

4.13 Assessment of Controlled and Uncontrolled Spill From Project Reservoirs Study Plan

This study is designed to provide information regarding the potential effects of ramping at Sacramento Municipal Utility District’s (SMUD) Upper American River Project facilities (excluding Camino and Slab Creek powerhouses) on aquatic resources. For the purpose of this study, ramping is defined as a hydro project operator’s act of decreasing or increasing controllable water releases from a Project facility, and normally is presented in a rate (change in downstream water surface elevation over time or change in flow released from the facility over time). Note that the current UARP Federal Energy Regulatory Commission (FERC) license does not include any ramping rates and SMUD does not have any informal agreements related to ramping rates. The study is based on the hypothesis that 1) SMUD does not normally change the rate of flow releases at any UARP facilities except powerhouses, 2) with the exception of Camino and Slab Creek powerhouse, UARP powerhouses release water directly into UARP reservoirs, and 3) these UARP reservoirs typically do not spill except during spring runoff when SMUD has little ability to control releases from the dams. Therefore, the potential to control flow is low. To investigate this hypothesis and determine the extent to which SMUD can control releases, a paper study is proposed. The affects of ramping at Camino and Slab Creek powerhouse as well as at Pacific Gas and Electric’s Chili Bar Project (which like Camino and Slab Creek powerhouses, release water directly into a river channel) will be addressed in a separate study plan.

4.13.1 Pertinent Issue Questions

This Assessment of Controlled and Uncontrolled Spill From Project Reservoirs Study Plan will be used, in part, to address the following Aquatics/Water Issue Question:

- 66. Could the ramp up and down rate be sped up in the future license to avoid future spills? What are the effects on biota and safety?

As described above, a separate study plan will be developed to address Issue Questions 33 (How are the ramping rates affecting aquatic and riparian species, including Chili Bar?) and 67 (What are the effects, including temperature, turbidity, recreation, etc. of the daily ramping below Chili Bar to aquatic and riparian resources?)

4.13.2 Background

As described in Section A, Project Description, of the SMUD’s Initial Information Package (IIP), the UARP includes eight powerhouses, six of which release into UARP reservoirs (Gerle Creek, Union Valley, Junction and Camino reservoirs). Camino and Slab Creek powerhouse release directly into the South Fork American River (SFAR). (Table 1). Union Valley Dam releases and spills directly into Junction Reservoir.

Table 1. UARP powerhouses and each powerhouse rated flow capacity and release point.		
<i>Powerhouse</i>	<i>Turbine Nameplate Rated Flow</i>	<i>Release Point</i>
Loon Lake	997 cfs (1 unit)	Gerle Creek Reservoir (1,260 ac-ft) - via Loon Lake Powerhouse Penstock
Robbs Peak	1,046 cfs (1 unit)	Union Valley Reservoir (277,290 ac-ft) - direct release
Jones Fork	281 cfs (1 unit)	Union Valley Reservoir (277,290 ac-ft) – direct release
Union Valley	1,577 cfs (1 unit)	Junction Reservoir (3,250 ac-ft) – direct release
Jaybird	1,378 cfs (total for 2 units)	Camino Reservoir (1,530 ac-ft) – direct release
Camino	2,018 cfs (total for 2 units)	SFAR 0.7 mile upstream of Slab Creek Reservoir – direct release
Slab Creek	36 cfs (1 unit)	SFAR 8.0 miles upstream of Chili Bar Reservoir – direct release
White Rock	3,860 cfs (total for 2 units)	Chili Bar Reservoir – direct release

SMUD historically operated so that, to the extent within SMUD’s control, Gerle Creek, Union Valley, Junction and Camino reservoirs would not spill. This means that typically, any spill from these reservoirs occurs during spring runoff when releases have normally been outside SMUD’s control. A summary of these spill events for each of these reservoirs is shown in SMUD’s IIP at Tables B3.2-1, B3.4-1, B3.5-1, B3.6-1 and B3.7-1, which are provided below for ease of reference. In each of these tables, the mean average flow during spill events is the mean of the average daily spill flows for those days when spill occurred (does not include non-spill days), and the mean maximum flow during spill events is the mean of the annual maximum spill events. Note that for the period of record shown in the table, Gerle Creek Reservoir (in combination with Robbs Peak Reservoir) and Union Valley

<i>Water Year</i>	<i>Dam Spill</i>		<i>Flow During Spill Events</i>		<i>Date of Last Day of Spill</i>
	<i>Total No. of Days</i>	<i>Greatest No. of Consecutive Days</i>	<i>Average Flow (cfs)</i>	<i>Maximum Flow (cfs)</i>	
1976	0	-	-	-	-
1977	0	-	-	-	-
1978	3	3	16	17	September 14
1979	3	2	82	204	January 12
1980	17	10	954	5,980	February 19
1981	0	-	-	-	-
1982	40	9	491	2,980	September 29
1983	60	52	231	1,380	July 9
1984	21	10	727	2,590	March 14
1985	1	1	27	27	February 9
1986	20	11	959	5,370	March 11
1987	1	1	84	84	February 13
1988	0	-	-	-	-
1989	7	2	45	157	April 1
1990	0	-	-	-	-
1991	2	2	457	781	March 5
1992	0	-	-	-	-
1993	5	2	133	282	June 1
1994	0	-	-	-	-
1995	49	37	576	2,035	July 2
1996	20	11	578	3,107	May 22
1997	20	4	1,022	7,690	June 5
1998	11	3	173	1,214	June 23
Mean	12	10	465	2,119	
Minimum	0	0	18	27	
Maximum	60	52	1,353	7,690	

<i>Water Year</i>	<i>Dam Spill</i>		<i>Flow During Spill Events</i>		<i>Date of Last Day of Spill</i>
	<i>Total No. of Days</i>	<i>Greatest No. of Consecutive Days</i>	<i>Average Flow (cfs)</i>	<i>Maximum Flow (cfs)</i>	
1976	0	-	-	-	-
1977	0	-	-	-	-
1978	0	-	-	-	-
1979	0	-	-	-	-
1980	0	-	-	-	-
1981	0	-	-	-	-
1982	44	20	359	962	June 23
1983	36	36	596	832	July 12
1984	39	22	599	1,575	January 8
1985	0	-	-	-	-
1986	42	42	673	2,177	April 1
1987	0	-	-	-	-
1988	0	-	-	-	-
1989	0	-	-	-	-
1990	0	-	-	-	-
1991	0	-	-	-	-
1992	0	-	-	-	-
1993	0	-	-	-	-
1994	0	-	-	-	-
1995	66	56	721	3,062	July 14
1996	9	5	1,671	3,921	May 26
1997	13	10	2,219	9,518	June 6
1998	25	25	772	1,613	July 6
Mean	12	9	729	2,958	
Minimum	0	0	359	962	
Maximum	66	56	2,219	9,518	

<i>Water Year</i>	<i>Dam Spill</i>		<i>Flow During Spill Events</i>		<i>Date of Last Day of Spill</i>
	<i>Total No. of Days</i>	<i>Greatest No. of Consecutive Days</i>	<i>Average Flow (cfs)</i>	<i>Maximum Flow (cfs)</i>	
1993	2	1	77	83	January 22
1994	0	-	-	-	-
1995	99	95	882	4,584	July 15
1996	39	25	702	5,512	June 6
1997	84	35	803	14,746	June 6
1998	35	32	847	1,941	July 13
Mean	44	38	798	5,373	
Minimum	0	0	77	83	
Maximum	99	95	882	14,746	

<i>Water Year</i>	<i>Dam Spill</i>		<i>Flow During Spill Events</i>		<i>Date of Last Day of Spill</i>
	<i>Total No. of Days</i>	<i>Greatest No. of Consecutive Days</i>	<i>Average Flow (cfs)</i>	<i>Maximum Flow (cfs)</i>	
1976	0	-	-	-	-
1977	0	-	-	-	-
1978	0	-	-	-	-
1979	0	-	-	-	-
1980	10	10	1,718	5,080	January 21
1981	0	-	-	-	-
1982	97	77	636	4,810	June 25
1983	141	98	583	3,600	July 12
1984	37	18	1,407	4,270	January 7
1985	0	-	-	-	-
1986	45	45	1,354	9,610	April 1
1987	0	-	-	-	-
1988	0	-	-	-	-
1989	0	-	-	-	-
1990	0	-	-	-	-
1991	4	4	192	277	February 23
1992	0	-	-	-	-
1993	2	2	491	639	January 22
1994	0	-	-	-	-
1995	131	96	920	6,241	July 23
1996	85	62	457	6,173	June 12
1997	97	76	1,447	31,577	June 6
1998	38	34	779	1,923	July 14
Mean	30	47	937	6,745	
Minimum	0	0	192	277	
Maximum	141	98	1,718	31,577	

Reservoir each spilled 3.3 percent of the days in the record, Junction Reservoir spilled 11.8 percent of the days in the record, and Camino Reservoir spilled 8.2 percent of the time.

4.13.3 Study Objectives

The study objective is to determine the extent to which SMUD can control ramping downstream of reservoirs into which UARP powerhouses directly release water (Gerle Creek, Union Valley, Junction and Camino reservoirs).

4.13.4 Study Area and Sampling Locations

The study area includes Gerle Creek, Junction and Camino reservoirs. Union Valley Reservoir is excluded because it spills directly into Junction Reservoir. No fieldwork is proposed and no sampling locations are identified.

4.13.5 Information Needed From Other Studies

Information needed from other studies includes: 1) daily and hourly releases/spills from Gerle Creek, Junction and Camino reservoirs from the Hydrology Study; and 2) aquatic and riparian species that might occur downstream from Gerle Creek, Junction and Camino reservoirs from the Fish Survey and Amphibians/Aquatic Reptiles Study. Information from this study might be beneficial to the Channel Morphology Study as well as other studies.

4.13.6 Study Methods And Schedule

Study methods will include: 1) reviewing the hydrologic data (daily and hourly flows where available) for the study area and determining those periods when SMUD can exercise control over flows. This will likely be done selecting typical water years rather than every water year; 2) in those periods when SMUD can control ramping, describe what historically has occurred regarding changes in flow (including narrative description and plots); and 3) in those periods when SMUD can control ramping, describe the extend of control possible. Lastly, evaluate whether additional control of ramping, other than that which has been historically been done by SMUD, could reasonably protect or improve conditions for aquatic and riparian species, or could reduce spills. It is anticipated that the paper study will be done in 2002, with a report to the Aquatic TWG and Plenary Group for review in late 2002. If the Aquatic TWG or Plenary Group conclude that additional information is needed, a new study plan will be developed by the Aquatic TWG and implemented in 2003.

4.13.7 Analysis

Data analysis will include a discussion of the above data, the ability of SMUD to control flows, and affects on aquatic and riparian species.

4.13.8 Study Output

The report will be presented to the Aquatic TWG and Plenary Group by late 2002. Additional studies, if needed, will occur in 2003. The ultimate study output will be a written report that includes the issues addressed, objectives, study area including sampling locations, methods, analysis, results, discussion and conclusions. The report will be prepared in a format so that it can easily be incorporated into the Licensee's draft environmental assessment that will be submitted to FERC with the Licensee's application for a new license.

4.13.9 Preliminary Estimated Study Cost

A preliminary cost estimate for this study will be developed after approval by the Plenary Group.

4.13.10 Plenary Group Endorsement

The Aquatics TWG approved this plan on April 25, 2002. The participants a the meeting who said they could "live with" this study plan were PCWA, El Dorado County, BLM, CDFG, USFS, USFWS, SMUD, SWRCB and PG&E. None of the participants at the meeting said they could not "live with" this study plan. The Plenary Group approved the plan on June 5, 2002. The participants a the meeting who said they could "live with" this study plan were PCWA, El Dorado County, BLM, BOR, USFS, CSPA, SMUD, FOR, PG&E. None of the participants at the meeting said they could not "live with" this study plan.

4.13.11 Literature Cited

Sacramento Municipal Utility District. 2001. Initial Information Package for Relicensing of the Upper American River Project (FERC Project No. 2101). Sacramento, CA.