Project 184
El Dorado Irrigation District

Streamflow and Reservoir Storage Gaging Plan

September 2007

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1.0 BACKGROUND

On October 18, 2006, the Federal Energy Regulatory Commission (FERC) issued the ORDER ISSUING NEW LICENSE for Project 184 (License). Under the United States Forest Service (Forest Service) 4(e) Condition 40 (Condition 40), Licensee, El Dorado Irrigation District (EID) is required to submit a streamflow and reservoir storage Gaging Plan within one year of License issuance.

Condition 40 states:

"Condition No. 40 – Streamflow and Reservoir Storage Gaging Plan

> *The licensee shall, within 1 year after license issuance, develop and file for FERC approval a Streamflow and Reservoir Storage Gaging Plan (gaging plan) that meets United States Geological Survey (USGS) standards. The licensee shall provide copies of the Gaging Plan and USGS review results to the FS, ERC, SWRCB, and FERC. The plan shall be approved by the SWRCB prior to filing with FERC. The licensee shall implement the plan upon approval.*
>
> *At a minimum, the plan shall address compliance gaging at the following locations:*
>
> *Echo Creek below Echo Lakes Dam*
> *Pyramid Creek below Lake Aloha Dam*
> *Caples Creek below Caples Lake Dam*
> *Silver Fork American River below Silver Lake Dam*
> *Silver Fork American River below Oyster Creek*
> *SFAR below Kyburz Diversion Dam*
> *Carpenter Creek below Carpenter Creek Diversion Dam*
> *No Name Creek below No Name Creek Diversion Dam*
> *Alder Creek below Alder Creek Diversion*
> *Mill Creek below Mill Creek Diversion Dam*
> *Bull Creek below Bull Creek Diversion Dam*
> *Ogilby Creek below Ogilby Diversion Dam*
> *Esmeralda Creek below Esmeralda Creek Diversion Dam*
>
> *The licensee shall perform an investigation to determine whether telemetry equipment can be installed at Lake Aloha to monitor conditions and/or control operations. If the licensee, SWRCB, and FS concur that such equipment is economically and technologically feasible and can be installed consistent with law, regulations, and policies applicable to Desolation Wilderness, the licensee shall seek necessary approvals for such installation."*

2.0 INTRODUCTION

The Streamflow and Reservoir Storage Gaging Plan (gaging plan) documents that the Licensee's proposed gaging facilities and monitoring methodologies are suitable and complete for purposes of confirming License compliance as coordinated and approved pursuant to Condition 40. This plan is the result of a collaborative effort between the Licensee, Project 184 Ecological Resources Committee (ERC), Forest Service, and the State Water Resources Control Board (SWRCB). As gaging facilities are modified, there may be minor changes from the details presented in this gaging plan; however, the overall intent of this plan will not change.

3.0 GAGE INFORMATION AND PLANNED MODIFICATIONS

Sections 5 and 6 of this Plan provide a description of EID gaging facilities. This includes each facility's current limitations and planned modifications to meet compliance requirements. Table 19, at the end of the document, details the planned modifications and the timeline in which they will be completed.

The proposed modifications to gaging stations will meet USGS standards. The final designs for each proposed modification will be submitted to the USGS for review.

4.0 COMPLIANCE WITH 4(E) CONDITION 40

A map of the locations of the existing and planned Project 184 stream and reservoir gages is shown in Figure 1.

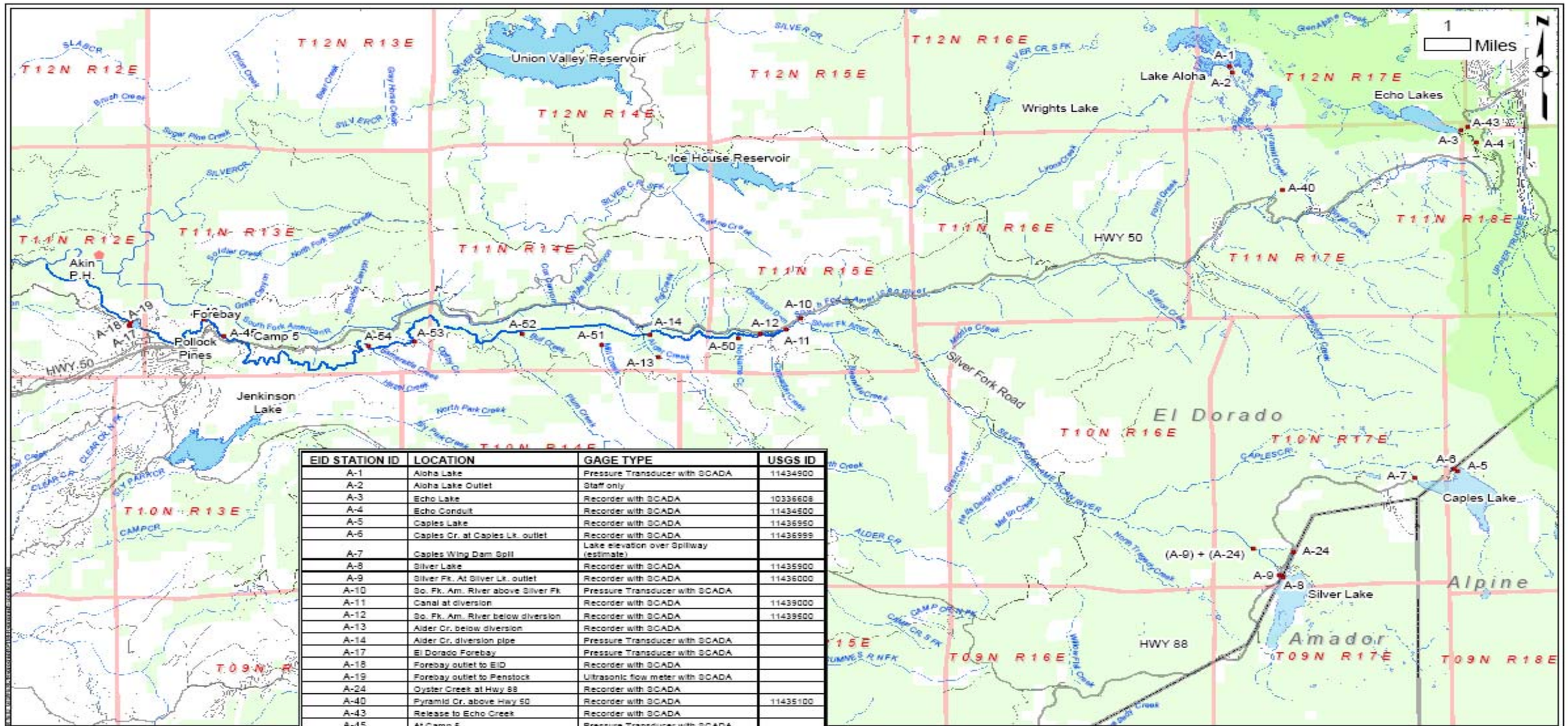
Gages will follow USGS guidelines for operation and quality assurance procedures. Table 1 describes each of the license compliance gaging stations and Sections 5.0 and 6.0 discuss them in detail. These gages will be used to measure compliance with the minimum streamflow and reservoir storage levels specified in Forest Service 4(e) Condition 40.

Minimum streamflow and reservoir storage requirements are specific to the current water year type. There are five possible water year types: critically dry, dry, below normal, above normal, and wet. Tables 2 through 18 show the minimum streamflow and reservoir operation requirements for each stream or lake.

EID operates certain gages throughout the system for operational and informational purposes only. Table 2 lists these gages and Section 7.0 discusses them further.

A copy of the USGS review of this gaging plan is attached as Appendix B, in accordance with Forest Service 4(e) Condition 40.

Figure 1: Locations of Streamflow and Reservoir Storage Gages in Project No. 184



EID STATION ID	LOCATION	GAGE TYPE	USGS ID
A-1	Aloha Lake	Pressure Transducer with SCADA	11434900
A-2	Aloha Lake Outlet	Staff only	
A-3	Echo Lake	Recorder with SCADA	10336608
A-4	Echo Conduit	Recorder with SCADA	11434500
A-5	Caples Lake	Recorder with SCADA	11436950
A-6	Caples Cr. at Caples Lk. outlet	Recorder with SCADA	11436999
A-7	Caples Wing Dam Spill	Lake elevation over Spillway (estimate)	
A-8	Silver Lake	Recorder with SCADA	11435900
A-9	Silver Fk. At Silver Lk. outlet	Recorder with SCADA	11436000
A-10	So. Fk. Am. River above Silver Fk.	Pressure Transducer with SCADA	
A-11	Canal at diversion	Recorder with SCADA	11439000
A-12	So. Fk. Am. River below diversion	Recorder with SCADA	11439500
A-13	Alder Cr. below diversion	Recorder with SCADA	
A-14	Alder Cr. diversion pipe	Pressure Transducer with SCADA	
A-17	El Dorado Forebay	Pressure Transducer with SCADA	
A-18	Forebay outlet to EID	Recorder with SCADA	
A-19	Forebay outlet to Penstock	Ultrasonic flow meter with SCADA	
A-24	Oyster Creek at Hwy 88	Recorder with SCADA	
A-40	Pyramid Cr. above Hwy 50	Recorder with SCADA	11435100
A-43	Release to Echo Creek	Recorder with SCADA	
A-45	At Camp 5	Pressure Transducer with SCADA	
A-46	Below Flume 51	Recorder with SCADA	
A-50	No Name Creek below diversion	Recorder with SCADA	
A-51	Mill Cr. above diversion	Recorder with SCADA	
A-52	Bull Cr. diversion	Recorder with SCADA	
A-53	Ogilby Cr. below diversion	Recorder with SCADA	
A-54	Esmeralda Cr. below diversion	Recorder with SCADA	
A-9 + A-24	Silver Fk. Below Oyster Cr confluence	No gage (A-9) + (A-24) = d/s confluence	

El Dorado Irrigation District
2890 Mosquito Road
Placerville, CA

El Dorado National Forest
Private Land
Hydrograph Locations
Tahoe Basin Mgt. Unit
County Boundaries
El Dorado Canal

FERC Project 184
Hydrograph Locations
Rev.: 3.0
Date: August 9, 2007
Figure 1

Table 1. Streamflow and reservoir storage gages. All gages will be reviewed and published by the USGS.

EID STATION ID	LOCATION	GAGE TYPE	USGS ID
A-1	Aloha Lake	Pressure Transducer with SCADA	11434900
A-3	Echo Lake	Recorder with SCADA	10336608
A-4	Echo Conduit	Recorder with SCADA	11434500
A-5	Caples Lake	Recorder with SCADA	11436950
A-6	Caples Cr. at Caples Lk. outlet	Recorder with SCADA	11436999
A-8	Silver Lake	Recorder with SCADA	11435900
A-9	Silver Fk. At Silver Lk. outlet	Recorder with SCADA	11436000
A-11	Canal at diversion	Recorder with SCADA	11439000
A-12	So. Fk. Am. River below diversion	Recorder with SCADA	11439500
A-13	Alder Cr. below diversion	Recorder with SCADA	
A-14	Alder Cr. diversion pipe	Pressure Transducer with SCADA	
A-24	Oyster Creek at Hwy 88	Recorder with SCADA	
A-40	Pyramid Cr. above Hwy 50	Recorder with SCADA	11435100
A-43	Release to Echo Creek	Recorder with SCADA	
A-50	No Name Creek below diversion	Recorder with SCADA	
A-51	Mill Cr. above diversion	Recorder with SCADA	
A-52	Bull Cr. diversion	Recorder with SCADA	
A-53	Ogilby Cr. below diversion	Recorder with SCADA	
A-54	Esmeralda Cr. below diversion	Recorder with SCADA	
A-9 + A-24	Silver Fk. Below Oyster Cr confluence	No gage (A-9) + (A-24) = d/s confluence	

Table 2. EID gages. These gages are used for operating or public information purposes.

EID STATION ID	LOCATION	GAGE TYPE
A-2	Aloha Lake Outlet	Staff gage only
A-7	Caples Wing Dam Spill	Lake elevation over Spillway (estimate)
A-10	So. Fk. Am. River above Silver Fk	Pressure Transducer with SCADA
A-17	El Dorado Forebay	Pressure Transducer with SCADA
A-18	Forebay outlet to EID	Recorder with SCADA
A-19	Forebay outlet to Penstock	Ultrasonic flow meter with SCADA
A-45	At Camp 5	Pressure Transducer with SCADA
A-46	Below Flume 51	Recorder with SCADA

5.0 LAKES

Project 184 consists of four reservoirs. These reservoirs are listed below along with the gaging season.

Caples Lake, full year
Silver Lake, full year
Echo Lakes, seasonal
Lake Aloha, seasonal

Storage levels in these reservoirs will be monitored by the gaging stations discussed below. These gages will be operated according to USGS guidelines for operation and quality assurance procedures.

5.1 Caples Lake

Caples Lake is located on the Highway 88 corridor in Alpine County. Storage is recorded at Caples Lake by gage A-5 (USGS gage 11436950). An 8'x12' concrete block gage house is equipped with a newly installed High Level data logger that stores and sends data to Camp 5 office via radio transmission. Forest Service 4(e) Condition No. 52.2 of the FERC License stipulates that Caples Lake be operated according to the requirements in Table 3.

Table 3. Caples Lake End-of-Month Operating Requirements

Caples Lake							
			End of Month Lake Levels by Water Year				
	Month		In Acre-Feet				
			CD	DRY	BN	AN	WET
	JUNE		18704	18704	22338	22338	22338
	JULY		18413	18646	22089	22338	22338
	AUGUST		14376	14376	18006	18006	18006
	SEPT		14376	14376	18006	18006	18006

EID will also put forth a good faith effort to operate Caples Lake according to the Settlement Agreement with the League to Save Sierra Lakes, which states:

> *…the Board of Directors hereby directs its operating staff and management to work in good faith and employ best efforts to: Release stored water from Caples Lake between August 1 and October 31 in a manner that avoids average releases greater than 100 acre feet per day;…"*

Gage A-7, Caples Wing Spill Dam, will measure the flow that spills over Caples Lake wing dam. EID operated the lake to avoid spilling at this location at all times. The Forest Service 4(e) Condition 34 requires EID to limit the spill in Caples spillway channel to 60 cfs or less. In order to comply with Condition 34, a method for measuring spill is necessary. There is not an adequate site downstream of the dam to monitor flow. A rating will be developed to estimate spill over the flash boards. The lake elevation will be used to monitor the spill.

5.2 Silver Lake

Storage in Silver Lake is recorded by gage A-8 (USGS 11435900) and is located on the Highway 88 corridor in Amador County. A 7'x 9' concrete block gage house at this site is equipped with High Level data logger/bubbler system that collects, stores, and sends data through radio transmission to EID's Camp 5 office. Discretionary releases from Silver Lake may only be made after September 15 of each year. Prior to September 30 of each year, gage A-8 shall read no less than 12 feet. Silver Lake must reach a gage height of 12 ft by October 25 and shall be no less than 7.4 ft on November 1 of each year. Readings from gage A-8 are posted on the Project 184 website hourly.

Discretionary releases will not be made from Silver Lake prior to Labor Day each year. From Labor Day until September 15 discretionary releases will not be made from Silver Lake unless a Stage 1, 2, or 3 Emergency Notice is issued. After September 15 of each year, discretionary releases from Silver Lake may be made, with the limitation that stage height on September 30 shall be no less than 12.0 feet as measured on the gage at the outlet works. Silver Lake stage shall be no less than 7.4 as of November 1 of each year.

EID will also put forth a good faith effort to operate Silver Lake according to the Settlement Agreement with the League to Save Sierra Lakes, which states:

> *…the Board of Directors hereby directs its operating staff and management to work in good faith and employ best efforts to: …Achieve September 30 Silver Lake staff gauge target elevations of 14.4 feet in Wet and Above Normal years and 13.0 feet in all other years, and October 15 target elevations of 11.0 feet in Wet and Above Normal years and 10.3 feet in all other years;…"*

To monitor the instream flow requirement on Silver Fork American River below the Oyster Creek confluence, EID will monitor gages A-9 and A-24 and provide a summation of the flows to produce the total flow downstream of the confluence. An arithmetic solution is required because the location of Silver Fork/Oyster Creek confluence is not suitable for gage installation and maintenance.

5.3 Lake Aloha

Storage at Lake Aloha is typically measured between May 1 and late October by gage A-1 (USGS 11434900, Lake Aloha). As a general rule, when water is being stored in the lake, storage is measured and recorded. The exact dates vary depending on the watershed conditions.

Gage A-1 at Lake Aloha is located in the Desolation Wilderness. It is reached by crossing Echo Lake by boat and hiking 4 miles on a trail to Lake Aloha. EID has installed telemetry at the main dam using a pressure transducer to read the lake elevation. Data are sent back to the Camp 5 office via radio. This telemetry provides better control of operations thereby reducing the number of spill each year and assisting EID to maintain a full reservoir for the recreation season. Hourly readings from gage A-1 are posted on the Project 184 website every 3 hours.

End-of-month lake level operational requirements at Lake Aloha are established in State Water Board Decision 1635 as modified by Order WR 2001-22. Each year, from June through September, Lake Aloha should be operated according to Table 4, which was taken from Order WR 2001-22.

Table 4. Lake Aloha End-of-Month Operating Requirements

MONTH	CRITICAL WATER YEAR E.O.M. STAGE (Gage height, feet)	DRY WATER YEAR E.O.M. STAGE (Gage height, feet)	BELOW NORMAL WATER YEAR E.O.M. STAGE (Gage height, feet)	ABOVE NORMAL WATER YEAR E.O.M. STAGE (Gage height, feet)	WET WATER YEAR E.O.M. STAGE (Gage height, feet)
June	Average: 18.3 Minimum: 16.2	Average: 19.6 Minimum: 18.1	Average: 19.5 Minimum: 18.2	Average: 19.5 Minimum: 17.2	Average: 18.1 Minimum: 14.3
July	Average: 11.0 Minimum: 5.0	Average: 15.2 Minimum: 10.1	Average: 17.1 Minimum: 15.3	Average: 18.8 Minimum: 16.6	Average: 19.2 Minimum: 14.6
August	Average: 6.6 Minimum: 5.0	Average: 7.6 Minimum: 5.0	Average: 9.9 Minimum: 5.2	Average: 12.2 Minimum: 7.3	Average: 14.2 Minimum: 8.4
September	Average: 6.0 Minimum: 5.0	Average: 5.7 Minimum: 5.0	Average: 6.8 Minimum: 5.0	Average: 7.6 Minimum: 5.0	Average: 8.1 Minimum: 5.0

5.4 Echo Lakes

Storage at Echo Lakes is measured between early May and late November, the exact dates depend on snow conditions and accessibility. As a general rule, when water is being stored in the lakes, measurements are made and recorded. Echo Lakes will be operated so that the channel between the Upper and Lower Echo Lakes is navigable by motorized watercraft, between July 1 and Labor Day of each year, while still complying with minimum streamflow or other conditions and requirements.

Gage A-3 (USGS 11336608, Echo Lakes) is located on Lower Echo Lake, which is north of Highway 50; about 2 miles north of Echo summit. A 7'x 7' concrete gage house has a new High Level data logger/bubbler system that collects and stores the data as well as sends the data back to Camp 5 office by radio through the Heavenly Valley repeater. Echo Lakes storage is maintained near full capacity through the summer until after Labor Day weekend when tourism slows considerably. At this time, the lakes are drafted and water flows through the Echo Conduit, Echo Ditch, and Echo Tunnel which convey Echo Lakes water into the South Fork American River. Prior to and during drafting operations, Echo Lakes drain naturally into Echo Creek, a tributary to the Upper Truckee River.

6.0 STREAMFLOW

The minimum streamflow schedules have been separated into five water year types: Wet, Above Normal (AN), Below Normal (BN), Dry, and Critically Dry (CD). Minimum streamflows will be monitored by the gaging stations listed below. Some gages are full range gages while others are partial range or seasonal. These distinctions are also listed below.

Echo Creek below Echo Lakes Dam, full range/seasonal gage
Echo Conduit, seasonal gage
Pyramid Creek at Twin Bridges, full range gage
Caples Creek below Caples Lake Dam, full range gage
Silver Fork American River below Silver Lake Dam, full range gage
Oyster Creek at Highway 88, seasonal gage
Silver Fork American River below Oyster Creek,
(sum of the previous two gages) seasonal calculation
South Fork American River below Kyburz Diversion Dam, full range gage
El Dorado Canal at Diversion Dam, full range gage
Carpenter Creek below Carpenter Creek Diversion Dam, no gage
No Name Creek below No Name Creek Diversion Dam, partial gage
Alder Creek below Alder Creek Diversion, full range gage
Alder Creek Diversion Pipe, full range/seasonal gage
Mill Creek below Mill Creek Diversion Dam, partial range gage
Bull Creek below Bull Creek Diversion Dam, partial range gage
Ogilby Creek below Ogilby Diversion Dam, partial range gage
Esmeralda Creek below Esmeralda Creek Diversion Dam, partial range gage

Flows in these streams and rivers will be monitored by the gaging stations discussed in the following subsections, 6.1 through 6.17. These gages will be operated according to USGS guidelines for operation and quality assurance procedures.

6.1 Echo Creek below Echo Lakes Dam

Echo Creek is a tributary to the Upper Truckee River, which naturally flows into Lake Tahoe when it is not diverted to the SFAR. Gage A-43 measures flow in Echo Creek, below Echo Dam. This gage is located approximately 300 yards downstream of the outlet to Echo Creek. The gage has a 24-inch stilling well and uses a High Sierra data logger to collect and store the gage readings. Data are transmitted to the Camp 5 office via radio signal. For License compliance, the rock dam, which serves as the control, will need minor improvements. This dam is located downstream of the gage and it will be grouted to prevent leakage through the dam at low flows. This work will be done according to the timeline outlined in Table 19. The data logger will be replaced with a High Level data logger for better accuracy and for consistency with the other gaging stations.

Table 5. Minimum Streamflow Requirements - Echo Creek

Echo Creek Below Echo Lakes Dam						
	Month	Minimum Streamflow by Water Year (cfs)				
		CD	DRY	BN	AN	WET
	OCT	6 or NF	6 or NF	6 or NF	6 or NF	6 or NF
	NOV	6 or NF	6 or NF	6 or NF	6 or NF	6 or NF
	DEC	6 or NF	6 or NF	6 or NF	6 or NF	6 or NF
	JAN	6 or NF	6 or NF	6 or NF	6 or NF	6 or NF
	FEB	6 or NF	6 or NF	6 or NF	10 or NF	10 or NF
	MAR	6 or NF	6 or NF	6 or NF	15 or NF	15 or NF
	APR	6 or NF	10 or NF	15 or NF	25 or NF	25 or NF
	MAY	6 or NF	15 or NF	30 or NF	45 or NF	45 or NF
	JUNE	6 or NF	15 or NF	30 or NF	40 or NF	40 or NF
	JULY	6 or NF	10 or NF	15 or NF	20 or NF	20 or NF
	AUG	6 or NF	6 or NF	6 or NF	6 or NF	6 or NF
	SEPT	6 or NF	6 or NF	6 or NF	6 or NF	6 or NF

6.2 Echo Conduit

Flow through Echo Conduit is measured by gage A-4 (USGS 11434500) located behind the Berkley Municipal Camp. The conduit traverses the east-facing slope of the Sierra Nevada Mountains carrying water to the Echo Tunnel. The maximum flow through the conduit is 30 cfs. A 30-inch stilling well houses the tape float that reads the stage in the conduit. The data are collected and stored by a High Level data logger and sent through radio transmission to the Camp 5 office. The gage is read during the diversion season, beginning on the first Tuesday after Labor Day weekend and ending November 15 each year.

6.3 Pyramid Creek below Lake Aloha Dam (at Twin Bridges)

Gage A-40 (USGS 11435100) is located north of the Highway 50 crossing of Pyramid Creek at Twin Bridges. The gage is located about one mile upstream from Highway 50 and the access trail is a steep hike. There is a 36-inch stilling well, with shelter, to house the gaging equipment, which consists of a new High Level data logger/bubbler system (See Figure 2). The data are collected and sent to the Camp 5 office with up-to-the-minute accuracy. The control is natural and because it remains stable, there are no plans to improve it. Lake Aloha will be operated so that gage A-40 on Pyramid Creek will comply with the streamflow requirements in Table 6.

Figure 2. Pyramid Creek gaging station (A-40) is located downstream of Lake Aloha at Twin Bridges.

Table 6. Minimum Streamflow Requirements - Pyramid Creek

Pyramid Creek Below Lake Aloha Dam						
	Month		**Minimum Streamflow by Water Year (cfs)**			
			CD	DRY	BN	AN	WET
	OCT		1 or NF	1 or NF	2 or NF	3 or NF	3 or NF
	NOV		1 or NF	3 or NF	4 or NF	5 or NF	5 or NF
	DEC		2 or NF	3 or NF	5 or NF	6 or NF	6 or NF
	JAN		2 or NF	3 or NF	5 or NF	6 or NF	6 or NF
	FEB		2 or NF	4 or NF	6 or NF	8 or NF	8 or NF
	MAR		2 or NF	5 or NF	7 or NF	10 or NF	10 or NF
	APR		3 or NF	5 or NF	8 or NF	11 or NF	11 or NF
	MAY		5 or NF	10 or NF	15 or NF	20 or NF	20 or NF
	JUNE		5 or NF	10 or NF	14 or NF	19 or NF	19 or NF
	JULY		2 or NF	4 or NF	6 or NF	8 or NF	8 or NF
	AUG		1 or NF	2 or NF	3 or NF	4 or NF	4 or NF
	SEPT		1 or NF	1 or NF	2 or NF	2 or NF	2 or NF

6.4 Caples Creek below Caples Lake Dam

Gage A-6 (11436999, Caples Creek at Caples Lake Outlet) is located in Caples Creek, approximately 300 yards downstream of the Caples Lake outlet. A 4'x 4' gage house is equipped with an air bubbler and High Level data logger that records, stores, and sends data through radio transmission to the Camp 5 office. The control is concrete with a v-notch weir that

is highly accurate. The License requires EID to release pulse flows from Caples Lake that coincide with the peak spring runoff. The magnitude of the pulse flows is determined by water year (Table 7) and can be as high as 345 cfs. Installation of a new bank operated cableway will be necessary to safely measure the higher spring streamflows and extend the rating curve for this location.

Minimum streamflow below Caples Lake will be monitored by gage A-6. Table 8 shows the streamflow requirements. When outflow of Caples Lake is required to be natural flow, EID will perform a water balance of the lake in order to determine natural flow.

Table 7. Pulse Flows for Caples Creek

	Pulse Flow by Water Year (cfs)					
Reach	**CD**	**Dry**	**BN**	**AN**	**Wet**	**Duration and Timing**
Caples Creek Channel	0	150	210	300	345	5-day continuous pulse timed
Below Caples Lake						to correspond to annual spring
Dam						peak runoff

Table 8. Minimum Streamflow Requirements - Caples Creek

Caples Creek Below Caples Lake Dam						
Month		**Minimum Streamflow by Water Year (cfs)**				
	CD	DRY	BN	AN	WET	
OCT	5	5	5	5	5	
NOV	5	6 or NF	8 or NF	10 or NF	10 or NF	
DEC	5	7 or NF	10 or NF	10 or NF	10 or NF	
JAN	5	7 or NF	10 or NF	15 or NF	15 or NF	
FEB	5	7 or NF	10 or NF	15 or NF	15 or NF	
MAR	5	10 or NF	15 or NF	20 or NF	20 or NF	
APR	10	12 or NF	18 or NF	25 or NF	25 or NF	
MAY	14	27 or NF	40 or NF	55 or NF	55 or NF	
JUNE	14	28 or NF	42 or NF	55 or NF	55 or NF	
JULY	12	25 or NF	35 or NF	50 or NF	50 or NF	
AUG	5	5	6 or NF	8 or NF	8 or NF	
SEPT	5	5	5	5	5	

6.5 Silver Fork American River below Silver Lake Dam

Minimum streamflows for the Silver Fork American River (Silver Fork) below the Silver Lake Dam will be monitored by gage A-9 (USGS 11436000). This gage is located approximately 0.5 miles downstream of the outlet of Silver Lake dam, on the Highway 88 corridor in Amador County. A 7'x 9' concrete block gage house has a High Level data logger/tape float system that

stores and transmits data via radio to the Camp 5 office. The gage control is a concrete v-notch weir that has proved to be quite accurate. A bank-operated cableway is used to measure high flows at this site. Gage A-9 will monitor compliance with minimum streamflow requirements displayed in Table 9. This compliance site is required to flow 4 cfs or natural flow ("NF" in Table 9). When outflow of Silver Lake drops below 4 cfs, EID will perform a water balance of the lake in order to determine natural flow.

Table 9. Minimum Streamflow Requirements - Silver Fork Below Silver Lake Dam

Silver Fork American River Below Silver Lake Dam	
Month	
	ALL
OCT	4 or NF
NOV	4 or NF
DEC	4 or NF
JAN	4 or NF
FEB	4 or NF
MAR	4 or NF
APR	4 or NF
MAY	4 or NF
JUNE	4 or NF
JULY	4 or NF
AUG	4 or NF
SEPT	4 or NF

6.6 Oyster Creek at Hwy 88

Gage A-24, Oyster Creek at Hwy 88 (USGS 11436500) is used to measure "leakage" from Silver Lake. Silver Lake is partly situated in a basin consisting of lahar rock. The lahar has one or more subterranean channels through which water flows out at lake levels above 12.5 feet on the A-8 staff gage. The term "leakage" is used to describe the total outflow through the subterranean channels of lahar rock which converge in Oyster Creek, downstream of Oyster Pond. The A-24 gage location is northeast of the Silver Lake main dam, in the Silver Lake campground, below Oyster pond. Currently there is a staff gage in place that is read when the Lake is above 12.50 feet, which is when leakage from the lake begins. The staff gage will be replaced by a bubbler system with a High Level data logger that will be located downstream of the current location, on Oyster Creek near the Highway 88 overpass. The natural channel will be used as a control at this site and the gage will continue to be read only when the Silver Lake staff gage is above 12.5 feet. These improvements will be made according to the schedule in Table 19.

6.7 Silver Fork American River below Oyster Creek

A compliance point for minimum streamflow is located on the Silver Fork American River, downstream of the confluence with Oyster Creek. This point measures the total outflow of Silver Lake. EID plans to use both gage A-24 on Oyster Creek (described in Section 6.6) and

gage A-9 (described in Section 6.5) at the Silver Lake Dam outlet to calculate the streamflow at the compliance point. The sum of the two gages measures the License streamflow requirement (Table 10). EID plans to use the sum of two gages rather than installing a new gage at the compliance point because the compliance point is located in a reach of the river that is very difficult to access. Installation and maintenance of a gaging station at the compliance point presents a safety risk.

Table 10. Minimum Streamflow Requirements - Silver Fork Below Oyster Creek

Silver Fork American River Below Oyster Creek							
	Month		**Minimum Streamflow by Water Year (cfs)**				
			CD	DRY	BN	AN	WET
	OCT		8 or NF	8 or NF	8 or NF	8 or NF	8 or NF
	NOV		8 or NF	8 or NF	10 or NF	16 or NF	16 or NF
	DEC		8 or NF	8 or NF	10 or NF	16 or NF	16 or NF
	JAN		8 or NF	8 or NF	12 or NF	16 or NF	16 or NF
	FEB		8 or NF	10 or NF	17 or NF	23 or NF	23 or NF
	MAR		8 or NF	15 or NF	26 or NF	35 or NF	35 or NF
	APR		8 or NF	18 or NF	50 or NF	50 or NF	50 or NF
	MAY		10 or NF	20 or NF	90 or NF	100 or NF	100 or NF
	JUNE		8 or NF	10 or NF	60 or NF	60 or NF	60 or NF
	JULY		8 or NF	8 or NF	18 or NF	20 or NF	25 or NF
	AUG		8 or NF	8 or NF	8 or NF	8 or NF	8 or NF
	SEPT		8 or NF	8 or NF	8 or NF	8 or NF	8 or NF

6.8 South Fork American River below Kyburz Diversion Dam

Gage A-12 will monitor streamflow below the Kyburz diversion dam. This gage is located on Highway 50 approximately two miles west of the town of Kyburz. A High Level data logger was recently installed which stores and sends data through radio telemetry to Camp 5. This site has a large natural control with a cable car cableway that is used to make several measurements throughout the water year in order to maintain an accurate rating curve. This gage is highly affected by the diversion dam located one mile upstream. Minimum streamflow requirements vary with water year and month as shown in Table 11.

Table 11. Minimum Streamflow Requirements – South Fork Below Kyburz

South Fork American River Below Kyburz Diversion						
	Month	Minimum Streamflow by Water Year (cfs)				
		CD	DRY	BN	AN	WET
	OCT	15	15	40	50	50
	NOV	15	18	40	50	50
	DEC	15	25	40	50	50
	JAN	15	25	40	50	50
	FEB	20	30	40	50	75
	MAR	30	60	110	110	110
	APR	60	120	180	180	180
	MAY	60	120	180	240	240
	JUNE	60	120	180	240	240
	JULY	40	85	125	160	160
	AUG	18	18	65	65	65
	SEPT	15	15	50	50	50

6.9 El Dorado Canal at Diversion Dam

Gage A-11 (USGS 11439000) measures the water diverted to the El Dorado Canal just downstream of the diversion dam. The gage house is shown as Figure. It has a data recorder and radio transmission to Camp 5.

Figure 3. Gage house at gage A-11, El Dorado Canal downstream of the diversion dam.

6.10 Carpenter Creek below Carpenter Creek Diversion Dam

Carpenter Creek is a tributary to the El Dorado Canal. Carpenter Creek will not be diverted to the El Dorado Canal, therefore, it will not be subject to USGS review. It is discussed here because it is included in Forest Service 4(e) Condition 40. All water in Carpenter Creek flows directly into the South Fork American River immediately upstream of the A-12 gage. All Carpenter Creek inflow will contribute to the minimum streamflow requirements at gage A-12, SFAR below the Kyburz diversion. EID will amend the License to eliminate the Carpenter Creek Diversion. For informational purposes, the minimum streamflow requirements at this location have been included as Table 12.

Table 12. Minimum Streamflow Requirements – Carpenter Creek

Carpenter Creek Below Carpenter Creek Diversion Dam	
Month	
	ALL
OCT	1 or NF
NOV	1 or NF
DEC	2 or NF
JAN	2 or NF
FEB	3 or NF
MAR	4 or NF
APR	5 or NF
MAY	4 or NF
JUNE	2 or NF
JULY	1 or NF
AUG	1 or NF
SEPT	1 or NF

6.11 No Name Creek below No Name Creek Diversion Dam

No Name Creek is a small tributary to the El Dorado Canal. For compliance with the License, a new gaging facility (gage A-50) will be constructed to record the bypass flow that enters the SFAR. The diversion structure will be improved or re-designed so that it is more effective. The location of the gaging station could change, depending of the design of the new diversion. The gaging station will include a bubbler system and telemetry so that accurate data can be transmitted Camp 5 for monitoring. The minimum streamflow requirements are shown in Table 13.

Table 13. Minimum Streamflow Requirements – No Name Creek

No Name Creek Below No Name Creek Diversion Dam	
Month	
	ALL
OCT	1 or NF
NOV	1 or NF
DEC	1 or NF
JAN	1 or NF
FEB	1 or NF
MAR	1 or NF
APR	1 or NF
MAY	1 or NF
JUNE	1 or NF
JULY	1 or NF
AUG	1 or NF
SEPT	1 or NF

6.12 Alder Creek below Alder Creek Diversion

The minimum streamflows (Table 14) at Alder Creek below Alder diversion are monitored by gaging station A-13. This gage is located on Alder Creek about three miles upstream of the confluence of Alder Creek with the South Fork American River. Currently there is a pressure transducer to measure the stage of the stream. This site will be updated to with bubbler system and telemetry, according to the schedule in Table 19. The control was rebuilt with concrete and a v-notch weir for low flows in 2000. It remains accurate and does not require improvement. To ensure the safety of EID staff, high-flow measurements will be taken at the bridge, located one half mile downstream of the diversion.

Table 14. Minimum Streamflow Requirements – Alder Creek

Alder Creek Below Alder Creek Diversion Dam						
Month	Minimum Streamflow by Water Year (cfs)					
	CD	DRY	BN	AN	WET	
OCT	25 or NF	25 or NF	25 or NF	25 or NF	25 or NF	
NOV	5 or NF	5 or NF	5 or NF	5 or NF	5 or NF	
DEC	5 or NF	5 or NF	5 or NF	10 or NF	10 or NF	
JAN	5 or NF	5 or NF	10 or NF	10 or NF	10 or NF	
FEB	5 or NF	5 or NF	10 or NF	10 or NF	10 or NF	
MAR	25 or NF	25 or NF	45 or NF	45 or NF	45 or NF	
APR	25 or NF	35 or NF	65 or NF	90 or NF	90 or NF	
MAY	25 or NF	30 or NF	55 or NF	75 or NF	75 or NF	
JUNE	25 or NF	25 or NF	25 or NF	25 or NF	25 or NF	
JULY	25 or NF	25 or NF	25 or NF	25 or NF	25 or NF	
AUG	25 or NF	25 or NF	25 or NF	25 or NF	25 or NF	
SEPT	25 or NF	25 or NF	25 or NF	25 or NF	25 or NF	

6.13 Alder Creek Diversion Pipe

Gage A-14 is located in the Alder Creek diversion pipe located just upstream of the El Dorado Canal. The gaging station consists of an 18-inch Parshall flume with a pressure transducer and radio telemetry to Camp 5. This gage is very accurate and allows EID to measure Alder Creek diversion flows into the canal. This gage does not need improvement.

Gage A-14 will be used in conjunction with gage A-13 to compute the total flow from Alder Creek basin. Water is diverted from Alder Creek between December 1 and June 15 of each year.

6.14 Mill Creek below Mill Creek Diversion Dam

The Mill Creek diversion is located above Highway 50 upstream of the Randall Tract Homeowners Association. Since the construction of the Mill-to-Bull Creek Tunnel, the Mill Creek diversion has not been used. The stream is measured by a staff gage installed in April 2007. A permanent gage (gage A-51) will be installed according to the schedule in Table 19. At the location of the former diversion structure, Mill Creek will have natural flow. Therefore, the minimum streamflow requirement in Table 15 will always be met. EID plans to maintain diversion right at Mill Creek but it has not been determined if the diversion will be at the current location or at a downstream location.

Table 15. Minimum Streamflow Requirements – Mill Creek

Mill Creek Below Mill Creek Diversion Dam			
	Month		
			ALL
	OCT		1 or NF
	NOV		2 or NF
	DEC		3 or NF
	JAN		4 or NF
	FEB		6 or NF
	MAR		7 or NF
	APR		6 or NF
	MAY		4 or NF
	JUNE		2 or NF
	JULY		1 or NF
	AUG		1 or NF
	SEPT		1 or NF

6.15 Bull Creek below Bull Creek Diversion Dam

Bull Creek is a small tributary to the El Dorado Canal. In accordance with the License, a new gaging facility (gage A-52) will be constructed to record the bypass flow that enters the SFAR.

The diversion structure will be improved or re-designed to be more effective. The location of the gaging station could change, depending of the design of the new diversion. The gaging station will include a bubbler system and telemetry so that accurate data can be transmitted Camp 5 for monitoring. The new diversion will be operated to meet the minimum streamflows required by the License (Table 16).

Table 16. Minimum Streamflow Requirements – Bull Creek

Bull Creek Below Bull Creek Diversion Dam			
	Month		
			ALL
	OCT		1 or NF
	NOV		1 or NF
	DEC		1 or NF
	JAN		1 or NF
	FEB		1 or NF
	MAR		1 or NF
	APR		1 or NF
	MAY		1 or NF
	JUNE		1 or NF
	JULY		1 or NF
	AUG		1 or NF
	SEPT		1 or NF

6.16 Ogilby Creek below Ogilby Diversion Dam

Ogilby Creek is a small tributary to the El Dorado Canal. The existing diversion structure is shown in Figure . A new gaging facility (gage A-53) will be constructed in order to make measurements at this location more accurate. The diversion structure will most likely be re-designed so that the maximum flow through the diversion is 10 cfs, which is EID's water right. A gaging station will record the required bypass flow (Table 17) that enters the SFAR. The gaging station will include a bubbler system and telemetry so that data can be transmitted Camp 5 for monitoring. The location of the gaging station could change, depending of the design of the new diversion.

Figure 4. The existing Ogilby Creek diversion and flow bypass structure.

Table 17. Minimum Streamflow Requirements – Ogilby Creek

Ogilby Creek Below Ogilby Creek Diversion Dam			
	Month		
			ALL
	OCT		1 or NF
	NOV		1 or NF
	DEC		1 or NF
	JAN		1 or NF
	FEB		2 or NF
	MAR		2 or NF
	APR		2 or NF
	MAY		2 or NF
	JUNE		1 or NF
	JULY		1 or NF
	AUG		1 or NF
	SEPT		1 or NF

6.17 Esmeralda Creek below Esmeralda Creek Diversion Dam

Esmeralda Creek is a small tributary to the El Dorado Canal. The existing diversion structure is depicted in Figure 3. A new gaging facility (gage A-54) will be constructed at this location. The gaging station will record the required bypass flow (Table 18) that enters the SFAR. The gaging station will include a bubbler system and telemetry so that accurate data can be transmitted Camp 5 for monitoring. The gaging station will be designed after the Esmeralda Creek Restoration plan is complete and approved. This restoration is required by Forest Service 4(e) Condition 36. Condition 36 requires the restoration to take place within 5 years of License. This timeline is reflected in Table 19. The new diversion will be operated to meet the minimum streamflows required by the License (Table 18).

Figure 5. The existing Esmeralda Creek diversion. July 2007.

Table 18. Minimum Streamflow Requirements – Esmeralda Creek

Esmeralda Creek Below Esmeralda Diversion Dam	
Month	
	ALL
OCT	1 or NF
NOV	1 or NF
DEC	1 or NF
JAN	1 or NF
FEB	1 or NF
MAR	2 or NF
APR	2 or NF
MAY	2 or NF
JUNE	1 or NF
JULY	1 or NF
AUG	1 or NF
SEPT	1 or NF

7.0 EID GAGES

EID operates certain gages throughout the system for operational and informational purposes only (See Table 2). A description of these gages is presented in this section. Gage records from these sites are not reviewed by the USGS for quality assurance.

7.1 Lake Aloha Outlet

The Lake Aloha outlet gage (A-2) is a staff gage used for operational purposes. It is located just down stream of the Lake Aloha outlet works. This gage provides information that assists the lake operators to make adjustments to the outflow.

7.2 Caples Wing Dam Spill

Gage A-7, Caples Wing Spill Dam, will measure the flow that spills over Caples Lake wing dam. EID operated the lake to avoid spilling at this location at all times. The Forest Service 4(e) Condition 34 requires EID to limit the spill in Caples spillway channel to 60 cfs or less. In order to comply with Condition 34, a method for measuring spill is necessary. There is not an adequate site downstream of the dam to monitor flow. A rating will be developed to estimate spill over the flash boards. The lake elevation will be used to monitor the spill.

7.3 South Fork American River above Silver Fork Confluence

Gage A-10 is located upstream of the Kyburz Diversion Dam, just upstream of the Silver Fork confluence. This gage will be used to calculate streamflow in the Silver Fork American River (see Section 7.4). The station requires new gaging equipment and telemetry. The gaging station

will consist of a bubbler system and High Level data logger. The data will be transmitted to Camp 5 via telemetry. The SCADA system will also be updated to perform calculations that produce real-time flow data for the Silver Fork.

7.4 Silver Fork American River

EID will post the flows in the Silver Fork American River on the Project 184 web site in order to provide boater and anglers with streamflow information. However, this is not a compliance site for FERC. Due to limited accessibility along the Silver Fork American River (Silver Fork), a gaging station has not been installed along the Silver Fork. As an alternative, EID plans to calculate streamflows for the Silver Fork by first adding flows at gaging stations A-11 (El Dorado Canal Diversion, Section 6.9) and A-12 (South Fork American River below Kyburz, Section 6.8), both located downstream of the confluence of Silver and South Fork American Rivers. Flows from gaging station A-10 (South Fork above Silver Fork, Section 7.3), located upstream of the confluence of Silver and South Fork American Rivers, will then be subtracted from the combined downstream flows to calculate the streamflows for the Silver Fork. A High Level data logger will be installed at gaging station A-10 and the gage will be re-calibrated to reflect the full range of streamflows that occur at this location. The SCADA system will be updated to perform the calculation to produce the real-time streamflow data for the Silver Fork. The flows for Silver Fork American River will then be posted to the Project 184 Website.

7.5 Forebay Reservoir

Water in the Forebay Reservoir may be impounded to the top of 3-foot flashboards. The top foot of the flashboards will be left out of the spillway every season between November 1 and March 31 as required by the Department of Water Resources, Division of Safety of Dams.

Storage in Forebay Reservoir is measured year-round by gage A-17 located on the southwest corner of the Forebay Main Dam. The gaging station consists of a pressure transducer and staff gage. There is no data logger at this gage; however, data are transmitted to Camp 5 for monitoring. Forebay Reservoir is operated by the powerhouse personnel according to the demands for water at the Reservoir 1 water treatment plant.

7.6 Forebay Outlet to EID Water Treatment Plant

Water stored in the Forebay Reservoir is diverted to the water treatment plant as a first priority, and the powerhouse receives water as a second priority. Gage A-18 monitors flow out of the Forebay into the Main Ditch, which leads to the Reservoir 1 Water Treatment Plant. The gage is located about 100 feet downstream of the toe of Forebay Dam. A four-foot rectangular weir measures flow and the data are recorded and transmitted to Camp 5 for monitoring.

7.7 Forebay Outlet to Penstock

Gage A-19 measures the flow out of the Forebay into the penstock, leading to the powerhouse. The gage is located downstream of the main dam, at the upper butterfly valve house, which is

northwest of the reservoir. The gage uses a Panametric flow meter that is installed in the penstock. This gage is not recorded but it is monitored by powerhouse personnel.

7.8 Canal at Camp 5

Gage A-45 measures the flow in the El Dorado Canal at a location near Camp 5. This gage is used to measure flow in the canal as a safety measure and to determine the amount of leakage occurring in the canal system.

7.9 Canal below Flume 51

Gage A-46 measures the flow in the El Dorado Canal in Flume 51. This gage is used to measure flow in the canal as a safety measure and to determine the amount of leakage occurring in the canal system.

8.0 CONCLUSION

This gaging plan discusses the EID gaging facilities and how they will be improved, designed, constructed, and operated to document compliance with reservoir storage operations, ramping requirements, and provision of streamflow releases from Project 184 facilities. All final designs for the gaging station improvements will be submitted to the USGS for review and approval prior to construction. This plan is expected to satisfy the requirements of USFS 4(e) Condition 40, of the FERC License for Project 184.

Table 19. Summary of Gaging Station Improvements

EID Station ID	Location	Improvements Required	Expected Date of Improvement
A-1	Aloha Lake	None	n/a
A-2	Aloha Lake Outlet	None	n/a
A-3	Echo Lake	None	n/a
A-4	Echo Conduit	None	n/a
A-5	Caples Lake	None	n/a
A-6	Caples Creek at Caple Lake Outlet	Install new bank-operated cableway, rate gage for higher flows	2009
A-7	Caples Wing Spill Dam	Rate spillway to measure spill at dam	2009
A-8	Silver Lake	None	n/a
A-9	Silver Creek at Silver Lake Outlet	None	n/a
A-10	SFAR above Silver Fork	Install gaging equipment and telemetry, collect data for rating curve	2010
A-11	Canal at Diversion	None	n/a
A-12	SFAR below Diversion	None	n/a
A-13	Alder Creek below diversion	Update gaging equipment, rate full range of flows	2009
A-14	Alder Creek diversion pipe	None	n/a
A-17	El Dorado Forebay	None	n/a
A-18	Forebay Outlet to EID WTP	None	n/a
A-19	Forebay Outlet to Penstock	None	n/a
A-24	Oyster Creek at Hwy 88	Install bubbler system	2009
A-40	Pyramid Creek above Hwy 50	none	n/a
A-43	Release to Echo Creek	Install new datalogger, improve control	2008
A-46	Below Flume 51	None	n/a
A-50	No Name Creek below diversion	Environmental permitting, build new diversion, install gaging station	2010
A-51	Mill Creek below diversion	Install permanent gage	2009
A-52	Bull Creek below diversion	Environmental permitting, build new diversion, install gaging station	2010
A-53	Ogilby Creek below diversion	Environmental permitting, build new diversion, install gaging station	2010
A-54	Esmeralda Creek below diversion	Environmental permitting, build new diversion, install gaging station	2011
A-9 + A-24	Silver Creek below Oyster Creek confluence	Update SCADA to perform the calculation	2009

UNITED STATES OF AMERICA 123 FERC ¶ 62,093
FEDERAL ENERGY REGULATORY COMMISSION

EL DORADO IRRIGATION DISTRICT PROJECT NO. 184 – 150

ORDER MODIFYING AND APPROVING STREAMFLOW AND RESERVOIR GAGING PLAN UNDER SECTION 4 (E) CONDITION 40 AND WATER QUALITY CERTIFICATION CONDITION 9

(Issued May 02, 2008)

The El Dorado Irrigation District (licensee) filed on April 17, 2008, a plan to monitor streamflows and reservoir water levels pursuant to U. S. Forest Service (USFS) Section 4 (e) Condition 40 and Condition 9 of the California State Water Resources Control Board (State Board) water quality certification (WQC). The license is subject to these conditions pursuant to Ordering Paragraphs D and E [1]. The project is located on the South Fork American River (SFAR) and its tributaries in El Dorado, Alpine, and Amador Counties, California, and occupies Federal lands administered by the USFS.

LICENSE REQUIREMENTS AND BACKGROUND

The USFS filed its final Section 4 (e) conditions on October 31, 2003. Condition 40 states that the licensee shall, within 1 year of the issuance of the license, develop and file for Commission approval, a Streamflow and Reservoir Gaging Plan (gaging plan) that meets U. S. Geological Survey (USGS) standards. The licensee shall provide copies of the gaging plan and USGS review results to the USFS, the Environmental Resources Committee (ERC; required by USFS Condition 38), the State Board, and the Commission. The plan shall be approved by the State Board prior to filing with the Commission. The licensee shall implement the plan upon approval.

At a minimum, the plan shall address compliance gaging at the following locations:

Echo Creek below Echo Lakes Dam
Pyramid Creek below Lake Aloha Dam
Caples Creek below Caples Lake Dam
Silver Fork American River below Silver Lake Dam
Silver Fork American River below Oyster Creek
SFAR below Kyburz Diversion Dam

1 117 FERC ¶ 62, 044 (2006)

Carpenter Creek below Carpenter Creek Diversion Dam
No Name Creek below No Name Creek Diversion Dam
Alder Creek below Alder Creek Diversion
Mill Creek below Mill Creek Diversion Dam
Bull Creek below Bull Creek Diversion Dam
Ogilby Creek below Ogilby Diversion Dam
Esmeralda Creek below Esmeralda Creek Diversion Dam

The licensee shall perform an investigation to determine whether telemetry equipment can be installed at Lake Aloha to monitor conditions and/or control operations. If the licensee, the State Board, and the USFS concur that such equipment is economically and technologically feasible and can be installed consistent with law, regulations, and policies applicable to Desolation Wilderness, the licensee shall seek necessary approvals for such installation.

The State Board issued its WQC on April 4, 2006. Condition 9 states that the licensee shall, within 1 year after license issuance, develop and file a Streamflow and Reservoir Storage Gaging Plan (gaging plan) that meets United States Geological Survey (USGS) standards with the State Board for approval. The plan shall include locations and methods for determining natural flow identified in Condition 1 [2]. The plan shall be approved by the Chief of the Division of Water Rights prior to filing with the Commission for its approval. The licensee shall provide copies of the approved gaging plan and USGS review results to the USFS, State Board and the ERC. The licensee shall implement the plan within two years upon approval.

At a minimum, the plan shall address compliance gaging at the following locations:

- Echo Creek below Echo Lakes Dam
- Pyramid Creek below Lake Aloha Dam
- Caples Creek below Caples Lake Dam
- Silver Fork American River below Silver Lake Dam
- Silver Fork American River below Oyster Creek
- SFAR below Kyburz Diversion Dam
- Carpenter Creek below Carpenter Creek Diversion Dam
- No Name Creek below No Name Creek Diversion Dam

2 Condition 1 identified the following locations: Echo Creek below Echo Dam; Pyramid Creek below Lake Aloha; Caples Creek below Caples Dam; Silver Fork American River below Silver Lake Dam; South Fork American River below Kyburz Diversion; and Carpenter, No Name, Alder, Mill, Bull, Ogilby, and Esmeralda Creeks below their diversions at the El Dorado Canal

- Alder Creek below Alder Creek Diversion
- Mill Creek below Mill Creek Diversion Dam
- Bull Creek below Bull Creek Diversion Dam
- Ogilby Creek below Ogilby Diversion Dam
- Esmeralda Creek below Esmeralda Creek Diversion Dam

The licensee shall perform an investigation to determine whether telemetry equipment can be installed at Lake Aloha to monitor conditions and control operations. If the State Board and USFS concur in consultation with the licensee that such equipment is economically and technologically feasible and can be installed consistent with law, regulations, and policies applicable to Desolation Wilderness, the licensee shall seek necessary approvals for such installation and install the equipment upon approval.

LICENSEE'S PLAN

The licensee proposes to use a variety of streamflow gaging techniques to monitor and record the required flows and reservoir water levels at four reservoirs, three canal locations, and 17 stream sites. These gages include both natural and manmade flow controls, stilling wells, floats and pressure transducers, data recorders, and ultrasonic flow meters. One streamflow would be determined through a mathematical calculation due to physical constraints at the site that limit the installation of a gaging station. The monitoring and recording equipment would be linked to a Supervisory Control and Data Acquisition (SCADA) system to centralize the collection and review of the data.

The licensee proposes to utilize existing flow controls and monitoring equipment at some of the required stations, make minor improvements at some stations, and install new equipment and make major modifications to flow controls at others. One required gaging station will become unnecessary, as the diversion dam is no longer used and will be deleted from the license.

Some of the proposed changes are not fully described, as they depend upon site conditions that require additional evaluation by the licensee. The plan includes a schedule that identifies the years in which these changes would be implemented. The first modification would be implemented in 2008; the last is scheduled for 2011.

AGENCY COMMENTS

The licensee reported it had developed the plan in consultation with the USFS, the ERC, the California Department of Fish and Game (CDFG), and the State Board. The USGS reviewed a draft copy of the plan, and issued a letter dated September 10, 2007,

that stated the plan met all the requirements, as it understood them. The State Board letter dated April 17, 2008, approved the plan.

DISCUSSION AND COMMENTS

The licensee proposes to utilize 27 gaging stations to meet the streamflow and reservoir gaging requirements. They propose to use 15 existing gaging stations without modification, and to modify 12 others between 2008 and 2011. The licensee's plan is vague in its discussion of the modifications proposed to be made at later dates. This lack of detail is reasonable, given the uncertainty of the gaging station designs needed to meet the license requirements; however, these proposals will require additional review by the Commission.

Additionally, the proposed modification may entail construction that would require coordination with the Regional Engineer, San Francisco Regional Office pursuant to Part 12 of the Commission's regulations. The licensee should consult with the Regional Engineer at least 90 days prior to its planned start of gage installation to determine what information must be filed to ensure compliance with Part 12.

The gaging modifications will also alter the descriptions contained within this Streamflow and Reservoir Gaging Plan. The licensee should file a revised plan that contains full and accurate descriptions of all gaging stations upon completion of the final modification.

The Streamflow and Reservoir Gaging Plan provides a general framework for monitoring and recording the required minimum streamflows and water levels at the El Dorado Project. The plan, as modified herein, should be approved.

<u>The Director Orders:</u>

(A) The Streamflow and Reservoir Gaging Plan filed by the El Dorado Irrigation District on April 17, 2008, is approved, subject to the modifications in Paragraphs B and C.

(B) The licensee shall consult with the Commission's Regional Engineer, San Francisco Regional Office, at least 90 days prior to the start of each gaging station modification contemplated in the Streamflow and Reservoir Gaging Plan to determine what information must be filed in compliance with Part 12 of the Commission's regulations. The licensee may not begin installation of any of the gaging station components until authorized by the Regional Engineer.

(C) The licensee shall file a revised Streamflow and Reservoir Gaging Plan for Commission approval within 90 days of the final gaging station modification. The revised plan shall include a complete description of all gaging stations, documentation that the U. S. Geological Survey has reviewed the revised plan and found it to meet its standards, and documentation that the U. S. Forest Service, the Environmental Resources Committee, and the California State Water Resources Control Board approve the revised plan.

(D) This order constitutes final agency action. Request for rehearing by the Commission may be filed within 30 days from the date of the issuance of this order, pursuant to 18 CFR ' 385.713.

George H. Taylor
Chief, Biological Resources Branch
Division of Hydropower Administration
and Compliance