

# Monitoring Program 2016 Final Annual Report Sacramento Municipal Utility District

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Hydro License Implementation • June 2017

Upper American River Project

FERC Project No. 2101

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## 1.0 INTRODUCTION

This Monitoring Program Annual Report (Report) is being submitted to the Federal Energy Regulatory Commission (FERC) by the Sacramento Municipal Utility District (SMUD), in accordance with State Water Resources Control Board (SWRCB) Condition 8 of the 401 Water Quality Certification and U.S. Forest Service (USFS) 4(e) Condition 31(hereafter Conditions), located in Appendices A and B, respectively, of FERC's Order Issuing New License (License; FERC 2014) for the Upper American River Project (UARP).

SWRCB 401 Condition 8 states:

*The Licensee shall prepare an annual report that fully describes the monitoring efforts of the previous calendar year, including the data collected and analysis of that data. The report shall be filed with the Commission by June 30 of each year for the preceding year. USFS, CDFW, USFWS, and the State Water Board shall have at least 30 days to review and comment on the draft report prior to filing with the Commission. The Licensee shall provide copies of the final annual report to USFS, CDFW, USFWS, and the Deputy Director.*

USFS 4(e) Condition 31 states:

*The Licensee shall file with FERC by June 30 of each year an annual report fully describing the monitoring efforts of the previous calendar year. FS, CDFG, FWS, and SWRCB shall have at least 30 days to review and comment on the draft report prior to filing with FERC. The licensee shall provide copies of the annual report to FS, CDFG, FWS, and SWRCB.*

Additionally, SWRCB Condition 10 requires SMUD to include a summary of the efforts made to pass large woody debris at several Project reservoirs in the Annual Monitoring Report.

SWRCB 401 Condition 10 states:

*The Licensee shall ensure that mobile instream large woody debris continues downstream beyond Robbs Peak Reservoir Dam, Junction Reservoir Dam, Camino Reservoir Dam, and Slab Creek Reservoir Dam. This requirement will not be in effect when access and working conditions are dangerous or unsafe. At a minimum, all sizes greater than both 20 centimeters wide and 12 meters in length shall be allowed to continue downstream beyond Robbs Peak Reservoir Dam, Junction Reservoir Dam, Camino Reservoir Dam, and Slab Creek Reservoir Dam. Smaller sizes are also allowed but are not required to be moved beyond these dams. To demonstrate compliance with this condition, the Licensee shall include in the annual monitoring report that is required in Condition 8 (Monitoring Program) a summary of the efforts made during the year to pass large woody debris below the dams.*

Furthermore, Article 401(b) of the License requires SMUD to file the Annual Report with FERC, along with any comments received by the Agencies during the review period, by June 30 of each year.

Finally, the preface to the Conditions states that:

*For purposes of the ecological resources adaptive management program, each year is defined on a calendar year basis (i.e., January through December). This Monitoring Program covers monitoring to be conducted during all years until a new license is issued. Where years are specified, Year 1 is the first year during which all initial minimum streamflows required by the license are implemented by May 1.*

All minimum streamflows required by the License were implemented in October 2014; therefore Year 1 as it pertains to the Monitoring Program was 2015. This Report summarizes results of Monitoring Year 2 (2016). Refer to the Monitoring Frequency section of this report for information about the frequency of resource-specific monitoring effort required by the License. Some monitoring activities have specific reporting requirements and deadlines in lieu of this Report which are noted in the summaries presented in Section 3.0.

For context in considering the monitoring results, the California Department of Water Resources (DWR) May Bulletin 120 forecast the 2016 water year type as Above Normal, and the UARP was operated under this scenario for the remainder of the water year. However, the final 2016 water year type was later re-classified as “Below Normal” based on DWR’s Full Natural Flow record for the American River at Folsom in October 2016.

## **2.0 MONITORING FREQUENCY**

The Monitoring Program covers monitoring to be conducted during all years until a new license is issued. Table 1 describes the monitoring frequencies for the first five years of the License. As noted in Section 3.0, some monitoring activities have specific reporting requirements and deadlines in lieu of this Report.

**Table 1. Monitoring Program Frequency First Five Years.**

	License Monitoring Year				
	1	2	3	4	5
	(2015)	(2016)	(2017)	(2018)	(2019)
Trout Population Monitoring					X
Hardhead Population Monitoring		X	X		X
Aquatic Macroinvertebrate					X
Amphibian and Aquatic Reptile Monitoring (including Foothill Yellow-legged Frog)		X	X	X	X
Sierra Nevada Yellow-legged Frog (formerly Mountain Yellow-legged Frog) Monitoring					X
Riparian Vegetation Monitoring					X
Algae Species Identification and Monitoring		X			
Geomorphology (Sensitive Site Investigation and Mitigation Plan Development)	X	X			
Geomorphology (Continuing Evaluation of Representative Channel Areas)					X
Water Temperature		X	X	X	X
In Situ Water Quality	X	X	X	X	X
Bacteria Monitoring	X	X	X	X	X
Metals bioaccumulation		X			
Water General Chemistry			X		
Robbs Peak Powerhouse Entrainment	X	X	X		
Bear Management Monitoring		X	X	X	X
Bald Eagle Monitoring		X	X	X	X
Large Woody Debris	X	X	X	X	X

### **3.0 MONITORING PROGRAM CONDITIONS**

Table 2 documents the 2017 status of ecological monitoring specified in the License, including the status of SMUD's resource Monitoring Program as specified in USFS 4(e) Condition 31 which also encompasses all those measures listed in SWRCB's 401 Condition 8, as well as SWRCB Condition 10.

**Table 2. Status of Ecological Condition Monitoring 2017.**

Condition	Title	Status	Comments
<b>General Conditions</b>			
USFS 4(e) Condition 27; SWRCB Condition 1	Minimum Streamflows	Current	Implement specified minimum streamflows within three months after License issuance.
USFS 4(e) Condition 27; SWRCB Condition 1	Silver Creek "Block of Water" Plan	Current	Plan approved by FERC June 2016.
USFS 4(e) Condition 28; SWRCB Condition 2	Pulse Flows	Current	Pulse flows released below Ice House Reservoir Dam and attempted at Rubicon Reservoir Dam in 2016.
USFS 4(e) Condition 29; SWRCB Condition 3	Ramping Rates	Current	Use ramping rate of 1 foot per hour when implementing pulse flows, minimum streamflows, or recreational streamflow releases.
USFS 4(e) Condition 30	Coordination with Chili Bar Licensee	Current	Plan approved by FERC October 2015.
USFS 4(e) Condition 49; SWRCB Condition 5	Reservoir Levels	Current	Meet or exceed end-of-month reservoir elevations, July through September, at the three storage reservoirs, and manage most other reservoirs as required. Send report every 5 years.
USFS 4(e) Condition 50; SWRCB Condition 4	Recreation Streamflows	Current	Recreation flows released from Ice House and Slab Creek Reservoirs under forecasted Above Normal water year type requirements in 2016. Scheduled for 2017 under Wet water year type requirements.

Condition	Title	Status	Comments
USFS 4(e) Condition 51; SWRCB Condition 7	Public Information Services	Current	Plan approved by FERC November 2016.
<b>Monitoring Program</b>			
USFS 4(e) Condition 31.1; SWRCB Condition 8.a	Fish Populations Monitoring	Current	<p>Separate hardhead and trout population plans were developed by the Licensee; the Hardhead Monitoring Plan was approved by FERC in August 2016, and the Trout Monitoring Plan in December 2016. Hardhead monitoring was conducted in 2016, and is scheduled again for 2017 and 2019.</p> <p>Activities initiated in 2016 under the approved Plan included: monitoring from immediately downstream of Mosquito Road Bridge down to the confluence with Rock Creek, and snorkel surveying at six sites.</p> <p>The first required trout monitoring effort is in 2019.</p> <p>The Final Report containing the data and analysis from the 2016 monitoring effort is attached in Appendix A.</p>
USFS 4(e) Condition 31.2; SWRCB Condition 8.b	Aquatic Macroinvertebrates Monitoring	Current	Plan was approved by FERC in December 2016. The first required monitoring effort is in 2019.
USFS 4(e) Condition 31.3; SWRCB Condition 8.c	Amphibian and Aquatic Reptile Monitoring	Current	<p>This Plan was approved by FERC in May 2016. Monitoring was conducted in 2016, and is scheduled again for 2017, 2018, and 2019.</p> <p>Activities completed in 2016 under the approved Plan included monitoring at six sites within five Project reaches.</p> <p>The Final Report containing the data and analysis from</p>



Condition	Title	Status	Comments
			the 2016 monitoring effort is attached in Appendix B.
USFS 4(e) Condition 31.3; SWRCB Condition 8.c.6–8	Sierra Nevada Yellow-Legged Frog (formerly Mountain Yellow-legged Frog) Monitoring	In Progress	On July 25, 2016 the Licensee requested an extension for filing this Plan. The request was approved by FERC on October 26, 2016 and the filing date for the Plan was extended to November 23, 2017. The Plan was distributed for Consultation Group review on April 27, 2017; comments are due back by May 29, 2017. The first required monitoring effort is in 2019.
USFS 4(e) Condition 31.4; SWRCB Condition 8.d	Foothill Yellow-Legged Frog Flow Fluctuations Monitoring	Current	This Plan is incorporated in the Amphibian and Aquatic Reptile Monitoring Plan (summarized above).
USFS 4(e) Condition 31.5; SWRCB Condition 8.e	Riparian Vegetation Monitoring	In Progress	This Plan was filed with FERC November 2016. The first required monitoring effort is in 2019.
USFS 4(e) Condition 31.6; SWRCB Condition 8.f	Algae Species Identification and Monitoring	Current	<p>This Plan was approved by FERC in December 2015. Monitoring was conducted in 2016.</p> <p>Activities initiated in 2016 under the approved Plan included sampling, identifying, and archiving samples of all available algae from sites in Silver Creek downstream of Junction Reservoir Dam, South Fork Rubicon River downstream of Robbs Peak Reservoir Dam, Silver Creek downstream of Camino Reservoir Dam, and South Fork American River downstream of Slab Creek Reservoir Dam.</p>

Condition	Title	Status	Comments
			The Final Report containing the data and analysis from the 2016 monitoring effort is attached in Appendix C.
USFS 4(e) Condition 31.7; SWRCB Condition 8.g	Geomorphology: Sensitive Site Investigation and Mitigation Plan	In Progress	Plan was approved by FERC June 2015 and monitoring was conducted in 2016. The Final Report filed with FERC October 2016 contains the data and analysis from the 2016 monitoring effort.
USFS 4(e) Condition 31.8; SWRCB Condition 8.h	Geomorphology: Continuing Evaluation of Representative Channel Areas	In Progress	A six-month extension to file this Plan was approved by FERC December 2016; this Plan is pending SWRCB and USFS approval, requested by May 19, 2017. Plan is due to FERC May 23, 2017.
USFS 4(e) Condition 31.9; SWRCB Condition 8.i	Water Temperature Monitoring	Current	<p>Plan was approved by FERC September 2015. Monitoring was conducted in 2016 and is scheduled again for 2017, 2018, and 2019.</p> <p>Activities implemented in 2016 under the approved Plan included continuous water temperature monitoring at 18 sites throughout the UARP utilizing fixed stations or dataloggers.</p> <p>The Final Report containing the data and analysis from the 2016 monitoring effort is attached in Appendix D.</p>
USFS 4(e) Condition 31.10; SWRCB Condition 8.j	Water Quality Monitoring	Current	<p>This Plan was approved by FERC July 2015. Monitoring for <i>in situ</i> and bacterial elements was conducted in 2016, and is scheduled for 2017, 2018, and 2019. Monitoring for metal bioaccumulation occurred in 2016 (Year 2); water chemistry sampling is scheduled to occur in 2017 (Year 3).</p> <p>Activities implemented in 2016 under the approved Plan included <i>in situ</i> water quality and bacterial monitoring in reservoirs and stream reaches of the UARP, and fish</p>

Condition	Title	Status	Comments
			tissue sampling to assess potential bioaccumulation of metals in resident fish within specific UARP reservoirs.  The Final Report containing the data and analysis of the 2016 monitoring effort is attached in Appendix E.
USFS 4(e) Condition 31.12; SWRCB Condition 8.k	Robbs Peak Powerhouse Entrainment	Current	This Plan was approved by FERC July 2015. Monitoring was conducted in 2016. Following agency review of the draft report, the final report was filed with FERC on April 19, 2017.
USFS 4(e) Condition 31.13	Bear Human Interaction Monitoring	Current	This Plan was filed with FERC May 2015. Monitoring was conducted in 2016 and is scheduled again for 2017, 2018, and 2019.  Activities implemented in 2016 under the approved Plan included preparing a bear-human interaction data form; installing deposit boxes and initiating monitoring at developed UARP-related recreation facilities within the UARP Project Area including hosted and unhosted day-use and overnight facilities; and development of initial estimate of bear-human interactions.  The Final Report containing the data and analysis from the 2016 monitoring effort is attached in Appendix F.
USFS 4(e) Condition 31.13; SWRCB Condition 8.l	Bald Eagle Monitoring	Current	This Plan was approved by FERC July 2015. Monitoring was conducted in 2016 and is scheduled again in 2017, 2018, and 2019.  Activities implemented in 2016 under the approved Plan included nesting surveys and two night roost surveys at Union Valley Reservoir, nesting surveys at Ice House Reservoir, and nesting surveys at Loon Lake.  The Final Report containing the data and analysis from the 2016 monitoring effort is attached in Appendix G.

Condition	Title	Status	Comments
USFS 4(e) Condition 31.13	Avian Protection Plan	Current	Plan approved by FERC August 2015, implementation ongoing.
<b>Resource Management Plans</b>			
USFS 4(e) Condition 33	Gerle Creek Channel Stabilization Plan	In Progress	One year extension approved by FERC August 2016. Plan development pending Agency determination of final pulse flow magnitude for Loon Lake reach of Gerle Creek.
USFS 4(e) Condition 34	Fish Passage Plan for Gerle Creek Reservoir	In Progress	Plan approved by FERC August 2015, monitoring conducted 2015 and 2016. Following agency review of the draft report, the final report was filed with FERC on April 11, 2017.
USFS 4(e) Condition 35; SWRCB Condition 10	Large Woody Debris	Current	No large woody debris meeting the specifications described in SWRCB Condition 10 was observed in 2016.
USFS 4(e) Condition 36; SWRCB Condition 6	Streamflow and Reservoir Elevation Gaging	Current	Plan approved by FERC July 2015, implementation ongoing.
USFS 4(e) Condition 39	Vegetation and Invasive Weed Management Plan	In Progress	One-year extension approved by FERC August 2016. Plan development ongoing. Final Plan due to FERC July 2017.

#### **4.0 LITERATURE CITED**

FERC (Federal Energy Regulatory Commission). 2014. Federal Energy Regulatory Commission Order 148 FERC 62,070 Issuing New License for the Sacramento Municipal Utility District Upper American River Hydroelectric Project No. 2101. Issued July 23.



**APPENDIX A**

**2016 Hardhead Monitoring Report**

**APPENDIX B****2016 Amphibian and Aquatic Reptile Monitoring Report**

**APPENDIX C****2016 Algae Species Identification and Monitoring Report**





## APPENDIX D

### 2016 Water Temperature Monitoring Report

**APPENDIX E****2016 Water Quality Monitoring Report**

**APPENDIX F****2016 Bear Management Monitoring Report**

**APPENDIX G****2016 Bald Eagle Monitoring Report**