

## **Section 2**

### **Mono Basin Operations**

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**Compliance with State Water Resources Control Board  
Decision 1631 and Order Nos. 98-05 and 98-07**

**May 2010**

**Los Angeles Department of Water and Power**

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## ***Introduction***

Pursuant to State Water Resources Control Board (SWRCB) Decision 1631 and Order Nos. 98-05 and 98-07 (Orders), the Los Angeles Department of Water and Power (LADWP) is to undertake certain activities in the Mono Basin to be in compliance with the terms and conditions of its water right licenses 10191 and 10192. In addition to the restoration and monitoring activities covered in Section 1 of this report, LADWP has certain required operational activities.

## **MONO BASIN OPERATIONS PLAN RY 2010-11**

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### ***Forecast for RY 2010-11***

The Mono Basin's May 1<sup>st</sup> forecast for Runoff Year (RY) 2010-11 for April to March period is 127,400 acre-feet (AF), or 104 percent of average using the 1956-2005 long term mean of 122,383 AF (attached). The May forecast was prepared using Ellery and Gem precipitation data as well as the incremental change in the Gem Pass snow pillow data to account for additional snowfall since the April forecast. This value puts the year type within the "Normal" category. According to the Grant Lake Operations Management Plan (GLOMP) approved under SWRCB Order 98-05, LADWP is to follow Guideline D (attached) for the operating requirements during RY 2010-11, with several variations described below.

### ***Rush Creek***

Baseflows will follow Guideline D of 47 cubic feet per second (cfs) from April 1 to September 30, 2010, and 44 cfs from October 1, 2010 to March 31, 2011, or Rush Creek at Damsite, whichever is less, down to a minimum of 31 cfs.

### ***Rush Creek Augmentation***

To meet flow targets for lower Rush Creek, LADWP at times must employ facilities in addition to the Mono Gate One Return Ditch (MGORD). During the wetter years, LADWP must release flows in excess of the MGORD design capacity of 380 cfs and Grant Lake Reservoir's (Grant) outlet pipe maximum design flow capacity of 371 cfs. However, due to growth of vegetation, sediment deposits, scouring in areas, and rodent holes, the actual flow capacity of MGORD has been reduced and LADWP is not comfortable running more than approximately 350 cfs in the MGORD. This year, if Grant does not spill, LADWP will be utilizing a pump to take water from Grant and send it down the spillway to augment Rush Creek. The pump will send down about 30 cfs for 5 days and in combination with 350 cfs from the MGORD, the required 380 cfs will be achieved down Rush Creek.

In wetter years, LADWP employs one or both of its additional facilities to release higher peak flows. These facilities include the 5-Siphons bypass, which can release up to 100 cfs from Lee Vining Creek, and the Grant Lake Reservoir (Grant) Spillway, which can release large reservoir spills, into Lower Rush Creek during the wetter years.

### *5-Siphons Bypass*

Aside from utilizing the 5-Siphons bypass facility to augment Rush Creek peak flow requirements, LADWP intends to test the physical capability to augment up to 150 cfs from the Lee Vining Conduit through the 5-Siphons bypass facility. However, Southern California Edison (SCE) operates the upstream reservoirs and their preliminary estimates show that they most likely will not be able to provide in excess of such flow down the Lee Vining Creek due to their operating requirements and lack of adequate forecasted runoff.

### *Grant Reservoir Spill*

Grant Reservoir is forecasted not to spill during the RY 2010-11.

### **One Year Temporary Permit Application**

For the winter 2010, LADWP plans to submit a one-year temporary permit application to SWRCB to operate the Mono Basin using the newly recommended flows of the final Synthesis Report. The plan is to operate under the new recommended flows using the existing facilities to gain an understanding of the impact on the ecosystem as well as an understanding of operational issues.

### **Lee Vining Creek**

Baseflows will follow Guideline D of 54 cfs, or Lee Vining Creek Above, whichever is less, from April 1 to September 30, 2010, and 40 cfs, or Lee Vining Creek Above, whichever is less, from October 1, 2010 to March 31, 2011. All flows in excess of these requirements will be diverted to Grant through the Lee Vining Conduit. Peak flow will be allowed to pass through the diversion facility without any diversion.

The expected magnitude and timing of the peak flows in Lee Vining, Walker, and Parker Creeks were generated by a predictive model and are shown below:

Predicted magnitude and timing of peak flows.		
<b>Creek</b>	<b>Magnitude</b>	<b>Timing</b>
Lee Vining	196 cfs	June 5, 2010
Walker	29 cfs	June 15, 2010
Parker	43 cfs	June 19, 2010

The model used regression analysis of historical data using representative data from the RY 2003 (a similar year type) to predict future events. Since the actual values depend heavily on ambient temperatures and actual flows coming down are difficult to predict with any degree of certainty, it is more than likely that the values in the above table will change. It is intended that they be used as an indicator of approximate magnitude and timing of the peak flows.

### **Parker and Walker Creeks**

Parker and Walker Creek facilities will be operated as pass through.

### **Grant Lake Reservoir**

Grant storage volume was 33,535 AF, translating into a surface elevation of 7,116.8 feet above mean sea level (AMSL) at the start of this runoff year. According to LADWP

model, using representative historical data from the 2003 runoff year (86 percent of normal year), and Guideline D baseflows, the model forecasts Grant to be approximately 27,900 AF by the end of the runoff year (see Scenario A at the end of this section). Also attached, for comparison, is Scenario B using inflow data from the 2000 runoff year (91 percent of normal year). In this case, the model forecasts Grant to end the runoff year with approximately 38,800 AF. Before selecting representative historical runoff year for modeling, the year's preceding runoff year is also looked at for similarities with the preceding runoff year of the current forecasted year. Forecasted scenarios will be relatively close only if this year's hydrology turns out to be similar to the hydrology of the selected past runoff year. Operations are subject to change with variations in actual hydrology during the upcoming runoff year.

### ***Planned Exports for RY 2010-11***

LADWP plans to export 16,000 AF this year in accordance with SWRCB Decision 1631 and Guideline D, with an approximately constant export regime from the start of the runoff year.

### ***Expected Mono Lake Elevations during RY 2010-11***

Mono Lake began this runoff year at 6,382.0 ft AMSL where it is forecasted to remain about the same and end the runoff year at 6382.3 ft AMSL (see attached chart).

## **REVIEW OF THE MONO BASIN RY 2009-10 OPERATIONS**

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### ***Rush Creek***

The runoff from Rush Creek was approximately 57,890 AF which is the total water delivered to Grant's 'Damsite' by Rush Creek. Grant's elevation was near historic low to start the runoff year, and any peak operation would have kept it well below the 11,500 AF storage threshold; therefore per Order 98-05, peak operation was not done on Rush Creek. Also, due to concern of the historic low elevation and its impact on temperature, and turbidity, several conference calls were conducted between the stream scientists, stakeholders, and LADWP to address the concerns. On March 2009, on behalf of the stream scientists and the stakeholders, LADWP petitioned SWRCB for "Temporary Urgency Change" so that lower minimum baseflow could be released down Rush Creek. This was to store more water in Grant and alleviate warm water temperature and turbidity concerns for trout. That petition was granted and allowed the baseflow to be lowered to 22 cfs (from 47 cfs) from April 1st through May 15, 2009, hence allowing approximately 2,000 AF to be stored in Grant.

Rush Creek flows below 'the Narrows', which consist of Rush Creek releases (Return Ditch, Spill, and 5-Siphons Augmentation) combined with Parker and Walker Creek flows, had an approximate total of 38,105 AF released to Mono Lake with the highest flow of 111 cfs occurring on June 1, 2009.

### **Mono Gate One**

During RY 2009-10, Mono Gate One's upgrade project (phase II) was commenced.

The corrugated metal building was removed, the old structure was completely demolished and a new floor and walls were built, three new flow control gates were installed within the new structure, and new equipment for flow measuring and monitoring telemetry were installed.

Export was halted for this work but flow to the MGORD was maintained through the bypass pipe that was installed in 2008 for that purpose. The new Mono Gate One is up and running but the facility still has to be covered with an outer building similar to its original look and that will be installed this spring.



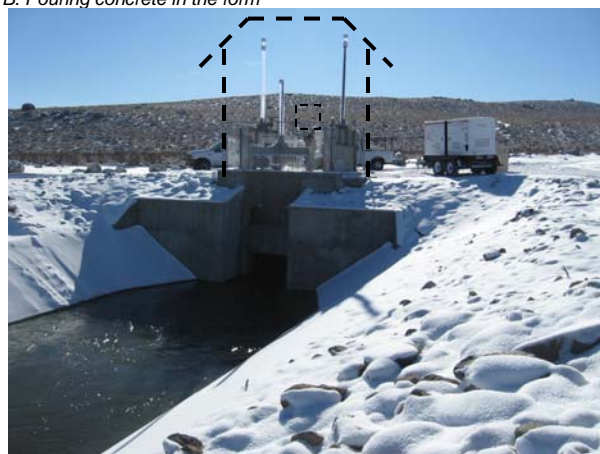
A. Forming structure between tunnel from Grant & tunnel to export



B. Pouring concrete in the form



C. Forms removed. Return ditch in the foreground



D. Complete with only the outer structure left to put in place

### **Rush Creek Augmentation**

To meet flow targets for lower Rush Creek, LADWP at times must employ facilities in addition to the Mono Gate One Return Ditch (MGORD). During the wetter years, LADWP must release flows in excess of the MGORD design capacity of 380 cfs and Grant's outlet pipe maximum design flow capacity of 371 cfs. However, due to growth of vegetation, sediment deposits, scouring in areas, and rodent holes, the actual flow capacity of MGORD has been reduced to approximately 350 cfs. During these wetter years, LADWP employs one or both of its additional facilities to release higher peak flows. These facilities include the 5-Siphons bypass, which can release up to 100 cfs from Lee Vining Creek, and the Grant Reservoir Spillway, which can release large reservoir spills, into lower Rush Creek and during the wetter year types.

### ***5-Siphons Bypass***

The 5-Siphons bypass was utilized during RY 2009-10 to augment Rush Creek before construction (June) and after construction (December) for phase II of Mono Gate One upgrade project. This was because flow in the Grant outlet tunnel had to be lowered to 15-23 cfs for a couple days so that construction crew could safely go inside the tunnel and install bulkheads and sandbags to divert flow to the bypass pipe instead of flowing to Mono Gate One. In order to maintain baseflow below the MGORD, approximately up to 35 cfs was sent down to lower Rush Creek from Lee Vining Conduit via the 5-Siphons bypass. A total of approximately 250 AF of water was diverted from Lee Vining Conduit to lower Rush Creek during these operations.

### ***Grant Reservoir Spill***

Grant did not spill during RY 2009-10.

### ***Lee Vining Creek***

Between April 30 and May 5, 2009, the stream scientists conducted Instream Flow Study on Lee Vining Creek as they did on Rush Creek in August of 2008. For the study, one-time flow change petition was submitted to SWRCB (and granted); and flows were adjusted to 12-, 20-, 28-, 37-, and 54-cfs for one day each except 37 cfs was for two days (May 3rd and 4th).

On May 18, 2009, the first instantaneous peak of 232 cfs (which was also the day's average maximum flow) was fully passed through the diversion facility. On June 1, 2009, a higher instantaneous peak of 262 cfs was recorded while the day's average maximum flow was 230 cfs. But by then diversion had resumed three days earlier and approximately 127 cfs was diverted to Grant. Total Lee Vining Creek runoff for the year was approximately 40,527 AF.

### ***Rush and Lee Vining Creeks Winter Flow Variance***

On September 22, 2009 LADWP filed two petitions to SWRCB requesting "Temporary Urgency Change" to Water Right Licenses 10191 and 10192 pursuant to Water Code Section 1435. The petitions were to temporarily lower the winter baseflows in Rush and Lee Vining creeks per stream scientists' recommendations in their Instream Flow Study Report to test fishery response to lower baseflows. The SWRCB approved the petitions on October 12, 2009 and the flows were lowered:

- Rush Creek – From 44 cfs to a range of 28 to 32 cfs from October 3, 2009 to March 31, 2010;
- Lee Vining – From 54 cfs to a range of 16 to 18 cfs from October 3 to December 31, 2009; and a range of 12 to 14 cfs from January to March 31, 2010.

A monitoring program developed by the stream scientists was implemented during these new lower flows to monitor for fish passage and icing concerns in the creeks.

### ***Parker and Walker Creeks***

Parker Creek had its highest flow on June 30 at 39 cfs. Total runoff for the year was approximately 6,780 AF.

Walker Creek had its highest flow on May 20 at 25 cfs. Total runoff for the year was approximately 3,842 AF.



### **Grant Lake Reservoir**

Grant began the 2009-10 runoff year at approximately 10,122 AF (7,087.2 ft AMSL). After several discussions with the stream scientists and the parties, LADWP, on behalf of the stream scientists and the stakeholders, submitted a petition to the SWRCB for "Temporary Urgency Change" so that a lower baseflow of 22 cfs (from 47 cfs) could be released down Rush Creek hence decreasing the net withdrawal from Grant. The petition was approved and allowed baseflow for lower Rush Creek to be lowered to 22 cfs from April 1 until May 15, 2009. LADWP also delayed export in order to gain storage. The lower baseflows and the delay in export helped Grant gain storage steadily and by August 2009 the storage increased to 37,500 AF (7120.8 ft AMSL).

### **Exports during RY 2009-10**

Export was delayed during much of 2009. First, because of Grant's historically low level, LADWP decided to delay export to help gain storage. Then phase II of the Mono Gate One upgrade project commenced and so no export was possible until the upgrade of the facility was completed. With the new Mono Gate One, in order to catch up with the allowed annual export of 16,000 AF, export resumed in December 2009 at a higher daily rate. During RY 2009-10, LADWP exported 15,702 AF from the Mono Basin, which falls below the allowed volume under Decision 1631.

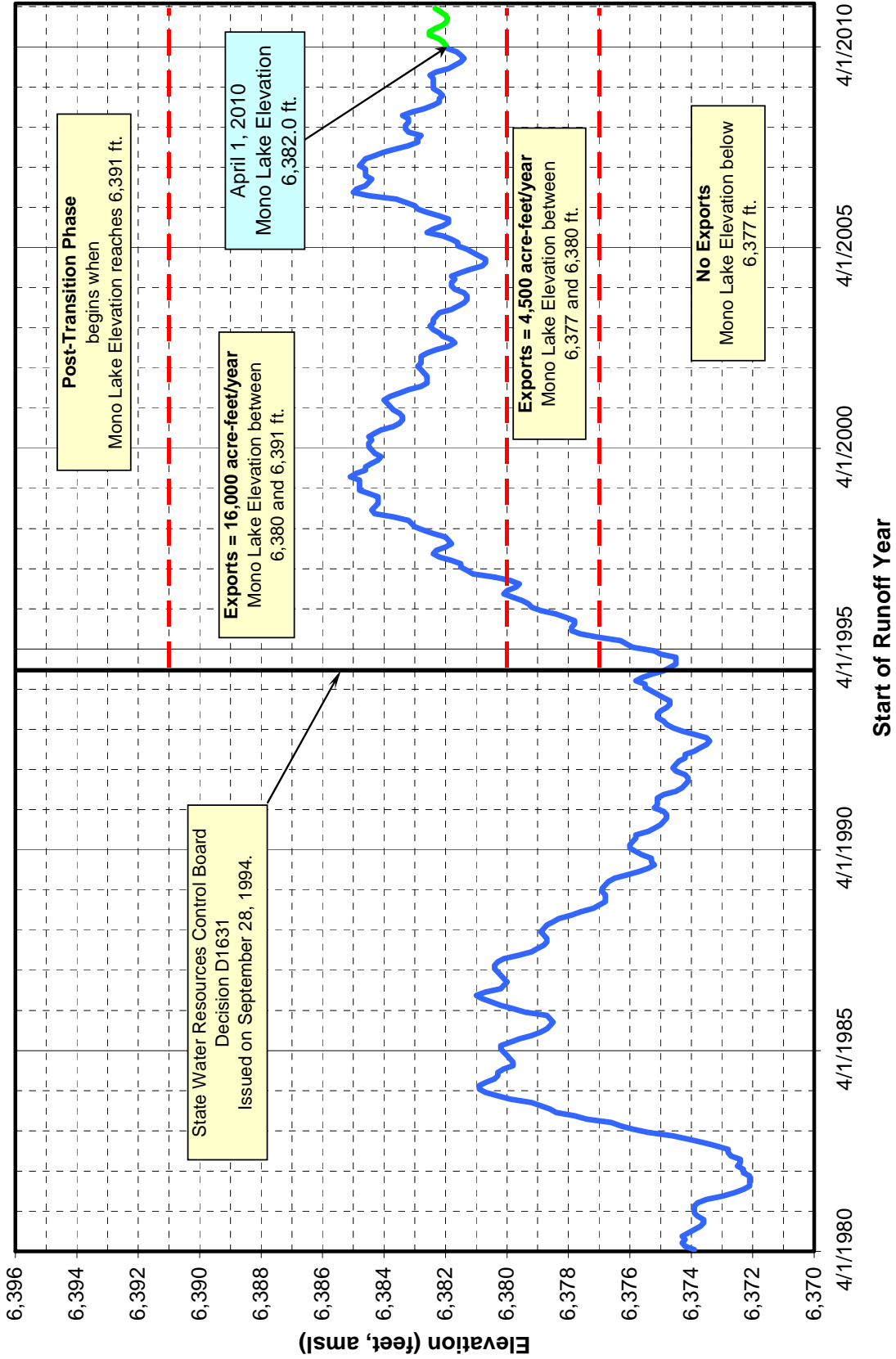
### **Mono Lake Elevations during RY 2009-10**

Mono Lake elevations were monitored 29 times during RY 2009-10 as shown in the following table. The Lake elevation was at 6,382.4 ft AMSL at the beginning of the runoff year, and ended the season at 6,382.0 ft AMSL.

#### **RY 2009-10 Mono Lake Elevation Readings (ft AMSL)**

<b>Month</b>	<b>Day</b>	<b>Year</b>	<b>Elevation</b>	<b>Month</b>	<b>Day</b>	<b>Year</b>	<b>Elevation</b>
4	17	2009	6382.4	8	26	2009	6381.9
4	23	2009	6382.4	9	2	2009	6381.9
5	9	2009	6382.4	9	11	2009	6382.5
5	21	2009	6382.4	9	17	2009	6381.8
5	28	2009	6382.4	10	1	2009	6381.7
6	3	2009	6382.4	10	8	2009	6381.6
6	11	2009	6382.5	10	21	2009	6381.6
6	25	2009	6382.5	11	5	2009	6381.5
7	2	2009	6382.5	12	3	2009	6381.4
7	9	2009	6382.5	12	10	2009	6381.4
7	23	2009	6382.5	12	22	2009	6381.4
7	30	2009	6382.3	1	7	2010	6381.5
8	6	2009	6382.2	2	18	2010	6381.8
8	13	2009	6382.0	3	18	2010	6382.0
8	21	2009	6382.0				

# Mono Lake Elevation



**MONO BASIN  
RUNOFF FORECAST  
May 1, 2010**

**APRIL THROUGH SEPTEMBER RUNOFF**

	<b>MOST PROBABLE VALUE</b>		<b>REASONABLE MAXIMUM</b>	<b>REASONABLE MINIMUM</b>	<b>LONG-TERM MEAN (1956 - 2005)</b>
	<u>(Acre-feet)</u>	<u>(% of Avg.)</u>	<u>(% of Avg.)</u>	<u>(% of Avg.)</u>	<u>(Acre-feet)</u>
<b>MONO BASIN:</b>	<b>110,000</b>	<b>106%</b>	<b>115%</b>	<b>96%</b>	<b>103,890</b>

**APRIL THROUGH MARCH RUNOFF**

	<b>MOST PROBABLE VALUE</b>		<b>REASONABLE MAXIMUM</b>	<b>REASONABLE MINIMUM</b>	<b>LONG-TERM MEAN (1956 - 2005)</b>
	<u>(Acre-feet)</u>	<u>(% of Avg.)</u>	<u>(% of Avg.)</u>	<u>(% of Avg.)</u>	<u>(Acre-feet)</u>
<b>MONO BASIN:</b>	<b>127,400</b>	<b>104%</b>	<b>115%</b>	<b>94%</b>	<b>122,383</b>

MOST PROBABLE - That runoff which is expected if median precipitation occurs after the forecast date.

REASONABLE MAXIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average once in 10 years.

REASONABLE MINIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average 9 out of 10 years.

## Mono Basin Operations, Guideline D

Year Type:..... NORMAL  
 Forecasted Runoff in acre-feet.....100,750 – 130,670

### Lower Rush Creek

Base Flows:

	April	May-Jul	Aug-Sep	Oct-Mar
<b>Flow (cfs)</b>	50	75	50	45

Minimum base flows are 47 cfs for Apr-Sep and 44 cfs for Oct-Mar, or the inflow to Grant Lake, whichever is less (flows listed above are for Mono Lake maintenance water). However, if Grant Lake inflow is less than the dry year base flow requirements under Guideline A, dry year requirements apply. If Grant Lake storage drops below 11,500 acre-feet (7,089.4' elevation), base flow requirements for a dry-year under Guideline A also apply (D-1631, p 197-198).

Peak Flows: - 380 cfs for 5 days followed by 300 cfs for 7 days\*.

Ramping: - Begin ramping on June 1<sup>st</sup> (rule of thumb). Note that peak operations will take 43 days, so timing this with peak flows in P/W Creeks, with fish movement, and cottonwood germination is beneficial.  
 - 10 percent daily change during ascending and descending limbs, or 10-cfs, whichever is greater.

### Lee Vining Creek

Base Flows:

	Apr-Sep	Oct-Mar
<b>Flow (cfs)</b>	54	40

Minimum base flows are those specified above or the stream flow at the point of diversion, whichever is less.

Peak Flows: - Allow peak flow to pass through diversion facility.

Ramping: - Begin ramping on May 15<sup>th</sup> (rule of thumb)  
 - 20 percent daily change during ascending and 15 percent during descending limbs, or 10-cfs, whichever is greater.

Diversions: - Divert flows in excess of base flows until May 15<sup>th</sup> (rule of thumb).  
 - Diversions may resume 15 days after peak flow (rule of thumb); divert all flows in excess of base flows.

Augmentation: - None.

### Parker and Walker Creeks

Flow-through conditions for entire year.

### Exports

4,500 acre-feet scenario – Maintain 6 cfs export throughout the year.  
 16,000 acre-feet scenario – Maintain 23 cfs export except during peak flows in lower Rush Creek. During this time, exports should be zero.

\*Section 1. a. (1) of Order 98-05 states that LADWP may reduce SRF's in dry/normal and normal years to maintain exports allowed under D-1631; that LADWP will seek to have between 30,000 and 35,000 acre-feet (elev. 7,113' and 7,119") in Grant Lake at the beginning and end of each runoff season; and LADWP will not be required to reduce storage in Grant Lake below 11,500 acre-feet (elev. 7089.4') to provide SRFs.

## Scenarios: RY 2010 Forecasted Grant Lake Reservoir Illustrations

