition in Slab Creek Reservoir from Iowa Hill Development construction	Implement Proposed Article 1-42 Water Quality and Water Pollution.	<p>One-time: Provide to agencies the detailed design plans, construction schedule, approved Storm Water Pollution Prevention Plan, and obtain permits prior to starting project construction.</p> <p>Ongoing: Implement the Plans and permit conditions throughout project construction and operation.</p>	<p>Ongoing: Throughout project construction and operation.</p>	SMUD	SMUD
Iowa Hill Development construction creation of dust and erosion	Implement Proposed Iowa Hill Visual Resources Protection Plan per Article 1-27, which will address dust and erosion control.	<p>One-time: Develop a Visual Resources Protection Plan and file it with FERC before initiating ground-disturbing activities. A draft Plan will be submitted to the U. S. Forest Service for review.</p> <p>Ongoing: Implement the Plan throughout project construction and operation.</p>	<p>Ongoing: Throughout project construction and operation.</p>	Construction Contractor and SMUD	SMUD
	Implement Proposed Article 1-47 Spoils Disposal.	<p>One-time: Prior to the start of project construction, consult with agencies to obtain approvals for discharge of spoils to land.</p> <p>Ongoing: Conduct spoils disposal throughout project construction.</p>	<p>One-time: Prior to the start of project construction.</p> <p>Ongoing: Periodic check of spoils disposal throughout project construction.</p>	Construction Contractor and SMUD	SMUD
Impacts on groundwater from Iowa Hill Development	Implement Proposed Article 1-43 Groundwater.	<p>One-time: Develop a U. S. Forest Service-approved plan for managing groundwater and file it with FERC prior to the start of project construction.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	<p>Ongoing: Implement Plan throughout project construction and operation.</p>	SMUD	SMUD

Water Resources

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Impacts on water quantity (streamflows and reservoir levels)	Implement Proposed Article 1-1 Minimum Streamflows.	Ongoing: Beginning as early as 3 months after license issuance, and throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-10 Streamflow and Reservoir Elevation Gaging.	One-time: Develop and file with FERC a SWRCB-approved Streamflow and Reservoir Elevation Gaging Plan that meets U. S. Geological Survey standards within 1 year after license issuance. Ongoing: Implement the Plan throughout project operation.	Ongoing: Implement Plan Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-23 Reservoir Levels.	One-time: Meet or exceed end-of-month reservoir elevations within 6 months of license issuance. Ongoing: Throughout project operation; every 5 years, prepare a report indicating results.	Ongoing: Throughout project operation.	SMUD	SMUD
Streamflow and Reservoir Elevation Gaging Plan	Implement Proposed Article 1-10 Streamflow and Reservoir Elevation Gaging.	One-time: Develop and file with FERC a SWRCB-approved Streamflow and Reservoir Elevation Gaging Plan that meets U. S. Geological Survey standards within 1 year after license issuance. Ongoing: Implement the Plan throughout project operation.	Ongoing: Implement Plan Throughout project operation.	SMUD	SMUD
	Investigate telemetry equipment, and install it if feasible and after necessary approvals are received.	One-time: Include in Plan. Within 1 years after license issuance.	One-time: 1 year after license issuance.	SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
	Install and maintain simple staff gages at the put-ins for the Slab Creek and Ice House recreational boating runs.	One-time: Within 2 years after license issuance.	One-time: 2 years after license issuance.	SMUD	SMUD
Public information services	Implement Proposed Article 1-25 Public Information Services.	One-time: Develop in consultation with agencies and submit to FERC a U. S. Forest Service- and SWRCB-approved plan for providing real-time lake stage height and storage information, and real-time streamflow and reservoir level information within 1 year after license issuance. Ongoing: Implement the Plan throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
		One-time: Develop a SWRCB-approved Streamflow and Reservoir Elevation Gaging Plan meeting U. S. Geological Survey standards and file it with FERC within 1 year after license issuance. Ongoing: Implement the Plan throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts on water quality	Implement Proposed Article 1-1 Minimum Streamflows.	Ongoing: Beginning as early as 3 months after license issuance, and throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
	If the new flow regime does not reduce mean daily temperatures to less than 20°C in Silver Creek below Junction and Camino Dams, develop a plan for using a block of water to further reduce reach temperatures in wet years.	<p>One-time: Develop the Plan at the start of operation.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-11 Canal and Penstock Emergency and Maintenance Release Points.	One-time: Within 1 year after license issuance.	One-time: 1 year after license issuance.	SMUD	SMUD
Iowa Hill Development construction and maintenance impacts on water quality	Implement Proposed Article 1-42 Water Quality and Water Pollution.	<p>One-time: Submit the plans and permits to the agencies and file an approved Storm Water Pollution Prevention Plan (SWPPP) to FERC prior to the start of project construction.</p> <p>Ongoing: Implement the plans and permits throughout project construction and operation. Retain copy of SWPPP onsite and update as needed.</p>	Ongoing: Throughout project operation. Update as needed.	SMUD	SMUD
Recreation activity impacts on water quality	Implement Proposed Article 1-5(10) Monitoring Program.	<p>One-time: Develop and submit a Draft Plan to SWRCB within 6 months of license issuance; file Final Plan with FERC.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Impacts on water temperature to primary stream flow and reservoirs	Implement Proposed Article 1-5(9) Monitoring Program.	<p>One-time: Submit a SWRCB-approved Plan to FERC within 1 year after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts on water temperature to edgewater of streams and reservoirs	Implement Proposed Article 1-5(3) Monitoring Program. FYLF = Foothill Yellow-Legged Frog MYLF = Mountain Yellow-Legged Frog	<p>One-time: Develop a FYLF Plan within 1 year after license issuance; develop a MYLF Plan within 2 years after license issuance.</p> <p>Ongoing: Implement the Plans throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-6(1), (2), and (9) Adaptive Management Program.	<p>One-time: Implement the Program within 3 months after license issuance.</p> <p>Ongoing: Implement the Program throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-40 Aquatic Resources.	Ongoing: For 2 years prior to and 2 years after Iowa Hill Development operations starts.	Ongoing: For 2 years prior to and 2 years after Iowa Hill Development operation starts.	SMUD	SMUD
Impacts on water temperature from Iowa Hill Development	Implement Proposed Article 1-40(2) Aquatic Resources.	Ongoing: For 2 years prior to and 2 years after Iowa Hill Development operations starts.	Ongoing: For 2 years prior to and 2 years after Iowa Hill Development operation starts.	SMUD	SMUD
Impacts on water quality	Implement Proposed Article 1-5(10) Monitoring Program.	<p>One-time: Develop and submit a Draft Plan to SWRCB within 6 months of license issuance; file Final Plan with FERC.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Algae monitoring and adaptive management	Implement Proposed Article 1-5(6) Monitoring Program.	One-time: Develop a Program within 1 year after license issuance. Ongoing: Implement the Program throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-6(7) Adaptive Management Program.	One-time: Implement the Program within 3 months after license issuance. Ongoing: Implement the Program throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Aquatic Resources					
Effects on minimum stream flows	Implement Proposed Article 1-8 Fish Passage at Gerle Creek.	Ongoing: Throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-6 Adaptive Management Program.	One-time: Implement the Program within 3 months after license issuance. Ongoing: Implement the Program throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-10 Streamflow and Reservoir Elevation Gaging.	One-time: Within 1 year after license issuance.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-1 Minimum Streamflows.	Ongoing: Throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts from ramping rates	Implement Proposed Article 1-3 Ramping Rates.	One-time: Use a ramping rate of 1 foot per hour starting within 3 months after license issuance. Ongoing: Throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Impacts from pulse flows	Implement Proposed Article 1-2 Pulse Flows.	<p>One-time: Provide pulse flows after new minimum stream flows are established and not before 3 months after license issuance.</p> <p>Ongoing: Throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
Monitoring and Adaptive Management Program	Implement Proposed Article 1-6 Adaptive Management Program.	<p>Ongoing: Implement the Program within 3 months after license issuance and throughout project operation.</p> <p>Ongoing: Implement the Program throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
Impacts from large woody debris	Implement Proposed Article 1-9 Large Woody Debris.	<p>Ongoing: Throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
Impacts from Iowa Hill Development	Implement Proposed Article 1-40 Aquatic Resources.	<p>Ongoing: For 2 years prior to and 2 years after Iowa Hill Development operations starts.</p>	<p>Ongoing: For 2 years prior to and 2 years after Iowa Hill Development operation starts.</p>	SMUD	SMUD
Terrestrial Resources					
Impacts on riparian vegetation and wetlands	Implement Proposed Article 1-1 Minimum Streamflows.	<p>Ongoing: Throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
	Implement Proposed Article 1-2 Pulse Flows.	<p>One-time: Provide pulse flows after new minimum stream flows are established and not before 3 months after license issuance.</p> <p>Ongoing: Throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
	Implement Proposed Article 1-5(5) Monitoring Program.	<p>One-time: Develop a Plan within 2 years after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-23 Reservoir Levels.	<p>One-time: Meet or exceed end-of-month reservoir elevations within 6 months of license issuance.</p> <p>Ongoing: Throughout project operation; every 5 years, prepare a report indicating results.</p>	Ongoing: Throughout project operation. Report every 5 years.	SMUD	SMUD
Impacts on wildlife and plants	Implement Proposed Article 1-5 Monitoring Program.	Ongoing: Implement the Program after license issuance and throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-12 Wildlife and Plant Protection Measures.	Ongoing: Prior to construction start, and throughout project construction and operation.	Ongoing: Throughout project construction and operation.	SMUD	SMUD
	Implement Proposed Article 1-19 Specific Recreation Measures.	Ongoing: Implement projects at specific times throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts from Iowa Hill Development	Implement Proposed Article 1-41 Terrestrial Resources.	One-time: Purchase land prior to the start of project construction.	One-time: Prior to the start of project construction.	SMUD	SMUD
		Ongoing: Manage land as wildlife habitat throughout project operation.	Ongoing: Throughout project operation.		

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Vegetation and noxious weed management	Implement Proposed Article 1-13 Vegetation and Invasive Weed Management Plan, and expand the Plan to include all lands within the project boundary that are affected by project operation and maintenance.	<p>One-time: Develop a Plan within 2 years after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-14 Annual Review of Ecological Conditions.	Ongoing: Meet with agencies by April 1 of each year.	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts of minimum flows on special-status amphibians and reptiles	Implement Proposed Article 1-1 Minimum Streamflows.	Ongoing: Throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts of pulse flows	Implement Proposed Article 1-2 Pulse Flows.	<p>One-time: Provide pulse flows after new minimum stream flows are established and not before 3 months after license issuance.</p> <p>Ongoing: Throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-5 Monitoring Program.	<p>One-time: Develop an amphibian and reptile plan within 1 year after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD

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		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Impacts of ramping rates	Implement Proposed Article 1-3 Ramping Rates.	<p>One-time: Use a ramping rate of 1 foot per hour starting within 3 months after license issuance.</p> <p>Ongoing: Throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
Impacts of recreational streamflows on foothill yellow-legged frogs	If foothill yellow-legged frogs inhabit the project area in the future, conduct amphibian monitoring, as indicated in Proposed Article 1-5 Monitoring Program.	<p>One-time: Develop an amphibian and reptile plan within 1 year after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
Monitoring and Adaptive Management Programs	Implement Proposed Article 1-5 Monitoring Program.	<p>One-time: Develop an amphibian and reptile plan within 1 year after license issuance; develop a mountain yellow-legged frog plan within 2 years after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
	Implement Proposed Article 1-6 Adaptive Management Program.	<p>One-time: Implement the Program within 3 months after license issuance.</p> <p>Ongoing: Implement the Program throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
Impacts from large woody debris	Implement Proposed Article 1-9 Large Woody Debris.	<p>Ongoing: Throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
	Implement Proposed Article 1-24 Recreation Streamflows.	<p>Ongoing: Determine water year type February through May each year and operate accordingly throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Secondary impacts of wildlife and plant protection measures	Implement Proposed Article 1-12 Wildlife and Plant Protection Measures.	Ongoing: Prior to construction start, and throughout project construction and operation.	Ongoing: Throughout project construction and operation.	SMUD	SMUD
Secondary impacts on plants and habitat	Implement Proposed Article 1-19 Specific Recreation Measures.	Ongoing: Implement projects at specific times throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts on bald eagle	Implement Proposed Article 1-5 Monitoring Program.	One-time: Develop a bald eagle monitoring plan within 6 months after license issuance. Ongoing: Implement Plan throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-12 Wildlife and Plant Protection Measures.	One-time: Develop a USFWS-approved Avian Protection Plan within 1 year after license issuance. Ongoing: Implement Plan throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Habitat loss and temporary disturbance from Iowa Hill Development	Implement Proposed Article 1-12 Wildlife and Plant Protection Measures.	Ongoing: Prior to construction start, and throughout project construction and operation.	Ongoing: Throughout project construction and operation.	SMUD	SMUD
	Implement Proposed Article 1-41 Terrestrial Resources.	One-time: Purchase land prior to the start of project construction. Ongoing: Manage land as wildlife habitat throughout project operation.	One-time: Prior to the start of project construction. Ongoing: Throughout project operation.	SMUD	SMUD

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		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Threatened and Endangered Species					
Impacts on Pine Hill endemic plants	Implement Proposed Article 1-12 Wildlife and Plant Protection Measures.	Ongoing: Prior to construction start, and throughout project construction and operation.	Ongoing: Throughout project construction and operation.	SMUD	SMUD
	Implement Proposed Article 1-13 Vegetation and Invasive Weed Management Plan, expanding the Plan to include all lands within the project boundary that are affected by project operation and maintenance.	One-time: Develop a Plan within 2 years after license issuance. Ongoing: Implement the Plan throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts on Valley Elderberry Longhorn Beetle	Implement Proposed Article 1-12 Wildlife and Plant Protection Measures.	Ongoing: Prior to construction start, and throughout project construction and operation.	Ongoing: Throughout project construction and operation.	SMUD	SMUD
	Implement USFWS' Valley Elderberry Longhorn Beetle Conservation Guidelines as part of Proposed Article 1-13 Vegetation and Invasive Weed Management Plan.	One-time: Develop a Plan within 2 years after license issuance. Ongoing: Implement the Plan throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Impacts on California Red-legged Frog	If California red-legged frogs inhabit the project area in the future, conduct amphibian monitoring, as indicated in Proposed Article 1-5 Monitoring Program.	One-time: Develop an amphibian and reptile plan within 1 year after license issuance. Ongoing: Implement the Plan throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD

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		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Recreational Resources					
Impacts on existing recreational facilities	Implement Proposed Article 1-15 Recreation Implementation Plan.	One-time: Develop a Recreation Implementation Plan within 6 months after license issuance. Ongoing: Implement the Plan throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-18 Review of Recreation Developments.	Ongoing: Meet with U. S. Forest Service every 6 years.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-19 Specific Recreation Measures.	Ongoing: Implement projects at specific times throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Recreational access plan for Slab Creek Reservoir	Implement Proposed Article 1-19 Specific Recreation Measures.	Ongoing: Implement projects at specific times throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-24 Recreation Streamflows.	Ongoing: Determine water year type February through May each year and operate accordingly throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Monitoring and Adaptive Management	Implement Proposed Article 1-5 Monitoring Program (pursuant to Proposed Article 1-18).	Ongoing: Meet with U. S. Forest Service every 6 years.	Ongoing: Throughout project operation.	SMUD	SMUD
	Implement Proposed Article 1-6 Adaptive Management Program.	One-time: Implement the Program within 3 months after license issuance. Ongoing: Implement the Program throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
	Implement Proposed Article 1-16 Recreation Survey.	Ongoing: Conduct recreational survey and prepare a report every 6 years.	Ongoing: Throughout project operation. Report every 6 years.	SMUD	SMUD
	Implement Proposed Article 1-25 Public Information Services.	Ongoing: Provide data to support the determination of carrying capacity on lands affected by the project throughout project operation. Collect this data as part of recreational survey in Proposed Article 1-16.	Ongoing: Throughout project operation.	SMUD	SMUD
Recreational site operation and maintenance	Implement Proposed Article 1-21 Recreation Operation, Maintenance, and Administration.	Ongoing: Contribute up to \$1 million annually to the U. S. Forest Service.	Ongoing: Throughout project operation.	SMUD	SMUD
Fish stocking	Implement Proposed Article 1-26 Fish Stocking.	Ongoing: Stock 25,000 to 50,000 pounds of fish each year distributed between Loon Lake, Union Valley, and Ice House Reservoirs.	Ongoing: Throughout project operation.	SMUD	SMUD
Trails system management	Implement Proposed Article 1-19 Specific Recreation Measures.	Ongoing: Implement projects at specific times throughout project operation.	Ongoing: Throughout project operation.	SMUD	SMUD
Reservoir levels	Implement Proposed Article 1-23 Reservoir Levels.	One-time: Meet or exceed end-of-month reservoir elevations within 6 months of license issuance. Ongoing: Throughout project operation; every 5 years, prepare a report indicating results.	Ongoing: Throughout project operation. Report every 5 years.	SMUD	SMUD

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Potential hazardous hydraulic conditions at the Iowa Hill Development intake/outlet structure in Slab Creek Reservoir	Design the structure to include safety features including boat restraining barriers, warning signs, and other guidance to the public. Use <i>FERC Guidelines for Public Safety at Hydropower Projects</i> .	<p>One-time: During project design.</p> <p>Ongoing: Maintain throughout project operation.</p>	<p>Ongoing: Maintain throughout project operation.</p>	SMUD	SMUD
Coordinated operations	Implement Proposed Article 1-4 Coordination with Chili Bar Licensee.	<p>One-time: Develop a Coordinated Operations Plan jointly with PG&E, and file it with FERC within 120 days after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
Recreational streamflows	Implement Proposed Article 1-24 Recreation Streamflows.	<p>Ongoing: Provide recreational streamflows in the SF Silver Creek below Ice House Dam and the SFAR below Slab Creek Dam; monitor boating use from within 3 months after license issuance.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD
Streamflow and reservoir elevation gaging	Implement Proposed Article 1-10 Streamflow and Reservoir Elevation Gaging.	<p>One-time: Develop a SWRCB-approved Streamflow and Reservoir Elevation Gaging Plan meeting U. S. Geological Survey standards and file it with FERC within 1 year after license issuance.</p> <p>One-time: Within 2 years after license issuance, install and maintain simple staff gages at the put-ins for the Slab Creek and Ice House recreational boating runs.</p>	<p>Ongoing: Throughout project operation.</p> <p>One-time: 2 years after license issuance.</p>	SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Public information services	Implement Proposed Article 1-25 Public Information Services.	<p>One-time: Prepare a U. S. Forest Service-approved Interpretive, Education, and Public Information Plan in consultation with agencies and submit it to FERC within 2 years after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation. Prepare and update brochures and maps throughout project operation.</p>	Ongoing: Throughout project operation.	SMUD	SMUD
Land Use					
Land ownership, management, and use	Implement Proposed Article 1-30 Transportation System Management.	<p>One-time: Develop a U. S. Forest Service-approved Transportation System Management Plan and file it with FERC within 1 year after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation. Every 5 years, prepare a U. S. Forest Service-approved 5-year plan to identify the maintenance and reconstruction needs for project roads, and file it with FERC.</p>	Ongoing: Throughout project construction. Update every 5 years.	Construction Contractor and SMUD	SMUD
Trails System Management Plan	Implement Proposed Article 1-31 Trails System Management.	<p>One-time: Develop a U. S. Forest Service-approved Trails System Management Plan and file it with FERC within 1 year after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation. Every 5 years, prepare a U. S. Forest Service-approved 5-year plan to identify the maintenance and reconstruction needs for project trails, and file it with FERC.</p>	Ongoing: 1 year after license issuance, and every 5 years after license issuance.	SMUD	SMUD

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Facility management	Implement Proposed Article 1-32 Facility Management.	<p>One-time: Develop a U. S. Forest Service-approved Facility Management Plan and file it with FERC within 1 year after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation. Every 5 years, prepare a U. S. Forest Service-approved 5-year plan to identify the maintenance, reconstruction, and removal needs for project facilities, and file it with FERC.</p>	<p>Ongoing: 1 year after license issuance, and every 5 years after license issuance.</p>	SMUD	SMUD
Proposed project boundary	Revise the existing project boundary to include all project facilities, per Proposed Article 1-18.	<p>One-time: within 1 year after license issuance.</p>	<p>One-time: 1 year after license issuance.</p>	SMUD	SMUD
Fire Management and Response Plan	Implement Proposed Article 1-34 Fire Management and Response Plan.	<p>One-time: Develop a U. S. Forest Service-approved Fire Prevention and Response Plan in consultation with fire agencies and file it with FERC within 1 year after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation. Update the Plan, as necessary, in consultation with the fire agencies.</p>	<p>Ongoing: Update as needed throughout project operation.</p>	Construction Contractor and SMUD	SMUD
Aesthetic Resources					
Reservoir levels	Implement Proposed Article 1-23 Reservoir Levels.	<p>One-time: Meet or exceed end-of-month reservoir elevations within 6 months of license issuance.</p> <p>Ongoing: Throughout project operation; every 5 years, prepare a report indicating results.</p>	<p>Ongoing: Throughout project operation.</p>	SMUD	SMUD

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Visual Resource Protection Plan	Implement Proposed Article 1-27 Visual Resource Protection.	<p>One-time: Develop a U. S. Forest Service-approved Plan addressing clearings, spoil piles, project facilities, mitigation measures, and implementation schedule during project planning and prior to construction of the project, and file the Plan with FERC.</p> <p>Ongoing: Meet with the U. S. Forest Service every 5 years to review opportunities to improve blending the project into the surrounding landscape.</p>	<p>Ongoing: During project planning and prior to construction of the project, and every 5 years.</p>	SMUD	SMUD
Visual impacts of Iowa Hill Development	Implement Proposed Article 1-44 Compliance with Visual Quality Standards.	<p>One-time: Develop a design of the Iowa Hill Development that meets the visual quality standards of the Eldorado National Forest Land and Resource Management Plan. Provide plan specifications and simulated views of the design to the U. S. Forest Service.</p>	<p>One-time: During project planning.</p>	SMUD	SMUD

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Iowa Hill Development impacts on the existing visual character or quality of the site and its surroundings, including introduction of a new source of light and glare, and creation of dust and erosion	Implement proposed Iowa Hill Visual Resources Protection Plan per Article 1-27. Elements to be addressed in the Plan include: 1) measures to reduce color contrasts of those parts of the upper reservoir berm, transmission line towers, switchyard, and tunnel portal (e.g., painting, COR-TEN [®] steel, concrete tinting); 2) measures to limit nighttime light pollution during project construction and operation; 3) dust and erosion control, and re-vegetation of disturbed areas; and 4) measures to reduce visibility of construction activities.	<p>One-time: Develop a Visual Resources Protection Plan and file it with FERC before initiating ground-disturbing activities. A draft Plan will be submitted to the U. S. Forest Service for review.</p> <p>Ongoing: Implement the Plan throughout project construction and operation.</p>	Ongoing: Throughout project construction and operation.	Construction Contractor and SMUD	SMUD
Cultural Resources					
Impacts on cultural resources	Implement Proposed Article 1-28 Heritage Resources.	<p>One-time: Develop a Heritage Properties Management Plan to be approved by the U. S. Forest Service, and file it with FERC within 6 months after license issuance.</p> <p>Ongoing: Implement the Plan throughout project construction and operation.</p>	Ongoing: Throughout project construction and operation.	SMUD	SMUD

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
	Implement Proposed Article 1-29 Heritage Resource Discovery.	Ongoing: If, prior to, during ground disturbance, or as a result of project operation, items of potential cultural, historical, archaeological, or paleontological value are reported or discovered, or a known deposit of such items is disturbed, work will cease in the affected area, and the U. S. Forest Service will be notified. Ground-disturbing work will not resume until notice in writing is received from the U.S. Forest Service.	Ongoing: Throughout project construction and operation.	SMUD and/or archaeologist	SMUD and/or archaeologist
Impacts from Iowa Hill Development	Implement Proposed Article 1-45 Heritage Resources Protection.	Ongoing: If, prior to, during ground disturbance, or as a result of project operation, items of potential cultural, historical, archaeological, or paleontological value are reported or discovered, or a known deposit of such items is disturbed, work will cease in the affected area, and the U.S. Forest Service will be notified. Ground-disturbing work will not resume until notice in writing is received from the U.S. Forest Service.	Ongoing: Throughout project construction and operation.	SMUD and/or archaeologist	SMUD and/or archaeologist
Air Resources					
Impacts on air quality from Iowa Hill Development construction	Apply water or chemical dust suppressant on unpaved surface, combined with vacuum sweeping and water flushing of paved surfaces. Re-plant vegetation in disturbed areas.	Ongoing: Throughout project construction.	Ongoing: Throughout project construction.	Construction Contractor	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
	Non-road equipment will follow the updated emission standards established by EPA's Clean Air Non-road Diesel Engine Standard.	Ongoing: Throughout project construction.	Ongoing: Throughout project construction.	Construction Contractor	SMUD
	Limit diesel engine idling, shut off engines when not in use, and use preventative maintenance to keep engines running optimally.	Ongoing: Throughout project construction.	Ongoing: Throughout project construction.	Construction Contractor	SMUD
Transportation and Traffic					
	Implement Proposed Article 1-30 Transportation System Management.	One-time: Develop a U. S. Forest Service-approved Transportation System Management Plan and file it with FERC within 1 year after license issuance. Ongoing: Implement the Plan throughout project operation. Every 5 years, prepare a U. S. Forest Service-approved 5-year plan to identify the maintenance and reconstruction needs for project roads, and file it with FERC.	Ongoing: 1 year after license issuance. Update every 5 years.	Construction Contractor and SMUD	SMUD
	Implement Proposed Article 1-34 Fire Management and Response Plan.	One-time: Develop a U. S. Forest Service-approved Fire Prevention and Response Plan in consultation with fire agencies and file it with FERC within 1 year after license issuance. Ongoing: Implement the Plan throughout project operation. Update the Plan, as necessary, in consultation with the fire agencies.	Ongoing: Update as needed throughout project operation.	Construction Contractor and SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
<p>Iowa Hill Development construction traffic impacts on existing traffic load and capacity of street system; LOS; increase hazards due to a design feature or incompatible uses; conflicts between construction traffic and school buses; seasonal tourist traffic, and periods of heavy local resident use; and impact on existing parking capacity</p>	<p>Implement the final Iowa Hill Transportation Management Plan, which will address: 1) a description of road segments to be constructed or upgraded to provide access; 2) use of carpools and vanpools; 3) a map of preferred access routes to be used by different vehicles and for different purposes, including fire evacuation; 4) a description of the condition of all roads along the selected routes and a plan to maintain, repair, and/or upgrade them; 5) detailed survey, plans, and environmental studies of new roads; 6) an emergency access policy; 7) traffic control measures and an annual employee awareness program; 8) provisions to ensure that all applicable LORS are complied with; 9) a provision that all temporary signs, lighting, and traffic control devices conform to applicable standards; and 10) a project public communication measure to allow citizens a mechanism and point-of-contact to voice any concerns.</p>	<p>One-time: Develop the final Iowa Hill Transportation Management Plan and file it with FERC for approval before initiating ground-disturbing activities. A draft Plan will be submitted to specific agencies and the Advisory Committee for review.</p> <p>Ongoing: Implement the Plan throughout project construction.</p>	<p>Ongoing: Throughout project construction.</p>	<p>Construction Contractor and SMUD</p>	<p>SMUD</p>

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Noise Resources					
Impacts on noise levels from Iowa Hill Development construction, including exceedance of County standards and impacts from blasting, which are unavoidable temporary and intermittent during project construction	Implement Proposed Article 1-48 Iowa Hill Construction Noise Plan, which will address: 1) vehicle idling; 2) advance notification of any materials transport and construction activities; 3) notices for residents indicating the nature, timing, and duration of all materials transport and construction activities; 4) a Noise Hot Line telephone system for reporting construction noise disturbances; 5) monitoring to address compliance with the above measures; and 6) actions to mitigate violations of the above measures. The Noise Plan will also address: a) a scheduling plan for noisy construction activities, such as surface blasting, to minimize conflicts with local residents; b) measures to minimize unnecessary vehicle noise, including noise associated with muffler maintenance; and c) noise and seismic monitoring.	<p>One-time: Develop a U. S. Forest Service-approved Construction Noise Plan prior to the start of construction.</p> <p>Ongoing: Implement the Plan throughout project construction.</p> <p>Monitoring reports will be filed with the USFS and El Dorado County on a monthly basis throughout project construction, and would list any noise disturbance complaints received.</p> <p>Monitoring reports will also list any noise disturbance complaints received, and any additional actions needed to minimize noise disturbances.</p>	<p>Ongoing: Throughout project construction.</p>	Construction Contractor and SMUD	SMUD

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Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Public Health and Safety					
	Implement Proposed Article 1-34 Fire Management and Response Plan.	<p>One-time: Develop a U. S. Forest Service-approved Fire Prevention and Response Plan in consultation with fire agencies and file it with FERC within 1 year after license issuance.</p> <p>Ongoing: Implement the Plan throughout project operation. Update the Plan, as necessary, in consultation with the fire agencies.</p>	Ongoing: Update as needed throughout project operation.	Construction Contractor and SMUD	SMUD

Table B-1 Upper American River Project Mitigation and Monitoring Summary

Impact	Mitigation	Mitigation Implementation Duration	Monitoring Duration	Responsibility	
		One-time or Ongoing	One-time or Ongoing	Mitigation Implementation	Mitigation Monitoring
Impacts from Iowa Hill Development construction on fire suppression capability; exposure to risk of loss, injury, or death from a wildland fire; increase in risk of a fire start; and impacts to any fire suppression efforts, emergency vehicle access, and evacuation of workers and the public.	Implement a Fire Risk and Protection Plan for Iowa Hill Development, which will address: 1) measures to reduce the risk of fires when operating mechanical equipment on the construction site and while driving to and from the work sites; 2) measures for the storage and handling of flammable materials; 3) measures for construction site firefighting; 4) fire safety awareness training as part of the annual employee environmental awareness program; 5) emergency procedures including notification and evacuation procedures and routes; and 6) provisions including monitoring measures to ensure SMUD and its contractors will comply, as appropriate, with all applicable LORS.	<p>One-time: Develop a Fire Risk and Protection Plan for Iowa Hill Development and file it with FERC before initiating ground-disturbing activities. A draft Plan will be submitted to the U. S. Forest Service and El Dorado County for review.</p> <p>Ongoing: Implement the Plan throughout project construction.</p>	Ongoing: During Plan preparation, and throughout project construction.	Construction Contractor and SMUD	SMUD