



## Allocation and Default Flow Schedule

Effective February 1, 2013

### 1.0 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, 2013, consistent with the Restoration Flow Guidelines section 13(j)(i). This allocation and default flow schedule provides the following information:

- Forecasted Unimpaired Runoff: estimated flows that would occur absent regulation on the river.
- Hydrograph Volumes: annual allocation hydrograph based on water year unimpaired inflow, utilizing the Method 3.1 with the Gamma 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 on 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<sup>th</sup> and 50<sup>th</sup> 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.

## 2.0 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 (DWR) Water Supply Index forecast latest update on January 1, 2013 for Water Year 2013 San Joaquin River inflow to Millerton Lake Unimpaired Flow<sup>1</sup>;
- The National Weather Service (NWS) ESP Forecast (Water Year 2013) for the San Joaquin River at Millerton Lake<sup>2</sup>;

Table 1 shows the 2013 San Joaquin River water year forecast breakdown at Millerton Lake. The DWR forecast is based on January 1, 2013 information while the NWS forecast is updated on January 14, 2013 including 146 TAF of observed inflow.

**Table 1-San Joaquin River Water Year Forecast at Millerton Lake**

Forecast Source	90%	50%	10%
DWR, January 1, 2013	1020 TAF	1690 TAF	2820 TAF
NWS, January 14, 2013	1017 TAF	1540 TAF	2908 TAF

A forecast of Critical-High or wetter provides for full exercise of flow flexibility by the Restoration Administrator. The January 1, 2013 Forecast of Unimpaired Runoff for Water Year 2013 (DWR) shows a 90% probability of at least **1,020 thousand acre-feet (TAF)**, resulting in a **Normal-Dry Year** hydrograph for the SJRRP.

## 3.0 Exhibit B Method 3.1 Hydrograph Volumes

Table 2 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.

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<sup>1</sup> <http://cdec.water.ca.gov/cgi-progs/products/SJWSI.pdf>

<sup>2</sup> [http://www.cnrfc.noaa.gov/rawESP\\_WY.php?id=FRAC1](http://www.cnrfc.noaa.gov/rawESP_WY.php?id=FRAC1)

1 **Table 2—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	1500	1355	1350	40,165
Apr 16 - Apr 30	350	205	200	5,950
May 1 - Jun 30	350	165	160	19,359
Jul 1 - Aug 31	350	125	120	14,757
Sept 1 - Sept 30	350	145	140	8,331
Oct 1 - Oct 31	350	195	190	11,683
Nov 1 - Nov 6	700	575	570	6,783
Nov 7 - Nov 10	700	575	570	4,523
Nov 11 - Dec 31	350	235	230	23,266
Jan 1 - Feb 28	350	255	250	29,256
				Total=218,559

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3 **4.0 Restoration Budget**

4 Table 3 shows the components of the restoration budget for March 1 through February 28. There  
 5 are no riparian recruitment flows as the restoration year type is normal-dry. The estimated total  
 6 flow volume for restoration is 218,559 acre-feet. Because a continuous allocation method is  
 7 used, the total flow volume for restoration as well as various accounting components for the  
 8 same restoration non-critical year type will change with an updated unimpaired flow forecast.

9 **Table 3 – 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	1500	1500	1500	1355	150		40,165		
Apr. 16	350	1500	350	205	150		5,950		
May. 1	350	1500	350	165	190	19,359			0

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)
Jul. 1	350	1500	350	125	230	14,757			
Sep. 1	350	1500	350	145	210	8,331			
Oct. 1	350	1500	350	195	160	11,683			
Nov. 1	700	1500	700	575	130			6,783	
Nov. 7	700	1500	700	575	120			4,523	
Nov. 11	350	1500	350	235	120	23,266			
Jan. 1	350	1500	350	255	100	15,372			
Feb. 1	350	1500	350	255	100	13,884			
					Total=	106,651	100,602	11,306	0

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2 Levee stability constraints at Reach 2B restrict local flows to 810 cfs corresponding to an  
3 estimated release from Friant Dam of about 1,030 cfs. Consistent with the March 25, 2010 memo  
4 on the exercise of flexibility during Interim Flows, the Friant capacity is set to 1,500 cfs for the  
5 purpose of computing volumes. Field conditions will limit the physical release from Friant Dam  
6 to rates less than 1,030 cfs based on real-time data collection and flow bench evaluations.

## 7 **5.0 Remaining Flexible Flow Volume**

8 The Friant release for accounting uses the most recent flow schedule. The amount of water  
9 remaining for flexible flow scheduling is the volume of flexible flow water in excess of releases  
10 required to meet riparian demands less the past releases. Table 4 shows the estimated remaining  
11 volume.

12 **Table 4 – Estimated Flexible Flow Volume Remaining**

Flow Account	Yearly Allocation (af)	Release to Date (af)	Remaining Flow Volume (af)
Spring Flexible Flow	100,602	0	100,602
Riparian Recruitment	0	0	0
Fall Flexible Flow	11,306	0	11,306
Total Restoration Flow Volume	218,559	0	218,559

## 6.0 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 local flow 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 1,030 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.

## 7.0 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, the Friant Dam release will be restricted to 1,030 cfs to provide levee stability for Reach 2A and seepage protection in downstream reaches. Reclamation develops a default schedule according to Method 3.1 with the gamma pathways described in the Restoration Flow Guidelines and adds the remaining water to the end of Spring flexible flow period (Table 5). Subsequent default schedules will be derived from new flow forecasts and will be modified based on the restoration flow released up to that time from the previous Restoration Flow Schedule recommended by the Restoration Administrator.

**Table 5 – Default Flow Schedule**

March 1 – March 15	500 cfs
March 16 – March 31	1,030 cfs
April 1 – April 15	1,030 cfs
April 16 – April 30	350 cfs

## 8.0 Additional Flow Schedules

As per the draft Restoration Flow Guidelines document, additional Restoration release allocations that would result from the 10<sup>th</sup> and 50<sup>th</sup> percentile unimpaired runoff are presented in Table 6. Although these flow schedules are not utilized for restoration purpose, these flow ranges provide an insight into the uncertainty of flow forecasting as well as what may happen once updated forecasting is available at a later date.

**Table 6 – Additional Flow Schedule, 10<sup>th</sup> and 50<sup>th</sup> Percentile**

Flow Period	Flow Schedule, (10th percentile, 2820 TAF Unimpaired Inflow, Wet year), cfs	Flow Schedule, (50th percentile, 1690 TAF Unimpaired Inflow, N-Wet year), cfs
Mar 1 - Mar 15	500	500
Mar 16 - Mar 31	1500	1500
Apr 1 - Apr 15	1500	1500
Apr 16 - Apr 30	1500	1500
May 1 - Jun 30	1500	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

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