

Attachment 1

Sediment Monitoring Scope of Work, 2010 Fiscal Year

**Final 2011 Agency Plan
Appendix A Studies**



San Joaquin River Restoration Program – Sediment Monitoring Scope of Work, 2010 Fiscal Year.

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COMPONENT 1

The USGS proposes to sample suspended sediment and bedload during the period of high flow release at 5 sites: The five sites are in the reach of the San Joaquin River that extends from downstream of Friant Dam to the USGS gage near Mendota. The sites were pre-selected by the USBR. Each site is located at or near a streamgaging station. Each site would be sampled weekly by the USGS for a period of 8 weeks starting approximately March 1, 2010 and ending approximately April 30, 2010. In addition to sampling, the USGS will make at least one streamflow measurement per week at each site in order to aid USBR in development of high flow rating curves.

Each USGS crew would spend one full day at each of the sampling sites, collecting two sets of suspended sediment samples, two sets of bedload samples, and making at least one streamflow measurement.

Suspended sediment samples collected by USGS will be analyzed for sand/fine split except for those collected in support of Component 3 (surrogate research at Gravelly Ford) which will need to be analyzed for Sand Analysis.

The following five sampling sites have been selected by USBR for USGS sampling:

- 1-SJR at HW 41
- 2-SJR nr Skaggs Bridge
- 3-SJR at Gravelly Ford (suspended sediment surrogate research site)
- 4-SJR below bifurcation
- 5-SJR nr Mendota

USGS staff has visited these locations and have determined that the best sampling locations at or near these sites would be as follows:

- SJR at HW 41 (Sample from unused part of southbound HWY 41 bridge)
- SJR nr Skaggs Bridge (sample from the HWY 145 bridge or from boat deployed at park)
The decision whether to sample from the bridge or a boat will be made by the sampling crew and is based on safety of boat operation under current flow conditions. Sampling from the bridge will require appropriate traffic control measures and encroachment permit.
- SJR at Gravelly Ford (sample by wading or from boat)
There is a safety concern here for high flow boat sampling. The decision to sample from a boat will be made by the sampling crew and is based on safety of boat operation under current flow conditions. Permission may be needed from land owners to launch from either side of the river as needed.
- SJR below bifurcation (sample by wading or from boat)
- SJR nr Mendota (Sample from cableway)

COMPONENT 2

The USBR will sample suspended sediment at the same 5 sites as USGS sampling (see component 1 above), plus 2 additional tributary sites. USBR will also sample Bedload at 4 sites; the two tributary sites plus two main stem sites at HWY 41 and Skaggs Bridge. Sampling will be performed for flow periods not sampled by USGS, commencing at the onset of and continuing for the duration of flow, or through the end of the 2010 WY, whichever occurs first. The 2 tributary sites would be sampled only during the 2 month release event and/or during storm events. The samples collected by USBR will be analyzed by the USGS Sediment Lab in Marina, CA. The results of the samples meeting USGS standards will be entered into the National Water Information System (NWIS) data base with results being published in the USGS CAWSC Annual Data Report, and on NWISWEB.

The USBR sampling crews will collect all samples according to USGS protocols. The USBR sampling methods and equipment will be reviewed by USGS staff (Denis O'Halloran) on two occasions during the flow period at each of the seven sites. The USBR is responsible for obtaining the necessary training, and acquiring the necessary sampling equipment needed for this component. USBR field crews would collect a minimum of two suspended sediment samples per month throughout the rest of the year or flow period at the 5 mainstem sites.

Samples collected by USBR in support of Component 3 (suspended sediment surrogate research at Gravelly Ford) will be analyzed for Sand Analysis. Suspended sediment samples collect at the remaining six sampling locations will be analyzed for sand/fine split (sand break) only. USBR will deliver samples to the Marina Sediment Lab on a monthly basis.

USBR sampling plan:

Suspended Sediment:

- Cottonwood Creek – Sampled during storm events and/or during release events. Not to exceed 7 samples (14 sample sets). Samples analyzed for sand/fine split (sand break). Samples most likely collected by wading using EWI sampling method.
- Little Dry Creek - - Sampled during storm events and/or during release events. Not to exceed 7 samples (14 sample sets). Samples analyzed for sand/fine split (sand break). Samples most likely collected by wading or from bridge using EWI sampling method.
- SJR at HW 41 – Sample twice per month at wading stages. Assuming 10 months of flow when no USGS samples are collected. Not to exceed 20 samples (40 sample sets) collected using EWI method. Samples analyzed for sand/fine split (sand break).
- SJR nr Skaggs Bridge – Sample twice per month at wading stages. Assuming 10 months of flow when no USGS samples are collected. Not to exceed 20 samples (40 sample sets) collected using EWI method. Samples analyzed for sand/fine split (sand break).
- SJR at Gravelly Ford – Sample twice per month at wading stages. Assuming 10 months of flow when no USGS samples are collected. Not to exceed 20 samples (40 sample sets) collected using EWI method. Samples must be analyzed for sand analyses. Sand analysis is required in support of Component 3, Suspended Sediment Surrogate research.

Suspended Sediment con't:

- SJR below bifurcation – Sample twice per month at wading stages. Assuming 5 months of flow when no USGS samples are collected. Not to exceed 10 samples (20 sample sets) collected using EWI method. Samples analyzed for sand/fine split (sand break).
- SJR nr Mendota – Sample twice per month from cableway or boat. Assuming 10 months of flow when no USGS samples are collected. Not to exceed 20 samples (40 sample sets) collected using EWI method. Samples analyzed for sand/fine split (sand break).

Bedload:

- Cottonwood Creek – Sampled during storm events and/or during release events. Not to exceed 7 samples. Each sampled using SEWI method which is 2 passes per sample. Samples most likely collected by wading.
- Dry Creek – Sampled during storm events and/or during release events. Not to exceed 7 samples. Each sampled using SEWI method which is 2 passes per sample. Samples most likely collected from by wading or from bridge.
- SJR at Hwy 41 – Sample once per month at wading stages while bedload is moving only during periods when USGS is not sampling. Not to exceed 5 samples. Each sampled using SEWI method which is 2 passes per sample.
- SJR at Skaggs Bridge – Sample once per month at wading stages while bedload is moving only during periods when USGS is not sampling. Not to exceed 5 samples. Each sampled using SEWI method which is 2 passes per sample.

COMPONENT 3

Suspended sediment surrogate research: At the Gravelly Ford gaging location, USGS (Scott Wright) will test instrumentation for continuous monitoring of suspended-sediment concentration and particle size distribution. The LISST-Streamside package, manufactured by Sequoia Scientific, will be used. This package consists of a laser-diffraction instrument on shore connected to a pumping system. Samples can be drawn from the pump through the optics as frequently as desired, and the laser-diffraction measurement yields concentrations in 32 particle size ranges. The LISST measures volume concentration such that it must be calibrated using conventional samples of mass concentration and particle size. This will be accomplished using sample data collected for Components 1 and 2 above, as well as by installing an additional pump sampler. Continuous records of concentration and particle size allow for a more detailed assessment of changes in sediment supply, particularly during high flow releases from Friant Dam, and can provide an excellent test of numerical models. The surrogate research will be focused around the high flow releases. All suspended sediment samples collected at the selected research site by USGS, USBR and the automated USGS pumping sampler, will be analyzed for sand analysis at the USGS Marina, CA Sediment Lab. A report will be published.