SAN JOAQUIN RIVER RESTORATION PROGRAM

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2014 Restoration Allocation and Default Flow Schedule

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Introduction

The following transmits the 2014 Restoration Allocation and Default Flow Schedule to the Restoration Administrator for the San Joaquin River Restoration Program (SJRRP), consistent with the Restoration Flow Guidelines (RFG, December 2013). This Restoration Allocation and Default Flow Schedule provides:

- Forecasted Water Year Unimpaired Runoff: estimated flows that would occur absent regulation on the river. This runoff is utilized to identify the Restoration Year Type.
- Hydrograph Volumes: annual allocation hydrograph based on water year unimpaired inflow, utilizing the Method 3.1 with the Gamma pathway (RFG-Appendix C) agreed to by the Parties in December 2008.
- Flow targets at Gravelly Ford: flows at the head of Reach 2 based on scheduled releases from Friant Dam less the assumed Holding Contract demands and losses in Exhibit B.
- Restoration budget: volumes for the annual allocation, spring flexible flow, base flow, riparian recruitment, and fall flexible flow.
- 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 Bureau of Reclamation (Reclamation), Friant Division estimate of unimpaired flow to support the water supply allocation;
- The Department of Water Resources (DWR) Water Supply Index forecast latest update on January 1, 2014 (published on January 9, 2014) for Water Year 2014 San Joaquin River inflow to Millerton Lake Unimpaired Flow[1];
- The National Weather Service (NWS) Raw Ensemble Streamflow Prediction (ESP) Water Supply Forecast (Water Year 2014) for the San Joaquin River at Millerton Lake[2];

Table 1 shows the 2014 San Joaquin River Water Year forecast breakdown at Millerton Lake. The latest DWR forecast is based on January 1, 2014 information while the NWS forecast is updated on January 15, 2014 including 38.5 thousand acre-feet (TAF) observed inflow. Since the 50% exceedance forecast is less than 1,831 TAF, the 90% exceedance forecast is used to determine the pattern year type. The pattern year type is critical low. Based on the method 1D (RFG, December 2013) for a critical low pattern year type, the DWR 90% forecast unimpaired runoff of 295 TAF is used to estimate the Restoration allocation, resulting in a **Critical Low Year** hydrograph for the SJRRP. A forecast of Critical-Low provides no flexibility to the Restoration Administrator to schedule flows.

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

Forecast Source	90%	50%	10%
DWR, January 1, 2014	295 TAF	815 TAF	1,950 TAF
NWS, January 9, 2014	177 TAF	573 TAF	1,817 TAF
NWS, January 15, 2014	163 TAF	478 TAF	1,661 TAF

[1] http:// http://cdec.water.ca.gov/cgi-progs/iodir?s=b120

[2] http://www.cnrfc.noaa.gov/rawESP_WY.php?id=FRAC1

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 Holding Contracts.

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 at Gravelly Ford (af)
Mar 1 - Mar 15	130	5	0	0
Mar 16 - Mar 31	130	5	0	0
Apr 1 - Apr 15	150	5	0	0
Apr 16 - Apr 30	150	5	0	0
May 1 - Jun 30	190	5	0	0
Jul 1 - Aug 31	230	5	0	0
Sept 1 - Sept 30	210	5	0	0
Oct 1 - Oct 31	160	5	0	0
Nov 1 - Nov 6	130	5	0	0
Nov 7 - Nov 10	120	5	0	0
Nov 11 - Dec 31	120	5	0	0
Jan 1 - Feb 28	100	5	0	
				Total= 0

cfs=cubic feet per second
af = acre-feet

Restoration Budget

Table 3 shows the components of the restoration budget for March 1, 2014, through February 28, 2015. All the flow accounts—Spring flexible flow, base flow, riparian recruitment, and Fall flexible flow—are without any balance because the Restoration Year Type is critical low. The estimated total allocation consists of 116,866 acre-feet riparian release and 0 acre-feet restoration release. The total flow volume for restoration as well as various accounting flow components will change with an updated unimpaired flow forecast outside of the critical low range.

Table 3 – Restoration Budget with Flow Accounts

Schedule Start Date	Friant Releases (cfs)	Gravelly Ford Flow Targets (cfs)	Riparian Demand (cfs)	Riparian Demand (af)	Base Flow (af)	Spring Flexible Flow (af)	Fall Flexible Flow (af)	Riparian Recruitment Flow (af)
Mar. 1	130	5	130	3,868		0		
Mar. 16	130	5	130	4,126		0		
Apr. 1	150	5	150	4,463		0		
Apr. 16	150	5	150	4,463		0		
May. 1	190	5	190	22,988	0			0
Jul. 1	230	5	230	28,284	0			
Sep. 1	210	5	210	12,496	0			
Oct. 1	160	5	160	9,838	0			
Nov. 1	130	5	130	1,547			0	
Nov. 7	120	5	120	952			0	
Nov. 11	120	5	120	12,139				
Jan. 1	100	5	100	6,149				
Feb. 1	100	5	100	5,554				
			Total=	**116,866**	**0**	**0**	**0**	**0**

cfs=cubic feet per second
af = acre-feet

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 past releases. Table 4 shows the estimated remaining volume.

Table 4 – Estimated Flexible Flow Volume Remaining

Flow Account	Yearly Allocation (af)	Release up to Date (af)	Remaining Flow Volume (af)
Spring Flexible Flow+ Base Flow (March 1-May 28, 2014)	0	0	0
Riparian Recruitment	0	0	0
Fall Flexible Flow	0	0	0
Buffer Flow	0	0	0
Purchased Water	0	0	0

af= acre-feet

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 during non-critical low Restoration Year Types. At this time, channel capacity does not constrain restoration releases from Friant Dam because there are no restoration releases. Reclamation will 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 during the non-critical low years in the absence of a recommendation from the Restoration Administrator, consistent with the Settlement. Since the Restoration Year Type is Critical Low, the default flow schedule is simply the riparian demand from the Exhibit B in the Settlement (Table 5). Subsequent default schedules will be derived from new flow forecasts and will be modified based on the restoration flow volume remaining for the year. The current default flow schedule is shown for the Spring flexible period which could be modified based on the March 1 updated flow forecast to be published on March 10, 2014.

Table 5 – Restoration Default Flow Schedule

Date	Flow
Mar 1 – Mar 31	0 cfs
Apr 1 – Apr 30	0 cfs
May 1 – May 28	0 cfs

cfs=cubic feet per second

Additional Flow Schedules

As per the Restoration Flow Guidelines, additional Restoration allocations that will result from the 10th and 50th percentile unimpaired runoff are presented in Table 6. Although these flow schedules are not utilized for restoration purposes, these flow ranges provide insight into the uncertainty of flow forecasting as well as what may happen once updated forecasts are available.

Table 6 – Additional Flow Schedules, 10th and 50th Percentile

Flow Period	Flow Schedule, (10th percentile, 1,950 TAF Unimpaired Inflow, Normal-Wet year), cfs	Flow Schedule, (50th percentile, 815 TAF Unimpaired Inflow, Dry year), cfs
Mar 1 - Mar 15	500	500
Mar 16 - Mar 31	1,500	1,500
Apr 1 - Apr 15	2,500	463
Apr 16 - Apr 30	3,880	350
May 1 - Jun 30	350	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
Total Allocation	**470,348 acre-feet**	**304,637 acre-feet**

cfs = cubic feet per second