Allocation and Default Flow Schedule February 1, 2012

San Joaquin River Restoration Program

Introduction

The following text transmits an allocation and default flow schedule to the Restoration Administrator for the San Joaquin River Restoration Program (SJRRP) effective February 1, 2012 and consistent with the Restoration Flow Guidelines section 13(j)(i). This allocation and default flow schedule provides the following information:

- Forecast Unimpaired Runoff: estimated flows that would occur absent regulation on the river.
- Hydrograph Volumes: allocation hydrograph based on water year unimpaired inflow, utilizing the Method 3.1 with Gama pathway agreed to by the Parties in December 2008 and included in the draft Restoration Flow Guidelines.
- Flow targets at Gravelly Ford: flows at the head of reach 2 based scheduled releases from Friant Dam less the assumed riparian demand and losses in Exhibit B.
- Restoration budget: volumes for the annual allocation, Spring flexible flow, base flow, riparian recruitment, and Fall flexible flow periods after channel capacity constraints.
- Remaining Flexible Flow Volume: the amount of water released for the SJRRP and the remaining volume of water available for scheduling.
- Operational Constraints: flow release limitations based on downstream channel capacity, regulatory, or legal constraints.
- Default Flow Schedule: the restoration schedule in the absence of a recommendation from the Restoration Administrator.
- Additional Flow Schedules: this section provides Restoration release allocations that would result from 10^{th} and 50^{th} percentiles unimpaired runoff.

Consistent with Paragraph 18 of the Settlement, the Restoration Administrator shall make recommendations to the Secretary of the Interior concerning the manner in which the hydrographs shall be implemented. The Restoration Administrator is requested to recommend a flow schedule showing the use of the entire Annual Allocation during the upcoming Restoration Year, and categorize all recommended flows by account (e.g., shifts in the Default Flow Schedule, Buffer Flow releases) consistent with the Restoration Flow Guidelines.

Forecast Unimpaired Runoff

Unimpaired runoff represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds. The forecast of the unimpaired runoff determines the potential river release requirements for the SJRRP. Information for forecasting the unimpaired runoff includes:

- The USBR, Friant Division estimate of unimpaired flow to support water supply allocation;
- The Department of Water Resources Water Supply Index forecast latest update on January 1, 2012 for Water Year 2012 San Joaquin River inflow to Millerton Lake Unimpaired Flow[1];
- The National Weather Service ESP Forecast (January to September, 2012) for the San Joaquin River at Millerton Lake[2];

A forecast of Critical-High or wetter provides for full exercise of flow flexibility by the Restoration Administrator. The January 1, 2012 Forecast of Unimpaired Runoff for Water Year 2012 (http://cdec.water.ca.gov/snow/bulletin120/index2.htm, latest report by DWR) shows a 90% probability of at least **640 thousand acre-feet**, resulting in a **Critical-High Year** hydrograph for the SJRRP.

Exhibit B Method 3.1 Hydrograph Volumes

Table 1 shows the Exhibit B Method 3.1 hydrograph volumes and corresponding allocation volumes for the entire year including total releases from Friant Dam and releases for the SJRRP in excess of Riparian Holding Contracts.

Table 1—Exhibit B Method 3.1 Hydrograph Volumes

Flow Period	Releases from Friant Dam (cfs)	Flows Targets at Gravelly Ford (cfs)	SJRRP Flows at Gravelly Ford (cfs)	Release Volume from Friant Dam for the SJRRP (af)
Mar 1 - Mar 15	500	375	370	11,008
Mar 16 - Mar 31	1500	1375	1370	43,478
Apr 1 - Apr 15	200	55	50	1,488
Apr 16 - Apr 30	200	55	50	1,488
May 1 - Jun 30	215	30	25	3,025
Jul 1 - Aug 31	255	30	25	3,074

[1] http://cdec.water.ca.gov/cgi-progs/prev_forecat_discussion_ss/SJWSI.pdf

[2] http://wateroutlook.nwrfc.noaa.gov/point/ensemble?espdate=2012-01-11&begmonth=2012-01-12&endmonth=2012-07-12&gtype=acc&acctype=cdf&gridlines=y#id=FRAC1&gridlines=y&espdate=2012-01-11&ensydate=1963&ensydate2=off&ensoyear=n&ensostrg=all&avgruntype=mean&histdate=1900&histdate2=off&begmonth=2012-01-01&endmonth=2012-09-01&gtype=acc&acctype=cdf&

Sept 1 - Sept 30	260	55	50	2,975
Oct 1 - Oct 31	160	5	0	0
Nov 1 - Nov 6	400	275	270	3,213
Nov 7 - Nov 10	120	5	0	0
Nov 11 - Dec 31	120	5	0	0
Jan 1 - Feb 29	110	15	10	1,190
				Total=70,939

Restoration Budget

Table 2 shows the components of the restoration budget for March 1 through February 28. There are no riparian recruitment flows as the restoration year type is critical-high. The estimated total flow volume for restoration is 70,939 acre-feet. Because a continuous allocation method is used, the total flow volume for restoration as well as various accounting components for the same restoration non-critical year type will change with updated unimpaired flow forecast.

Table 2 – Restoration Budget with Flow Accounts

Schedule Start	Friant Default Flow (cfs)	Friant Capacity Constraint (cfs)	Friant Interim Flow (cfs)	Gravelly Ford Flow Targets (cfs)	Assumed Riparian Demand (cfs)	Base Flow (af)	Spring Flexible Flow (af)	Fall Flexible Flow (af)	Riparian Recruitment Flow (af)
Mar. 1	500	1500	500	375	130		11,008		
Mar. 16	1500	1500	1500	1375	130		43,478		
Apr. 1	200	1500	200	55	150		1,488		
Apr. 16	200	1500	200	55	150		1,488		
May. 1	215	1500	215	30	190	3,025			0
Jul. 1	255	1500	255	30	230	3,074			
Sep. 1	260	1500	260	55	210	2,975			
Oct. 1	160	1500	160	5	160	0			
Nov. 1	400	1500	400	275	130			3,213	
Nov. 7	120	1500	120	5	120			0	
Nov. 11	120	1500	120	5	120	0			
Jan. 1	110	1500	110	15	100	615			
Feb. 1	110	1500	110	15	100	575			
					Total=	10,264	57,461	3,213	0

Levee stability constraints at the downstream end of Reach 2B restrict local flows to 810 cfs corresponding to an estimated release from Friant Dam of about 1,060 cfs. Consistent with the March 25, 2010 memo on the exercise of flexibility during Interim Flows, the Friant capacity is set to 1,500 cfs for the purpose of computing volumes. Field conditions will limit the physical release from Friant Dam to rates less than 1,500 cfs based on real-time data collection and flow bench evaluations.

Remaining Flexible Flow Volume

The Friant release for accounting uses the most recent flow schedule. The amount of water remaining for flexible flow scheduling is the volume of flexible flow water in excess of releases required to meet riparian demands less the past releases. Table 3 shows the estimated remaining volume.

Table 3 – Estimated Flexible Flow Volume Remaining

Flow Account	Yearly Allocation (af)	Release to Date (af)	Remaining Flow Volume (af)
Spring Flexible Flow	57,461	0	57,461
Riparian Recruitment	0	0	0
Fall Flexible Flow	3,213	0	3,213
Total Restoration Flow Volume	70,939	0	70,939

Operational Constraints

Operating criteria such as channel conveyance capacity, ramping rate constraints, scheduled maintenance, and downstream seepage concerns may restrict the release of Restoration Flows. Seepage management constraints may limit the release of Interim Flows at Friant Dam and below Mendota Dam. Reclamation will re-regulate flows at Mendota Dam to the extent that real-time water supply demands provide the ability to divert Interim Flows. The best available information on constraints at the time of this allocation include:

- Reach 2A: 1060 cfs based on Levee Stability
- Reach 2B: 810 cfs based Levee Stability
- Mendota Pool Diversion: 400 cfs for the month of February
- Reaches 3-5: 0.0 cfs based on existing groundwater levels above thresholds

At this time, channel capacity constraints releases from Friant Dam to less than 1,060 cfs and requests that the Restoration Administrator consider at least one intermediate bench of 500 cfs or less from Friant Dam to test real-time conditions. Reclamation will further coordinate with the Restoration Administrator through the weekly Flow Scheduling Subgroup conference calls and on an as needed basis.

Default Flow Schedule

The Default Flow Schedule identifies how Reclamation will schedule the restoration allocation in the absence of a recommendation from the Restoration Administrator consistent with the Settlement. Although the interim flow schedule provides for up to 1,500 cfs release for the purpose of determining volumes, Friant Dam release will be restricted to 1,060 cfs to provide levee stability for Reach 2B and seepage protection in downstream reaches. Reclamation develops a default schedule according to Method 3.1 with gamma pathways described in the Restoration Flow Guidelines and add the remaining water to the end of Spring Rise (Table 4). Subsequent default schedules will be derived from a new flow forecast and will be modified based on the restoration flow released up to that time from the previous Restoration Flow Schedule.

Table 4 – Default Flow Schedule

March 1 – March 15	500 cfs
March 16 – March 31	1060 cfs
April 1 – April 8	1060 cfs
April 9 – April 30	200 cfs

Additional Flow Schedules

As per the draft Restoration Flow Guidelines document, additional Restoration release allocations that would result from the 10th and 50th Percentile unimpaired runoff are presented in Table 5. Although these flow schedules are not utilized for restoration purpose, these flow ranges provide an insight to the uncertainty of flow forecasting as well as what may happen once updated forecasting is available at a later date.

1 Table 5 – Additional Flow Schedule, 10th and 50th Percentile

Flow Period	Flow Schedule, (10 percentile), cfs	Flow Schedule, (50 percentile), cfs
	Unimpaired Inflow, 2400 TAF, N-Wet	Unimpaired Inflow, 1260 TAF, N-Dry
Mar 1 - Mar 15	500	500
Mar 16 - Mar 31	1500	1500
Apr 1 - Apr 15	1500	1500
Apr 16 - Apr 30	1500	668
May 1 - Jun 30	842	350
Jul 1 - Aug 31	350	350
Sept 1 - Sept 30	350	350
Oct 1 - Oct 31	350	350
Nov 1 - Nov 6	700	700
Nov 7 - Nov 10	700	700
Nov 11 - Dec 31	350	350
Jan 1 - Feb 28	350	350

2