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# SACRAMENTO RIVER DEEP WATER SHIP CHANNEL NAVIGATION PROJECT

## SAMPLING AND ANALYSIS PLAN (SAP)



July 2004

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### Project Description

The U.S. Army Corps of Engineers (USACE) is investigating the continuation of the authorized project to deepen and widen portions of the Sacramento River Deep Water Ship Channel (SRDWSC). The SRDWSC serves deep draft commercial vessels en route to the Port of Sacramento. Deepening the project (from 30- to 35-foot MLLW) and widening portions of the channel to improve navigation safety, was authorized by Congress in 1986. Construction was initiated in 1989 and dredging was completed between River Miles 43.3 (Port of Sacramento) and 35.5. The current investigation focuses on resuming the construction and completing the project between River Mile 35.5 to 0.0.

The purpose of this Sampling and Analysis Plan (SAP) is to adequately characterize the material to be dredged, confirm that this material is suitable for placement in the various upland sites available for this project, and that neither ground nor surface water would be significantly impacted. Based on the 2003 condition survey (USACE, 2003a) and a bathymetric survey between River Miles 15.0 to 25.0 (USACE, 2003b), the project would involve dredging up to approximately 6,500,000 cubic yards (cy) of material (Table 1; 5,100,000 cy to the 35-foot project depth, plus an additional 1,400,000 cy of 1-foot overdepth allowance). The project area and approximate sampling locations are shown in Figures 1-7. The sample positions are termed approximate only because it may be necessary for the sample vessel to vary the position to provide cores of adequate volume. Currently proposed widening areas are shown in Figure 8. These areas of channel widening follow recommendations from a ship simulation study to increase navigation safety within the channel.

The material would be hydraulically dredged and pumped via pipeline into various upland placement sites. The sites to be used would be the same as those currently used for maintenance dredging along the channel. These placement sites are shown in Attachment A of the General Order Waste Discharge Requirements 05-01-116, dated May 11, 2001, issued by the Central Valley Regional Water Quality Control Board (CVRWQCB) for maintenance dredging along the SRDWSC. Some placement sites may have to be augmented in size and some will be required that have not been used in the recent past. The slurry pumped into the sites would consist mostly of water. Water would be discharged back into the SRDWSC after most of the suspended solids have settled out.

The top layer of material to be dredged is likely similar to maintenance dredging material that is regularly dredged from the channel bottom. The deeper material to be dredged is not known to be significantly affected by anthropogenic activity and is considered native material. Since some areas are shallower than others or will involve widening, certain areas of the project would contain more material to be dredged than others. However, material to be dredged occurs across the entire project area.

## Sampling and Analysis Plan

To adequately characterize the material to be dredged along the entire project, 35 cores of sediment spaced equally along the 35.5-mile length of the project area will be collected and composited for analysis. The sampling locations are shown in Figures 1-7. Cores will be collected using a vibratory coring device. Each core will be collected down to 36-feet MLLW (35-foot project depth, plus 1-foot overdepth allowance). Samples will be collected from the midpoint of each river mile, and will be collected laterally off the centerline of the channel if sufficient material is not present at the centerline. Each coring will represent the material located one half mile upstream to one half mile downstream of the coring location. Individual cores will be composited together in groups of either 4 or 5, according to the scheme outlined in Table 2. Composites will be made by sub-sampling the individual core samples and mixing the sub-samples together to create the uniform composite. Each composite will characterize an area of the channel between approximately 4 and 5 miles long. It is likely that adjacent material, both vertically and horizontally, has roughly the same characteristics as each other. Therefore, each composite should adequately characterize all the material contained in the reach of that composite.

Each composite will be analyzed for all of the pre-dredge sediment and elutriate analyses given in the Monitoring and Reporting Program for the General Order Waste Discharge Requirements (GO WDR) 05-01-116, dated May 11, 2001, issued by the Central Valley Regional Water Quality Control Board (CVRWQCB) for maintenance dredging along the SDWSC. This includes various bulk sediment, Waste Extraction Test with de-ionized water (DI-WET), and Effluent Elutriate Test (EET) analyses. As previously acknowledged by the CVRWQCB, commercial laboratories cannot currently meet all of the detection limits identified in GO WDR 05-01-116, particularly for polychlorinated biphenyls (PCBs). Therefore, for compounds with detection limits that cannot currently be met, we plan to attain the best detection limits reasonably achievable.

The Corps will have a contractor collect and analyze the material according to this SAP.

## References

United States Army Corps of Engineers (USACE), 2003a. 2003 Condition Survey for the Sacramento Deep Water Ship Channel.

United States Army Corps of Engineers (USACE), 2003b. Bathymetric Survey of River Miles 15 to 25 for the Sacramento Deep Water Ship Channel.

**Table 1: Sacramento River DWSC Approximate Maximum [**

**Project to 35' MLLW**

River Mile	Stationing		Proposed Project	
	Start	End	to 35' MLLW	+1' Overdepth
1	1+00	52+00	49027	84699
2	53+00	105+00	37556	84566
3	106+00	158+00	24323	42828
4	159+00	211+00	49745	88931
5	212+00	264+00	287629	355469
6	265+00	317+00	342823	410483
7	318+00	370+00	305246	371574
8	371+00	422+00	281754	346721
9	423+00	475+00	263377	330246
10	476+00	528+00	297679	364579
11	529+00	581+00	225042	292793
12	582+00	634+00	92490	141707
13	635+00	687+00	227509	293329
14	688+00	739+00	89947	120588
15	740+00	792+00	234446	253499
16	793+00	845+00	1294	1543
17	846+00	898+00	29829	35268
18	899+00	951+00	13127	13945
19	952+00	1003+00	59190	79600
20	1004+00	1056+00	41956	80078
21	1057+00	1109+00	32914	70778
22	1110+00	1162+00	25993	63028
23	1163+00	1214+00	27576	58977
24	1215+00	1267+00	3647	27873
25	1268+00	1320+00	47942	87067
26	1321+00	1373+00	316933	364171
27	1374+00	1426+00	179900	220861
28	1427+00	1478+00	130392	168235
29	1479+00	1531+00	172850	211125
30	1532+00	1584+00	186204	224728
31	1585+00	1637+00	228039	266934
32	1638+00	1690+00	200288	238708
33	1691+00	1742+00	163333	200992
34	1743+00	1795+00	241369	279708
35	1796+00	1848+00	220243	258954
Totals			5,131,614	6,534,584
OD				1,402,969

**TABLE 2.** Sacramento River Deep Water Ship Channel  
Sampling and Compositing Scheme

SAMPLE <sup>a</sup>	APPROXIMATE SAMPLING LOCATION, (RIVER MILE)	APPROXIMATE MAXIMUM SEDIMENT VOLUME REPRESENTED BY COMPOSITE
1	0.5	301,024cy (Composite 1)
2	1.5	
3	2.5	
4	3.5	
5	4.5	1,814,492 cy (Composite 2)
6	5.5	
7	6.5	
8	7.5	
9	8.5	1,092,407 cy (Composite 3)
10	9.5	
11	10.5	
12	11.5	
13	12.5	424,842 cy (Composite 4)
14	13.5	
15	14.5	
16	15.5	
17	16.5	293,484 cy (Composite 5)
18	17.5	
19	18.5	
20	19.5	
21	20.5	538,086 cy (Composite 6)
22	21.5	
23	22.5	
24	23.5	
25	24.5	824,950 cy (Composite 7)
26	25.5	
27	26.5	
28	27.5	
29	28.5	1,245,297 cy (Composite 8)
30	29.5	
31	30.5	
32	31.5	
33	32.5	
34	33.5	
35	34.5	

**FOOTNOTES:**

*a. Eight composite samples: 1, 2, 3, 4, 5, 6, 7, and 8.*

Figure 1: Sacramento River Deep Water Ship Channel. Vacinity Map and Figure Index

