



United States Department of the Interior

BUREAU OF RECLAMATION
Central Valley Operations Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

IN REPLY
REFER TO:

CVO-400
WTR-4.10

VIA ELECTRONIC MAIL

Mr. Les Grober
Deputy Director, Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812

Subject: Monitoring and Reporting Program on Water Rights Order No. 90-5 (Water Rights)

Dear Mr. Grober:

For the month of December, the temperature control point was set at Balls Ferry, per the June 2016, Sacramento River Temperature Plan.

During December 2016, the average daily water temperature compliance of 56.0 °F or less was met at the Balls Ferry compliance point on the Sacramento River. During the month of December 2016, the average monthly water temperature was 49.1 °F at Balls Ferry.

Enclosed is the monitoring report for December 2016, under Order No. 90-5. The report contains the following data:

Station	Description
Shasta Inlets (R-1) “	Water Temperature Profile Turbidity, monthly, ntu
Shasta Dam (R-2) “	Water Temperature, daily average, degrees F Turbidity, ntu, monthly
Shasta Dam (R-2a)	Flow, average daily, cfs
Keswick (R-3) “	Water Temperature, daily average, degrees F Turbidity, ntu, monthly
Keswick (R-3a)	Flow, average daily, cfs

Station	Description
Spring Creek Power plant (R-4) “	Water Temperature, daily average, degrees F Turbidity, ntu, monthly Flow, average daily cfs
Control Point (R-5) Control Point	Water Temperature, daily average, degrees F Turbidity, ntu, monthly
Sacramento at Delta (R-6)	Water Temperature, monthly, degrees F Turbidity, ntu, monthly
McCloud (R-7) “	Water Temperature, monthly, degrees F Turbidity, ntu, monthly
Pit River (R-8) “	Water Temperature, monthly, degrees F Turbidity, ntu, monthly
Lewiston (R-9)	Water Temperature, daily average, degrees F
Lewiston (R-9a)	Flow, average daily, cfs

Please contact Ms. Randi Field at 916-979-2066, should you have any questions regarding this data.

Sincerely,



Elizabeth Kiteck
Chief, Water Operations

Enclosures

cc: Mr. Kenneth Emanuel
Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812
(w/encl)

Central Valley Operations Office
 *Data obtained from the California Data Exchange Center
 **Data calculated by the Central Valley Operations Office
 ***Measurements taken by the Northern CA Area Office Personnel
Water Temperature Data in Degrees F
December 2016

Req. Sampling Frequency - Daily Average (Reading indicates daily average)							Req. Sampling Frequency - Monthly		
Date	Sta 2 Shd*	Sta 3 Kwk*	Sta 4 Spp**	Sta 5 Bsf**	Sta9 Lws*	Sta10 Nfh*	Sta 6 Dlt***	Sta 7 Mss***	Sta 8 Pmn***
1	52.5	52.0	55.1	50.7	47.1	45.7			
2	52.5	51.8	54.6	50.6	46.5	44.7			
3	52.2	51.8	55.0	50.9	46.5	44.0			
4	52.2	51.9	54.9	51.1	46.7	44.8			
5	52.1	51.7	54.5	50.7	46.3	44.6			
6	52.1	51.5	53.9	50.1	45.3	43.3		41.4	
7	52.1	51.1	53.3	49.4	44.8	41.2			
8	51.9	51.2	53.0	48.5	44.8	40.8			
9	52.7	51.3	53.4	48.3	45.5	42.5			
10	53.4	51.4	52.6	49.3	45.4	43.9			
11	53.3	52.1	53.1	49.0	45.2	43.4			
12	53.1	52.3	52.1	49.9	45.0	43.0			
13	52.8	52.2	51.9	49.9	44.8	42.7			
14	52.6	52.2	51.6	48.9	44.7	43.0			
15	52.7	52.1	51.6	51.6	45.2	45.3	47.9		
16	52.3	51.7	51.4	50.0	44.5	44.7			
17	52.0	51.3	51.2	47.5	43.9	42.2			
18	51.8	51.0	50.8	46.8	43.5	40.8			
19	51.6	50.4	50.5	47.1	43.4	40.5			
20	51.2	50.3	50.2	47.8	43.8	41.5			42.8
21	51.3	50.7	49.9	49.6	43.9	42.5			
22	50.9	50.9	49.6	49.7	43.0	41.1			
23	50.6	50.6	49.3	48.7	43.2	40.9			
24	50.5	50.2	49.3	48.1	43.1	40.7			
25	50.3	49.9	49.3	47.5	42.9	40.6			
26	50.2	49.8	48.8	47.4	42.3	39.7			
27	50.0	49.8	48.5	48.1	42.4	39.8			
28	49.9	49.6	48.4	48.3	42.8	41.0			
29	49.8	49.5	48.3	48.4	42.9	41.1			
30	49.6	49.6	48.2	48.5	43.2	41.2			
31	49.5	49.5	48.0	48.7	42.9	41.8			

Control Point: 12/1-12/31 BSF @ 56.0 DAT

Cross Channel Gate Operation:
 December 01-31 closed

**Measurements taken by the Northern CA Area Office Personnel
December 2016**

TEMPERATURE					
Sampling Frequency					
Every two weeks May 1 through November 30.					
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
	12/22/2016				
Lake Elev	Temperature	Temperature	Temperature	Temperature	Temperature
MSL	Degrees F	Degrees F	Degrees F	Degrees F	Degrees F
(400 Feet Upstream of Dam)					
	Time: 11:15				
625	46.5				
650	46.6				
675	46.9				
700	47.4				
725	48.1				
750	48.6				
775	49.1				
800	49.5				
825	50.5				
850	51.5				
875	52.6				
900	53.3				
925	53.3				
950	53.3				
975	53.3				
1000	53.3				
1025					
1050					
Lake Surface	53.4 @ 1022.10'				

TURBIDITY					
Sampling Frequency					
Monthly, except weekly May 1 through Sep 30, when turbidity at Station 2 is equal to or greater than 10 NTU					
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
	12/22/2016				
Lake Elev	Turbidity	Turbidity	Turbidity	Turbidity	Turbidity
MSL	ntu	ntu	ntu	ntu	ntu
(400 Feet Upstream of Dam)					
	Time: 11:15				
625	7.3				
650	7.2				
675	6.9				
700	6.0				
725	4.8				
750	4.6				
775	3.9				
800	3.3				
825	2.5				
850	1.8				
875	1.5				
900	1.4				
925	1.4				
950	1.4				
975	1.2				
1000	1.0				
1025					
1050					
Lake Surface	0.8 @ 1022.10'				

Central Valley Operations Office
 Measurements taken by the Northern CA Area Office Personnel

**Summary of Turbidity and Dissolved Oxygen Water Sampling
 December 2016**

Turbidity Measurements, NTU

Sampling Frequency

Monthly, except weekly from May 1 through September 30, when turbidity at Station 2 is equal to or greater than 10 NTU.

Station

	R-2	R-3a	R-4	R-5	R-6	R-7	R-8	
	Shasta Dam		Spring					
	Discharge	Keswick	Creek PP		Sacramento	McCloud	Pit	
Day	at Bridge	Discharge	Discharge	Clear Creek	River (DLT)	River	River	
6						1.3		
9	3.6							
14			0.8					
15					93.2			
19				3.0				
20							7.1	
21		2.2						

Dissolved Oxygen, mg/l

Sampling Frequency

Every two weeks from May 1 through September 30; samples to be taken before 1000 hours.

Station

	R-2	R-3	R-5	
	Shasta Dam			Hour
	Discharge	Keswick		Time Sample
Day	at Bridge	Discharge	Clear Creek	Taken
9	9.0			10:20
19			10.0	12:10
21		10.6		13:20

Control Point: 12/1-12/31 BSF @ 56.0 DAT

SHASTA LAKE, DAM AND POWERPLANT

QG

GENERATION RELEASE, CFS

WATER YEAR OCTOBER 2016 TO SEPTEMBER2017

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6,289	4,929	4,122									
2	6,463	4,805	4,181									
3	6,942	4,257	4,630									
4	6,469	4,132	4,570									
5	6,546	3,985	4,123									
6	5,865	4,666	4,054									
7	4,953	4,429	4,088									
8	6,060	4,387	4,979									
9	6,069	3,948	5,086									
10	5,860	3,670	4,720									
11	6,325	4,016	4,126									
12	6,275	4,279	3,453									
13	5,812	4,781	3,984									
14	6,180	4,605	3,960									
15	5,544	4,948	1,657									
16	6,164	5,005	2,446									
17	6,027	4,610	2,801									
18	5,192	4,023	2,871									
19	4,812	4,247	2,656									
20	5,304	4,378	3,422									
21	5,789	4,357	7,632									
22	5,733	4,673	7,859									
23	5,549	4,642	9,317									
24	5,367	4,159	9,866									
25	4,817	4,461	9,186									
26	4,817	4,341	9,346									
27	4,791	4,427	8,207									
28	4,057	4,238	8,682									
29	3,861	4,423	9,191									
30	5,475	4,779	8,429									
31	4,387		7,482									
TOTAL	173,794	132,600	171,086									
MEAN	5,606	4,420	5,519									
MAX	6,942	5,005	9,866									
MIN	3,861	3,670	1,657									

WATER YEAR TOTALS

TOTAL	477,480
DAILY MEAN	5,190
DAILY MAX	9,866 12/24/2016
DAILY MIN	1,657 12/15/2016

UNITED STATES DEPARTMENT OF THE INTERIOR
 U.S. BUREAU OF RECLAMATION-CENTRAL VALLEY PROJECT-CALIFORNIA

RUN DATE: January 5, 2017

KESWICK DAM, RESERVOIR, AND POWERPLANT

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TOTAL RELEASE, CFS

WATER YEAR OCTOBER 2016 TO SEPTEMBER2017

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7,368	4,950	4,816									
2	7,366	5,147	4,832									
3	7,349	5,023	4,842									
4	7,021	4,831	4,840									
5	7,013	4,841	4,841									
6	6,764	4,841	4,841									
7	6,751	4,841	4,838									
8	6,756	4,840	4,835									
9	6,751	4,854	4,840									
10	6,510	4,866	4,839									
11	6,505	4,866	4,837									
12	6,537	4,866	4,841									
13	6,545	4,865	4,840									
14	6,542	4,863	4,842									
15	6,519	4,779	4,997									
16	6,515	4,865	4,946									
17	6,519	4,866	4,889									
18	6,232	4,864	4,891									
19	6,222	4,866	4,890									
20	6,225	4,862	4,870									
21	5,770	4,865	9,706									
22	5,495	4,864	9,852									
23	5,493	4,864	9,753									
24	5,444	4,866	9,762									
25	5,346	4,861	9,760									
26	4,888	4,814	9,762									
27	4,887	4,815	9,825									
28	4,889	4,810	9,839									
29	4,889	4,816	9,836									
30	4,864	4,816	8,527									
31	4,864		7,175									
TOTAL	190,839	145,987	201,004									
MEAN	6,166	4,866	6,484									
MAX	7,368	5,147	9,852									
MIN	4,864	4,779	4,816									

WATER YEAR TOTALS

TOTAL	537,830	
DAILY MEAN	5,846	
DAILY MAX	9,852	12/22/2016
DAILY MIN	4,779	11/15/2016

LEWISTON DAM, LAKE, AND JUDGE FRANCIS CARR POWERPLANT

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RELEASE TO RIVER, CFS

WATER YEAR OCTOBER 2016 TO SEPTEMBER2017

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	466	313	310									
2	461	320	311									
3	440	319	307									
4	440	317	304									
5	448	316	306									
6	450	316	305									
7	450	314	306									
8	446	302	306									
9	447	311	306									
10	449	303	308									
11	463	304	309									
12	465	304	308									
13	455	302	308									
14	451	321	308									
15	447	311	313									
16	445	310	311									
17	408	313	311									
18	330	314	312									
19	301	313	309									
20	301	312	307									
21	300	313	303									
22	302	311	306									
23	305	309	308									
24	306	307	308									
25	305	311	307									
26	317	313	306									
27	321	311	307									
28	309	311	306									
29	308	311	307									
30	309	310	307									
31	308		306									
TOTAL	11,953	9,342	9,536									
MEAN	386	311	308									
MAX	466	321	313									
MIN	300	302	303									

WATER YEAR TOTALS

TOTAL	30,831	
DAILY MEAN	336	
DAILY MAX	466	10/01/2016
DAILY MIN	300	10/21/2016

WHISKEYTOWN DAM, LAKE, AND SPRING CREEK POWERPLANT

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GENERATION RELEASE, CFS

WATER YEAR OCTOBER 2016 TO SEPTEMBER 2017

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	746	18	14									
2	349	14	293									
3	276	530	14									
4	454	481	14									
5	309	519	14									
6	808	14	62									
7	1,036	14	220									
8	398	31	215									
9	292	471	16									
10	292	654	130									
11	365	183	14									
12	417	180	414									
13	380	23	393									
14	14	166	583									
15	362	35	2,090									
16	417	86	2,161									
17	658	164	1,723									
18	1,086	170	1,674									
19	802	193	1,821									
20	730	135	703									
21	295	14	519									
22	16	336	475									
23	14	511	122									
24	14	238	315									
25	14	311	152									
26	19	171	200									
27	191	280	1,049									
28	14	344	353									
29	14	14	164									
30	14	14	82									
31	989		25									
TOTAL	11,785	6,314	16,024									
MEAN	380	210	517									
MAX	1,086	654	2,161									
MIN	14	14	14									

WATER YEAR TOTALS

TOTAL	34,123	
DAILY MEAN	371	
DAILY MAX	2,161	12/16/2016
DAILY MIN	14	10/14/2016