APPENDIX A: SPI RESULTS

Appendix A. Woodard Bay Sediment Profile Imaging Results

Station	Grain Size Major Mode (# replicates)	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)	Number Of Reps With Dredged Material	Boundary Roughness Mean (cm)	Benthic Habitat (# replicates)
WB01	> 4 phi (3)	16.07	0.00	0	0.61	UN.SF (3)
WB02	> 4 phi (3)	16.42	0.00	0	2.13	UN.SF (3)
WB03	> 4 phi (2), 4 to 3 phi (1)	8.77	0.00	0	0.93	UN.SF (1), UN.SI (2)
WB04	> 4 phi (3)	15.70	0.00	0	0.66	UN.SF (3)
WB05	> 4 phi (2), 4 to 3 phi (1)	10.60	0.00	0	1.81	UN.SF (2), UN.SI (1)
WB06	> 4 phi (3)	9.30	0.00	0	1.10	UN.SF (3)
WB07	> 4 phi (3)	18.43	0.00	0	0.56	UN.SF (3)
WB08	> 4 phi (3)	16.61	0.00	0	2.85	UN.SF (3)
WB09	> 4 phi (3)	16.91	0.00	0	1.09	UN.SF (3)
WB10	> 4 phi (3)	18.15	0.00	0	0.76	UN.SF (3)
WB11	> 4 phi (3)	17.74	0.00	0	0.59	UN.SF (3)
WB12	> 4 phi (3)	17.19	0.00	0	1.09	UN.SF (3)
WB13	> 4 phi (1), 4 to 3 phi (1)	3.69	0.00	0	0.95	UN.SF (1), UN.SS (1)
WB15	> 4 phi (2), 4 to 3 phi (1)	8.11	0.00	0	0.77	UN.SF (2), UN.SI (1)
WB16	> 4 phi (3)	18.02	0.00	0	0.65	UN.SF (3)
WB17	3 to 2 phi (1), 4 to 3 phi (2)	5.25	0.00	0	1.42	UN.SF (1), UN.SI (1), UN.SS (1)
WB18	> 4 phi (2), 4 to 3 phi (1)	12.89	0.00	0	1.77	UN.SI (3)
WB19	> 4 phi (3)	11.32	0.00	0	4.43	UN.SF (3)
WB20	> 4 phi (1), 4 to 3 phi (2)	12.43	0.00	0	0.71	UN.SF (3)
WB21	> 4 phi (3)	17.95	0.00	0	1.12	UN.SF (3)
WB22	3 to 2 phi (3)	0.62	0.00	0	0.64	SA.F (3)
WB23	> 4 phi (3)	16.96	0.00	0	0.96	UN.SF (3)
WB24	> 4 phi (3)	15.15	0.00	0	1.07	UN.SF (3)
WB25	> 4 phi (3)	16.77	0.00	0	0.64	UN.SF (3)
WB26	3 to 2 phi (3)	4.15	0.00	0	0.94	SA.F (1), UN.SS (2)
WB27	4 to 3 phi (3)	15.10	0.00	0	0.79	UN.SF (2), UN.SS (1)
WB28	> 4 phi (3)	17.27	0.00	0	1.47	UN.SF (3)
WB29	> 4 phi (3)	17.10	0.00	0	0.81	UN.SF (3)
WB30	4 to 3 phi (3)	14.69	0.00	0	1.35	UN.SI (3)
WB31	N/A (3)	0.00	0.00	0	0.00	HR (3)
WB32	> 4 phi (2), N/A (1)	9.81	0.00	0	1.01	HR (1), UN.SF (1), UN.SI (1)
WB33	> 4 phi (3)	8.98	0.00	0	1.43	UN.SF (1), UN.SI (2)
WB34	4 to 3 phi (3)	8.24	0.00	0	0.97	UN.SI (3)
WB35	> 4 phi (1), 4 to 3 phi (2)	9.16	0.00	0	1.38	UN.SS (3)
WB36	> 4 phi (3)	15.53	0.00	0	1.14	UN.SF (1), UN.SI (2)
WB37	> 4 phi (1), 4 to 3 phi (3)	7.49	0.00	0	1.13	UN.SI (2), UN.SS (2)
WB38	4 to 3 phi (1), N/A (2)	2.39	0.00	0	0.51	UN.SI (2)
WB39	3 to 2 phi (3)	5.46	0.00	0	1.11	UN.SS (3)
WB40	4 to 3 phi (3)	11.88	0.00	0	1.41	UN.SI (3)
WB41	4 to 3 phi (3)	1.71	0.00	0	0.71	SA.F (3)
WB42	3 to 2 phi (1), N/A (2)	0.00	0.00	0	0.00	SH.SA (3)
WB43	4 to 3 phi (3)	9.48	0.00	0	1.35	UN.SI (3)
WB44	> 4 phi (3)	9.43	0.00	0	0.92	UN.SF (3)
WB45	> 4 phi (3)	12.58	0.00	0	1.02	UN.SF (3)
WB46	> 4 phi (3)	17.04	0.00	0	0.55	UN.SF (3)
WB47	4 to 3 phi (3)	6.95	0.00	0	0.78	UN.SI (3)
WB48	> 4 phi (3)	9.08	0.00	0	1.09	UN.SF (1), UN.SI (2)

AVG		11.37			1.09	
MAX		18.43			4.43	
MIN		0.00			0.00	

Appendix A. Woodard Bay Sediment Profile Imaging Results

Successional Stages Present	Highest Stage Present	Successional Stages Present (# replicates)	RPD Mean (cm)	Methane Present	OSI Mean	OSI Median	Additional1 Description	Additional1 Value
I,III	ST I on III	ST I (2), ST I on III (1)	4.42	No	8.33	7.00		0
I,III	ST I on III	ST I (2), ST I on III (1)	3.29	No	7.33	7.00	Woody debris percent	2.67
I,III	ST III	ST I (2), ST III (1)	1.59	No	5.00	4.00	Woody debris percent	6.00
III	ST III	ST III (3)	2.66	No	9.00	9.00	Woody debris percent	1.67
I,III	ST III	ST I (2), ST III (1)	2.56	No	6.00	5.00	Woody debris percent	2.00
I,INDET	ST I	INDET (1), ST I (2)	1.45	No	4.00	4.00	Woody debris percent	6.67
I	ST I	ST I (3)	4.25	No	6.67	7.00	Woody debris percent	0.00
I,III	ST III	ST I (2), ST III (1)	3.54	No	6.67	7.00	Woody debris percent	0.00
I	ST I	ST I (3)	4.35	No	7.00	7.00	Woody debris percent	0.00
I	ST I	ST I (3)	4.88	No	7.00	7.00	Woody debris percent	0.00
I,III	ST III	ST I (2), ST III (1)	4.24	No	8.33	7.00	Woody debris percent	0.00
I	ST I	ST I (3)	4.09	No	6.33	7.00	Woody debris percent	0.00
I,INDET	ST I	INDET (1), ST I (2)	1.69	No	3.50	3.50	Woody debris percent	0.00
I	ST I	ST I (3)	2.54	No	5.00	5.00	Woody debris percent	0.67
I,III	ST I on III	ST I (2), ST I on III (1)	4.77	No	8.33	7.00	Woody debris percent	0.00
I,III	ST I on III	ST I (2), ST I on III (1)	2.09	No	5.67	5.00	Woody debris percent	7.67
I,III	ST I on III	ST I (1), ST I on III (2)	2.57	No	7.67	8.00	Woody debris percent	6.67
I,III	ST I on III	ST I (2), ST I on III (1)	2.98	No	6.67	7.00	Woody debris percent	2.67
I,III	ST I on III	ST I (2), ST I on III (1)	2.58	No	6.00	5.00	Woody debris percent	0.00
I,III	ST I on III	ST I (2), ST I on III (1)	3.29	No	7.33	6.00	Woody debris percent	0.67
I	ST I	ST I (3)	0.62	No	2.33	2.00	Woody debris percent	0.00
I,III	ST I on III	ST I (1), ST I on III (2)	3.78	No	9.00	10.00	Woody debris percent	0.00
I,III	ST III	ST I on III (1), ST III (2)	2.56	No	9.00	9.00	Woody debris percent	0.00
I,III	ST I on III	ST I on III (3)	4.11	No	10.67	11.00	Woody debris percent	0.00
I,III	ST III	ST I (2), ST III (1)	2.26	No	5.67	4.00	Woody debris percent	0.00
I,III	ST III	ST I (1), ST III (2)	2.76	No	7.67	9.00	Woody debris percent	0.00
I	ST I	ST I (3)	3.34	No	6.00	6.00	Woody debris percent	2.33
III	ST III	ST III (3)	3.45	No	10.00	10.00	Woody debris percent	0.00
I	ST I	ST I (3)	3.02	No	5.67	6.00	Woody debris percent	0.00
INDET	INDET	INDET (3)	INDET	No	INDET	INDET	Woody debris percent	0.00
I,III,INDET	ST I on III	INDET (1), ST I (1), ST I on III (1)	2.99	No	7.50	7.50	Woody debris percent	3.33
I	ST I	ST I (3)	1.98	No	4.00	4.00	Woody debris percent	0.00
I	ST I	ST I (3)	2.09	No	4.33	4.00	Woody debris percent	0.00
I,III	ST III	ST I (2), ST III (1)	1.75	No	5.33	5.00	Woody debris percent	0.00
I,III	ST III	ST I (2), ST III (1)	3.06	No	7.00	7.00	Woody debris percent	0.00
I,III	ST III	ST I (2), ST III (2)	1.79	No	6.00	5.50	Woody debris percent	0.00
I,INDET	ST I	INDET (2), ST I (1)	2.61	No	5.00	5.00	Woody debris percent	0.00
I	ST I	ST I (3)	2.21	No	4.00	4.00	Woody debris percent	0.00
I	ST I	ST I (3)	2.03	No	4.33	4.00	Woody debris percent	0.00
I	ST I	ST I (3)	1.70	No	4.00	4.00	Woody debris percent	0.00
INDET	INDET	INDET (3)	INDET	No	INDET	INDET	Woody debris percent	0.00
I	ST I	ST I (3)	2.69	No	5.00	5.00	Woody debris percent	0.00
I,III	ST III	ST I (1), ST III (2)	2.24	No	7.00	8.00	Woody debris percent	4.00
I,III	ST III	ST I (2), ST III (1)	1.91	No	5.33	4.00	Woody debris percent	1.67
I	ST I	ST I (3)	4.39	No	7.00	7.00	Woody debris percent	0.00
I	ST I	ST I (3)	2.08	No	4.00	4.00	Woody debris percent	2.33
I	ST I	ST I (3)	2.11	No	4.00	4.00	Woody debris percent	0

			2.83		6.26	6.08		1.09
			4.88		10.67	11.00		7.67
			0.62		2.33	2.00		0.00

Appendix A. Woodard Bay Sediment Profile Imaging Results

Station	Replicate	Date	Time	Successional Stage	Grain Size (phi)			Benthic Habitat	Mud Clasts		Camera Penetration (cm)			
					Min	Max	Maj Mode		Present	Avg. Diam	Min	Max	Range	Mean
WB01	A	2/19/2008	09:52:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	16.9	17.54	0.64	17.22
WB01	D	2/19/2008	14:49:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	15.03	15.76	0.73	15.4
WB01	E	2/19/2008	14:50:00	ST I on III	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	15.36	15.81	0.45	15.59
WB02	A	2/19/2008	09:39:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	16.09	17.02	0.93	16.56
WB02	B	2/19/2008	09:41:00	ST I on III	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	14.65	17.31	2.66	15.98
WB02	C	2/19/2008	09:43:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	15.31	18.11	2.8	16.71
WB03	A	2/18/2008	14:54:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SI	FALSE	0	9.26	9.87	0.61	9.57
WB03	B	2/18/2008	14:56:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SF	TRUE	0	8.59	9.07	0.48	8.83
WB03	C	2/18/2008	14:57:00	ST III	> 4 phi	4 to 3 phi	> 4 phi	UN.SI	TRUE	0	7.05	8.76	1.71	7.91
WB04	A	2/19/2008	09:31:00	ST III	> 4 phi	2 phi	> 4 phi	UN.SF	FALSE	0	15.6	15.76	0.16	15.68
WB04	B	2/19/2008	09:33:00	ST III	> 4 phi	2 phi	> 4 phi	UN.SF	TRUE	0	15.17	15.95	0.78	15.56
WB04	C	2/19/2008	09:35:00	ST III	> 4 phi	2 phi	> 4 phi	UN.SF	FALSE	0	15.33	16.36	1.03	15.85
WB05	A	2/19/2008	09:24:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	13.37	14.43	1.06	13.9
WB05	B	2/19/2008	09:26:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	14.41	15.69	1.28	15.05
WB05	C	2/19/2008	09:27:00	ST I	> 4 phi	4 phi	4 to 3 phi	UN.SI	FALSE	0	1.31	4.41	3.1	2.86
WB06	A	2/19/2008	09:16:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	8.1	8.9	0.8	8.5
WB06	B	2/19/2008	09:18:00	INDET	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	6.17	7.48	1.31	6.82
WB06	C	2/19/2008	09:19:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	11.99	13.19	1.2	12.59
WB07	D	2/19/2008	14:41:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	17.97	18.42	0.45	18.19
WB07	E	2/19/2008	14:42:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	17.83	18.26	0.43	18.05
WB07	F	2/19/2008	14:44:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	18.65	19.46	0.81	19.06
WB08	A	2/19/2008	10:13:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	18.3	19.39	1.09	18.84
WB08	D	2/19/2008	14:31:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	11.61	16.71	5.1	14.16
WB08	E	2/19/2008	14:32:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	15.64	17.99	2.35	16.82
WB09	C	2/19/2008	10:27:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	18.35	19.08	0.73	18.72
WB09	E	2/19/2008	14:23:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	16.12	17.09	0.97	16.6
WB09	F	2/19/2008	14:25:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	14.62	16.19	1.57	15.41
WB10	D	2/19/2008	14:15:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	17.89	18.54	0.65	18.22
WB10	E	2/19/2008	14:16:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	18.04	18.59	0.55	18.32
WB10	F	2/19/2008	14:17:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	17.35	18.44	1.09	17.9
WB11	A	2/19/2008	11:05:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	17.56	18.13	0.57	17.84
WB11	B	2/19/2008	11:07:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	17.16	17.94	0.78	17.55
WB11	C	2/19/2008	11:08:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	17.61	18.04	0.43	17.83
WB12	A	2/19/2008	11:13:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	16.21	16.94	0.73	16.58
WB12	B	2/19/2008	11:15:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	17.12	17.51	0.39	17.32
WB12	C	2/19/2008	11:16:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	16.61	18.75	2.14	17.68
WB13	A	2/19/2008	11:41:00	INDET	INDET	INDET	INDET	INDET	FALSE	0	INDET	INDET	INDET	INDET
WB13	B	2/19/2008	11:43:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SS	FALSE	0	6.39	7.15	0.76	6.77
WB13	C	2/19/2008	11:44:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	3.26	5.34	2.08	4.3
WB15	A	2/19/2008	11:30:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	12.29	12.86	0.57	12.57
WB15	B	2/19/2008	11:31:00	ST I	> 4 phi	4 phi	4 to 3 phi	UN.SI	TRUE	0	6.03	6.93	0.9	6.48
WB15	C	2/19/2008	11:33:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	4.84	5.69	0.85	5.27
WB16	A	2/19/2008	11:22:00	ST I on III	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	17.51	18.42	0.91	17.97
WB16	B	2/19/2008	11:24:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	17.88	18.23	0.35	18.06
WB16	C	2/19/2008	11:25:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	17.69	18.37	0.68	18.03
WB17	A	2/19/2008	11:49:00	ST I on III	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	6.58	7.17	0.59	6.88
WB17	B	2/19/2008	11:50:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SF	TRUE	0	4.35	5.25	0.9	4.8
WB17	C	2/19/2008	11:51:00	ST I	> 4 phi	2 phi	3 to 2 phi	UN.SS	FALSE	0	2.69	5.46	2.77	4.07
WB18	A	2/19/2008	11:54:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	7.57	11.94	4.37	9.76
WB18	B	2/19/2008	11:56:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SI	FALSE	0	14.43	14.95	0.52	14.69
WB18	C	2/19/2008	11:57:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SI	TRUE	0	14	14.43	0.43	14.22

Station	Replicate	Date	Time	Successional Stage	Grain Size (phi)			Benthic Habitat	Mud Clasts		Camera Penetration (cm)			
					Min	Max	Maj Mode		Present	Avg. Diam	Min	Max	Range	Mean
WB19	A	2/19/2008	12:02:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	12.25	13.91	1.66	13.08
WB19	B	2/19/2008	12:04:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	8.1	12.04	3.94	10.07
WB19	C	2/19/2008	12:05:00	ST I on III	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	6.98	14.67	7.69	10.82
WB20	A	2/18/2008	16:34:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	10.28	11.47	1.19	10.88
WB20	B	2/18/2008	16:36:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SF	FALSE	0	12.99	13.62	0.63	13.31
WB20	C	2/18/2008	16:37:00	ST I on III	> 4 phi	3 phi	4 to 3 phi	UN.SF	TRUE	0	12.94	13.24	0.3	13.09
WB21	A	2/19/2008	12:10:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	17.18	18.4	1.22	17.79
WB21	B	2/19/2008	12:12:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	17.61	18.68	1.07	18.15
WB21	C	2/19/2008	12:13:00	ST I on III	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	17.37	18.44	1.07	17.91
WB22	A	2/18/2008	14:01:00	ST I	4 phi	3 phi	3 to 2 phi	SA.F	FALSE	0	0.47	1.07	0.6	0.77
WB22	B	2/18/2008	14:02:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	0.09	0.62	0.53	0.36
WB22	C	2/18/2008	14:03:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	0.33	1.12	0.79	0.73
WB23	D	2/19/2008	14:02:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	16.42	17.07	0.65	16.74
WB23	E	2/19/2008	14:04:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	16.38	17.66	1.28	17.02
WB23	F	2/19/2008	14:06:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	16.64	17.59	0.95	17.11
WB24	A	2/18/2008	14:47:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	14.93	15.64	0.71	15.28
WB24	B	2/18/2008	14:48:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	14.55	15.52	0.97	15.03
WB24	C	2/18/2008	14:49:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	14.36	15.9	1.54	15.13
WB25	A	2/19/2008	12:17:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	16.17	16.85	0.68	16.51
WB25	B	2/19/2008	12:19:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	16.78	17.47	0.69	17.12
WB25	C	2/19/2008	12:20:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	16.42	16.97	0.55	16.69
WB26	A	2/18/2008	13:55:00	ST III	> 4 phi	3 phi	3 to 2 phi	UN.SS	FALSE	0	4.27	5.98	1.71	5.12
WB26	B	2/18/2008	13:56:00	ST I	> 4 phi	3 phi	3 to 2 phi	UN.SS	FALSE	0	5.55	5.91	0.36	5.73
WB26	C	2/18/2008	13:58:00	ST I	> 4 phi	3 phi	3 to 2 phi	SA.F	FALSE	0	1.23	1.97	0.74	1.6
WB27	A	2/18/2008	13:46:00	ST III	> 4 phi	3 phi	4 to 3 phi	UN.SF	FALSE	0	14.22	14.9	0.68	14.56
WB27	B	2/18/2008	13:48:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SS	FALSE	0	14.65	15.74	1.09	15.19
WB27	C	2/18/2008	13:49:00	ST III	> 4 phi	3 phi	4 to 3 phi	UN.SF	FALSE	0	15.24	15.85	0.61	15.55
WB28	A	2/18/2008	16:18:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	16.74	17.47	0.73	17.1
WB28	B	2/18/2008	16:20:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	17.56	18.07	0.51	17.81
WB28	C	2/18/2008	16:21:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	15.33	18.49	3.16	16.91
WB29	A	2/18/2008	16:10:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	16.71	17.42	0.71	17.06
WB29	B	2/18/2008	16:12:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	16.93	17.31	0.38	17.12
WB29	C	2/18/2008	16:13:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	16.47	17.8	1.33	17.13
WB30	A	2/18/2008	16:26:00	ST I	> 4 phi	2 phi	4 to 3 phi	UN.SI	FALSE	0	14.62	15.52	0.9	15.07
WB30	B	2/18/2008	16:28:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	TRUE	0	14.52	15.76	1.24	15.14
WB30	C	2/18/2008	16:29:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	12.89	14.81	1.92	13.85
WB31	A	2/18/2008	13:40:00	INDET	N/A	N/A	N/A	HR	FALSE	0	N/A	N/A	N/A	N/A
WB31	B	2/18/2008	13:42:00	INDET	N/A	N/A	N/A	HR	FALSE	0	N/A	N/A	N/A	N/A
WB31	C	2/18/2008	13:42:00	INDET	N/A	N/A	N/A	HR	FALSE	0	N/A	N/A	N/A	N/A
WB32	A	2/18/2008	15:41:00	INDET	N/A	N/A	N/A	HR	FALSE	0	N/A	N/A	N/A	N/A
WB32	B	2/18/2008	15:43:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SI	FALSE	0	13.7	15.03	1.33	14.36

Station	Replicate	Date	Time	Successional Stage	Grain Size (phi)			Benthic Habitat	Mud Clasts		Camera Penetration (cm)			
					Min	Max	Maj Mode		Present	Avg. Diam	Min	Max	Range	Mean
WB32	C	2/18/2008	15:44:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	14.22	15.93	1.71	15.08
WB33	A	2/18/2008	15:49:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	10.16	11.11	0.95	10.64
WB33	B	2/18/2008	15:51:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SI	FALSE	0	4.82	6.58	1.76	5.7
WB33	C	2/18/2008	15:52:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SI	FALSE	0	9.82	11.39	1.57	10.6
WB34	A	2/18/2008	12:03:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	7.91	8.92	1.01	8.41
WB34	B	2/18/2008	12:04:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	TRUE	0	7.31	8.35	1.04	7.83
WB34	C	2/18/2008	12:05:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	8.05	8.92	0.87	8.49
WB35	A	2/18/2008	12:10:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SS	TRUE	0	6.55	8.62	2.07	7.59
WB35	B	2/18/2008	12:10:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SS	TRUE	0	9.38	10.63	1.25	10.01
WB35	C	2/18/2008	12:11:00	ST III	> 4 phi	2 phi	> 4 phi	UN.SS	FALSE	0	9.47	10.3	0.83	9.89
WB36	A	2/18/2008	15:56:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	TRUE	0	16.04	16.71	0.67	16.38
WB36	B	2/18/2008	15:59:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SI	TRUE	0	12.27	13.01	0.74	12.64
WB36	C	2/18/2008	16:00:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SI	TRUE	0	16.55	18.56	2.01	17.56
WB37	A	2/18/2008	11:57:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SS	TRUE	0	4.82	5.96	1.14	5.39
WB37	B	2/18/2008	11:58:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SS	TRUE	0	3.87	5.3	1.43	4.59
WB37	C	2/18/2008	11:58:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SI	FALSE	0	6.91	7.55	0.64	7.23
WB37	F	2/18/2008	13:36:00	ST III	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	12.1	13.41	1.31	12.76
WB38	A	2/18/2008	15:33:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	6.39	7.93	1.54	7.16
WB38	B	2/18/2008	15:34:00	INDET	N/A	N/A	N/A	UN.SI	FALSE	0	N/A	N/A	N/A	N/A
WB38	C	2/18/2008	15:35:00	INDET	N/A	N/A	N/A	INDET	FALSE	0	N/A	N/A	N/A	N/A
WB39	A	2/18/2008	11:52:00	ST I	> 4 phi	3 phi	3 to 2 phi	UN.SS	FALSE	0	5.11	6.07	0.96	5.59
WB39	B	2/18/2008	11:53:00	ST I	> 4 phi	3 phi	3 to 2 phi	UN.SS	FALSE	0	3.51	4.68	1.17	4.09
WB39	F	2/18/2008	13:28:00	ST I	> 4 phi	3 phi	3 to 2 phi	UN.SS	FALSE	0	6.1	7.29	1.19	6.69
WB40	A	2/18/2008	15:26:00	ST I	> 4 phi	2 phi	4 to 3 phi	UN.SI	TRUE	0	11.2	13.38	2.18	12.29
WB40	B	2/18/2008	15:27:00	ST I	> 4 phi	2 phi	4 to 3 phi	UN.SI	TRUE	0	10.77	11.99	1.22	11.38
WB40	C	2/18/2008	15:28:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	11.56	12.39	0.83	11.98
WB41	D	2/18/2008	13:17:00	ST I	4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	1.55	1.97	0.42	1.76
WB41	E	2/18/2008	13:18:00	ST I	4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	1.38	2.18	0.8	1.78
WB41	F	2/18/2008	13:19:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	1.12	2.04	0.92	1.58
WB42	A	2/18/2008	14:19:00	INDET	> 4 phi	3 phi	3 to 2 phi	SH.SA	FALSE	0	N/A	N/A	N/A	N/A
WB42	B	2/18/2008	14:21:00	INDET	N/A	N/A	N/A	SH.SA	FALSE	0	N/A	N/A	N/A	N/A
WB42	C	2/18/2008	14:21:00	INDET	N/A	N/A	N/A	SH.SA	FALSE	0	N/A	N/A	N/A	N/A
WB43	A	2/18/2008	14:25:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	9.54	9.81	0.27	9.68
WB43	B	2/18/2008	14:27:00	ST I	> 4 phi	2 phi	4 to 3 phi	UN.SI	FALSE	0	8.16	11.28	3.12	9.72
WB43	C	2/18/2008	14:28:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	8.71	9.38	0.67	9.05
WB44	A	2/18/2008	14:33:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	9.76	10.35	0.59	10.06
WB44	B	2/18/2008	14:35:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	8.45	9.26	0.81	8.85
WB44	C	2/18/2008	14:36:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	8.71	10.06	1.35	9.39
WB45	A	2/18/2008	14:40:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	12.32	14.33	2.01	13.32
WB45	B	2/18/2008	14:42:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	12.04	12.75	0.71	12.4
WB45	C	2/18/2008	14:43:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	11.85	12.2	0.35	12.02
WB46	A	2/19/2008	13:26:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	15.98	16.38	0.4	16.18
WB46	B	2/19/2008	13:30:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	17.16	17.78	0.62	17.47
WB46	C	2/19/2008	13:32:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	17.16	17.8	0.64	17.48
WB47	A	2/19/2008	13:38:00	ST I	> 4 phi	2 phi	4 to 3 phi	UN.SI	FALSE	0	5.44	6.31	0.87	5.88
WB47	B	2/19/2008	13:40:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	6.58	7.5	0.92	7.04
WB47	C	2/19/2008	13:42:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	7.67	8.21	0.54	7.94
WB48	A	2/19/2008	13:47:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	7.07	9.38	2.31	8.23
WB48	B	2/19/2008	13:50:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SI	TRUE	0	9	9.59	0.59	9.3
WB48	C	2/19/2008	13:51:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SI	TRUE	0	9.52	9.9	0.38	9.71

Station	Replicate	Redox Rebound Thickness (cm)			Apparent RPD Thickness (cm)			Methane			OSI	Surface Roughness	Low DO	Woody Debris Percent
		Min	Max	Mean	Min	Max	Mean	Count	Mean Depth	Diameter				
WB01	A	0	0	0	0.85	4.93	4.17	0	0	0	7	Biogenic	FALSE	0
WB01	D	0	0	0	0.52	4.75	4.12	0	0	0	7	Biogenic	FALSE	0
WB01	E	0	0	0	1.25	6.03	4.97	0	0	0	11	Physical	FALSE	0
WB02	A	0	0	0	1.25	4.60	4.13	0	0	0	7	Biogenic	FALSE	3
WB02	B	0	0	0	1.99	4.12	3.20	0	0	0	10	Physical	FALSE	2
WB02	C	0	0	0	1.25	3.42	2.55	0	0	0	5	Physical	FALSE	3
WB03	A	0	0	0	0.44	2.50	1.71	0	0	0	4	Physical	FALSE	5
WB03	B	0	0	0	0.52	1.99	1.43	0	0	0	3	Physical	FALSE	3
WB03	C	0	0	0	0.26	2.72	1.63	0	0	0	8	Physical	FALSE	10
WB04	A	0	0	0	1.40	3.64	2.70	0	0	0	9	Physical	FALSE	3
WB04	B	0	0	0	0.11	3.46	3.04	0	0	0	10	Physical	FALSE	1
WB04	C	0	0	0	0.77	2.80	2.24	0	0	0	8	Physical	FALSE	1
WB05	A	0	0	0	1.25	3.79	2.94	0	0	0	9	Physical	FALSE	5
WB05	B	0	0	0	1.07	3.53	2.67	0	0	0	5	Physical	FALSE	1
WB05	C	0	0	0	0.96	2.80	2.08	0	0	0	4	Physical	FALSE	0
WB06	A	0	0	0	0.04	3.79	1.62	0	0	0	4	Biogenic	FALSE	7
WB06	B	0	0	0	0.11	1.36	0.92	0	0	0	99	Physical	TRUE	10
WB06	C	0	0	0	0.15	2.58	1.81	0	0	0	4	Physical	FALSE	3
WB07	D	0	0	0	0.15	5.33	4.49	0	0	0	7	Biogenic	FALSE	0
WB07	E	0	0	0	0.99	5.52	4.67	0	0	0	7	Biogenic	FALSE	0
WB07	F	0	0	0	0.40	4.64	3.60	0	0	0	6	Biogenic	FALSE	0
WB08	A	0	0	0	0.70	6.95	5.99	0	0	0	7	Biogenic	FALSE	0
WB08	D	0	0	0	0.48	4.27	1.96	0	0	0	8	Physical	FALSE	0
WB08	E	0	0	0	0.29	3.49	2.68	0	0	0	5	Physical	FALSE	0
WB09	C	0	0	0	0.81	5.48	4.58	0	0	0	7	Physical	FALSE	0
WB09	E	0	0	0	0.77	4.97	4.52	0	0	0	7	Physical	FALSE	0
WB09	F	0	0	0	0.07	4.60	3.94	0	0	0	7	Not Set	FALSE	0
WB10	D	0	0	0	4.23	6.11	5.37	0	0	0	7	Biogenic	FALSE	0
WB10	E	0	0	0	0.70	5.26	4.60	0	0	0	7	Biogenic	FALSE	0
WB10	F	0	0	0	0.74	5.15	4.67	0	0	0	7	Physical	FALSE	0
WB11	A	0	0	0	1.25	5.00	4.15	0	0	0	7	Physical	FALSE	0
WB11	B	0	0	0	1.99	4.67	3.76	0	0	0	11	Biogenic	FALSE	0
WB11	C	0	0	0	1.14	5.22	4.81	0	0	0	7	Biogenic	FALSE	0
WB12	A	0	0	0	1.03	5.04	4.53	0	0	0	7	Biogenic	FALSE	0
WB12	B	0	0	0	0.85	5.66	4.92	0	0	0	7	Physical	FALSE	0
WB12	C	0	0	0	0.33	4.86	2.81	0	0	0	5	Physical	FALSE	0
WB13	A	0	0	0	INDET	INDET	-99.00	0	0	0	99	Indeterminate	FALSE	0
WB13	B	0	0	0	0.15	2.28	1.32	0	0	0	3	Physical	FALSE	0
WB13	C	0	0	0	0.04	3.16	2.06	0	0	0	4	Biogenic	FALSE	0
WB15	A	0	0	0	0.88	4.23	2.81	0	0	0	5	Physical	FALSE	2
WB15	B	0	0	0	0.04	3.13	2.50	0	0	0	5	Physical	FALSE	0
WB15	C	0	0	0	0.37	3.35	2.31	0	0	0	5	Physical	FALSE	0
WB16	A	0	0	0	1.10	5.48	4.86	0	0	0	11	Biogenic	FALSE	0
WB16	B	0	0	0	2.21	5.37	4.64	0	0	0	7	Biogenic	FALSE	0
WB16	C	0	0	0	0.07	5.66	4.82	0	0	0	7	Biogenic	FALSE	0
WB17	A	0	0	0	1.03	2.87	1.85	0	0	0	8	Physical	FALSE	3
WB17	B	0	0	0	1.10	2.87	2.09	0	0	0	4	Physical	FALSE	5
WB17	C	0	0	0	0.26	3.49	2.33	0	0	0	5	Physical	FALSE	15
WB18	A	0	0	0	0.70	3.94	3.09	0	0	0	6	Biogenic	FALSE	10
WB18	B	0	0	0	0.85	3.94	2.54	0	0	0	9	Biogenic	FALSE	5
WB18	C	0	0	0	0.70	3.49	2.08	0	0	0	8	Biogenic	FALSE	5

Station	Replicate	Redox Rebound Thickness (cm)			Apparent RPD Thickness (cm)			Methane			OSI	Surface Roughness	Low DO	Woody Debris Percent
		Min	Max	Mean	Min	Max	Mean	Count	Mean Depth	Diameter				
WB19	A	0	0	0	0.66	5.74	4.08	0	0	0	7	Physical	FALSE	0
WB19	B	0	0	0	0.48	3.61	2.18	0	0	0	4	Physical	FALSE	3
WB19	C	0	0	0	0.07	3.79	2.68	0	0	0	9	Biogenic	FALSE	5
WB20	A	0	0	0	0.07	2.80	2.21	0	0	0	4	Physical	FALSE	0
WB20	B	0	0	0	0.88	4.16	2.85	0	0	0	5	Physical	FALSE	0
WB20	C	0	0	0	0.55	3.38	2.67	0	0	0	9	Biogenic	FALSE	0
WB21	A	0	0	0	1.80	4.27	3.23	0	0	0	6	Biogenic	FALSE	2
WB21	B	0	0	0	1.25	4.78	3.61	0	0	0	6	Biogenic	FALSE	0
WB21	C	0	0	0	1.88	4.08	3.04	0	0	0	10	Physical	FALSE	0
WB22	A	0	0	0	>0.47	>1.07	>0.77	0	0	0	3	Physical	FALSE	0
WB22	B	0	0	0	>0.09	>0.62	>0.36	0	0	0	2	Physical	FALSE	0
WB22	C	0	0	0	>0.33	>1.12	>0.73	0	0	0	2	Physical	FALSE	0
WB23	D	0	0	0	0.04	5.26	4.56	0	0	0	7	Biogenic	FALSE	0
WB23	E	0	0	0	0.04	4.93	3.59	0	0	0	10	Physical	FALSE	0
WB23	F	0	0	0	0.18	4.82	3.20	0	0	0	10	Biogenic	FALSE	0
WB24	A	0	0	0	1.03	3.86	2.76	0	0	0	9	Physical	FALSE	0
WB24	B	0	0	0	0.74	4.08	2.30	0	0	0	9	Biogenic	FALSE	0
WB24	C	0	0	0	1.14	3.57	2.62	0	0	0	9	Biogenic	FALSE	0
WB25	A	0	0	0	1.03	4.41	3.71	0	0	0	10	Physical	FALSE	0
WB25	B	0	0	0	2.35	4.56	3.99	0	0	0	11	Biogenic	FALSE	0
WB25	C	0	0	0	0.48	5.19	4.63	0	0	0	11	Biogenic	FALSE	0
WB26	A	0	0	0	1.88	3.94	2.95	0	0	0	9	Physical	FALSE	0
WB26	B	0	0	0	0.22	3.05	2.24	0	0	0	4	Physical	FALSE	0
WB26	C	0	0	0	>1.23	>1.97	>1.6	0	0	0	4	Physical	FALSE	0
WB27	A	0	0	0	1.62	3.46	2.61	0	0	0	9	Biogenic	FALSE	0
WB27	B	0	0	0	0.52	3.42	2.75	0	0	0	5	Biogenic	FALSE	0
WB27	C	0	0	0	0.44	3.86	2.91	0	0	0	9	Biogenic	FALSE	0
WB28	A	0	0	0	3.42	5.11	4.41	0	0	0	7	Biogenic	FALSE	3
WB28	B	0	0	0	0.74	3.83	3.19	0	0	0	6	Biogenic	FALSE	2
WB28	C	0	0	0	1.25	3.68	2.42	0	0	0	5	Biogenic	FALSE	2
WB29	A	0	0	0	3.13	4.82	4.32	0	0	0	11	Biogenic	FALSE	0
WB29	B	0	0	0	2.06	4.30	2.97	0	0	0	9	Biogenic	FALSE	0
WB29	C	0	0	0	1.36	4.41	3.07	0	0	0	10	Biogenic	FALSE	0
WB30	A	0	0	0	1.55	3.72	3.12	0	0	0	6	Biogenic	FALSE	0
WB30	B	0	0	0	0.55	4.56	3.15	0	0	0	6	Biogenic	FALSE	0
WB30	C	0	0	0	0.18	3.42	2.80	0	0	0	5	Physical	FALSE	0
WB31	A	0	0	0	INDET	INDET	INDET	0	0	0	99	Not Set	FALSE	0
WB31	B	0	0	0	INDET	INDET	INDET	0	0	0	99	Indeterminate	FALSE	0
WB31	C	0	0	0	INDET	INDET	INDET	0	0	0	99	Physical	FALSE	0
WB32	A	0	0	0	INDET	INDET	INDET	0	0	0	99	Physical	FALSE	0
WB32	B	0	0	0	0.18	4.86	3.10	0	0	0	10	Biogenic	FALSE	5

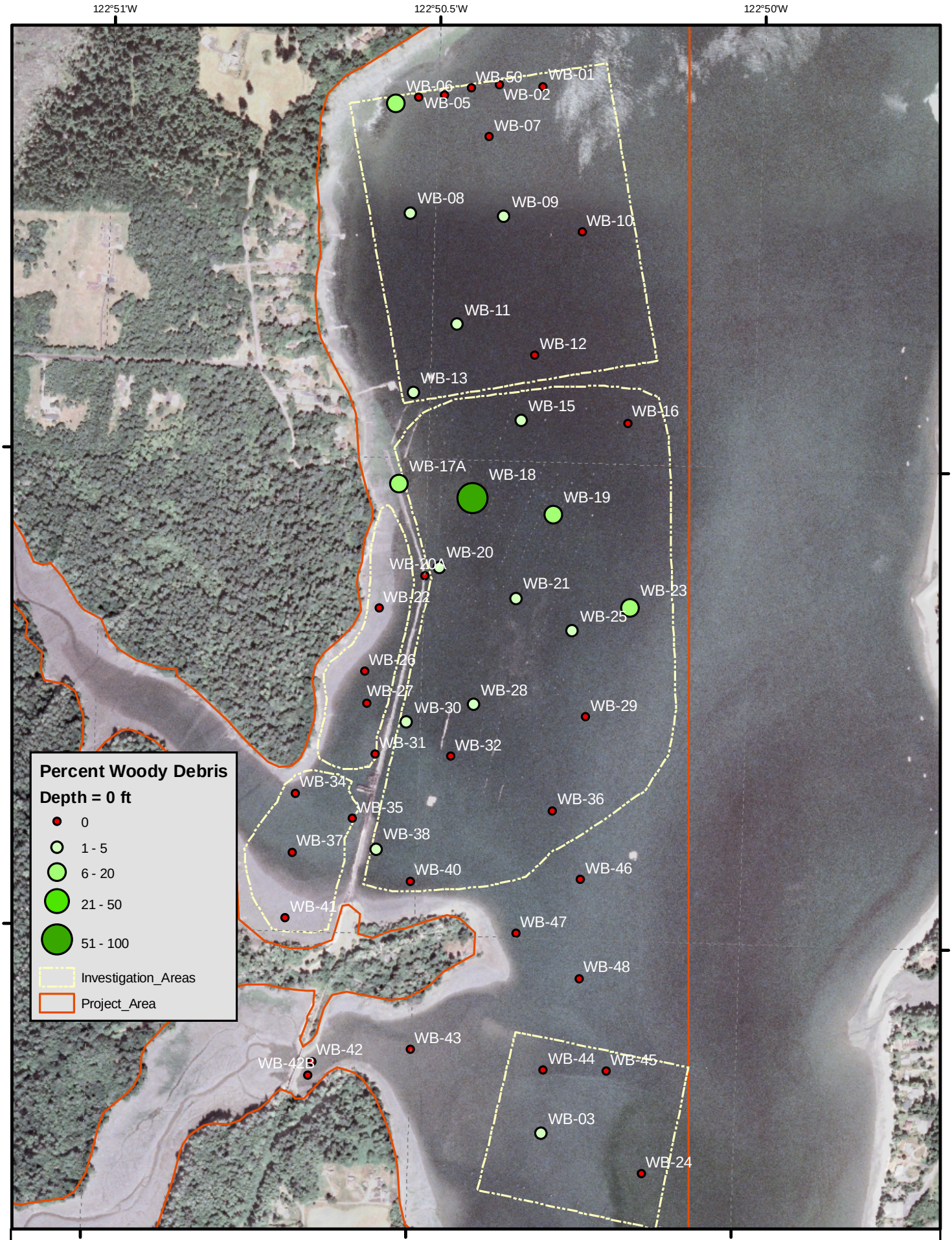
Station	Replicate	Redox Rebound Thickness (cm)			Apparent RPD Thickness (cm)			Methane			OSI	Surface Roughness	Low DO	Woody Debris Percent
		Min	Max	Mean	Min	Max	Mean	Count	Mean Depth	Diameter				
WB32	C	0	0	0	1.47	4.45	2.88	0	0	0	5	Biogenic	FALSE	5
WB33	A	0	0	0	0.11	3.97	2.16	0	0	0	4	Biogenic	FALSE	0
WB33	B	0	0	0	0.26	2.50	1.65	0	0	0	4	Physical	FALSE	0
WB33	C	0	0	0	0.07	3.05	2.14	0	0	0	4	Physical	FALSE	0
WB34	A	0	0	0	0.63	3.20	2.27	0	0	0	5	Physical	FALSE	0
WB34	B	0	0	0	0.26	2.76	1.94	0	0	0	4	Physical	FALSE	0
WB34	C	0	0	0	0.74	3.05	2.07	0	0	0	4	Physical	FALSE	0
WB35	A	0	0	0	0.15	1.99	1.58	0	0	0	4	Biogenic	FALSE	0
WB35	B	0	0	0	0.40	3.16	2.32	0	0	0	5	Physical	FALSE	0
WB35	C	0	0	0	0.63	1.88	1.36	0	0	0	7	Physical	FALSE	0
WB36	A	0	0	0	1.03	4.89	4.28	0	0	0	7	Biogenic	FALSE	0
WB36	B	0	0	0	0.04	2.10	1.56	0	0	0	8	Biogenic	FALSE	0
WB36	C	0	0	0	0.11	4.56	3.34	0	0	0	6	Biogenic	FALSE	0
WB37	A	0	0	0	0.04	1.95	1.56	0	0	0	4	Physical	FALSE	0
WB37	B	0	0	0	1.47	2.21	1.94	0	0	0	4	Physical	FALSE	0
WB37	C	0	0	0	0.22	1.51	1.20	0	0	0	7	Physical	FALSE	0
WB37	F	0	0	0	0.74	3.75	2.48	0	0	0	9	Physical	FALSE	0
WB38	A	0	0	0	0.55	3.31	2.61	0	0	0	5	Physical	FALSE	0
WB38	B	0	0	0	INDET	INDET	INDET	0	0	0	99	Physical	FALSE	0
WB38	C	0	0	0	INDET	INDET	INDET	0	0	0	99	Indeterminate	FALSE	0
WB39	A	0	0	0	0.04	3.05	2.24	0	0	0	4	Physical	FALSE	0
WB39	B	0	0	0	0.18	2.94	2.25	0	0	0	4	Biogenic	FALSE	0
WB39	F	0	0	0	0.33	2.87	2.15	0	0	0	4	Biogenic	FALSE	0
WB40	A	0	0	0	0.55	3.27	2.47	0	0	0	5	Biogenic	FALSE	0
WB40	B	0	0	0	0.52	3.09	1.81	0	0	0	4	Physical	FALSE	0
WB40	C	0	0	0	0.15	2.72	1.81	0	0	0	4	Biogenic	FALSE	0
WB41	D	0	0	0	>1.55	>1.97	>1.76	0	0	0	4	Physical	FALSE	0
WB41	E	0	0	0	>1.38	>2.18	>1.78	0	0	0	4	Physical	FALSE	0
WB41	F	0	0	0	0.07	2.50	1.55	0	0	0	4	Physical	FALSE	0
WB42	A	0	0	0	INDET	INDET	INDET	0	0	0	99	Biogenic	FALSE	0
WB42	B	0	0	0	INDET	INDET	INDET	0	0	0	99	Biogenic	FALSE	0
WB42	C	0	0	0	INDET	INDET	INDET	0	0	0	99	Biogenic	FALSE	0
WB43	A	0	0	0	1.03	4.27	3.26	0	0	0	6	Biogenic	FALSE	0
WB43	B	0	0	0	0.22	3.97	2.21	0	0	0	4	Physical	FALSE	0
WB43	C	0	0	0	0.96	3.46	2.59	0	0	0	5	Physical	FALSE	0
WB44	A	0	0	0	0.70	3.05	1.92	0	0	0	8	Physical	FALSE	10
WB44	B	0	0	0	0.44	3.35	1.98	0	0	0	4	Physical	FALSE	2
WB44	C	0	0	0	0.07	4.12	2.81	0	0	0	9	Physical	FALSE	0
WB45	A	0	0	0	0.92	2.65	1.65	0	0	0	8	Biogenic	FALSE	0
WB45	B	0	0	0	1.14	3.38	2.00	0	0	0	4	Physical	FALSE	5
WB45	C	0	0	0	0.07	3.13	2.08	0	0	0	4	Biogenic	FALSE	0
WB46	A	0	0	0	4.49	5.59	5.04	0	0	0	7	Biogenic	FALSE	0
WB46	B	0	0	0	0.33	4.71	4.17	0	0	0	7	Biogenic	FALSE	0
WB46	C	0	0	0	0.48	4.97	3.97	0	0	0	7	Biogenic	FALSE	0
WB47	A	0	0	0	0.15	2.80	2.03	0	0	0	4	Physical	FALSE	0
WB47	B	0	0	0	0.04	4.16	2.18	0	0	0	4	Physical	FALSE	0
WB47	C	0	0	0	0.77	2.69	2.04	0	0	0	4	Physical	FALSE	7
WB48	A	0	0	0	0.11	2.58	2.05	0	0	0	4	Physical	FALSE	0
WB48	B	0	0	0	0.33	2.83	2.20	0	0	0	4	Physical	FALSE	0
WB48	C	0	0	0	0.22	2.91	2.09	0	0	0	4	Physical	FALSE	0

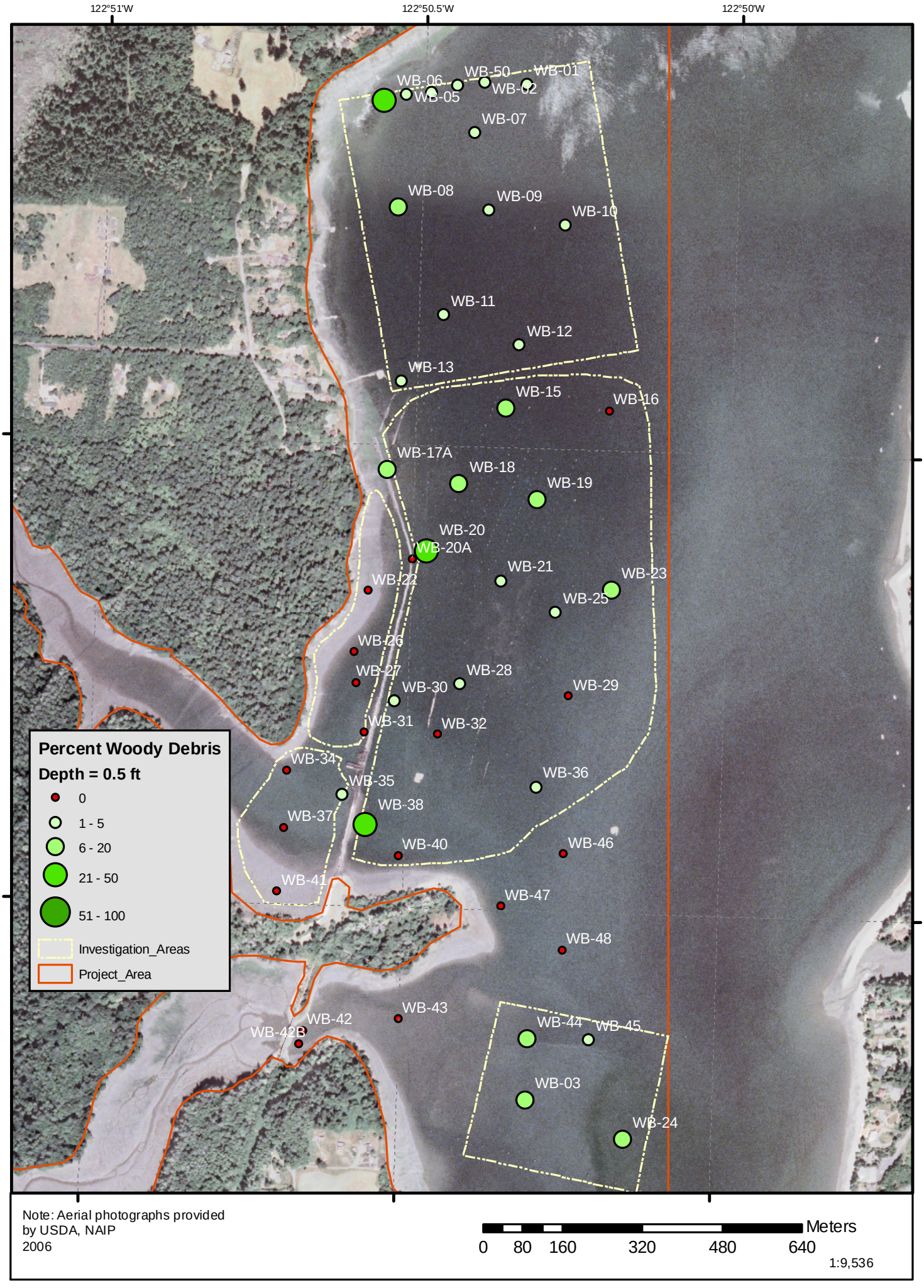
Station	Replicate	Comments
WB01	A	tan and gray silt/soft mud, reduced at depth, shell frags, polychaete at depth to left, tubes surface, frags brown diatom/cyano mat at surface
WB01	D	tan and gray silt/soft mud reduced at depth, surf tubes, frags of brown diatom/cyano mat surface, shear artiface at depth
WB01	E	tan and gray silt/soft mud, reduced at depth, frags of brown diatom/cyano mat surface, small void, reduced wipers clast shear artiface at depth
WB02	A	tan and gray silt/soft mud reduced at depth, frags of brown diatom/cyano mat surface shellf frags, fine woody debris frags at depth, reduced mud wiper artifacts at surface
WB02	B	tan and gray silt/ soft mud, reduced at depth, shell frags, sloping topography, wiper clasts, void, fine wood particles
WB02	C	tan and gray silt/soft mud reduced at depth, stage I tube, wiper clasts, shell frags, fine woody particles, possible collapsed void?
WB03	A	tan and gray sandy silt/ mud reduced, with clay fraction at depth, shallower RPD with high contrast, kelp on surface , fine woody particles, clay shear at depth with oxygenated sediment in fractures, shell
WB03	B	tan and gray sandy silt / mud with clay fraction at depth, reduced shallow RPD, brown diatom/cyan surface, fine wood particles, clay shear at depth, wiper clast surface
WB03	C	tan and gray sandy silt/mud with clay fraction at depth, reduced , possible wood piece at surface, small void, reduced wiper clast clay shear at depth, shell frags
WB04	A	tan and gray sandy silt/ soft mud, fine sand enriched at surface, reduced at depth, active feeding voids w oxygenated sed, woody particles at depth, shell frags, blown diatom/cyan mat surface
WB04	B	tan and gray f. sandy silt/soft mud reduced at depth, blown diatom/cyan mat surface reduced wiper clast, shell frags, wood particles/organics at depth, camera shear at depth, voids possibly collapsed
WB04	C	tan and gray sandy silt/soft mud reduced at depth, active feeding voids, fine organic/wood pariticles at depth, brown diatom/cyano mat surface, shell frags
WB05	A	tan and gray sandy silt/soft mud w clay fraction reduced at depth, burrow at righ. clay fractures, void possibly collapsed, brown diatom/cyano, wood piece upper center, fish (decorated warbonnet?) at
WB05	B	tan and gray sandy silt/soft mud reduced at depth, shell frags, brown diatom/cyano mat layer surface, macro algae farfield, fine wood/organic paricles at depth
WB05	C	low pen, hard clay? not gravel or sand, fine grained sediiment brown diatom/cyano layer covers surface decayed kelp or wood debris?
WB06	A	tan and gray sandy silt/soft mud w clay fraction, reduced, brown diatom/cyano layer surface, wood particles, shell frags, decaying wood piece at surface?
WB06	B	gray sandy silt/soft mud w clay fraction reduced, silty surface layer w bark and brown diatom/cyano layer, sulphidiic, shallow RPD on right, low DO, possible azoic, crushed shell , macroalgae or kelp
WB06	C	tan and gray sandy silt/soft mud w clay fraction reduced at depth (shallow RPD w/ high contrast), pulldown artifact at left, wood debris, brown diatom/cyano layer surface, shell frags, kelp frags farfield
WB07	D	tan and gray sandy silt/soft mud w clay fraction Reduced at depth, homogenous, possible filled inactive voids, shear artifact at depth
WB07	E	tans and gray sandy silt/soft mud reduced at depth, frags brown diatom/cyano layer on surface , possible collapsed burrow at depth
WB07	F	tan and gray silt/ soft mud reduced at depth, frags of brown diatom/cyano layer & wiper clast on surface, shell frag
WB08	A	tan and gray sandy silt /soft mud reduced at depth, brown diatom/cyano layer on surface, surface tubes at right? small polychaete at depth, large clast farfield (artifact)
WB08	D	tan and gray silt/soft mud reduced at depth, disturbed surface due to camera frame or large burrow? polys at depth with void
WB08	E	tan and gray silt/soft mud reduced at depth, frag brown diatom/cyan mat at surface reduced wiper clast pulled down through RPD, possible collapsed voids
WB09	C	tan and gray silt/soft mud reduced at depth, homogenous, shell frags
WB09	E	tan and gray silt/soft mud reduced at depth, brown diatom/cyano layer surface,possible collapsed void & polys at depth on left
WB09	F	tand and gray silt/soft mud reduced at depth, kelp on surface , polys at depth (Spionid on right?) possible collapsed voids
WB10	D	tan and gray silt soft mud reduced at depth, brown diatom/cyano surface, organic aggregrates at surface? filled voids at depth, camera shear artifact
WB10	E	tan and gray sandy silt/soft mud reduced at depth, brown diatom/cyano surface layer , camera shear artifact at depth
WB10	F	tan and gray silt/soft mud reduced at depth, large mud clast from camera frame on surface
WB11	A	tan and gray silt /soft mud reduced at depth, collapsed voids, brown diatom/cyano layer on surface, poly at depth, camera shear artifact at depth
WB11	B	tan and gray silt/soft mud reduced at depth, small void and poly at center, collapsed voids, shell frags, camera shear artifact
WB11	C	tan and gray silt/soft mud reduced at depth, wiper clasts surface , collapsed voids, frags of brown diatom/cyano surface
WB12	A	tan and gray silt/soft mud w clay fraction, reduced at depth, frags of brown diatom/cyano surface , reduced wiper clast, tubes at surface, collapsed void? camera shear at depth
WB12	B	tan and gray silt/ soft mud, reduced at depth, frags of brown diatom/cyano surface, collapsed voids? shell frags
WB12	C	tan and gray silt/soft mud w clay fraction, reduced at depth, large clast surface, poly at depth, poly at surface?
WB13	A	surface shot, no data
WB13	B	brn gray clay w f.sand, mixed w softer silt at depth, reduced at depth, lower pen, shallower RPD, shell, surface w brown diatom/cyano layer, white floc or softer layer surface
WB13	C	brn gray clay w f.sand with reduced softer sed at depth, low pen. dense acroalgae surface, possible horse clam siphon
WB15	A	tan and gray .f. sandy silt /soft mud reduced sulphidic at depth (high RPD contrast), brown diatom/cyano surface layer, collapsed voids? shell frags, wood/organic particles at depth, poly
WB15	B	tan and gray sandy silt/soft mud w clay fraction, lower penetration, reduced at depth, brown diatom/cyano layer surface, shell frags
WB15	C	tan and gray sandy sil/ soft mud w harder clay, reduced at depth, low pen (clay?) frags brown diatom/cyano surface , camera shear at depth
WB16	A	tan and gray sandy silt/ soft mud reduced at depth, brown diatom/cyano layer surface,voids, wiper clasts, polys at depth
WB16	B	tan and gray sandy silt/ soft mud reduced at depth, brown diatom/cyano surface layer, wiper clast, camera shear at depth
WB16	C	tan and gray sandy silt/ soft mud reduced at depth, brown diatom/cyano layer surface, wiper clast. polys at surface and at depth
WB17	A	tan and gray silty sand, reduced at depth, brown diatom/cyano layer surface, possible void (oxidized sed in void), scattered woody debris/organics, shell frags
WB17	B	tan and gray sandy silt/ mud reduced at depth, brown diatom/cyano layer, small bark pieces & macroalagae surface, shell frag
WB17	C	gray meduim sand mixed w silt, low pen, shell frags, brown diatom/cyano surface layer, decomposing wood piece? at surface
WB18	A	tan and gray sandy silt on soft mud reduced at depth (high RPD contrast), brown diatom/cyano surface layer, shell frags, wood/bark debris, burrow structure(s) or gravel? pullled down through RPD
WB18	B	tan and gray sandy silt /soft mud reduced at depth (high RPD contrast), surface tubes, brown diatom/cyano layer surface shell frags, voids possibly collapsed, wood/organic particles
WB18	C	tan and gray sandy silt on soft mud reduced at depth, brown diatom/cyano surface , void, burrow, wood particles, wiper clasts, shell frags

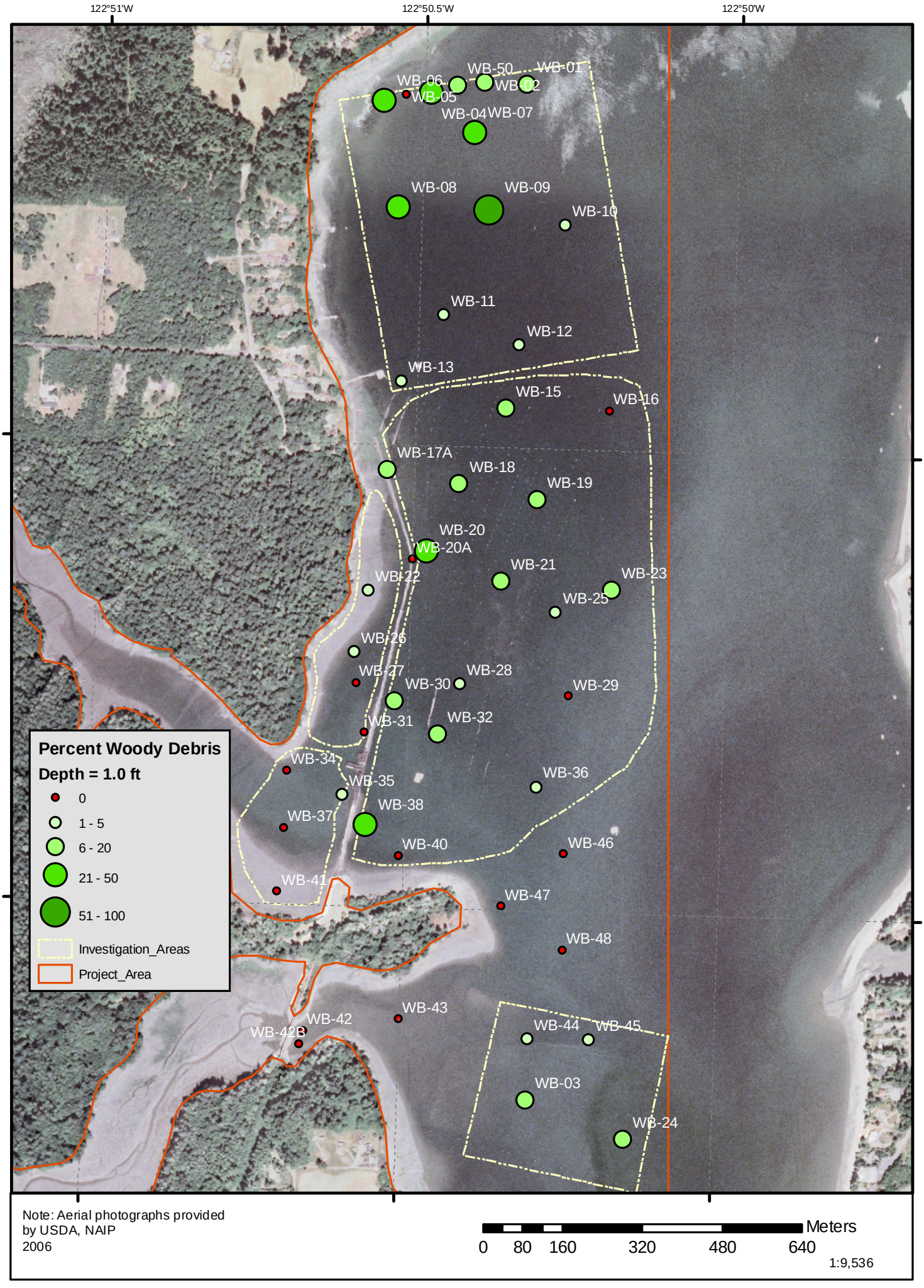
Station	Replicate	Comments
WB19	A	tans and gray silt w fine sand on soft mud w clay fraction, reduced at depth, kelp, brown diatom/cyano surface shell frags, burrow or camera shear at dept
WB19	B	tan and gray silt w fine sand on mud w clay fraction, reduced at depth, shell frags, wood debris dragdown?
WB19	C	tan and gray silt w fine sand on soft mud w clay fraction, reduced at depth, burrow , wood fragmnet or dead eelgrass blade pressed into sediment, void
WB20	A	gray silt w fine sand on soft mud w clay, diatom/cyano surface pulled down through RPD, shell frag, kelp or wood farifield
WB20	B	tan and gray silty fine sand on soft mud w clay fraction, reduced at depth, brown diatom/cyano surface, shell frags camera shear artifact at depth
WB20	C	tan and gray silt w fine sand on soft mud wi clay fraction reduced at depth, brown diatom/cyano surface layer, shell frags, poly at depth, voids
WB21	A	tan and gray silt w fine sand on soft mud w clay fraction, reduced at depth, frags brown diatom/cyano surface, wiper clasts, shell frags, fine wood/organic debris
WB21	B	tan and gray silt w fine sand on soft mud w clay fraction, reduced at depth, frags of brown diatom/cyano surface. wiper clasts, shell frags, collapsed voids at depth
WB21	C	tan and gray silt w fine sand on soft mud w clay fraction, reduced at depth, wiper clast surface, shell frags, void possibly collapsed
WB22	A	tan and gray fine sand, low pen, no floc layer
WB22	B	tan and gray fine sand, low pen, thin diatom/cyano layer on surface, shell frags
WB22	C	tan and gray fine sand , low pen, thin diatom/cyano surface layer , stick, shell frag
WB23	D	tan and gray silt w fine sand on soft mud w clay fraction, reduced at depth, frags brown diatom/cyano surface, reduced wiper clast, camera shear artifact at depth
WB23	E	tan and gray silt w fine sand on soft mud with clay fraction reduced at depth, wiper clasts poly at depth, void
WB23	F	tan and gray fine sandy silt/soft mud w clay fraction, reduced at depth, frags brown diatom/cyano surface, void & collapsed voids, possible burrow on right
WB24	A	tan and gray silt/soft mud w fine sand surface and clay fraction reduced at depth (high RPD contrast), feeding void, polys at depth, reduced wiper clast
WB24	B	tan and gray fine sandy surface on silt/ soft mud w clay fraction reduced at depth (high RPD contrast), polychaetes at depth, voids, burrow, camera shear artifact with disturbed sediment
WB24	C	tan and gray fine samdy silt/soft mud w clay fraction reduced at depth, feeding voids large burrow or camera artifact center, polys at depth, shell frags
WB25	A	tan and gray fine sandy silt/soft mud w clay fraction reduced at depth, frags brown floc surface, void (collapsed?)
WB25	B	tan and gray fine sandy silt/soft mud w clay fraction , reduced at depth, void and collapsed voids, frags of brown diatom/cyano surface, shell frags
WB25	C	tan and gray fine sandy silt/soft mud w clay fraction reduced at depth, frags of brown floc surface, voids and collapsed voids, wiper clasts,
WB26	A	tan and gray fine silty sand, slightly reduced at depth, low pen, small voids, thin brown diatom/cyano layer , shell frags
WB26	B	tan and gray fine sand mixed with silt,w clay fraction reduced at depth, thin brown diatom/cyano layer surface
WB26	C	tan and gray fine sand mixed with silt, RPD greater than pen, thiin brown green floc layer surface diatom/cyano layer?
WB27	A	tan and gray fine sandy silt/soft mud w clay fraction, reduced at depth, brown diatom/cyano layer surface , feeding void, collapsed void
WB27	B	tan and gray fine sandy silt/soft mud w clay fraction reduced at depth, brown diatom/cyano surface layer, camera shear artifact
WB27	C	tan and gray fine sandy silt/ soft mud w clay fraction , slightly reduced at depth, brown floc layer surface, void (collapsed?)
WB28	A	tan and gray fine sandy silt/ soft mud w clay fraction , reduced at depth, frags of brown diatom/cyano layer on irregular surface , reduced wiper clasts, fine wood/organic particle? shell frags
WB28	B	tan and gray fine sandy silt/soft mud w clay fraction reduced at depth, frags of brown diatom/cyano surface, shell frags, collapsed void
WB28	C	tan and gray fine sandy silt/soft mud w clay fraction at depth, large burrow, shell frags, fine wood/organic particles, possible collapsed burrow
WB29	A	tan and gray fine sandy silt/soft mud w clay fraction, reduced at depth, feeding voids and camera shear artifacts
WB29	B	tan and gray fine sandy silt/soft mud w clay fraction reduced at depth, feeding voids and polys at depth
WB29	C	tan and gray fine sandy silt/soft mud w clay fraction, reduced at depth, frags of brown diatom/cyano surface large burrow, poly at depth, void and collapsed feeding voids?
WB30	A	gray silty fine sand surface on silt/soft mud, reduced at depth, frags of diatom/cyano surface, prism artifact at depth or possible void?
WB30	B	tan and gray silt and fine sand surface on silt/soft mud w clay fraction, slighlty reduced at depth, frags brown diatom/cyano surface
WB30	C	gray fine sandy silt w soft mud reduced at depth, large shells surface, dead kelp frond, possible organism (gastropod?) in camera shear artifact
WB31	A	hard bottom , surface shot, no prism pen, frame visisble farfield
WB31	B	hard bottom, surface shot, no prism pen, frame visible farfield
WB31	C	hard bottom, surface shot, minimal prism pen, gravel , pebble bottom with algae, sediment drape, mussel shells
WB32	A	surface shot, no pen, hard/consolidated bottom covered with sediment drape or brown diatom/cyano layer, possible bryozoan encrusted shell ?
WB32	B	tan and gray fine sandy silt /soft mud reduced at depth, brown diatom/cyano layer at surface, stage I tube?, feeding void at left, camera shear artifact at depth, very fine wood/organic particles mixed

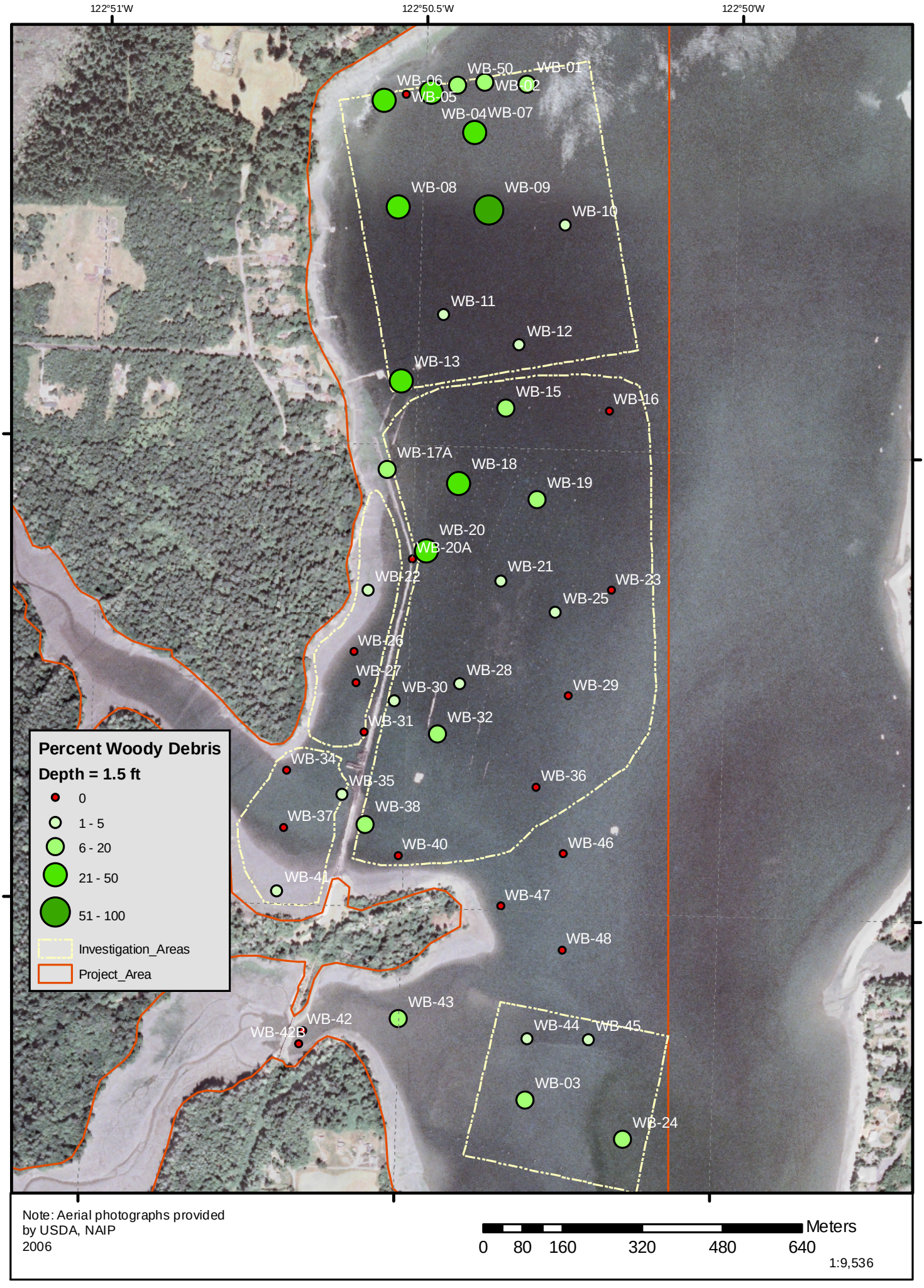
Station	Replicate	Comments
WB32	C	tan and gray sandy silt/soft mud, reduced at depth,, brown diatom/cyano surface, shell ,collapsed void? fine wood/organic particles mixed throughout
WB33	A	ian and gray sandy silt. soft mud w clay fraction, reduced at depth (high RPD contrast), shell hash throughout, brown diatom/cyano surface layer, possible collapsed voids, oyster shell farfield
WB33	B	tan and gray silt/soft mud w clay fraction, shell and shell hash surface, harder substrate and lower pen
WB33	C	tan and grey silt/mud w/ clay fraction reduced at depth. Shell hash, frag brown diatom/cyano. Large burrow? or cameral artifact
WB34	A	tan and gray fine silty sand w clay fraction reduced at depth brown diatom/cyano surface layer with sediment drape, shell frag, collapsed void?
WB34	B	tan and grey silty sand, reduced at depth, clay fractures, brown diatom/cyano surface, worm present at depth? possible void
WB34	C	tan and grey silty f sand, camera artifact, uniform brown diatom/cyano surface underneath thin sed layer (likely camera artifact)
WB35	A	tan and grey silty sand reduced at depth, brown diatom/cyano surface layer, camera artifacts, polys at depth?
WB35	B	tan and grey silty sand, reduced at depth, brown diatom/cyano layer on surface, kelp frond embedded in sed?
WB35	C	tan and grey sand/silt, reduced at depth, brown diatom/cyan layer at surface, smalll void, feeding burrow? or camera artifact at depth
WB36	A	tan and gray silt /soft mud, reduced at depth, shell frags, camera artifacts at depths and surface, brown diatom/cyano at surf., inactive/collapsed voids, worm burrow at surf?
WB36	B	tan and grey silt/ soft mud, reduced at depth, sulphidic (high RPD contrast), feeding void w poly & camera artifact, brown diatom/cyano at surf, mud clasts camer artifact
WB36	C	tan and grey silt/mud, reduced at depth, camera artifacts present
WB37	A	tan and gray silty sand w clay fraction , slighlty reduced at depth, brown diatom/cyano surface layer, reduced clasts, camera shear artifact
WB37	B	tan and gray silty sand w clay fraction, low pen, brown diatom/cyano surface layer w reduced wiper clasts camera shear artifact
WB37	C	tan and gray silty sand, soft mud, reduced at depth, feeding burrow/void, brown diatom/cyano surface
WB37	F	gray silty fine sand w clay fraction, slighlty reduced at depth, brown diatom/cyano layer surface, feeding void, camera shear at depth
WB38	A	tan and gray sily sand w clay fraction, slighlty reduced at depth, brown diatom/cyano layer surface, shell frags, trace wood fibers?
WB38	B	surface shot, no pen, surface has organic brown diatom/cyano surface, kelp frags, possible cobbles, but surface appears to be silty sand or large encrusted rock with sediment drape
WB38	C	surface or water shot, bottom not visisble, sediment in water column
WB39	A	tan and gray silty sand w clay fraction, slighlty reduced at depth, brown diatom/cyano layer on surface
WB39	B	tan and gray silty fine sand w clay fraction, thin brown diatom/cyano surface layer, emergent large burrow
WB39	F	gray silty fine sand w clay fraction, slighlty reduced at depth, frags of brown diatom/cyano at surface, large burrow opening
WB40	A	tan and gray silty sand w clay fraction reduced at depth, brown floc layer surface, reduced wiper clasts, possible burrow at left
WB40	B	tan and gray silty sand w clay fraction reduced at depth, reduced wiper clast, no surface layer, disturbed? camera shear artifact
WB40	C	tan and gray silty sand w clay fraction reduced at depth, brown diatom/cyano surface layer on right, left surface disturbed, camera shear or large burrow, sediment reworked from camera
WB41	D	gray fine sand, low pen, no organic surface layer, slight organic/silt drape on surface
WB41	E	gray fine sand, low pen, no organic surface layer, slight sediment drape, bedforn farfield?
WB41	F	gray v. fine sand, low pen, streaks of brown floc in RPD, bedforms?
WB42	A	shell bed, barnacle/oyster frags? and mussel shells, low pen sand under shell?
WB42	B	shell bed, oyster/barnacle shell frags? mussell shells, sandy under shell? seastar farfield
WB42	C	shell bed, oyster/barnacle shell frags? mussell shells, large Pisaster seastar sandy under shell?
WB43	A	tan and gray silty sand w clay fraction, slightly reduced at depth, brown diatom/cyano surface layer, large burrow mound farfield, shell frags
WB43	B	gray fine silty sand surface on sandy silt w clay fraction reduced at depth, shell frags, brown diatom/cyano surface layer smeared into RPD, sand ripple sloping topography
WB43	C	tan and gray silty sand w clay fraction, reduced at depth, brown diatom/cyano surface layer, large burrow cone or feature farfield ?, camera shear artifact at depth
WB44	A	tan and gray sandy silt/soft mud w clay fraction reduced at depth (somewhat high RPD contrast), decaying wood or kelp pressed inot sediment, large poly at depth w feeding void,
WB44	B	tan and gray sandy silt/ soft mud w clay fraction reduced at depth, collapsed voids? shell frags, trace wood/organic particles
WB44	C	tan and gray sandy silt/ soft mud w clay faction reduced at depth, macro algae (Ulva?) at surface, void,
WB45	A	tan and gray sandy silt/soft mud w clay fraction, reduced at depth, shell hash in surface, brown diatom/cyano surface layer, void and collapsed void, camera shear artifact right
WB45	B	tan and gray sandy silt/ soft mud w clay fraction , reduced at depth, shells, shell frags, sediiment drape & bark pieces on surface, burrows or dragdown artifacts
WB45	C	tan and gray sandy silt/soft mud w clay fraction reduced at depth, shall hash in surface layer, reduced wiper clasts, relic feeding void? poly at depth
WB46	A	tan and gray silt/ soft mud w clay fraction , reduced at depth, frags of brown diatom/cyano layer at surface, relic feeding void at depth, camera shear artifact
WB46	B	tan and gray silt/soft mud w clay fraction reduced at depth, frags brown diatom/cyano surface , homogenous
WB46	C	tan and gray silt/soft mud w clay fraction, reduced at depth, frags of brown diatom/cyano layer surface, collapsed voids, camera shear artifact
WB47	A	tan and gray silty sand w clay fraction, reduced at depth, lower pen, brown diatom/cyano surface layer, shell frags, magro algae farfield
WB47	B	tan and gray silty sand w clay fraction, reduced at depth, brown diatom/cyano layer on surface , macro algae farfield., shell frags
WB47	C	tan and gray silty sand w clay fraction, reduced at depth, brown diatom/cyano surface layer, wood fragments
WB48	A	tan and gray sandy silt/mud w clay fraction , reduced at depth, brown diatom/cyano surface layer , burrow or camera pull down artifact, shell fragment?
WB48	B	tan and gray sandy silt/mud w clay fraction. reduced at depth , frags brown diatom/cyano surface, macroalage farfield
WB48	C	tan and gray sandy silt/mud w clay fraction reduced at depth, brown diatom/cyano layer surface, reduced wiper clasts

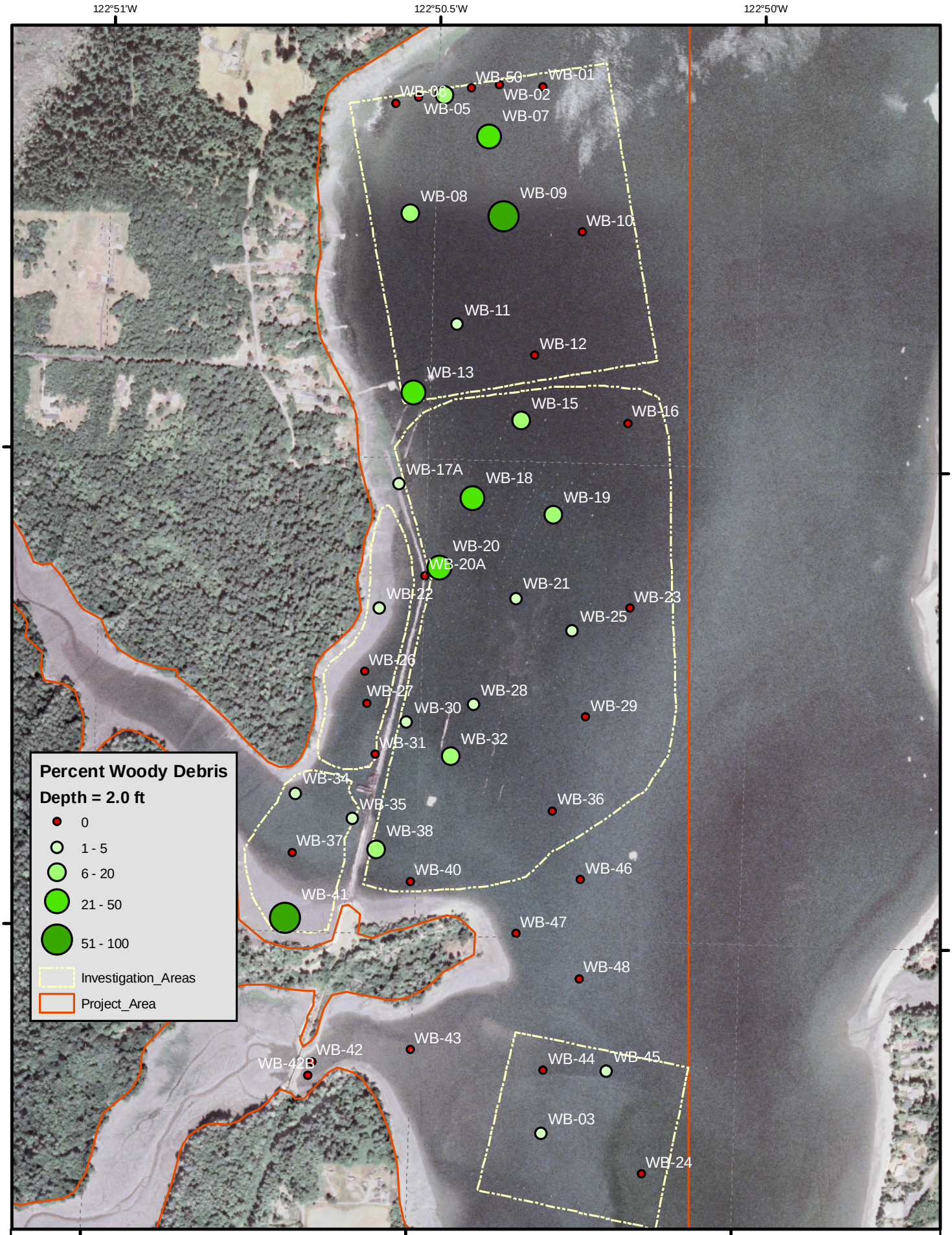
APPENDIX B: WOOD DEBRIS DISTRIBUTION DETERMINED FROM VIDEO PROBES

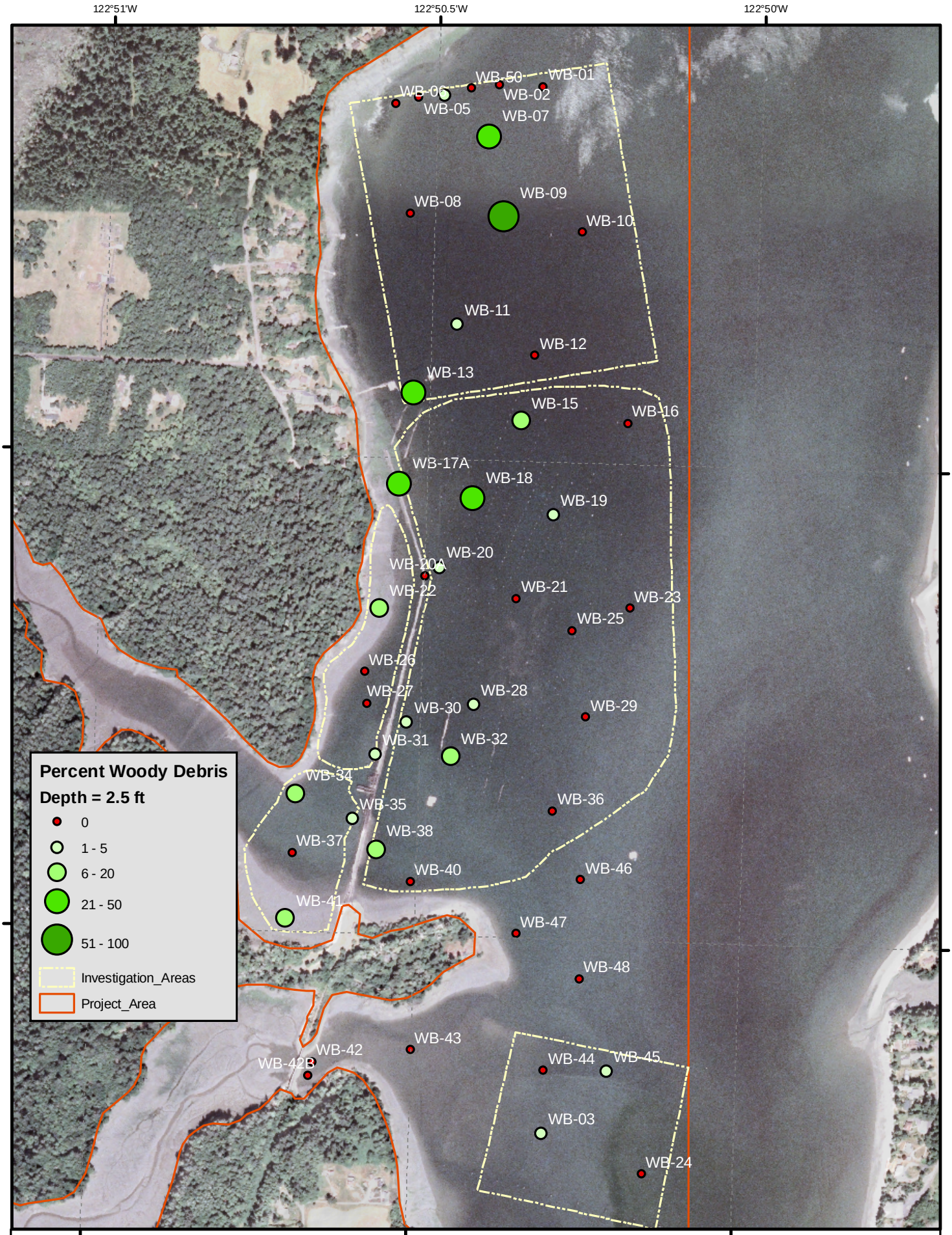

122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-06
WB-50
WB-01
WB-05
WB-02
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 0 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536

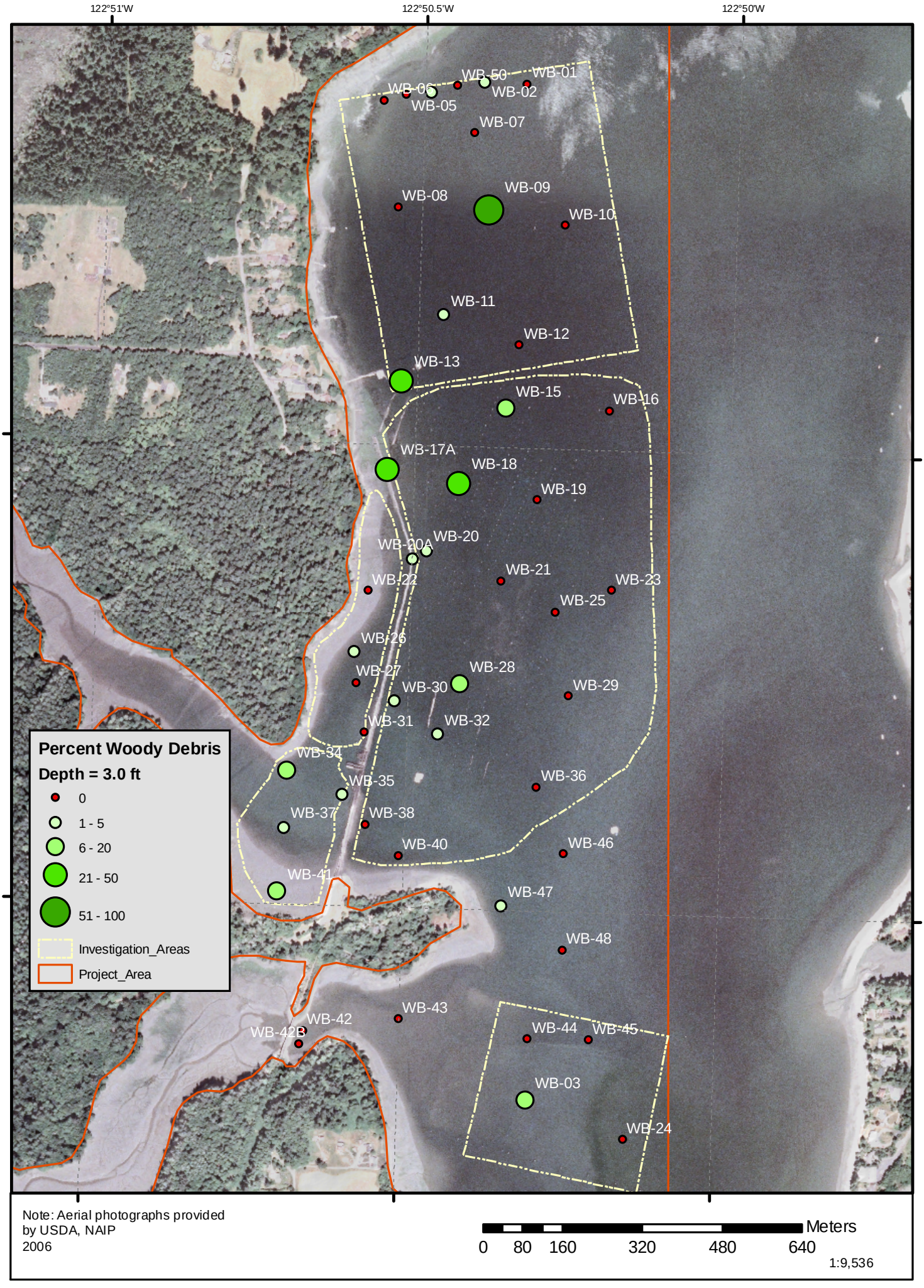

122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-06
WB-50
WB-01
WB-05
WB-02
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-23
WB-22
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-38
WB-37
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 0.5 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536

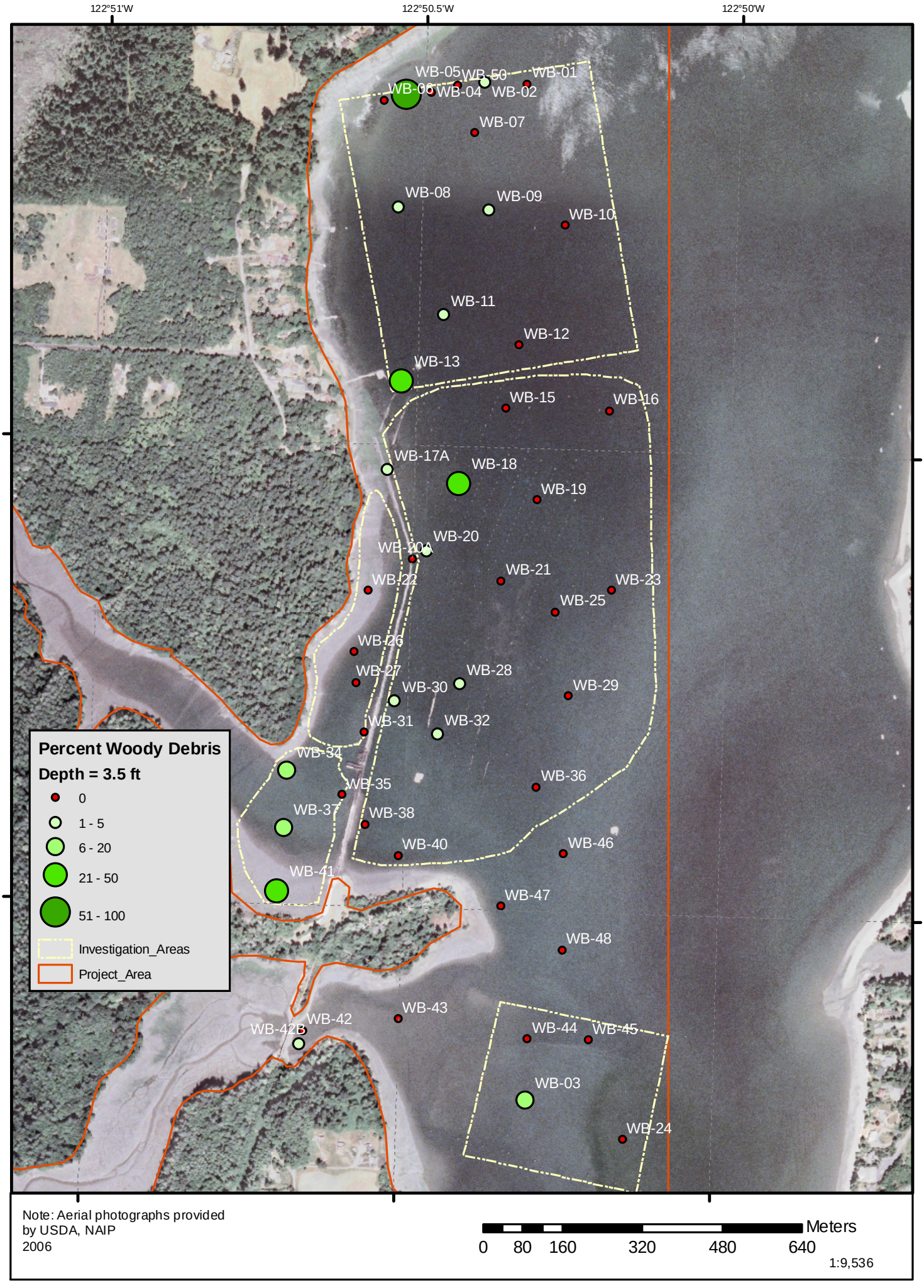

122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-01
WB-02
WB-03
WB-04
WB-05
WB-06
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-24
WB-25
WB-26
WB-27
WB-28
WB-29
WB-30
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-41
WB-42
WB-42B
WB-43
WB-44
WB-45
WB-46
WB-47
WB-48
WB-50
Percent Woody Debris
Depth = 1.0 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536

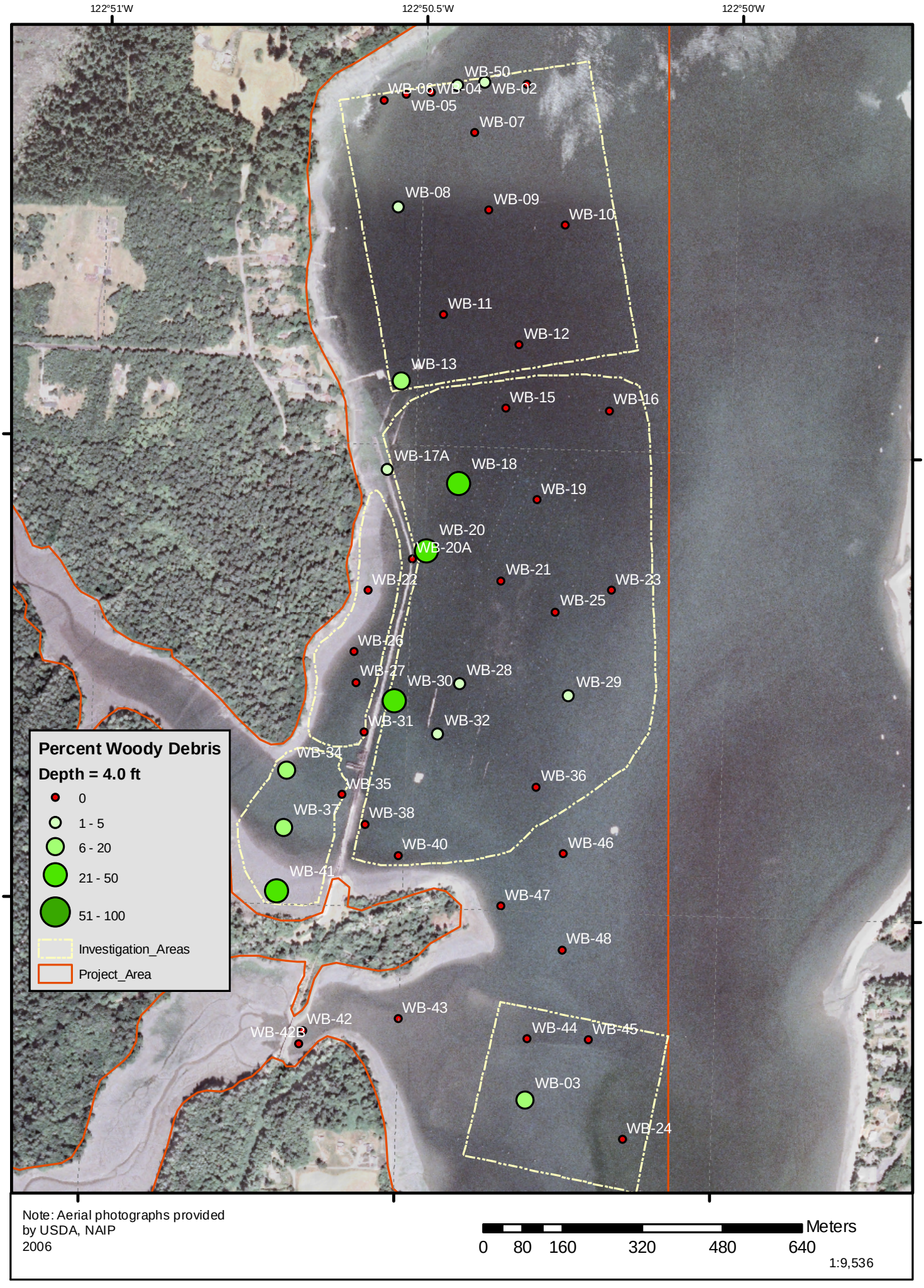

122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-01
WB-02
WB-03
WB-04
WB-05
WB-06
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-24
WB-25
WB-26
WB-27
WB-28
WB-29
WB-30
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-41
WB-42
WB-42B
WB-43
WB-44
WB-45
WB-46
WB-47
WB-48
WB-50
Percent Woody Debris
Depth = 1.5 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536

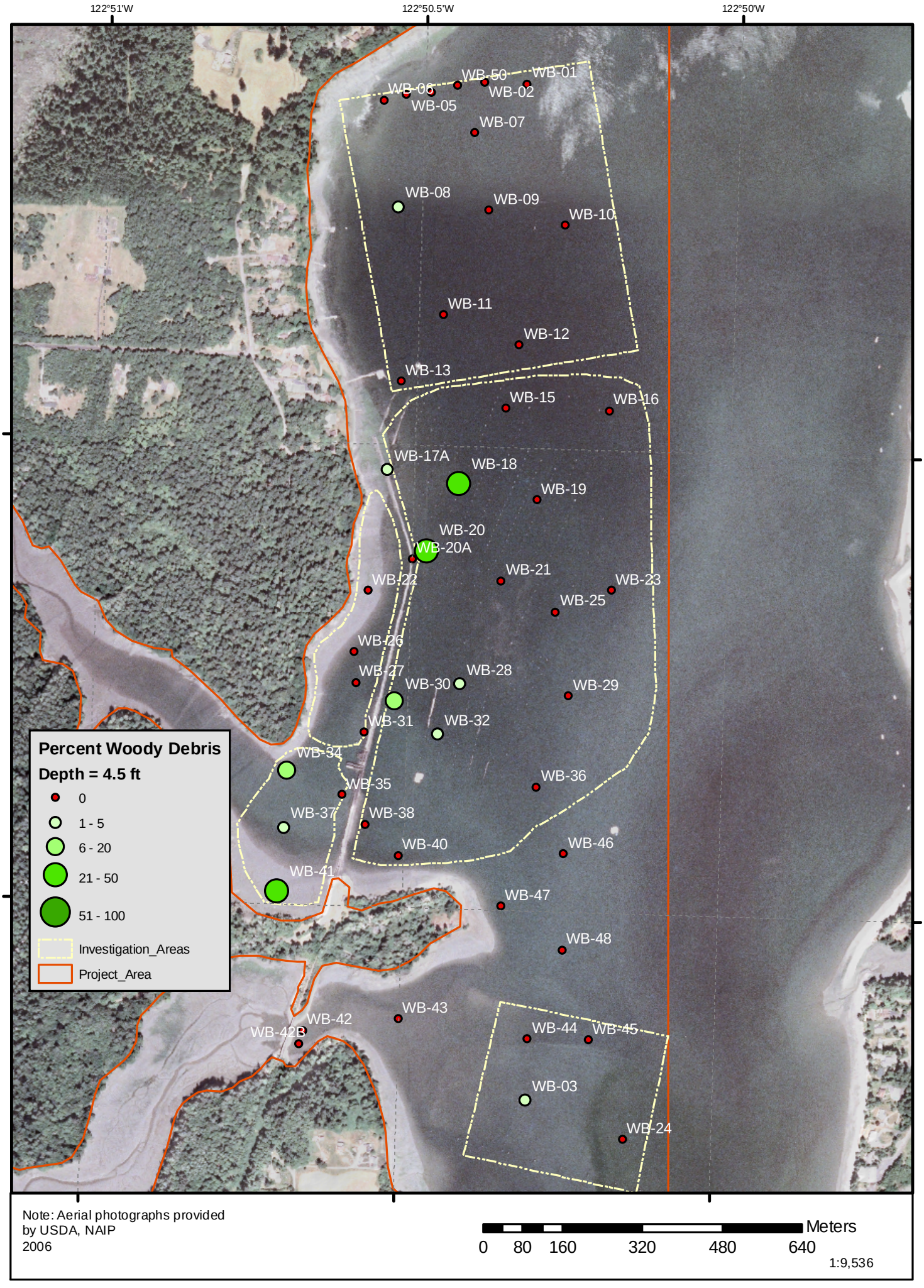

122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-50
WB-01
WB-00
WB-02
WB-05
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 2.0 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536

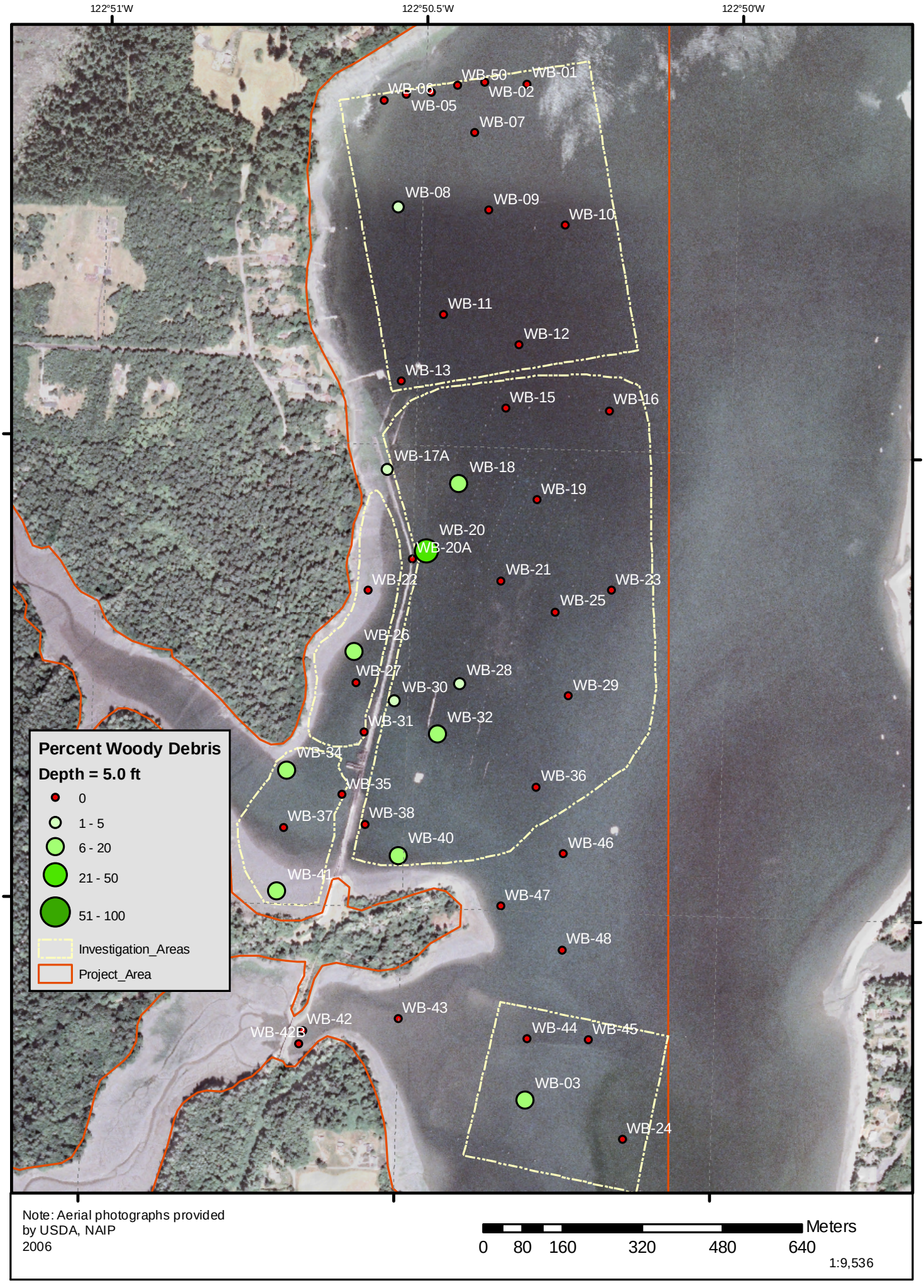

122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-50
WB-01
WB-06
WB-02
WB-05
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-22
WB-21
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 2.5 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536


122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-50
WB-01
WB-06
WB-02
WB-05
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 3.0 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536

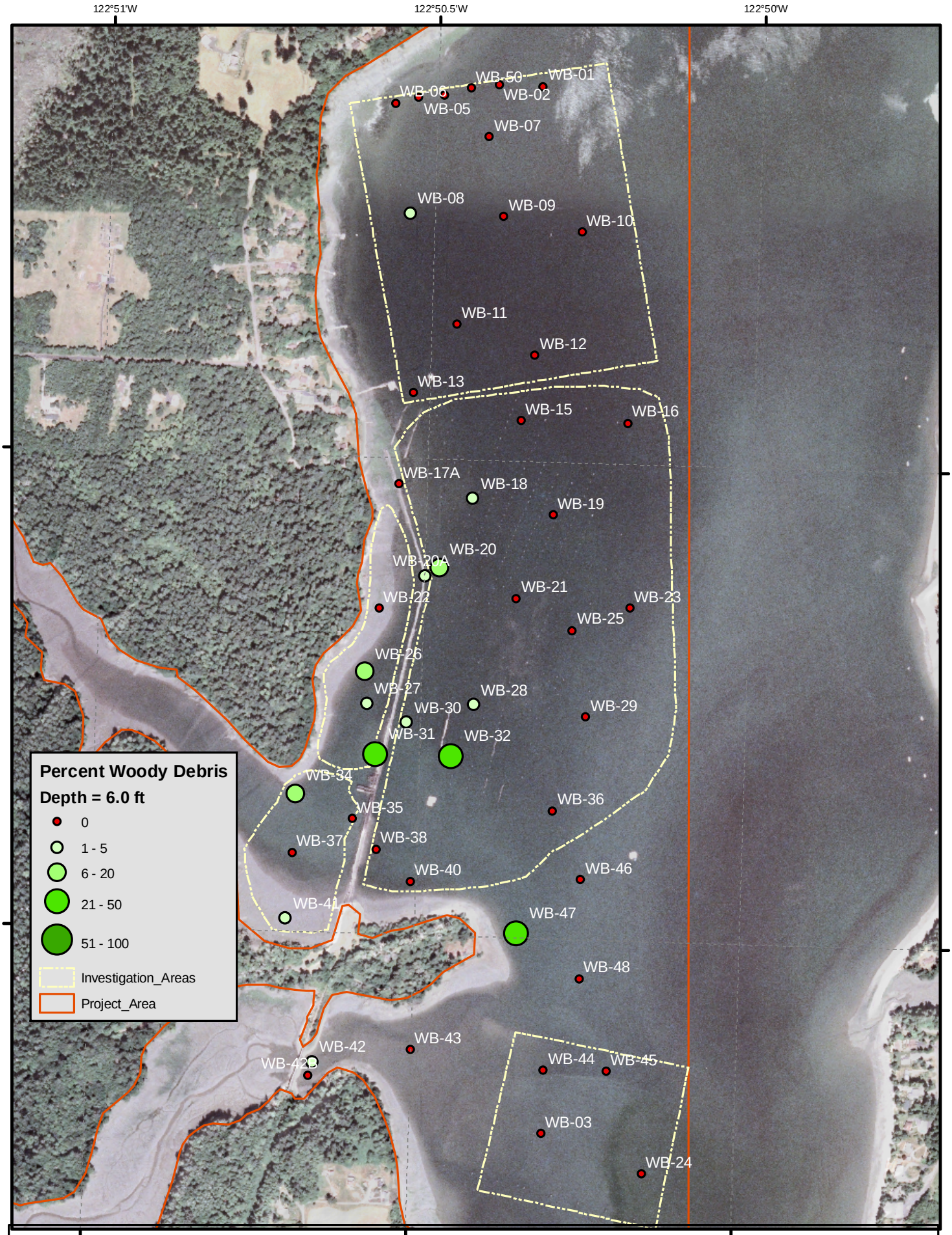

122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-05
WB-50
WB-01
WB-06
WB-04
WB-02
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 3.5 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536


122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-50
WB-06
WB-04
WB-02
WB-05
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-30
WB-28
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 4.0 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536


122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-50
WB-01
WB-06
WB-02
WB-05
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 4.5 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536


122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-50
WB-01
WB-06
WB-02
WB-05
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 5.0 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536


122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-50
WB-01
WB-06
WB-02
WB-05
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-43
WB-42
WB-42B
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 5.5 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536


122°51'W
122°50.5'W
122°50'W
47°8.5'N
47°8'N
WB-50
WB-01
WB-06
WB-02
WB-05
WB-07
WB-08
WB-09
WB-10
WB-11
WB-12
WB-13
WB-15
WB-16
WB-17A
WB-18
WB-19
WB-20
WB-20A
WB-21
WB-22
WB-23
WB-25
WB-26
WB-27
WB-28
WB-30
WB-29
WB-31
WB-32
WB-34
WB-35
WB-36
WB-37
WB-38
WB-40
WB-46
WB-41
WB-47
WB-48
WB-42
WB-43
WB-42A
WB-44
WB-45
WB-03
WB-24
Percent Woody Debris
Depth = 6.0 ft
0
1 - 5
6 - 20
21 - 50
51 - 100
Investigation_Areas
Project_Area
Note: Aerial photographs provided by USDA, NAIP 2006
0 80 160 320 480 640
Meters
1:9,536

APPENDIX C:
SUMMARY OF SEDIMENT CHEMISTRY DATA

Appendix C. Woodard Bay Surface Sediment Chemistry Data - TOC Normalized Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-03-S 2/27/08 LQ VQ	WB-06-S 2/26/08 LQ VQ	WB-09-S 2/26/08 LQ VQ	WB-12-S 2/26/08 LQ VQ	WB-16-S 2/26/08 LQ VQ	WB-17-S 2/26/08 LQ VQ	WB-21-S 2/26/08 LQ VQ	WB-22-S 2/26/08 LQ VQ
Conventionals										
Total Organic Carbon (% DW)	–	–	2.1	5.19	2.75	2.63	2.56	1.09	3.96	0.38
TVS (%DW)			6.62	12.2	9.03	9.28	8.45	2.97	11.8	1.6
Total Solids (% WW)	–	–	57.2	46.1	35.1	34.6	36.3	69.3	35.4	75.6
Ammonia (mg-N/kg DW)	–	–	9.1	11.7	16.6	19.9	16	4.1	16.9	4.2
Total Sulfides (mg/kg DW)	–	–	283	336	6.8	4.1	1.13 T	16.3	176	17
Grain Size										
Gravel			1.8	7.9	3.0	4.5	1.3	1.7	0.1	0.2
Sand, Very Coarse			1.5	4.7	3.1	2.0	2.2	1.3	4.8	0.4
Sand, Coarse			2.3	3.8	1.2	1.2	1.1	4.0	6.2	2.0
Sand, Medium			15.4	7.5	1.2	1.3	1.0	16.7	4.7	24.7
Sand, Fine			31.3	12.5	1.7	1.2	1.2	41.0	4.0	48.6
Sand, Very Fine			13.5	9.9	3.5	2.0	2.8	25.5	4.1	15.5
Silt			20.4	39.2	62.3	62.5	65.3	8.2	48.8	7.7
Clay			10.9	15.8	25.3	30.0	24.5	2.9	28.1	3.0
Metals in mg/kg DW										
Arsenic	57	93	4.4	6.1	9.1	9.4	9.5	4.1	10.9	2.2
Cadmium	5.1	6.7	0.8	0.8	0.8	0.8	0.8	0.5	1.3	0.2
Chromium	260	270	17.6	23.1	32.1	33.0	34.1	12.0	33.5	9.6
Copper	390	390	12.2	21.4	34.2	35.6	36.0	6.3	36.5	5.1
Lead	450	530	8.6	10.0	18.8	19.9	21.3	2.6	19.5	2.2
Mercury	0.41	0.59	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0
Silver	6.1	6.1	0.1	0.2	0.2	0.3	0.2	0.0	0.3	0.0
Zinc	410	960	28.1	59.2	70.3	73.9	74.1	20.2	76.4	15.8
LPAH in mg/kg TOC										
Naphthalene	99	170	0.5 U	2.1 U	0.3 T	0.6 U	0.5 U	0.9 U	0.4 U	2.6 U
Acenaphthylene	66	66	0.5 U	2.1 U	0.1 T	0.6 U	0.1 T	0.5 T	0.1 T	2.6 U
Acenaphthene	16	57	0.5 U	2.1 U	0.5 U	0.6 U	0.5 U	0.3 T	0.4 U	2.6 U
Fluorene	23	79	0.5 U	2.1 U	0.5 U	0.6 U	0.5 U	0.4 T	0.1 T	2.6 U
Phenanthrene	100	480	0.2 T	1.5 JD	0.2 T	0.2 T	0.4 T	3.2	0.3 T	0.5 T
Anthracene	220	1200	0.2 T	2.1 U	0.1 T	0.1 T	0.1 T	1.7	0.3 T	2.6 U
2-Methylnaphthalene	38	64	0.5 U	2.1 U	0.2 T	0.6 U	0.5 U	0.9 U	0.4 U	2.6 U
Total LPAH*	370	780	0.3 T	1.5 JD	0.9 T	0.4 T	0.6 T	6.1 T	0.8 T	0.5 T
HPAH in mg/kg TOC										
Fluoranthene	160	1200	0.6	3.7 D	0.6	0.5 T	0.9	10.1	1.2	2.5 T
Pyrene	1000	1400	0.7	3.1 D	0.6	0.6	0.8	13.8	1.5	2.0 T
Benzo(a)anthracene	110	270	0.2 T	0.7 JD	0.2 T	0.3 T	0.3 T	3.7	0.6	0.8 T
Chrysene	110	460	0.5	1.1 JD	0.5 T	0.6	0.5	8.3	1.5	1.3 T
Benzofluoranthenes*	230	450	0.6 T	1.3 JD	0.6 T	0.6 T	0.7 T	10.2	1.6	1.8 T
Benzo(a)pyrene	99	210	0.5 U	0.4 JD	0.2 T	0.3 T	0.2 T	3.4	0.5	0.6 T
Indeno(1,2,3-cd)pyrene	34	88	0.5 U	2.1 U	0.2 T	0.2 T	0.2 T	2.3	0.4	2.6 U
Dibenz(a,h)anthracene	12	33	0.5 U	2.1 U	0.5 U	0.6 U	0.5 U	0.9 U	0.4 U	2.6 U
Benzo(g,h,i)perylene	31	78	0.2 T	2.1 U	0.2 T	0.2 T	0.2 T	1.7	0.4 T	2.6 U
Total HPAH*	960	5300	3.5 T	11.5 JD	3.8 T	4.1 T	4.4 T	63.6	9.3 T	10.8 T

Appendix C. Woodard Bay Surface Sediment Chemistry Data - TOC Normalized Concentrations

Station Number / Collection Date	WA SMS SQS	WA SMS CSL	WB-03-S 2/27/08 LQ	VQ	WB-06-S 2/26/08 LQ	VQ	WB-09-S 2/26/08 LQ	VQ	WB-12-S 2/26/08 LQ	VQ	WB-16-S 2/26/08 LQ	VQ	WB-17-S 2/26/08 LQ	VQ	WB-21-S 2/26/08 LQ	VQ	WB-22-S 2/26/08 LQ	VQ
Chlorinated Aromatics in mg/kg TOC																		
1,4-Dichlorobenzene	3.1	9	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
1,2-Dichlorobenzene	2.3	2.3	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
1,2,4-Trichlorobenzene	0.81	1.8	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Hexachlorobenzene	0.38	2.3	0.05	U	0.00	U	0.04	U	0.04	U	0.04	U	0.01	U	0.03	U	0.26	U
Phthalate Esters in mg/kg TOC																		
Dimethylphthalate	53	53	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Diethylphthalate	61	110	0.1	T	2.1	U	0.5	U	0.1	T	0.5	U	0.3	T	0.4	U	2.6	U
Di-n-Butylphthalate	220	1700	0.6	T	4.2	U	1.1	U	1.1	U	1.1	U	1.8	U	0.7	U	5.3	U
Butylbenzylphthalate	4.9	64	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
bis(2-Ethylhexyl)phthalate	47	78	0.7	T	21.2	U	0.6	T	0.7	T	0.7	T	9.2	U	0.3	T	4.5	T
Di-n-Octylphthalate	58	4500	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Ionizable Organic Compounds in ug/kg DW																		
Phenol (8270SIM)	420	1200	280.0		140.0		780.0		1400.0		880.0		150.0		110.0		87.0	
Phenol (8270)	420	1200	53.0		330.0	U	43.0	U	56.0		100.0		38.0		89.0		32.0	
2-Methylphenol	63	63	20.0	U	27.0	U	28.0	U	29.0	U	28.0	U	19.0	U	26.0	U	20.0	U
4-Methylphenol	670	670	10.0	U	110.0	U	6.0	T	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
2,4-Dimethylphenol	29	29	20.0	U	27.0	U	28.0	U	29.0	U	28.0	U	19.0	U	26.0	U	20.0	U
Pentachlorophenol	360	690	8.8	U	11.0	U	1.1	T	3.5	T	13.0	Ui	6.7	U	2.9	T	6.4	U
Benzyl Alcohol	57	73	20.0	U	220.0	U	4.6	T	29.0	U	28.0	U	20.0	U	29.0	U	3.9	T
Benzoic Acid	650	650	190.0	T	2200.0	U	180.0	T	230.0	T	210.0	T	140.0	T	260.0	T	130.0	T
Miscellaneous Extractables in mg/kg TOC																		
Dibenzofuran	15	58	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.2	T	0.4	U	2.6	U
Hexachlorobutadiene	3.9	6.2	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
N-Nitrosodiphenylamine	11	11	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
PCBs in mg/kg TOC																		
Aroclor-1016	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	Ui
Aroclor-1221	–	–	1.0	U	0.4	U	1.1	U	1.1	U	1.1	U	1.8	U	0.7	U	5.3	Ui
Aroclor-1232	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	Ui
Aroclor-1242	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.9	Ui
Aroclor-1248	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Aroclor-1254	–	–	0.5	U	0.2	U	0.4	T	0.6	U	0.5	U	0.9	U	0.4	Ui	2.6	U
Aroclor-1260	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Total PCBs*	12	65	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U

U Undetected

T Estimated concentration less than the MRL but greater than th MDL

D Reported concentration is from a dilution

B The analyze was found in the associated method blank at a level that is significant relative to the sample

J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL

i The MRL/MDL is elevated due to a matrix or chromatographic interference

Appendix C. Woodard Bay Surface Sediment Chemistry Data - TOC Normalized Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-26-S 2/26/08 LQ VQ	WB-30-S 2/27/08 LQ VQ	WB-35-S 2/26/08 LQ VQ	WB-36-S 2/27/08 LQ VQ	WB-37-S 2/26/08 LQ VQ	WB-42-S 2/27/08 LQ VQ	WB-03-D 2/27/08 LQ VQ	WB-16-D 2/26/08 LQ VQ
Conventionals										
Total Organic Carbon (% DW)	–	–	1.58	9.14	8	2.97	2	1.37	1.43	2.56
TVS (%DW)			4.56	8.88	18.4	9.72	5.44	3.86	6.1	8.59
Total Solids (% WW)	–	–	66.4	49.2	39.9	34.9	61.1	65.6	58.2	36.4
Ammonia (mg-N/kg DW)	–	–	8.5	46.2	26.8	22.5	7.7	16.4	7.6	21
Total Sulfides (mg/kg DW)	–	–	34.5	210	16.8	346	0.7 T	0.8 U	267	0.99 T
Grain Size										
Gravel			0.0	45.2	0.2	11.9	0.0	24.0	2.9	0.2
Sand, Very Coarse			0.8	16.9	2.3	2.7	0.3	10.3	1.9	0.8
Sand, Coarse			2.4	7.6	3.9	2.0	0.5	17.0	2.6	2.7
Sand, Medium			14.3	5.2	6.6	1.8	1.3	29.9	14.6	1.3
Sand, Fine			31.6	4.1	10.6	2.0	13.2	24.7	32.7	1.3
Sand, Very Fine			21.2	1.9	14.0	2.5	30.9	4.7	12.7	4.0
Silt			19.4	11.9	41.4	53.7	41.4	4.4	18.9	62.4
Clay			7.6	9.2	17.0	22.4	10.3	2.8	10.3	23.4
Metals in mg/kg DW										
Arsenic	57	93	4.7	3.8	10.3	8.6	5.2	2.6	4.7	9.2
Cadmium	5.1	6.7	0.9	1.1	2.2	1.5	1.4	0.4	0.9	0.8
Chromium	260	270	12.2	10.2	23.6	35.8	15.4	11.4	18.7	33.2
Copper	390	390	10.1	13.0	27.9	33.3	15.1	6.8	13.3	35.4
Lead	450	530	4.1	10.7	10.4	21.6	5.8	7.0	10.0	20.6
Mercury	0.41	0.59	0.0	0.0	0.1	0.1	0.1	0.0 B	0.1	0.1
Silver	6.1	6.1	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.3
Zinc	410	960	27.1	24.9	65.3	68.2	38.6	20.2	30.9	72.7
LPAH in mg/kg TOC										
Naphthalene	99	170	0.6 U	0.4 U	0.3 U	0.5 U	0.1 T	0.7 U	1.4 U	0.5 U
Acenaphthylene	66	66	0.1 T	0.5 D	0.1 JD	0.1 T	0.1 T	0.9	1.4 U	0.1 T
Acenaphthene	16	57	0.6 U	0.3 JD	0.3 U	0.5 U	0.5 U	0.3 T	1.4 U	0.5 U
Fluorene	23	79	0.6 U	0.5 D	0.1 JD	0.1 T	0.5 T	0.4 T	1.4 U	0.5 U
Phenanthrene	100	480	0.3 T	3.7 D	0.3 JD	0.4 T	1.7	10.9	0.3 JD	0.2 T
Anthracene	220	1200	0.3 T	1.6 D	0.3 D	0.2 T	1.5	1.5	0.2 JD	0.1 T
2-Methylnaphthalene	38	64	0.6 U	0.2 JD	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
Total LPAH*	370	780	0.6 T	6.8 JD	0.8 JD	0.8 T	3.8 T	14.1 T	0.5 JD	0.4 T
HPAH in mg/kg TOC										
Fluoranthene	160	1200	0.9	12.0 D	0.9 D	1.3	1.7	43.8	1.0 JD	0.7
Pyrene	1000	1400	1.2	10.6 D	1.5 D	1.3	1.9	31.4	1.2 JD	0.8
Benzo(a)anthracene	110	270	0.4 T	3.2 D	0.6 D	0.4 T	1.1	6.1	0.3 JD	0.2 T
Chrysene	110	460	0.9	7.9 D	1.3 D	1.0	2.8	21.2	0.6 JD	0.5 T
Benzofluoranthenes*	230	450	1.2 T	6.9 D	1.6 D	1.0 T	1.7 T	10.7	0.9 JD	0.7 T
Benzo(a)pyrene	99	210	0.3 T	2.0 D	0.6 D	0.4 T	0.6	2.3	1.4 U	0.2 T
Indeno(1,2,3-cd)pyrene	34	88	0.3 T	1.2 D	0.4 D	0.3 T	0.3 T	1.5	0.2 JD	0.3 T
Dibenz(a,h)anthracene	12	33	0.6 U	0.3 JD	0.3 U	0.5 U	0.1 T	0.4 T	1.4 U	0.5 U
Benzo(g,h,i)perylene	31	78	0.2 T	0.9 D	0.3 D	0.3 T	0.3 T	1.2	0.3 JD	0.2 T
Total HPAH*	960	5300	6.7 T	51.8 JD	8.7 D	7.0 T	12.1 T	129.0 T	5.4 JD	4.2 T

Appendix C. Woodard Bay Surface Sediment Chemistry Data - TOC Normalized Concentrations

Station Number / Collection Date	WA SMS SQS	WA SMS CSL	WB-26-S 2/26/08 LQ VQ	WB-30-S 2/27/08 LQ VQ	WB-35-S 2/26/08 LQ VQ	WB-36-S 2/27/08 LQ VQ	WB-37-S 2/26/08 LQ VQ	WB-42-S 2/27/08 LQ VQ	WB-03-D 2/27/08 LQ VQ	WB-16-D 2/26/08 LQ VQ
Chlorinated Aromatics in mg/kg TOC										
1,4-Dichlorobenzene	3.1	9	0.6 U	0.4 U	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
1,2-Dichlorobenzene	2.3	2.3	0.6 U	0.4 U	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
1,2,4-Trichlorobenzene	0.81	1.8	0.6 U	0.4 U	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
Hexachlorobenzene	0.38	2.3	0.06 U	0.01 U	0.01 U	0.03 U	0.05 U	0.07 U	0.07 U	0.04 U
Phthalate Esters in mg/kg TOC										
Dimethylphthalate	53	53	0.6 U	0.4 U	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
Diethylphthalate	61	110	0.6 U	0.4 U	0.3 U	0.1 T	0.5 U	0.7 U	0.2 JD	0.5 U
Di-n-Butylphthalate	220	1700	1.3 U	0.9 U	0.6 U	0.7 T	1.0 U	1.5 U	2.8 U	1.1 U
Butylbenzylphthalate	4.9	64	0.6 U	0.4 U	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
bis(2-Ethylhexyl)phthalate	47	78	6.3 U	4.5 U	0.3 JD	5.1 U	5.0 U	0.9 T	14.0 U	0.5 T
Di-n-Octylphthalate	58	4500	0.6 U	0.4 U	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
Ionizable Organic Compounds in ug/kg DW										
Phenol (8270SIM)	420	1200	45.0	710.0	130.0	660.0	52.0	260.0	26.0	430.0
Phenol (8270)	420	1200	40.0	130.0 JD	140.0 D	43.0 U	70.0	110.0	530.0 D	51.0
2-Methylphenol	63	63	20.0 U	20.0 U	29.0 U	28.0 U	19.0 U	18.0 U	19.0 U	22.0 U
4-Methylphenol	670	670	10.0 U	41.0 U	26.0 U	15.0 U	3.6 T	10.0 U	58.0 D	14.0 U
2,4-Dimethylphenol	29	29	20.0 U	20.0 U	29.0 U	28.0 U	19.0 U	18.0 U	19.0 U	22.0 U
Pentachlorophenol	360	690	7.3 U	2.8 J	12.0 U	1.8 T	8.0 U	1.7 J	8.7 U	1.1 T
Benzyl Alcohol	57	73	20.0 U	82.0 U	51.0 U	29.0 U	4.8 T	20.0 U	40.0 U	28.0 U
Benzoic Acid	650	650	160.0 T	820.0 U	530.0 D	290.0 U	190.0 T	97.0 T	260.0 JD	180.0 T
Miscellaneous Extractables in mg/kg TOC										
Dibenzofuran	15	58	0.6 U	0.3 JD	0.0 JD	0.1 T	0.1 T	0.2 T	1.4 U	0.5 U
Hexachlorobutadiene	3.9	6.2	0.6 U	0.4 U	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
N-Nitrosodiphenylamine	11	11	0.6 U	0.4 U	0.3 U	0.5 U	0.5 U	0.7 U	1.4 U	0.5 U
PCBs in mg/kg TOC										
Aroclor-1016	–	–	0.6 U	0.1 U	0.2 U	0.5 U	0.5 U	0.7 U	0.7 U	0.5 U
Aroclor-1221	–	–	1.3 U	0.2 U	0.3 U	1.0 U	1.0 U	1.5 U	1.4 U	1.1 U
Aroclor-1232	–	–	0.6 U	0.1 U	0.2 U	0.5 U	0.5 U	0.7 U	0.7 U	0.5 U
Aroclor-1242	–	–	0.6 U	0.1 U	0.2 U	0.5 U	0.5 U	0.7 U	0.7 U	0.5 U
Aroclor-1248	–	–	0.6 U	0.1 U	0.2 U	0.5 U	0.5 U	0.7 U	0.7 U	0.5 U
Aroclor-1254	–	–	0.6 U	0.1 U	0.2 Ui	0.5 U	0.5 U	0.7 U	0.7 U	0.5 U
Aroclor-1260	–	–	0.6 U	0.1 U	0.2 U	0.5 U	0.5 U	0.7 U	0.7 U	0.5 U
Total PCBs*	12	65	0.6 U	0.1 U	0.2 U	0.5 U	0.5 U	0.7 U	0.7 U	0.5 U

U Undetected

T Estimated concentration less than the MRL but greater than th MDL

D Reported concentration is from a dilution

B The analyze was found in the associated method blank at a level that is

J The result is an estimated concentration that is less than the MRL but gr

i The MRL/MDL is elevated due to a matrix or chromatographic interfere

Appendix C. Woodard Bay Core Sediment Chemistry Data - TOC Normalized Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-04-C0-1 2/25/08 LQ VQ	WB-04-C1-3 2/25/08 LQ VQ	WB-08-C0-1 2/25/08 LQ VQ	WB-08-C1-3 2/25/08 LQ VQ	WB-13-C0-1 2/25/08 LQ VQ	WB-13-C1-3 2/25/08 LQ VQ	WB-18-C0-1 2/25/08 LQ VQ
Conventionals									
Total Organic Carbon (% DW)	–	–	1.6	1.3	6.0	7.1	1.6	0.8	8.0
TVS (%)			4.21	3.17	18.1	23.1	5.32	2.7	18.1
Total Solids (% WW)	–	–	61.9	73.7	37.5	40.5	61.7	78.5	33.3
Ammonia (mg-N/kg DW)	–	–	13.2	25.2	47.4	62.0	5.7	2.5	43.6
Total Sulfides (mg/kg DW)	–	–	136.0	23.0	365.0	435.0	88.6	1.0 T	699.0
Grain Size									
Gravel			5.1	4.8	24.0	12.8	7.0	26.1	17.6
Sand, Very Coarse			3.5	3.4	6.9	4.9	4.3	5.1	10.7
Sand, Coarse			6.2	6.3	2.4	3.1	7.1	11.5	5.7
Sand, Medium			30.1	21.7	2.1	5.0	25.0	20.3	6.3
Sand, Fine			22.4	30.6	1.5	8.2	18.3	18.7	4.3
Sand, Very Fine			3.4	6.1	1.0	4.2	6.1	6.5	2.5
Silt			17.7	17.6	41.1	42.6	21.9	10.1	39.0
Clay			7.7	8.2	16.4	20.3	10.5	2.2	16.3
Metals in mg/kg DW									
Arsenic	57	93	4.92	4.08	7.02	5.86	5.5	5.22	8.65
Cadmium	5.1	6.7	0.518	0.491	0.924	0.736	0.666	0.363	1.31
Chromium	260	270	17	18.5	30.2	28.5	20.8	17.7	26.7
Copper	390	390	13.3	11.3	29.8	23.4	15.5	7.49	27.7
Lead	450	530	6.7	4.86	18.9	12.2	6.57	1.7	15.2
Mercury	0.41	0.59	0.057	0.036	0.105	0.067	0.051	0.019 B	0.106
Silver	6.1	6.1	0.1	0.06	0.23	0.14	0.1	0.05	0.23
Zinc	410	960	32.1	27.3	64.4	46.3	33.7	18.9	63.1
LPAH in mg/kg TOC									
Naphthalene	99	170	0.6 U	0.8 U	0.2 U	0.3	0.6 U	1.2 U	0.2 U
Acenaphthylene	66	66	0.6 U	0.8 U	0.0 T	0.0 T	0.6 U	1.2 U	0.1 T
Acenaphthene	16	57	0.6 U	0.8 U	0.2 U	0.1 T	0.6 U	1.2 U	0.2 U
Fluorene	23	79	0.6 U	0.8 U	0.0 T	0.1 T	0.6 U	1.2 U	0.2 U
Phenanthrene	100	480	0.3 T	0.3 T	0.2 T	0.2	0.3 T	0.2 T	0.2 T
Anthracene	220	1200	0.2 T	0.2 T	0.1 T	0.1 T	0.2 T	1.2 U	0.1 T
2-Methylnaphthalene	38	64	0.6 U	0.8 U	0.2 U	0.2	0.6 U	1.2 U	0.2 U
Total LPAH*	370	780	0.4 T	0.5 T	0.3 T	1.0 T	0.5 T	0.2 T	0.4 T
HPAH in mg/kg TOC									
Fluoranthene	160	1200	1.0	0.9	0.3	0.4	0.6	1.2 U	0.5
Pyrene	1000	1400	1.7	1.2	0.9	0.4	1.2	1.2 U	0.7
Benzo(a)anthracene	110	270	0.3 T	0.3 T	0.2 T	0.1 T	0.3 T	1.2 U	0.3
Chrysene	110	460	0.7	0.5 T	0.5	0.2 T	0.8	1.2 U	1.4
Benzofluoranthenes*	230	450	1.0 T	0.7 T	0.4 T	0.2	0.8 T	1.2 U	0.7 T
Benzo(a)pyrene	99	210	0.4 T	0.3 T	0.2 T	0.1 T	0.6 U	1.2 U	0.2 T
Indeno(1,2,3-cd)pyrene	34	88	0.3 T	0.2 T	0.1 T	0.2 U	0.2 T	1.2 U	0.2 T
Dibenz(a,h)anthracene	12	33	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Benzo(g,h,i)perylene	31	78	0.3 T	0.2 T	0.1 T	0.2 U	0.3 T	1.2 U	0.1 T
Total HPAH*	960	5300	5.6 T	4.2 T	2.6 T	1.3 T	4.2	1.2 U	4.1 T

Appendix C. Woodard Bay Core Sediment Chemistry Data - TOC Normalized Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-04-C0-1 2/25/08 LQ VQ	WB-04-C1-3 2/25/08 LQ VQ	WB-08-C0-1 2/25/08 LQ VQ	WB-08-C1-3 2/25/08 LQ VQ	WB-13-C0-1 2/25/08 LQ VQ	WB-13-C1-3 2/25/08 LQ VQ	WB-18-C0-1 2/25/08 LQ VQ
Chlorinated Aromatics in mg/kg TOC									
1,4-Dichlorobenzene	3.1	9	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
1,2-Dichlorobenzene	2.3	2.3	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
1,2,4-Trichlorobenzene	0.81	1.8	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Hexachlorobenzene	0.38	2.3	0.06 U	0.08 U	0.02 Ui	0.18 U	0.01 J	0.11 U	0.20 U
Phthalate Esters in mg/kg TOC									
Dimethylphthalate	53	53	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Diethylphthalate	61	110	0.6 U	0.8 U	0.0 T	0.1 T	0.6 U	0.3 T	0.0 T
Di-n-Butylphthalate	220	1700	1.2 U	1.6 U	0.2 T	0.3 T	1.3 U	2.4 U	0.4 U
Butylbenzylphthalate	4.9	64	0.6 U	0.8 U	0.2 U	0.2 U	1.4	1.2 U	0.2 U
bis(2-Ethylhexyl)phthalate	47	78	6.2 U	7.7 U	2.3 U	1.8 U	6.5 U	11.9 U	0.2 T
Di-n-Octylphthalate	58	4500	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Ionizable Organic Compounds in ug/kg DW									
Phenol (8270SIM)	420	1200	300	37	410	92	81	48	170
Phenol (8270)	420	1200	30 U	30 U	40 U	37 U	9.2 T	30 U	46 U
2-Methylphenol	63	63	20 U	21 U	31 U	27 U	20 U	19 U	29 U
4-Methylphenol	670	670	2.4 T	9.8 U	14 U	13 U	3.2 T	10 U	16 U
2,4-Dimethylphenol	29	29	20 U	21 U	31 U	27 U	20 U	19 U	29 U
Pentachlorophenol	360	690	0.49 T	6.7 U	2.7 J	0.72 T	1.8 J	6.1 U	0.51 J
Benzyl Alcohol	57	73	20 U	20 U	27 U	25 U	20 U	20 U	31 U
Benzoic Acid	650	650	200 U	200 U	130 T	200 T	200 U	200 U	310 U
Miscellaneous Extractables in mg/kg TOC									
Dibenzofuran	15	58	0.6 U	0.8 U	0.2 U	0.1 T	0.6 U	1.2 U	0.2 U
Hexachlorobutadiene	3.9	6.2	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
N-Nitrosodiphenylamine	11	11	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
PCBs in mg/kg TOC									
Aroclor-1016	–	–	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Aroclor-1221	–	–	1.2 U	1.6 U	0.5 U	0.4 U	1.3 U	2.4 U	0.4 U
Aroclor-1232	–	–	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Aroclor-1242	–	–	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Aroclor-1248	–	–	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Aroclor-1254	–	–	0.6 U	0.8 U	0.2 Ui	0.2 U	0.6 U	1.2 U	0.1 T
Aroclor-1260	–	–	0.6 U	0.8 U	0.2 U	0.2 U	0.6 U	1.2 U	0.2 U
Total PCBs*	12	65	1.2 U	1.6 U	0.5 U	0.4 U	1.3 U	2.4 U	0.1 T

U Undetected

T Estimated concentration less than the MRL but greater than th MDL

D Reported concentration is from a dilution

B The analyze was found in the associated method blank at a level that is significant relative to the sample

J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL

i The MRL/MDL is elevated due to a matrix or chromatographic interference

Appendix C. Woodard Bay Core Sediment Chemistry Data - TOC Normalized Concentrations

Station Number / Collection Date	WA SMS SQS	WA SMS CSL	WB-18-C1-3 2/25/08 LQ	VQ	WB-20-C0-1 2/25/08 LQ	VQ	WB-20-C1-3 2/25/08 LQ	VQ	WB-28-C0-1 2/25/08 LQ	VQ	WB-31-C0-1 2/25/08 LQ	VQ	WB-31-C1-3 2/25/08 LQ	VQ	WB-38-C0-1 2/25/08 LQ	VQ
Conventionals																
Total Organic Carbon (% DW)	–	–	16.8		5.1		0.4		11.7		14.4		13.9		12.1	
TVS (%)			28.9		10.7		3.59		29.3		33.5		29.8		28.1	
Total Solids (% WW)	–	–	33.6		54.1		72.0		34.2		34.0		37.0		45.4	
Ammonia (mg-N/kg DW)	–	–	40.5		8.2		9.5		33.3		33.5		45.6		41.6	
Total Sulfides (mg/kg DW)	–	–	729.0		203.0		16.0		458.0		463.0		402.0		103.0	
Grain Size																
Gravel			21.0		5.6		5.0		13.0		12.9		14.7		22.3	
Sand, Very Coarse			8.3		2.6		1.6		6.5		6.6		4.6		9.8	
Sand, Coarse			5.3		2.5		2.0		5.5		5.0		3.7		7.0	
Sand, Medium			7.6		10.6		6.9		5.7		8.4		4.0		11.4	
Sand, Fine			10.8		32.6		28.7		6.6		9.0		5.5		11.7	
Sand, Very Fine			2.1		18.4		25.1		6.3		7.5		6.1		9.0	
Silt			25.9		15.8		19.3		36.2		33.7		39.4		22.8	
Clay			14.6		7.8		7.2		17.5		16.1		17.5		8.3	
Metals in mg/kg DW																
Arsenic	57	93	4.72		6.24		3.42		9.64		7.23		3.63		11	
Cadmium	5.1	6.7	1.18		1.04		0.428		1.68		1.31		0.92		1.56	
Chromium	260	270	20.8		16.2		17.3		28.2		21		28.9		18.7	
Copper	390	390	23.8		14.5		8.97		38		33.8		38.2		26.4	
Lead	450	530	10.1		6.04		1.94		15.1		9.41		11.5		9.73	
Mercury	0.41	0.59	0.071		0.068		0.024		0.127		0.072		0.08		0.071	
Silver	6.1	6.1	0.14		0.11		0.04		0.23		0.12		0.12		0.16	
Zinc	410	960	48.1		34.9		20		76.3		65.1		65.9		65.5	
LPAH in mg/kg TOC																
Naphthalene	99	170	0.0	T	0.2	U	2.7	U	0.0	T	0.5	U	0.5	U	0.1	U
Acenaphthylene	66	66	0.0	T	0.0	T	2.7	U	0.1	T	0.1	JD	0.1	JD	0.1	T
Acenaphthene	16	57	0.1	U	0.2	U	2.7	U	0.1	U	0.1	JD	0.2	JD	0.0	T
Fluorene	23	79	0.0	T	0.0	T	2.7	U	0.0	T	0.1	JD	0.1	JD	0.1	T
Phenanthrene	100	480	0.1		0.2		2.7	U	0.2		0.4	JD	0.4	JD	0.2	
Anthracene	220	1200	0.1	T	0.1	T	2.7	U	0.2		0.8	D	0.5	D	0.3	
2-Methylnaphthalene	38	64	0.1	U	0.2	U	2.7	U	0.0	T	0.5	U	0.5	U	0.1	U
Total LPAH*	370	780	0.2	T	0.4	T	2.7	U	0.6	T	1.5	JD	1.4		0.7	T
HPAH in mg/kg TOC																
Fluoranthene	160	1200	0.4		0.6		0.6	T	0.9		3.4	D	2.9	D	0.4	
Pyrene	1000	1400	0.7		1.4		1.5	T	1.6		3.7	D	2.2	D	0.7	
Benzo(a)anthracene	110	270	0.1		0.2		2.7	U	0.6		1.1	D	0.8	D	0.4	
Chrysene	110	460	0.3		0.6		2.7	U	1.0		1.7	D	1.2	D	1.2	
Benzofluoranthenes*	230	450	0.3	T	0.7	T	0.5	T	0.9		1.0	D	1.4	D	0.6	
Benzo(a)pyrene	99	210	0.1	T	0.2	T	2.7	U	0.3		0.6	D	0.6	D	0.2	
Indeno(1,2,3-cd)pyrene	34	88	0.1	T	0.1	T	2.7	U	0.2		0.4	JD	0.4	JD	0.1	
Dibenz(a,h)anthracene	12	33	0.1	U	0.2	U	2.7	U	0.0	T	0.1	JD	0.5	U	0.0	T
Benzo(g,h,i)perylene	31	78	0.0	T	0.1	T	2.7	U	0.1	T	0.3	JD	0.3	JD	0.1	U
Total HPAH*	960	5300	1.9		3.9		2.6	T	5.6	T	12.4	JD	9.6	JD	3.7	T

Appendix C. Woodard Bay Core Sediment Chemistry Data - TOC Normalized Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-18-C1-3 2/25/08 LQ VQ	WB-20-C0-1 2/25/08 LQ VQ	WB-20-C1-3 2/25/08 LQ VQ	WB-28-C0-1 2/25/08 LQ VQ	WB-31-C0-1 2/25/08 LQ VQ	WB-31-C1-3 2/25/08 LQ VQ	WB-38-C0-1 2/25/08 LQ VQ
Chlorinated Aromatics in mg/kg TOC									
1,4-Dichlorobenzene	3.1	9	0.1 U	0.2 U	2.7 U	0.1 U	0.5 U	0.5 U	0.1 U
1,2-Dichlorobenzene	2.3	2.3	0.1 U	0.2 U	2.7 U	0.1 U	0.5 U	0.5 U	0.1 U
1,2,4-Trichlorobenzene	0.81	1.8	0.1 U	0.2 U	2.7 U	0.1 U	0.5 U	0.5 U	0.1 U
Hexachlorobenzene	0.38	2.3	0.09 U	0.20 U	0.27 U	0.13 U	0.01 Ui	0.01 U	0.10 U
Phthalate Esters in mg/kg TOC									
Dimethylphthalate	53	53	0.1 U	0.2 U	2.7 U	0.1 U	0.5 U	0.5 U	0.1 U
Diethylphthalate	61	110	0.0 T	0.1 T	2.7 U	0.0 T	0.5 U	0.5 U	0.0 T
Di-n-Butylphthalate	220	1700	0.1 T	0.2 T	5.4 U	0.2 T	1.0 U	1.0 U	0.2 U
Butylbenzylphthalate	4.9	64	0.1 U	0.2 U	2.7 U	0.1 U	0.5 U	0.5 U	0.1 U
bis(2-Ethylhexyl)phthalate	47	78	0.9 U	0.8 T	27.0 U	1.3 U	5.1 U	4.9 U	1.0 U
Di-n-Octylphthalate	58	4500	0.1 U	0.2 U	2.7 U	0.1 U	0.5 U	0.5 U	0.1 U
Ionizable Organic Compounds in ug/kg DW									
Phenol (8270SIM)	420	1200	54	120	68	150	120	110	70
Phenol (8270)	420	1200	45 U	30 U	30 U	44 U	230 U	210 U	34 U
2-Methylphenol	63	63	31 U	26 U	20 U	30 U	29 U	27 U	23 U
4-Methylphenol	670	670	15 U	10 U	10 U	15 U	74 U	68 U	8.5 T
2,4-Dimethylphenol	29	29	31 U	26 U	20 U	30 U	29 U	27 U	23 U
Pentachlorophenol	360	690	2.4 T	9.1 U	6.8 U	15 U	14 U	13 U	11 U
Benzyl Alcohol	57	73	30 U	20 U	20 U	30 U	150 U	140 U	23 U
Benzoic Acid	650	650	300 U	200 U	200 U	300 U	1500 U	1400 U	110 T
Miscellaneous Extractables in mg/kg TOC									
Dibenzofuran	15	58	0.1 U	0.2 U	2.7 U	0.0 T	0.1 JD	0.2 JD	0.0 T
Hexachlorobutadiene	3.9	6.2	0.1 U	0.2 U	2.7 U	0.1 U	0.5 U	0.5 U	0.1 U
N-Nitrosodiphenylamine	11	11	0.1 U	0.2 U	2.7 U	0.1 U	0.3 JD	0.3 JD	0.1 U
PCBs in mg/kg TOC									
Aroclor-1016	–	–	0.1 U	0.2 U	2.7 U	0.1 U	0.1 U	0.1 Ui	0.1 U
Aroclor-1221	–	–	0.2 U	0.4 U	5.4 U	0.3 U	0.2 U	0.2 Ui	0.2 U
Aroclor-1232	–	–	0.1 U	0.2 U	2.7 U	0.1 U	0.1 U	0.1 Ui	0.1 U
Aroclor-1242	–	–	0.1 U	0.2 U	2.7 U	0.1 U	0.1 U	0.1 Ui	0.1 U
Aroclor-1248	–	–	0.1 U	0.2 U	2.7 U	0.1 U	0.1 U	0.1 U	0.1 U
Aroclor-1254	–	–	0.1 Ui	0.2 U	2.7 U	0.1 T	0.1 U	0.1 Ui	0.1 U
Aroclor-1260	–	–	0.1 U	0.2 U	2.7 U	0.1 U	0.1 U	0.1 U	0.1 U
Total PCBs*	12	65	0.2 U	0.4 U	5.4 U	0.1 T	0.2 U	0.2 Ui	0.2 U

U Undetected

T Estimated concentration less than the MRL but greater than th MDL

D Reported concentration is from a dilution

B The analyze was found in the associated method blank at a level that is

J The result is an estimated concentration that is less than the MRL but g

i The MRL/MDL is elevated due to a matrix or chromatographic interfer

Appendix C. Woodard Bay Core Sediment Chemistry Data - TOC Normalized Concentrations

Station Number / Collection Date	WA SMS SQS	WA SMS CSL	WB-38-C1-3 2/25/08	LQ	VQ	WB-43-C0-1 2/25/08	LQ	VQ	WB-44-C0-1 2/25/08	LQ	VQ	WB-44-C1-3 2/25/08	LQ	VQ
Conventionals														
Total Organic Carbon (% DW)	–	–	20.5			0.7			6.4			2.2		
TVS (%)			43.5			2.33			8.19			3.56		
Total Solids (% WW)	–	–	37.3			73.1			58.2			76.6		
Ammonia (mg-N/kg DW)	–	–	47.1			6.5			11.6			6.7		
Total Sulfides (mg/kg DW)	–	–	75.3			169.0			254.0			11.4		
Grain Size														
Gravel			18.6			4.2			13.1			2.3		
Sand, Very Coarse			14.1			2.4			5.4			1.3		
Sand, Coarse			10.0			3.5			3.3			5.0		
Sand, Medium			10.4			25.6			17.6			24.9		
Sand, Fine			11.6			30.2			29.8			40.7		
Sand, Very Fine			5.9			16.6			9.8			10.1		
Silt			20.7			12.6			14.5			9.6		
Clay			9.9			2.7			5.2			3.8		
Metals in mg/kg DW														
Arsenic	57	93	2.3			3.65			3.27			2.73		
Cadmium	5.1	6.7	0.286			0.388			0.423			0.338		
Chromium	260	270	14.3			17.2			10.7			14		
Copper	390	390	33.4			7.91			7.43			6.71		
Lead	450	530	7.35			2.98			3.11			2.19		
Mercury	0.41	0.59	0.075			0.026			0.046			0.021		
Silver	6.1	6.1	0.09			0.05			0.05			0.03		
Zinc	410	960	53.9			24.1			18.6			18.5		
LPAH in mg/kg TOC														
Naphthalene	99	170	0.7	U		1.5	U		0.2	U		0.5	U	
Acenaphthylene	66	66	0.7	U		1.5	U		0.1	T		0.5	U	
Acenaphthene	16	57	0.2	JD		1.5	U		0.2	U		0.5	U	
Fluorene	23	79	0.7	U		1.5	U		0.2	U		0.5	U	
Phenanthrene	100	480	0.3	JD		0.5	T		0.3			0.1	T	
Anthracene	220	1200	0.2	JD		1.5	U		0.1	T		0.5	U	
2-Methylnaphthalene	38	64	0.7	U		1.5	U		0.2	U		0.5	U	
Total LPAH*	370	780	0.7	JD		0.5	T		0.4	T		0.1	T	
HPAH in mg/kg TOC														
Fluoranthene	160	1200	0.8	D		1.1	T		0.5			0.2	T	
Pyrene	1000	1400	0.5	JD		1.1	T		0.5			0.2	T	
Benzo(a)anthracene	110	270	0.2	JD		0.4	T		0.2	T		0.5	U	
Chrysene	110	460	0.2	JD		0.9	T		0.3			0.1	T	
Benzofluoranthenes*	230	450	0.7	U		1.0	T		0.3	T		0.5	U	
Benzo(a)pyrene	99	210	0.7	U		0.5	T		0.2	T		0.5	U	
Indeno(1,2,3-cd)pyrene	34	88	0.7	U		0.4	T		0.1	T		0.5	U	
Dibenz(a,h)anthracene	12	33	0.7	U		1.5	U		0.2	U		0.5	U	
Benzo(g,h,i)perylene	31	78	0.7	U		0.4	T		0.1	T		0.5	U	
Total HPAH*	960	5300	1.8	JD		5.8	T		2.1	T		0.5	T	

Appendix C. Woodard Bay Core Sediment Chemistry Data - TOC Normalized Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-38-C1-3 2/25/08 LQ VQ	WB-43-C0-1 2/25/08 LQ VQ	WB-44-C0-1 2/25/08 LQ VQ	WB-44-C1-3 2/25/08 LQ VQ
Chlorinated Aromatics in mg/kg TOC						
1,4-Dichlorobenzene	3.1	9	0.7 U	1.5 U	0.2 U	0.5 U
1,2-Dichlorobenzene	2.3	2.3	0.7 U	1.5 U	0.2 U	0.5 U
1,2,4-Trichlorobenzene	0.81	1.8	0.7 U	1.5 U	0.2 U	0.5 U
Hexachlorobenzene	0.38	2.3	0.00 Ui	0.15 Ui	0.16 U	0.05 U
Phthalate Esters in mg/kg TOC						
Dimethylphthalate	53	53	0.7 U	1.5 U	0.2 U	0.5 U
Diethylphthalate	61	110	0.7 U	1.5 U	0.0 T	0.1 T
Di-n-Butylphthalate	220	1700	1.3 U	3.0 U	0.3 U	0.9 U
Butylbenzylphthalate	4.9	64	0.7 U	1.5 U	0.2 U	0.5 U
bis(2-Ethylhexyl)phthalate	47	78	6.8 U	14.6 U	1.6 U	4.5 U
Di-n-Octylphthalate	58	4500	0.7 U	1.5 U	0.2 U	0.5 U
Ionizable Organic Compounds in ug/kg DW						
Phenol (8270SIM)	420	1200	90	71	150	45
Phenol (8270)	420	1200	410 U	30 U	30 U	30 U
2-Methylphenol	63	63	28 U	20 U	20 U	20 U
4-Methylphenol	670	670	140 U	9.8 U	10 U	9.9 U
2,4-Dimethylphenol	29	29	28 U	20 U	20 U	20 U
Pentachlorophenol	360	690	13 U	6.8 U	8.6 U	0.8 J
Benzyl Alcohol	57	73	270 U	20 U	20 U	20 U
Benzoic Acid	650	650	2700 U	200 U	200 U	200 U
Miscellaneous Extractables in mg/kg TOC						
Dibenzofuran	15	58	0.7 U	1.5 U	0.2 U	0.5 U
Hexachlorobutadiene	3.9	6.2	0.7 U	1.5 U	0.2 U	0.5 U
N-Nitrosodiphenylamine	11	11	0.3 JD	1.5 U	0.2 U	0.5 U
PCBs in mg/kg TOC						
Aroclor-1016	–	–	0.1 U	1.5 U	0.2 U	0.5 U
Aroclor-1221	–	–	0.1 U	3.0 U	0.3 U	0.9 U
Aroclor-1232	–	–	0.1 U	1.5 U	0.2 U	0.5 U
Aroclor-1242	–	–	0.1 U	1.5 U	0.2 U	0.5 U
Aroclor-1248	–	–	0.1 U	1.5 U	0.2 U	0.5 U
Aroclor-1254	–	–	0.1 U	1.5 U	0.2 U	0.5 U
Aroclor-1260	–	–	0.1 U	1.5 U	0.2 U	0.5 U
Total PCBs*	12	65	0.1 U	3.0 U	0.3 U	0.9 U

U Undetected

T Estimated concentration less than the MRL but greater than th MDL

D Reported concentration is from a dilution

B The analyze was found in the associated method blank at a level that is

J The result is an estimated concentration that is less than the MRL but g

i The MRL/MDL is elevated due to a matrix or chromatographic interfer

Appendix C. Woodard Bay Surface Sediment Chemistry Data - Dry Weight Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-03-S 2/27/08 LQ VQ	WB-06-S 2/26/08 LQ VQ	WB-09-S 2/26/08 LQ VQ	WB-12-S 2/26/08 LQ VQ	WB-16-S 2/26/08 LQ VQ	WB-17-S 2/26/08 LQ VQ	WB-21-S 2/26/08 LQ VQ	WB-22-S 2/26/08 LQ VQ
Conventionals										
Total Organic Carbon (% DW)	–	–	2.1	5.19	2.75	2.63	2.56	1.09	3.96	0.38
TVS (%DW)			6.62	12.2	9.03	9.28	8.45	2.97	11.8	1.6
Total Solids (% WW)	–	–	57.2	46.1	35.1	34.6	36.3	69.3	35.4	75.6
Ammonia (mg-N/kg DW)	–	–	9.1	11.7	16.6	19.9	16	4.1	16.9	4.2
Total Sulfides (mg/kg DW)	–	–	283	336	6.8	4.1	1.13 T	16.3	176	17
Grain Size										
Gravel			1.8	7.9	3.0	4.5	1.3	1.7	0.1	0.2
Sand, Very Coarse			1.5	4.7	3.1	2.0	2.2	1.3	4.8	0.4
Sand, Coarse			2.3	3.8	1.2	1.2	1.1	4.0	6.2	2.0
Sand, Medium			15.4	7.5	1.2	1.3	1.0	16.7	4.7	24.7
Sand, Fine			31.3	12.5	1.7	1.2	1.2	41.0	4.0	48.6
Sand, Very Fine			13.5	9.9	3.5	2.0	2.8	25.5	4.1	15.5
Silt			20.4	39.2	62.3	62.5	65.3	8.2	48.8	7.7
Clay			10.9	15.8	25.3	30.0	24.5	2.9	28.1	3.0
Metals in mg/kg DW										
Arsenic	57	93	4.4	6.1	9.1	9.4	9.5	4.1	10.9	2.2
Cadmium	5.1	6.7	0.8	0.8	0.8	0.8	0.8	0.5	1.3	0.2
Chromium	260	270	17.6	23.1	32.1	33.0	34.1	12.0	33.5	9.6
Copper	390	390	12.2	21.4	34.2	35.6	36.0	6.3	36.5	5.1
Lead	450	530	8.6	10.0	18.8	19.9	21.3	2.6	19.5	2.2
Mercury	0.41	0.59	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0
Silver	6.1	6.1	0.1	0.2	0.2	0.3	0.2	0.0	0.3	0.0
Zinc	410	960	28.1	59.2	70.3	73.9	74.1	20.2	76.4	15.8
LPAH in ug/kg DW										
Naphthalene			10.0 U	110.0 U	7.7 T	15.0 U	14.0 U	10.0 U	15.0 U	9.8 U
Acenaphthylene			10.0 U	110.0 U	2.1 T	15.0 U	2.1 T	5.4 T	5.8 T	9.8 U
Acenaphthene			10.0 U	110.0 U	15.0 U	15.0 U	14.0 U	2.8 T	15.0 U	9.8 U
Fluorene			10.0 U	110.0 U	15.0 U	15.0 U	14.0 U	4.2 T	2.6 T	9.8 U
Phenanthrene			3.5 T	76.0 JD	6.7 T	6.1 T	9.1 T	35.0	13.0 T	1.8 T
Anthracene			3.6 T	110.0 U	2.6 T	3.6 T	3.6 T	19.0	12.0 T	9.8 U
2-Methylnaphthalene			10.0 U	110.0 U	5.5 T	15.0 U	14.0 U	10.0 U	15.0 U	9.8 U
Total LPAH*			7.1 T	76.0 JD	24.6 T	9.7 T	14.8 T	66.4 T	33.4 T	1.8 T
HPAH in ug/kg DW										
Fluoranthene			12.0	190.0 D	17.0	14.0 T	22.0	110.0	46.0	9.6 T
Pyrene			15.0	160.0 D	16.0	16.0	20.0	150.0	60.0	7.5 T
Benzo(a)anthracene			5.0 T	34.0 JD	6.4 T	7.3 T	6.6 T	40.0	22.0	3.2 T
Chrysene			10.0	57.0 JD	14.0 T	16.0	14.0	90.0	61.0	5.1 T
Benzofluoranthenes*			13.3 T	66.0 JD	16.9 T	16.2 T	16.7 T	111.0	64.0	6.7 T
Benzo(a)pyrene			10.0 U	22.0 JD	6.3 T	8.0 T	6.3 T	37.0	21.0	2.1 T
Indeno(1,2,3-cd)pyrene			10.0 U	110.0 U	5.5 T	6.4 T	5.9 T	25.0	15.0	9.8 U
Dibenz(a,h)anthracene			10.0 U	110.0 U	15.0 U	15.0 U	14.0 U	10.0 U	15.0 U	9.8 U
Benzo(g,h,i)perylene			4.1 T	110.0 U	5.0 T	5.8 T	5.5 T	19.0	14.0 T	9.8 U
Total HPAH*			72.7 T	595.0 JD	104.0 T	107.9 T	113.7 T	693.0	367.0 T	40.9 T

Appendix C. Woodard Bay Surface Sediment Chemistry Data - Dry Weight Concentrations

Station Number	WA SMS	WA SMS	WB-03-S		WB-06-S		WB-09-S		WB-12-S		WB-16-S		WB-17-S		WB-21-S		WB-22-S	
Collection Date	SQS	CSL	2/27/08	LQ VQ	2/26/08	LQ VQ	2/26/08	LQ VQ	2/26/08	LQ VQ	2/26/08	LQ VQ	2/26/08	LQ VQ	2/26/08	LQ VQ	2/26/08	LQ VQ
Chlorinated Aromatics in ug/kg DW																		
1,4-Dichlorobenzene			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
1,2-Dichlorobenzene			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
1,2,4-Trichlorobenzene			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
Hexachlorobenzene			1.0	U	0.1	T	1.0	Ui	1.0	Ui	1.0	Ui	0.1	J	1.0	U	1.0	U
Phthalate Esters in ug/kg DW																		
Dimethylphthalate			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
Diethylphthalate			2.6	T	110.0	U	15.0	U	2.5	T	14.0	U	2.9	T	15.0	U	9.8	U
Di-n-Butylphthalate			13.0	T	220.0	U	29.0	U	29.0	U	28.0	U	20.0	U	29.0	U	20.0	U
Butylbenzylphthalate			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
bis(2-Ethylhexyl)phthalate			14.0	T	1100.0	U	16.0	T	18.0	T	17.0	T	100.0	U	13.0	T	17.0	T
Di-n-Octylphthalate			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
Ionizable Organic Compounds in ug/kg DW																		
Phenol (8270SIM)	420	1200	280.0		140.0		780.0		1400.0		880.0		150.0		110.0		87.0	
Phenol (8270)	420	1200	53.0		330.0	U	43.0	U	56.0		100.0		38.0		89.0		32.0	
2-Methylphenol	63	63	20.0	U	27.0	U	28.0	U	29.0	U	28.0	U	19.0	U	26.0	U	20.0	U
4-Methylphenol	670	670	10.0	U	110.0	U	6.0	T	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
2,4-Dimethylphenol	29	29	20.0	U	27.0	U	28.0	U	29.0	U	28.0	U	19.0	U	26.0	U	20.0	U
Pentachlorophenol	360	690	8.8	U	11.0	U	1.1	T	3.5	JP	13.0	Ui	6.7	U	2.9	T	6.4	U
Benzyl Alcohol	57	73	20.0	U	220.0	U	4.6	T	29.0	U	28.0	U	20.0	U	29.0	U	3.9	T
Benzoic Acid	650	650	190.0	T	2200.0	U	180.0	T	230.0	T	210.0	T	140.0	T	260.0	T	130.0	T
Miscellaneous Extractables in ug/kg DW																		
Dibenzofuran			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	1.7	T	15.0	U	9.8	U
Hexachlorobutadiene			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
N-Nitrosodiphenylamine			10.0	U	110.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
PCBs in ug/kg DW																		
Aroclor-1016	–	–	10.0	U	11.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	10.0	Ui
Aroclor-1221	–	–	20.0	U	22.0	U	29.0	U	29.0	U	28.0	U	20.0	U	29.0	U	20.0	Ui
Aroclor-1232	–	–	10.0	U	11.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	10.0	Ui
Aroclor-1242	–	–	10.0	U	11.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	11.0	Ui
Aroclor-1248	–	–	10.0	U	11.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	10.0	U
Aroclor-1254	–	–	10.0	U	11.0	U	12.0	T	15.0	U	14.0	U	10.0	U	15.0	Ui	10.0	U
Aroclor-1260	–	–	10.0	U	11.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	10.0	U
Total PCBs*			10.0	U	11.0	U	15.0	U	15.0	U	14.0	U	10.0	U	15.0	U	10.0	U

U Undetected

T Estimated concentration less than the MRL but greater than th MDL

D Reported concentration is from a dilution

B The analyze was found in the associated method blank at a level that is significant relative to the sample

J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL

i The MRL/MDL is elevated due to a matrix or chromatographic interference

Appendix C. Woodard Bay Surface Sediment Chemistry Data - Dry Weight Concentrations

Station Number / Collection Date	WA SMS SQS	WA SMS CSL	WB-26-S 2/26/08 LQ	VQ	WB-30-S 2/27/08 LQ	VQ	WB-35-S 2/26/08 LQ	VQ	WB-36-S 2/27/08 LQ	VQ	WB-37-S 2/26/08 LQ	VQ	WB-42-S 2/27/08 LQ	VQ	WB-03-D 2/27/08 LQ	VQ	WB-16-D 2/26/08 LQ	VQ
Conventionals																		
Total Organic Carbon (% DW)	–	–	1.58		9.14		8		2.97		2		1.37		1.43		2.56	
TVS (%DW)			4.56		8.88		18.4		9.72		5.44		3.86		6.1		8.59	
Total Solids (% WW)	–	–	66.4		49.2		39.9		34.9		61.1		65.6		58.2		36.4	
Ammonia (mg-N/kg DW)	–	–	8.5		46.2		26.8		22.5		7.7		16.4		7.6		21	
Total Sulfides (mg/kg DW)	–	–	34.5		210		16.8		346		0.7	T	0.8	U	267		0.99	T
Grain Size																		
Gravel			0.0		45.2		0.2		11.9		0.0		24.0		2.9		0.2	
Sand, Very Coarse			0.8		16.9		2.3		2.7		0.3		10.3		1.9		0.8	
Sand, Coarse			2.4		7.6		3.9		2.0		0.5		17.0		2.6		2.7	
Sand, Medium			14.3		5.2		6.6		1.8		1.3		29.9		14.6		1.3	
Sand, Fine			31.6		4.1		10.6		2.0		13.2		24.7		32.7		1.3	
Sand, Very Fine			21.2		1.9		14.0		2.5		30.9		4.7		12.7		4.0	
Silt			19.4		11.9		41.4		53.7		41.4		4.4		18.9		62.4	
Clay			7.6		9.2		17.0		22.4		10.3		2.8		10.3		23.4	
Metals in mg/kg DW																		
Arsenic	57	93	4.7		3.8		10.3		8.6		5.2		2.6		4.7		9.2	
Cadmium	5.1	6.7	0.9		1.1		2.2		1.5		1.4		0.4		0.9		0.8	
Chromium	260	270	12.2		10.2		23.6		35.8		15.4		11.4		18.7		33.2	
Copper	390	390	10.1		13.0		27.9		33.3		15.1		6.8		13.3		35.4	
Lead	450	530	4.1		10.7		10.4		21.6		5.8		7.0		10.0		20.6	
Mercury	0.41	0.59	0.0		0.0		0.1		0.1		0.1		0.0	B	0.1		0.1	
Silver	6.1	6.1	0.1		0.1		0.2		0.2		0.1		0.0		0.1		0.3	
Zinc	410	960	27.1		24.9		65.3		68.2		38.6		20.2		30.9		72.7	
LPAH in ug/kg DW																		
Naphthalene			10.0	U	41.0	U	26.0	U	15.0	U	2.5	T	10.0	U	20.0	U	14.0	U
Acenaphthylene			1.7	T	44.0	D	8.9	JD	2.5	T	2.2	T	13.0		20.0	U	1.7	T
Acenaphthene			10.0	U	25.0	JD	26.0	U	15.0	U	9.9	U	3.5	T	20.0	U	14.0	U
Fluorene			10.0	U	48.0	D	5.6	JD	2.7	T	9.1	T	5.0	T	20.0	U	14.0	U
Phenanthrene			4.1	T	340.0	D	25.0	JD	13.0	T	33.0		150.0		4.5	JD	5.2	T
Anthracene			4.4	T	150.0	D	27.0	D	6.6	T	30.0		21.0		3.3	JD	3.3	T
2-Methylnaphthalene			10.0	U	16.0	JD	26.0	U	15.0	U	9.9	U	10.0	U	20.0	U	14.0	U
Total LPAH*			10.2	T	623.0	JD	66.5	JD	24.8	T	76.8	T	192.5	T	7.8	JD	10.2	T
HPAH in ug/kg DW																		
Fluoranthene			15.0		1100.0	D	71.0	D	38.0		33.0		600.0		15.0	JD	17.0	
Pyrene			19.0		970.0	D	120.0	D	38.0		37.0		430.0		17.0	JD	20.0	
Benzo(a)anthracene			6.7	T	290.0	D	51.0	D	12.0	T	22.0		84.0		4.2	JD	6.3	T
Chrysene			14.0		720.0	D	100.0	D	30.0		55.0		290.0		8.9	JD	13.0	T
Benzofluoranthenes*			18.6	T	630.0	D	124.0	D	30.3	T	34.2	T	146.0		12.8	JD	16.8	T
Benzo(a)pyrene			5.1	T	180.0	D	45.0	D	11.0	T	11.0		31.0		20.0	U	6.3	T
Indeno(1,2,3-cd)pyrene			5.1	T	110.0	D	31.0	D	9.4	T	6.9	T	20.0		3.4	JD	6.5	T
Dibenz(a,h)anthracene			10.0	U	24.0	JD	26.0	U	15.0	U	2.0	T	4.9	T	20.0	U	14.0	U
Benzo(g,h,i)perylene			3.8	T	81.0	D	27.0	D	9.1	T	6.6	T	16.0		3.6	JD	6.0	T
Total HPAH*			105.9	T	4735.0	JD	693.0	D	208.1	T	241.9	T	1767.9	T	77.7	JD	108.7	T

Appendix C. Woodard Bay Surface Sediment Chemistry Data - Dry Weight Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-26-S 2/26/08 LQ VQ	WB-30-S 2/27/08 LQ VQ	WB-35-S 2/26/08 LQ VQ	WB-36-S 2/27/08 LQ VQ	WB-37-S 2/26/08 LQ VQ	WB-42-S 2/27/08 LQ VQ	WB-03-D 2/27/08 LQ VQ	WB-16-D 2/26/08 LQ VQ
Chlorinated Aromatics in ug/kg DW										
1,4-Dichlorobenzene			10.0 U	41.0 U	26.0 U	15.0 U	9.9 U	10.0 U	20.0 U	14.0 U
1,2-Dichlorobenzene			10.0 U	41.0 U	26.0 U	15.0 U	9.9 U	10.0 U	20.0 U	14.0 U
1,2,4-Trichlorobenzene			10.0 U	41.0 U	26.0 U	15.0 U	9.9 U	10.0 U	20.0 U	14.0 U
Hexachlorobenzene			1.0 U	1.0 U	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 Ui
Phthalate Esters in ug/kg DW										
Dimethylphthalate			10.0 U	41.0 U	26.0 U	15.0 U	9.9 U	10.0 U	20.0 U	14.0 U
Diethylphthalate			10.0 U	41.0 U	26.0 U	3.4 T	9.9 U	10.0 U	3.2 JD	14.0 U
Di-n-Butylphthalate			20.0 U	82.0 U	51.0 U	21.0 T	20.0 U	20.0 U	40.0 U	28.0 U
Butylbenzylphthalate			10.0 U	41.0 U	26.0 U	15.0 U	9.9 U	10.0 U	20.0 U	14.0 U
bis(2-Ethylhexyl)phthalate			100.0 U	410.0 U	24.0 JD	150.0 U	99.0 U	12.0 T	200.0 U	13.0 T
Di-n-Octylphthalate			10.0 U	41.0 U	26.0 U	15.0 U	9.9 U	10.0 U	20.0 U	14.0 U
Ionizable Organic Compounds in ug/kg DW										
Phenol (8270SIM)	420	1200	45.0	710.0	130.0	660.0	52.0	260.0	26.0	430.0
Phenol (8270)	420	1200	40.0	130.0 JD	140.0 D	43.0 U	70.0	110.0	530.0 D	51.0
2-Methylphenol	63	63	20.0 U	20.0 U	29.0 U	28.0 U	19.0 U	18.0 U	19.0 U	22.0 U
4-Methylphenol	670	670	10.0 U	41.0 U	26.0 U	15.0 U	3.6 T	10.0 U	58.0 D	14.0 U
2,4-Dimethylphenol	29	29	20.0 U	20.0 U	29.0 U	28.0 U	19.0 U	18.0 U	19.0 U	22.0 U
Pentachlorophenol	360	690	7.3 U	2.8 J	12.0 U	1.8 T	8.0 U	1.7 J	8.7 U	1.1 T
Benzyl Alcohol	57	73	20.0 U	82.0 U	51.0 U	29.0 U	4.8 T	20.0 U	40.0 U	28.0 U
Benzoic Acid	650	650	160.0 T	820.0 U	530.0 D	290.0 U	190.0 T	97.0 T	260.0 JD	180.0 T
Miscellaneous Extractables in ug/kg DW										
Dibenzofuran			10.0 U	26.0 JD	3.1 JD	2.1 T	2.0 T	2.5 T	20.0 U	14.0 U
Hexachlorobutadiene			10.0 U	41.0 U	26.0 U	15.0 U	9.9 U	10.0 U	20.0 U	14.0 U
N-Nitrosodiphenylamine			10.0 U	41.0 U	26.0 U	15.0 U	9.9 U	10.0 U	20.0 U	14.0 U
PCBs in ug/kg DW										
Aroclor-1016	–	–	10.0 U	11.0 U	13.0 U	15.0 U	10.0 U	10.0 U	10.0 U	14.0 U
Aroclor-1221	–	–	20.0 U	21.0 U	26.0 U	29.0 U	20.0 U	20.0 U	20.0 U	28.0 U
Aroclor-1232	–	–	10.0 U	11.0 U	13.0 U	15.0 U	10.0 U	10.0 U	10.0 U	14.0 U
Aroclor-1242	–	–	10.0 U	11.0 U	13.0 U	15.0 U	10.0 U	10.0 U	10.0 U	14.0 U
Aroclor-1248	–	–	10.0 U	11.0 U	13.0 U	15.0 U	10.0 U	10.0 U	10.0 U	14.0 U
Aroclor-1254	–	–	10.0 U	11.0 U	13.0 Ui	15.0 U	10.0 U	10.0 U	10.0 U	14.0 U
Aroclor-1260	–	–	10.0 U	11.0 U	13.0 U	15.0 U	10.0 U	10.0 U	10.0 U	14.0 U
Total PCBs*			10.0 U	11.0 U	13.0 U	15.0 U	10.0 U	10.0 U	10.0 U	14.0 U

U Undetected
T Estimated concentration less than the MRL but greater than th MDL
D Reported concentration is from a dilution
B The analyze was found in the associated method blank at a level that is
J The result is an estimated concentration that is less than the MRL but gr
i The MRL/MDL is elevated due to a matrix or chromatographic interfere

Appendix C. Woodard Bay Core Sediment Chemistry Data - Dry Weight Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-04-C0-1 2/25/08 LQ VQ	WB-04-C1-3 2/25/08 LQ VQ	WB-08-C0-1 2/25/08 LQ VQ	WB-08-C1-3 2/25/08 LQ VQ	WB-13-C0-1 2/25/08 LQ VQ	WB-13-C1-3 2/25/08 LQ VQ	WB-18-C0-1 2/25/08 LQ VQ
Conventionals									
Total Organic Carbon (% DW)	–	–	1.61	1.28	6	7.05	1.55	0.84	8.04
TVS (%)			4.21	3.17	18.1	23.1	5.32	2.7	18.1
Total Solids (% WW)	–	–	61.9	73.7	37.5	40.5	61.7	78.5	33.3
Ammonia (mg-N/kg DW)	–	–	13.2	25.2	47.4	62	5.7	2.5	43.6
Total Sulfides (mg/kg DW)	–	–	136	23	365	435	88.6	1.01 T	699
Grain Size									
Gravel			5.13	4.82	24	12.8	7.03	26.1	17.6
Sand, Very Coarse			3.53	3.39	6.86	4.86	4.27	5.14	10.7
Sand, Coarse			6.22	6.26	2.35	3.05	7.07	11.54	5.7
Sand, Medium			30.1	21.7	2.06	4.98	25	20.3	6.28
Sand, Fine			22.4	30.6	1.53	8.16	18.3	18.7	4.33
Sand, Very Fine			3.42	6.09	1.02	4.2	6.07	6.53	2.51
Silt			17.7	17.6	41.1	42.6	21.9	10.1	39
Clay			7.66	8.15	16.4	20.3	10.5	2.22	16.3
Metals in mg/kg DW									
Arsenic	57	93	4.92	4.08	7.02	5.86	5.5	5.22	8.65
Cadmium	5.1	6.7	0.518	0.491	0.924	0.736	0.666	0.363	1.31
Chromium	260	270	17	18.5	30.2	28.5	20.8	17.7	26.7
Copper	390	390	13.3	11.3	29.8	23.4	15.5	7.49	27.7
Lead	450	530	6.7	4.86	18.9	12.2	6.57	1.7	15.2
Mercury	0.41	0.59	0.057	0.036	0.105	0.067	0.051	0.019 B	0.106
Silver	6.1	6.1	0.1	0.06	0.23	0.14	0.1	0.05	0.23
Zinc	410	960	32.1	27.3	64.4	46.3	33.7	18.9	63.1
LPAH in ug/kg DW									
Naphthalene			10 U	9.8 U	14 U	22	10 U	10 U	16 U
Acenaphthylene			10 U	9.8 U	1.8 T	2.1 T	10 U	10 U	5.1 T
Acenaphthene			10 U	9.8 U	14 U	3.8 T	10 U	10 U	16 U
Fluorene			10 U	9.8 U	2.2 T	4.4 T	10 U	10 U	16 U
Phenanthrene			4.4 T	4 T	9.8 T	15	4.3 T	1.8 T	14 T
Anthracene			2.5 T	2.7 T	7.1 T	5.2 T	2.7 T	10 U	9.5 T
2-Methylnaphthalene			10 U	9.8 U	14 U	16	10 U	10 U	16 U
Total LPAH*			6.9 T	6.7 T	20.9 T	68.5 T	7 T	1.8 T	28.6 T
HPAH in ug/kg DW									
Fluoranthene			16	12	19	27	10	10 U	40
Pyrene			27	15	53	26	19	10 U	57
Benzo(a)anthracene			5.2 T	4.2 T	11 T	7.7 T	5.2 T	10 U	22
Chrysene			11	6.3 T	27	12 T	12	10 U	110
Benzofluoranthenes*			16 T	9 T	24.2 T	13	12.1 T	10 U	60 T
Benzo(a)pyrene			5.8 T	3.6 T	9.2 T	7.2 T	10 U	10 U	15 T
Indeno(1,2,3-cd)pyrene			4.4 T	2 T	6.5 T	13 U	3.4 T	10 U	13 T
Dibenz(a,h)anthracene			10 U	9.8 U	14 U	13 U	10 U	10 U	16 U
Benzo(g,h,i)perylene			4.4 T	2.1 T	6.9 T	13 U	4.1 T	10 U	10 T
Total HPAH*			89.8 T	54.2 T	156.8 T	92.9 T	65.8	10 U	327 T

Appendix C. Woodard Bay Core Sediment Chemistry Data - Dry Weight Concentrations

Station Number / Collection Date	WA SMS SQS	WA SMS CSL	WB-04-C0-1 2/25/08 LQ	VQ	WB-04-C1-3 2/25/08 LQ	VQ	WB-08-C0-1 2/25/08 LQ	VQ	WB-08-C1-3 2/25/08 LQ	VQ	WB-13-C0-1 2/25/08 LQ	VQ	WB-13-C1-3 2/25/08 LQ	VQ	WB-18-C0-1 2/25/08 LQ	VQ
Chlorinated Aromatics in ug/kg DW																
1,4-Dichlorobenzene			10	U	9.8	U	14	U	13	U	10	U	10	U	16	U
1,2-Dichlorobenzene			10	U	9.8	U	14	U	13	U	10	U	10	U	16	U
1,2,4-Trichlorobenzene			10	U	9.8	U	14	U	13	U	10	U	10	U	16	U
Hexachlorobenzene			1	U	1	U	1	Ui	13	U	0.15	J	0.94	U	16	U
Phthalate Esters in ug/kg DW																
Dimethylphthalate			10	U	9.8	U	14	U	13	U	10	U	10	U	16	U
Diethylphthalate			10	U	9.8	U	2.8	T	4.1	T	10	U	2.2	T	2.1	T
Di-n-Butylphthalate			20	U	20	U	11	T	18	T	20	U	20	U	31	U
Butylbenzylphthalate			10	U	9.8	U	14	U	13	U	22		10	U	16	U
bis(2-Ethylhexyl)phthalate			100	U	98	U	140	U	130	U	100	U	100	U	15	T
Di-n-Octylphthalate			10	U	9.8	U	14	U	13	U	10	U	10	U	16	U
Ionizable Organic Compounds in ug/kg DW																
Phenol (8270SIM)	420	1200	300		37		410		92		81		48		170	
Phenol (8270)	420	1200	30	U	30	U	40	U	37	U	9.2	T	30	U	46	U
2-Methylphenol	63	63	20	U	21	U	31	U	27	U	20	U	19	U	29	U
4-Methylphenol	670	670	2.4	T	9.8	U	14	U	13	U	3.2	T	10	U	16	U
2,4-Dimethylphenol	29	29	50	U	49	U	67	U	62	U	50	U	50	U	76	U
Pentachlorophenol	360	690	0.49	T	6.7	U	2.7	J	0.72	T	1.8	J	6.1	U	0.51	J
Benzyl Alcohol	57	73	20	U	20	U	27	U	25	U	20	U	20	U	31	U
Benzoic Acid	650	650	200	U	200	U	130	T	200	T	200	U	200	U	310	U
Miscellaneous Extractables in ug/kg DW																
Dibenzofuran			10	U	9.8	U	14	U	6	T	10	U	10	U	16	U
Hexachlorobutadiene			10	U	9.8	U	14	U	13	U	10	U	10	U	16	U
N-Nitrosodiphenylamine			10	U	9.8	U	14	U	13	U	10	U	10	U	16	U
PCBs in ug/kg DW																
Aroclor-1016	–	–	10	U	10	U	14	U	13	U	10	U	10	U	15	U
Aroclor-1221	–	–	20	U	20	U	27	U	25	U	20	U	20	U	30	U
Aroclor-1232	–	–	10	U	10	U	14	U	13	U	10	U	10	U	15	U
Aroclor-1242	–	–	10	U	10	U	14	U	13	U	10	U	10	U	15	U
Aroclor-1248	–	–	10	U	10	U	14	U	13	U	10	U	10	U	15	U
Aroclor-1254	–	–	10	U	10	U	14	Ui	13	U	10	U	10	U	8.6	T
Aroclor-1260	–	–	10	U	10	U	14	U	13	U	10	U	10	U	15	U
Total PCBs*			20	U	20	U	27	U	25	U	20	U	20	U	8.6	T

U Undetected
T Estimated concentration less than the MRL but greater than th MDL
D Reported concentration is from a dilution
B The analyze was found in the associated method blank at a level that is significant relative to the sample
J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL
i The MRL/MDL is elevated due to a matrix or chromatographic interference

Appendix C. Woodard Bay Core Sediment Chemistry Data - Dry Weight Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-18-C1-3 2/25/08 LQ VQ	WB-20-C0-1 2/25/08 LQ VQ	WB-20-C1-3 2/25/08 LQ VQ	WB-28-C0-1 2/25/08 LQ VQ	WB-31-C0-1 2/25/08 LQ VQ	WB-31-C1-3 2/25/08 LQ VQ	WB-38-C0-1 2/25/08 LQ VQ	WB-38-C1-3 2/25/08 LQ VQ
Conventionals										
Total Organic Carbon (% DW)	–	–	16.8	5.06	0.37	11.7	14.4	13.9	12.1	20.5
TVS (%)			28.9	10.7	3.59	29.3	33.5	29.8	28.1	43.5
Total Solids (% WW)	–	–	33.6	54.1	72	34.2	34	37	45.4	37.3
Ammonia (mg-N/kg DW)	–	–	40.5	8.2	9.5	33.3	33.5	45.6	41.6	47.1
Total Sulfides (mg/kg DW)	–	–	729	203	16	458	463	402	103	75.3
Grain Size										
Gravel			21	5.56	4.99	13.01	12.9	14.7	22.3	18.6
Sand, Very Coarse			8.25	2.59	1.56	6.53	6.64	4.62	9.77	14.1
Sand, Coarse			5.32	2.51	1.99	5.52	5.03	3.74	6.99	9.99
Sand, Medium			7.6	10.6	6.9	5.65	8.37	4.04	11.4	10.4
Sand, Fine			10.8	32.6	28.7	6.58	8.97	5.52	11.7	11.6
Sand, Very Fine			2.07	18.4	25.1	6.33	7.5	6.14	9.03	5.87
Silt			25.9	15.8	19.3	36.22	33.7	39.4	22.8	20.7
Clay			14.6	7.76	7.15	17.53	16.1	17.5	8.33	9.93
Metals in mg/kg DW										
Arsenic	57	93	4.72	6.24	3.42	9.64	7.23	3.63	11	2.3
Cadmium	5.1	6.7	1.18	1.04	0.428	1.68	1.31	0.92	1.56	0.286
Chromium	260	270	20.8	16.2	17.3	28.2	21	28.9	18.7	14.3
Copper	390	390	23.8	14.5	8.97	38	33.8	38.2	26.4	33.4
Lead	450	530	10.1	6.04	1.94	15.1	9.41	11.5	9.73	7.35
Mercury	0.41	0.59	0.071	0.068	0.024	0.127	0.072	0.08	0.071	0.075
Silver	6.1	6.1	0.14	0.11	0.04	0.23	0.12	0.12	0.16	0.09
Zinc	410	960	48.1	34.9	20	76.3	65.1	65.9	65.5	53.9
LPAH in ug/kg DW										
Naphthalene			4.2 T	10 U	10 U	3.9 T	74 U	68 U	12 U	140 U
Acenaphthylene			4.3 T	2.4 T	10 U	7.3 T	17 JD	12 JD	6.5 T	140 U
Acenaphthene			15 U	10 U	10 U	15 U	14 JD	29 JD	1.7 T	41 JD
Fluorene			3.1 T	1.4 T	10 U	5.7 T	16 JD	20 JD	7.3 T	140 U
Phenanthrene			16	11	10 U	18	64 JD	62 JD	30	67 JD
Anthracene			9.8 T	6.7 T	10 U	28	110 D	69 D	38	37 JD
2-Methylnaphthalene			15 U	10 U	10 U	3.6 T	74 U	68 U	12 U	140 U
Total LPAH*			37.4 T	21.5 T	10 U	66.5 T	221 JD	192	83.5 T	145 JD
HPAH in ug/kg DW										
Fluoranthene			63	28	2.3 T	100	490 D	400 D	52	160 D
Pyrene			110	72	5.5 T	190	530 D	300 D	87	110 JD
Benzo(a)anthracene			23	12	10 U	69	160 D	110 D	44	51 JD
Chrysene			45	29	10 U	120	250 D	170 D	140	48 JD
Benzofluoranthenes*			47 T	33.1 T	2 T	103	150 D	189 D	76	140 U
Benzo(a)pyrene			14 T	9.9 T	10 U	34	90 D	77 D	28	140 U
Indeno(1,2,3-cd)pyrene			10 T	6.8 T	10 U	19	63 JD	50 JD	17	140 U
Dibenz(a,h)anthracene			15 U	10 U	10 U	3.4 T	13 JD	68 U	4.2 T	140 U
Benzo(g,h,i)perylene			7.9 T	5.3 T	10 U	13 T	42 JD	39 JD	12 U	140 U
Total HPAH*			319.9	196.1	9.8 T	651.4 T	1788 JD	1335 JD	448.2 T	369 JD

Appendix C. Woodard Bay Core Sediment Chemistry Data - Dry Weight Concentrations

Station Number	WA SMS	WA SMS	WB-18-C1-3			WB-20-C0-1			WB-20-C1-3			WB-28-C0-1			WB-31-C0-1			WB-31-C1-3			WB-38-C0-1			WB-38-C1-3		
Collection Date	SQS	CSL	2/25/08	LQ	VQ	2/25/08	LQ	VQ	2/25/08	LQ	VQ	2/25/08	LQ	VQ	2/25/08	LQ	VQ	2/25/08	LQ	VQ	2/25/08	LQ	VQ	2/25/08	LQ	VQ
Chlorinated Aromatics in ug/kg DW																										
1,4-Dichlorobenzene			15	U		10	U		10	U		15	U		74	U		68	U		12	U		140	U	
1,2-Dichlorobenzene			15	U		10	U		10	U		15	U		74	U		68	U		12	U		140	U	
1,2,4-Trichlorobenzene			15	U		10	U		10	U		15	U		74	U		68	U		12	U		140	U	
Hexachlorobenzene			15	U		10	U		1	U		15	U		1.2	Ui		1	U		12	U		1	Ui	
Phthalate Esters in ug/kg DW																										
Dimethylphthalate			15	U		10	U		10	U		15	U		74	U		68	U		12	U		140	U	
Diethylphthalate			4.5	T		2.7	T		10	U		3.6	T		74	U		68	U		2.6	T		140	U	
Di-n-Butylphthalate			19	T		9.6	T		20	U		19	T		150	U		140	U		23	U		270	U	
Butylbenzylphthalate			15	U		10	U		10	U		15	U		74	U		68	U		12	U		140	U	
bis(2-Ethylhexyl)phthalate			150	U		43	T		100	U		150	U		740	U		680	U		120	U		1400	U	
Di-n-Octylphthalate			15	U		10	U		10	U		15	U		74	U		68	U		12	U		140	U	
Ionizable Organic Compounds in ug/kg DW																										
Phenol (8270SIM)	420	1200	54			120			68			150			120			110			70			90		
Phenol (8270)	420	1200	45	U		30	U		30	U		44	U		230	U		210	U		34	U		410	U	
2-Methylphenol	63	63	31	U		26	U		20	U		30	U		29	U		27	U		23	U		28	U	
4-Methylphenol	670	670	15	U		10	U		10	U		15	U		74	U		68	U		8.5	T		140	U	
2,4-Dimethylphenol	29	29	75	U		50	U		50	U		73	U		370	U		340	U		56	U		670	U	
Pentachlorophenol	360	690	2.4	T		9.1	U		6.8	U		15	U		14	U		13	U		11	U		13	U	
Benzyl Alcohol	57	73	30	U		20	U		20	U		30	U		150	U		140	U		23	U		270	U	
Benzoic Acid	650	650	300	U		200	U		200	U		300	U		1500	U		1400	U		110	T		2700	U	
Miscellaneous Extractables in ug/kg DW																										
Dibenzofuran			15	U		10	U		10	U		2.6	T		20	JD		28	JD		2.3	T		140	U	
Hexachlorobutadiene			15	U		10	U		10	U		15	U		74	U		68	U		12	U		140	U	
N-Nitrosodiphenylamine			15	U		10	U		10	U		15	U		36	JD		40	JD		12	U		65	JD	
PCBs in ug/kg DW																										
Aroclor-1016	–	–	15	U		10	U		10	U		15	U		15	U		14	Ui		11	U		14	U	
Aroclor-1221	–	–	30	U		20	U		20	U		30	U		30	U		27	Ui		22	U		27	U	
Aroclor-1232	–	–	15	U		10	U		10	U		15	U		15	U		14	Ui		11	U		14	U	
Aroclor-1242	–	–	15	U		10	U		10	U		15	U		15	U		14	Ui		11	U		14	U	
Aroclor-1248	–	–	15	U		10	U		10	U		15	U		15	U		14	U		11	U		14	U	
Aroclor-1254	–	–	15	Ui		10	U		10	U		11	T		15	U		14	Ui		11	U		14	U	
Aroclor-1260	–	–	15	U		10	U		10	U		15	U		15	U		14	U		11	U		14	U	
Total PCBs*			30	U		20	U		20	U		11	T		30	U		27	Ui		22	U		27	U	

U Undetected
T Estimated concentration less than the MRL but greater than th MDL
D Reported concentration is from a dilution
B The analyze was found in the associated method blank at a level that is
J The result is an estimated concentration that is less than the MRL but gr
i The MRL/MDL is elevated due to a matrix or chromatographic interfere

Appendix C. Woodard Bay Core Sediment Chemistry Data - Dry Weight Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-43-C0-1 2/25/08	LQ	VQ	WB-44-C0-1 2/25/08	LQ	VQ	WB-44-C1-3 2/25/08	LQ	VQ	WB-18-R 2/25/08	LQ	VQ	WB-18-RB 2/25/08	LQ	VQ
Conventionals																	
Total Organic Carbon (% DW)	–	–	0.67			6.42			2.2								
TVS (%)			2.33			8.19			3.56								
Total Solids (% WW)	–	–	73.1			58.2			76.6								
Ammonia (mg-N/kg DW)	–	–	6.5			11.6			6.7								
Total Sulfides (mg/kg DW)	–	–	169			254			11.4								
Grain Size																	
Gravel			4.19			13.1			2.31								
Sand, Very Coarse			2.37			5.38			1.27								
Sand, Coarse			3.54			3.32			5.04								
Sand, Medium			25.6			17.6			24.9								
Sand, Fine			30.2			29.8			40.7								
Sand, Very Fine			16.6			9.83			10.1								
Silt			12.6			14.5			9.6								
Clay			2.72			5.19			3.83								
Metals in mg/kg DW																	
Arsenic	57	93	3.65			3.27			2.73			0.5	U		0.5	U	
Cadmium	5.1	6.7	0.388			0.423			0.338			0.02	U		0.02	U	
Chromium	260	270	17.2			10.7			14			0.22			0.26		
Copper	390	390	7.91			7.43			6.71			0.13			0.04	B	
Lead	450	530	2.98			3.11			2.19			0.025	B		0.05	U	
Mercury	0.41	0.59	0.026			0.046			0.021			0.2	U		0.2	U	
Silver	6.1	6.1	0.05			0.05			0.03			0.151			0.063		
Zinc	410	960	24.1			18.6			18.5			1.6			0.5		
LPAH in ug/kg DW																	
Naphthalene			9.8	U		10	U		9.9	U		0.2	U		0.036	T	
Acenaphthylene			9.8	U		3.3	T		9.9	U		0.2	U		0.2	U	
Acenaphthene			9.8	U		10	U		9.9	U		0.2	U		0.2	U	
Fluorene			9.8	U		10	U		9.9	U		0.2	U		0.2	U	
Phenanthrene			3.1	T		17			2.3	T		0.2	U		0.2	U	
Anthracene			9.8	U		4.7	T		9.9	U		0.2	U		0.2	U	
2-Methylnaphthalene			9.8	U		10	U		9.9	U		0.2	U		0.2	U	
Total LPAH*			3.1	T		25	T		2.3	T		0.2	U		0.036	T	
HPAH in ug/kg DW																	
Fluoranthene			7.5	T		30			4.1	T		0.2	U		0.2	U	
Pyrene			7.4	T		33			4.8	T		0.2	U		0.2	U	
Benzo(a)anthracene			2.9	T		9.8	T		9.9	U		0.2	U		0.2	U	
Chrysene			6.3	T		18			2.7	T		0.2	U		0.2	U	
Benzofluoranthenes*			6.6	T		22.1	T		9.9	U		0.2	U		0.2	U	
Benzo(a)pyrene			3.1	T		9.8	T		9.9	U		0.2	U		0.2	U	
Indeno(1,2,3-cd)pyrene			2.5	T		6.1	T		9.9	U		0.2	U		0.2	U	
Dibenz(a,h)anthracene			9.8	U		10	U		9.9	U		0.2	U		0.2	U	
Benzo(g,h,i)perylene			2.5	T		6.2	T		9.9	U		0.2	U		0.2	U	
Total HPAH*			38.8	T		135	T		11.6	T		0.2	U		0.2	U	

Appendix C. Woodard Bay Core Sediment Chemistry Data - Dry Weight Concentrations

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-43-C0-1 2/25/08 LQ VQ	WB-44-C0-1 2/25/08 LQ VQ	WB-44-C1-3 2/25/08 LQ VQ	WB-18-R 2/25/08 LQ VQ	WB-18-RB 2/25/08 LQ VQ
Chlorinated Aromatics in ug/kg DW							
1,4-Dichlorobenzene			9.8 U	10 U	9.9 U	0.2 U	0.2 U
1,2-Dichlorobenzene			9.8 U	10 U	9.9 U	0.2 U	0.2 U
1,2,4-Trichlorobenzene			9.8 U	10 U	9.9 U	0.2 U	0.2 U
Hexachlorobenzene			0.99 Ui	10 U	1 U	0.2 U	0.2 U
Phthalate Esters in ug/kg DW							
Dimethylphthalate			9.8 U	10 U	9.9 U	0.2 U	0.2 U
Diethylphthalate			9.8 U	1.9 T	1.3 T	0.019 T	0.2 U
Di-n-Butylphthalate			20 U	20 U	20 U	0.053 T	0.053 T
Butylbenzylphthalate			9.8 U	10 U	9.9 U	0.2 U	0.2 U
bis(2-Ethylhexyl)phthalate			98 U	100 U	99 U	0.96 U	0.96 U
Di-n-Octylphthalate			9.8 U	10 U	9.9 U	0.2 U	0.2 U
Ionizable Organic Compounds in ug/kg DW							
Phenol (8270SIM)	420	1200	71	150	45		
Phenol (8270)	420	1200	30 U	30 U	30 U	0.48 U	0.48 U
2-Methylphenol	63	63	20 U	20 U	20 U	0.48 U	0.48 U
4-Methylphenol	670	670	9.8 U	10 U	9.9 U	0.48 U	0.48 U
2,4-Dimethylphenol	29	29	49 U	50 U	50 U	3.9 U	3.9 U
Pentachlorophenol	360	690	6.8 U	8.6 U	0.8 J	0.96 U	0.96 U
Benzyl Alcohol	57	73	20 U	20 U	20 U	0.1 T	0.11 T
Benzoic Acid	650	650	200 U	200 U	200 U	4.8 U	4.8 U
Miscellaneous Extractables in ug/kg DW							
Dibenzofuran			9.8 U	10 U	9.9 U	0.2 U	0.2 U
Hexachlorobutadiene			9.8 U	10 U	9.9 U	0.2 U	0.2 U
N-Nitrosodiphenylamine			9.8 U	10 U	9.9 U	0.2 U	0.2 U
PCBs in ug/kg DW							
Aroclor-1016	–	–	10 U	10 U	10 U	0.2 U	0.2 U
Aroclor-1221	–	–	20 U	20 U	20 U	0.39 U	0.4 U
Aroclor-1232	–	–	10 U	10 U	10 U	0.2 U	0.2 U
Aroclor-1242	–	–	10 U	10 U	10 U	0.2 U	0.2 U
Aroclor-1248	–	–	10 U	10 U	10 U	0.2 U	0.2 U
Aroclor-1254	–	–	10 U	10 U	10 U	0.2 U	0.2 U
Aroclor-1260	–	–	10 U	10 U	10 U	0.2 U	0.2 U
Total PCBs*			20 U	20 U	20 U	0.39 U	0.4 U

U Undetected
T Estimated concentration less than the MRL but greater than th MDL
D Reported concentration is from a dilution
B The analyze was found in the associated method blank at a level that is
J The result is an estimated concentration that is less than the MRL but gr
i The MRL/MDL is elevated due to a matrix or chromatographic interfere

APPENDIX D: CHEMICAL DATA REPORT

WOODARD BAY SEDIMENT CHARACTERIZATION
HENDERSON INLET, OLYMPIA, WASHINGTON

CHEMICAL DATA FINAL REPORT

JULY 7, 2008

Prepared for:

U.S. Army Corps of Engineers, Seattle District
4735 East Marginal Way South
Seattle, Washington 98134

Prepared by:

Science Applications International Corporation
Environmental Sciences Division
18912 North Creek Parkway, Suite 101
Bothell, Washington 98011

1.0 Introduction

The Purpose of the Chemical Data Final Report (CDFR) is to provide a data quality assessment of the completeness, reliability, and usability of the sediment chemistry data collected as part of the 2008 Woodard Bay Aquatic Restoration Project Area (Project Area) monitoring event. This section briefly describes the project background, study design, data collection methods, and provides a summary of the QA/QC issues related to the project.

1.1 Project Background

The Project Area is located in Henderson Inlet in the Thurston County, WA, portion of south Puget Sound, which includes the Woodard Bay Natural Resources Conservation Area (NRCA). The NRCA was designated by the legislature for its unique wildlife and habitat features including the largest maternity bat roost in Washington State, an important haul-out area for harbor seals, and nesting and breeding areas for waterfowl. The Project Area and vicinity support one of the largest intact, undeveloped, protected shoreline areas in southern Puget Sound.

The site was operated as the Weyerhaeuser South Bay Log Dump, whose activities included extensive log rafting for storage prior to transport to lumber mills. Operations occurred from 1928 to 1985. Sediment dredging occurred along the west side of the Chapman Bay Pier approximately every 2 years from 1930 to 1980 to maintain water depths. Dredged material was placed in open water or along a railroad sidetrack located approximately one half mile south of the main facility (Anchor 2005). In 1988, DNR purchased the uplands, tidelands, and all improvement south of the former South Bay Log Dump. Prior to the ownership transfer, Weyerhaeuser removed the Bunker "C" oil tank and a bridge over the railroad. Additional structures removed included a three-car garage, bunkhouse, and 8,000-gallon wooden water tank (Hart Crowser 2007).

In 1989, Hart Crowser was contracted by Weyerhaeuser to perform an environmental assessment to complete the sale of the property. The assessment, which was mostly based on upland conditions, concluded that there was "limited potential for contamination in the sediment, soil, and groundwater of the site." The limited investigation identified the primary sources of contamination as petroleum products from spills associated with upland fuel oil tanks and on-site dredge spoils dumping (Hart Crowser 1989). However, data quality does not meet current analytical procedure guidelines (Ecology 2003) and no information was gathered regarding the presence of wood debris in aquatic sediments.

1.2 Study Design

The focus of the 2008 monitoring event was to complete a preliminary characterization of wood debris accumulation from the log dump activities and evaluate whether existing submerged wood debris and possible contamination from in-water log dump structures are impacting sediment quality at the site.

The 2008 monitoring event included the collection of 19 surface (0 to 30 cm) sediment samples and 10 subsurface cores from within Woodard Bay. The surface sediment samples were submitted for chemical and conventional analyses. The chemistry results were compared to SMS SQS criteria to determine whether the sediments exceed compliance levels.

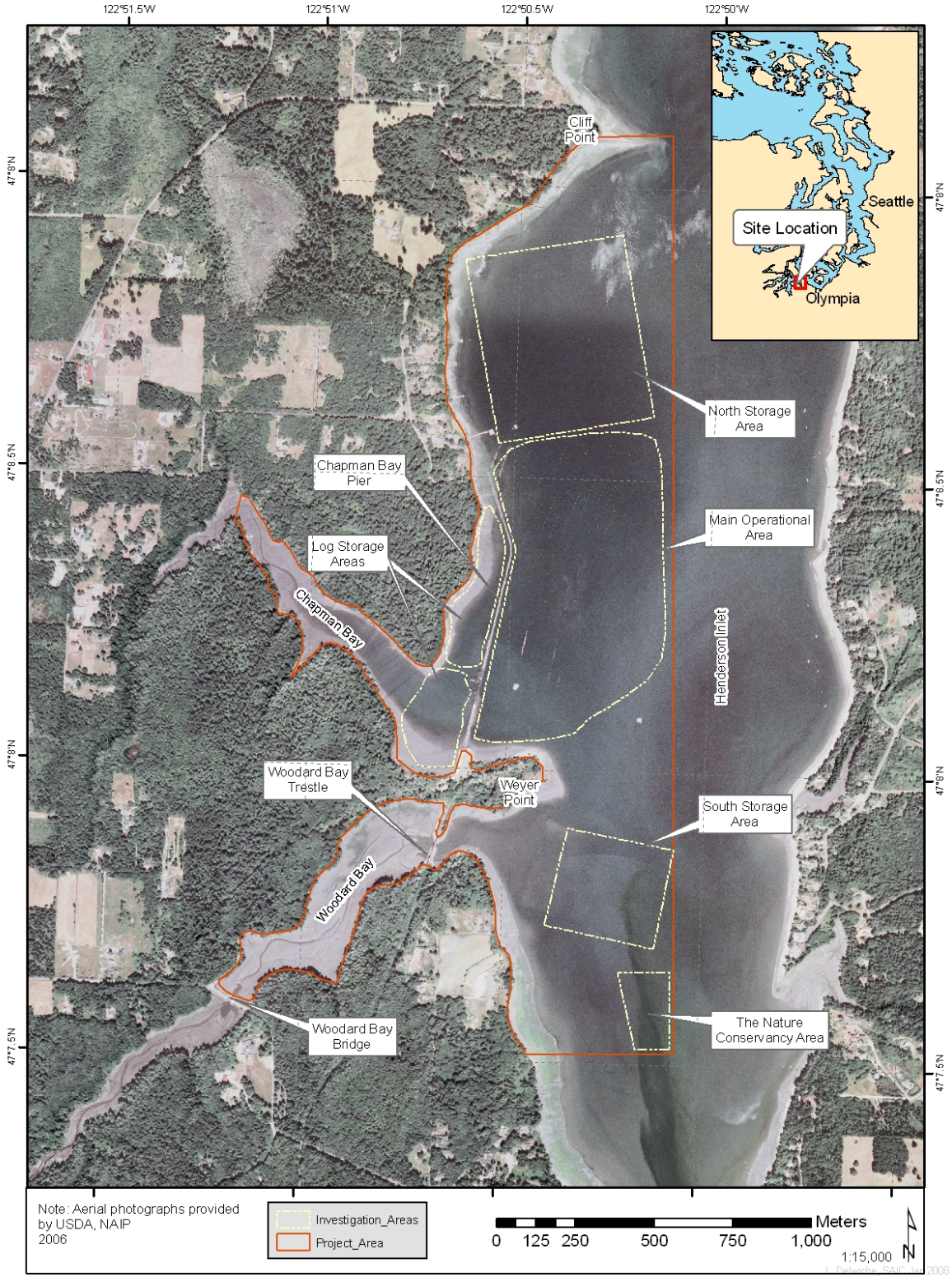


Figure 1. Woodard Bay Aquatic Restoration Project Area (Source data for map from Hart Crowser 2007)

1.3 Data Collection Methods

Field sampling was conducted in accordance with the Woodard Bay Sediment Characterization SAP/QAPP (SAIC 2008). Surface sediment samples were collected using a 0.25 m^2 hydraulic van Veen grab sampler. A single composite sample per monitoring location was collected for all chemical analyses. After an acceptable grab sample was logged and excess water siphoned off, the contents were placed in a pre-cleaned stainless-steel pan. Sediment coming in direct contact with the sampler was avoided for inclusion in the sample. The pan was covered with foil until sufficient volume of material was collected. Once a sufficient volume of sediment was collected, the sample was homogenized until a consistent color and texture was achieved.

Sediment cores were collected by advancing a vibracorer 7 feet below the sediment surface. For each core, the top 1-foot interval was composited. Thereafter, the core was composited in 2-foot intervals (i.e., 1 to 3 feet, 3 to 5 feet, and 5 to 7 feet).

Aliquots of the homogenized sediment were placed in the appropriate pre-cleaned containers obtained from the chemical laboratories. Each sample was clearly labeled with the project name, sample identification, type of analysis to be performed, date and time, initials of the person preparing the sample, and referenced by entry into the chain-of-custody form and container logbook. Samples were hand-couriered or shipped via overnight delivery.

Chemical analysis of 14 of 19 grab, surface intervals (0 to 1 ft) from all 10 sediment cores, and the 1 to 3 foot interval for 8 of the 10 sediment cores included the SMS analyte list and sediment conventionals.

1.4 Summary of QA/QC Project Issues

All of the chemical analytical procedures used in this program were performed in accordance with PSEP guidelines (PSEP 1997a,b,c,d), SMS Protocols (Ecology 2003), and modifications proposed during the Sediment Management Annual Review Meetings except where noted below. Chemical analyses were conducted by CAS, Kelso, WA. Due to matrix interference problems for some samples, the analytical laboratory could not meet the TDLs for some compounds, particularly hexachlorobenzene and both methylated and chlorinated phenol compounds. This resulted in sample detection limits (DLs) exceeding the SMS criteria in some instances. To compensate for the elevated DLs, the analytical laboratory conducted additional analyses using detector systems that were more sensitive to the specific classes of target compounds. Hexachlorobenzene was analyzed by U.S. EPA method 8081, chlorinated phenols were analyzed using U.S. EPA method 8151M, and phenol and methylated phenols were analyzed using U.S. EPA method 8270SIM.

The additional analyses resulted in lower DLs for these compounds. However, for a few samples, the DLs for 1,2–dichlorobenzene, 1,2,4-trichlorobenzene, and 2,4-dimethylphenol still exceeded the SMS criteria. In addition, the DLs for benzyl alcohol and benzoic acid exceeded SMS criteria for five samples. Additional analyses could not be conducted for benzyl alcohol and benzoic acid to improve the elevated DLs reported using U.S. EPA method 8270. The laboratory for this study (CAS) did not have an approved selective ion monitoring (SIM) method for benzyl alcohol and benzoic acid, as the toxicity levels are relatively high for these compounds, and a SIM method is normally not necessary.

The reanalysis also resulted in the reporting of higher concentrations of phenol for some samples, including five samples that exceeded SQS or CSL numerical criteria. The original

phenol concentrations reported using U.S. EPA method 8270 were below the SQS criteria. The reason for the variability in phenol concentrations between U.S. EPA methods 8270 and 8270SIM is unclear. The laboratory reported that it is not uncommon to see a difference of 30 to 40 percent between two analyses of the same sample due to sample heterogeneity. Phenols tend to associate with oils and tars and may not be distributed evenly in the sediment. U.S. EPA method 8270SIM uses a smaller amount of sample for extraction than U.S. EPA method 8270. Phenols also tend to extract poorly using both methods, and some of the chemical can be lost during extraction (Personal Communication, H. Jacky 2008).

2.0 Data QA/QC Parameters

The quality assurance/quality control (QA/QC) limits for the chemistry data reported by the laboratory were measured through precision, accuracy, representativeness, completeness, and comparability (PARCC).

2.1 Precision

Precision is a measure of mutual agreement among individual measurements of the same property under prescribed conditions. Precision was assessed by the analysis of duplicate matrix spikes performed on select project samples to determine the reproducibility of the measurements. Conventional parameter determinations were evaluated by the analysis of triplicate analyses. Semivolatile precision was evaluated by the analysis of matrix spike/matrix spike duplicates (MS/MSDs) performed on specific project samples.

2.2 Accuracy

Accuracy is the degree of agreement of a measurement (or an average of multiple measurements) with an accepted reference or true value, usually expressed as the difference between the two values (measured-true), the difference as a percentage of the true value, or as a ratio. Accuracy is a measure of the bias in the system and is expressed as the percent recovery of spiked (matrix or surrogate spike) samples. Laboratory control samples were analyzed with each batch of samples as a further assessment of analytical accuracy in the absence of matrix effects.

2.3 Representativeness

Representativeness expresses the degree to which data accurately and precisely represent an actual condition or characteristic at a particular sampling point. Representativeness is achieved by collecting samples representative of the matrix at the time of collection. Representativeness can be evaluated using replicate samples, additional sampling locations, and blanks.

2.4 Completeness

Completeness refers to the amount of measurement data collected relative to that needed to assess the project's technical objectives. Completeness was determined in accordance with the requirements established in the statement of work for this monitoring event (SAIC 2008). The contract specification required the calculation of acceptable sample results to all sample results. This did not account for estimated results that may still be usable for project decision making. Thus, in the revised TERC document, four calculations of completeness were requested.

$$Contract\_completeness = \left(\frac{\#contract\_compliant\_results}{\#results\_reported} \right) * 100$$

$$Analytical\_completeness = \left(\frac{\#unqualified\_results}{\#results\_reported} \right) * 100$$

$$Technical\_completeness = \left(\frac{\#usable\_results}{\#results\_reported} \right) * 100$$

$$Field\_sampling\_completeness = \left(\frac{\#samples\_collected}{\#results\_reported} \right) * 100$$

2.5 Comparability

Comparability is based on the use of established PSEP and Environmental Protection Agency (EPA)–approved methods for the analysis of the selected parameters. The quantification of the analytical parameters is based on published methods, supplemented with well-documented procedures used in the laboratory to ensure reproducibility of the data.

2.6 Field QA/QC Samples

Field QA/QC samples were collected during sampling to quantitatively measure and ensure the quality of the sampling effort and the analytical data. Field QA/QC samples included field replicates, equipment rinseate, and rinseate blanks. QA/QC samples were handled in the same manner as the environmental samples collected. Field duplicates were collected at the same time as the original sample using identical sampling techniques. Field duplicate sample results are used to assess the precision of the sample collection process and to help determine the representativeness of the sample. The equipment rinseate blank and rinseate blank provide a quality control check on the potential for cross contamination by measuring the effectiveness of the sampling and processing decontamination procedures.

2.7 Laboratory QA/QC Samples

One laboratory MS and MSD were analyzed for each analytical batch of samples for the analysis of metals, semi-volatile organic compounds (SVOCs), and total PCBs. One laboratory replicate was analyzed for all constituents (except grain size, total organic carbon [TOC], and total solids) for each analytical batch of samples. One laboratory method blank was analyzed for all constituents (except grain size and total solids) for each analytical batch of samples to assess potential laboratory contamination. Laboratory control samples, certified reference material, and surrogate spikes were used as defined by the analytical methods and equipment calibration requirements. These QA/QC samples were analyzed in accordance with the respective EPA method and will be used to evaluate the precision of the analytical method.

3.0 Analytical Results

Chemical analyses were conducted by Columbia Analytical Services (CAS) of Kelso, WA. SVOCs and PCBs were analyzed using methods 8270 and 8082, respectively. Mercury was analyzed using method 7471 and all other metals using method 6020. Sediment conventionals, including grain size, TOC, ammonia, total sulfides, total solids, and total volatile solids were analyzed using methods PSEP, ASTM D4129-82M, SM 4500, 9030B, Plumb, PSEP, and PSEP, respectively. The specific chemical analytes and conventional parameters measured, analytical methods, and target detection limits (TDLs) are provided in Table 1 and are discussed in the Quality Assurance Project Plan (QAPP) (SAIC 2008). The TDLs listed were subject to modification due to elevated sample concentrations, heterogeneous samples (sediment), and potential matrix interferences that may have precluded obtaining the desired quantification limit.

Surface sediment samples from the 12 monitoring locations, as well as 18 sediment core samples were submitted for chemical analysis. Field replicates for QA/QC purposes were collected with the surface sediment samples. Table 2 provides the sediment conventional parameter results. Table 3 provides the chemistry data results, with associated data qualifiers and comparison to Washington State SMS criteria.

4.0 Chemical Data Quality Assessment

This section provides the data quality assessment of the sediment conventional parameters and chemistry results. Samples were tracked following the chain-of-custody procedures described in the SAP/QAPP (SAIC 2008). All analytical results were reported in the proper format. Various problems or analytical difficulties the laboratories experienced are discussed in the following sections, as applicable.

4.1 Precision

The following sections (4.1.1 through 4.1.4) describe the precision results by analytical group and comparison to QA/QC objectives provided in Table 1. Precision is evaluated through the relative percent difference (RPD) between duplicate samples and relative standard deviation (RSD) between triplicate samples. Both field and analytical replicates are typically used in evaluating precision.

Table 1. Sediment Chemistry Analytical Methods, Target Detection Limits, and QA/QC Objectives

Analyte	Method	TDL	Precision	Accuracy	Completeness
Conventional Parameters					
Total Solids	PSEP	0.1	20%	75-125%	95%
Total Volatile Solids	PSEP	0.1	20%	N/A	95%
Total Organic Carbon	ASTM D4129-82M	0.1	20%	N/A	95%
Total Sulfides	9030B	1	20%	75-125%	95%
Ammonia	SM 4500	1	20%	75-125%	95%
Grain Size	PSEP	---	20%	N/A	95%
Metals		**mg/kg**			
Arsenic	6010B/6020	19	20%	75-125%	95%
Cadmium	6010B/6020	1.7	20%	75-125%	95%
Chromium	6010B/6020	87	20%	75-125%	95%
Copper	6010B/6020	130	20%	75-125%	95%
Lead	6010B/6020	150	20%	75-125%	95%
Mercury	7471A /245.5	0.14	20%	75-125%	95%
Silver	6010B/6020	2	20%	75-125%	95%
Zinc	6010B/6020	137	20%	75-125%	95%
PAHs		**µg/kg**			
Naphthalene	8270C/1625C	20	35%	50-150%	95%
Acenaphthylene	8270C/1625C	20	35%	50-150%	95%
Acenaphthene	8270C/1625C	20	35%	50-150%	95%
Fluorene	8270C/1625C	20	35%	50-150%	95%
Phenanthrene	8270C/1625C	20	35%	50-150%	95%
Anthracene	8270C/1625C	20	35%	50-150%	95%
2-Methylnaphthalene	8270C/1625C	20	35%	50-150%	95%
Fluoranthene	8270C/1625C	20	35%	50-150%	95%
Pyrene	8270C/1625C	20	35%	50-150%	95%
Benzo(a)anthracene	8270C/1625C	20	35%	50-150%	95%
Chrysene	8270C/1625C	20	35%	50-150%	95%
Benzofluoranthenes	8270C/1625C	20	35%	50-150%	95%
Benzo(a)pyrene	8270C/1625C	20	35%	50-150%	95%
Indeno(1,2,3-c,d)pyrene	8270C/1625C	20	35%	50-150%	95%
Dibenzo(a,h)anthracene	8270C/1625C	20	35%	50-150%	95%
Benzo(g,h,i)perylene	8270C/1625C	20	35%	50-150%	95%

Table 1. Sediment Chemistry Analytical Methods, Target Detection Limits, and QA/QC Objectives (continued)

Analyte	Method	TDL	Precision	Accuracy	Completeness
Chlorinated Benzenes		**µg/kg**			
1,2-Dichlorobenzene	8270C/1625C	3.2	35%	50-150%	95%
1,4-Dichlorobenzene	8270C/1625C	3.2	35%	50-150%	95%
1,2,4-Trichlorobenzene	8270C/1625C	6	35%	50-150%	95%
Hexachlorobenzene	SW8081A	12	35%	50-150%	95%
Phthalate Esters		**µg/kg**			
Dimethyl phthalate	8270C/1625C	20	35%	50-150%	95%
Diethyl phthalate	8270C/1625C	20	35%	50-150%	95%
Di-n-butyl phthalate	8270C/1625C	20	35%	50-150%	95%
Butyl benzyl phthalate	8270C/1625C	20	35%	50-150%	95%
Bis(2-ethylhexyl)phthalate	8270C/1625C	20	35%	50-150%	95%
Di-n-octyl phthalate	8270C/1625C	20	35%	50-150%	95%
Ionizable Organic Compounds		**µg/kg**			
Phenol	8270SIM	20	35%	50-150%	95%
2-Methylphenol	8270C/1625C	6	35%	50-150%	95%
4-Methylphenol	8270SIM	20	35%	50-150%	95%
2,4-Dimethylphenol	8270SIM	6	35%	50-150%	95%
Pentachlorophenol	SW8151M	61	35%	50-150%	95%
Benzyl alcohol	8270C/1625C	6	35%	50-150%	95%
Benzoic acid	8270C/1625C	100	35%	50-150%	95%
Miscellaneous Compounds		**µg/kg**			
Dibenzofuran	8270C/1625C	20	35%	50-150%	95%
Hexachlorobutadiene	8270C/1625C	20	35%	50-150%	95%
N-Nitrosodiphenylamine	8270C/1625C	12	35%	50-150%	95%
Total PCBs	8082	6	35%	50-150%	95%

Notes:

TDL Target Detection Limits
SMS Sediment Management Standards
SQS Sediment Quality Standards
CSL Cleanup Screening Levels
TOC Total Organic Carbon
N/A Not Applicable

Table 2. Summary of Sediment Conventional Parameter Results

Station Number Collection Date	WB-03-S 2/27/08	WB-06-S 2/26/08	WB-09-S 2/26/08	WB-12-S 2/26/08	WB-16-S 2/26/08	WB-17-S 2/26/08	WB-21-S 2/26/08	WB-22-S 2/26/08	WB-26-S 2/26/08	WB-30-S 2/27/08	WB-35-S 2/26/08	WB-36-S 2/27/08
Conventionals												
Total Organic Carbon (% DW)	2.1	5.19	2.75	2.63	2.56	1.09	3.96	0.38	1.58	9.14	8	2.97
TVS (%DW)	6.62	12.2	9.03	9.28	8.45	2.97	11.8	1.6	4.56	8.88	18.4	9.72
Total Solids (% WW)	57.2	46.1	35.1	34.6	36.3	69.3	35.4	75.6	66.4	49.2	39.9	34.9
Ammonia (mg-N/kg DW)	9.1	11.7	16.6	19.9	16	4.1	16.9	4.2	8.5	46.2	26.8	22.5
Total Sulfides (mg/kg DW)	283	336	6.8	4.1	1.13	16.3	176	17	34.5	210	16.8	346
Grain Size Fraction												
Gravel	1.8	7.9	3.0	4.5	1.3	1.7	0.1	0.2	0.0	45.2	0.2	11.9
Sand, Very Coarse	1.5	4.7	3.1	2.0	2.2	1.3	4.8	0.4	0.8	16.9	2.3	2.7
Sand, Coarse	2.3	3.8	1.2	1.2	1.1	4.0	6.2	2.0	2.4	7.6	3.9	2.0
Sand, Medium	15.4	7.5	1.2	1.3	1.0	16.7	4.7	24.7	14.3	5.2	6.6	1.8
Sand, Fine	31.3	12.5	1.7	1.2	1.2	41.0	4.0	48.6	31.6	4.1	10.6	2.0
Sand, Very Fine	13.5	9.9	3.5	2.0	2.8	25.5	4.1	15.5	21.2	1.9	14.0	2.5
Silt	20.4	39.2	62.3	62.5	65.3	8.2	48.8	7.7	19.4	11.9	41.4	53.7
Clay	10.9	15.8	25.3	30.0	24.5	2.9	28.1	3.0	7.6	9.2	17.0	22.4

Table 2. Summary of Sediment Conventional Parameter Results (continued)

Station Number Collection Date	WB-37-S 2/26/08	WB-42-S 2/27/08	WB-03-D 2/27/08	WB-16-D 2/26/08	WB-04-C0-1 2/25/08	WB-04-C1-3 2/25/08	WB-08-C0-1 2/25/08	WB-08-C1-3 2/25/08	WB-13-C0-1 2/25/08	WB-13-C1-3 2/25/08	WB-18-C0-1 2/25/08
Conventionals											
Total Organic Carbon (% DW)	2	1.37	1.43	2.56	1.61	1.28	6	7.05	1.55	0.84	8.04
TVS (%DW)	5.44	3.86	6.1	8.59	4.21	3.17	18.1	23.1	5.32	2.7	18.1
Total Solids (% WW)	61.1	65.6	58.2	36.4	61.9	73.7	37.5	40.5	61.7	78.5	33.3
Ammonia (mg-N/kg DW)	7.7	16.4	7.6	21	13.2	25.2	47.4	62	5.7	2.5	43.6
Total Sulfides (mg/kg DW)	0.7	0.8	267	0.99	136	23	365	435	88.6	1.01	699
Grain Size Fraction											
Gravel	0.0	24.0	2.9	0.2	5.13	4.82	24	12.8	7.03	26.1	17.6
Sand, Very Coarse	0.3	10.3	1.9	0.8	3.53	3.39	6.86	4.86	4.27	5.14	10.7
Sand, Coarse	0.5	17.0	2.6	2.7	6.22	6.26	2.35	3.05	7.07	11.54	5.7
Sand, Medium	1.3	29.9	14.6	1.3	30.1	21.7	2.06	4.98	25	20.3	6.28
Sand, Fine	13.2	24.7	32.7	1.3	22.4	30.6	1.53	8.16	18.3	18.7	4.33
Sand, Very Fine	30.9	4.7	12.7	4.0	3.42	6.09	1.02	4.2	6.07	6.53	2.51
Silt	41.4	4.4	18.9	62.4	17.7	17.6	41.1	42.6	21.9	10.1	39
Clay	10.3	2.8	10.3	23.4	7.66	8.15	16.4	20.3	10.5	2.22	16.3

Table 2. Summary of Sediment Conventional Parameter Results (continued)

Station Number Collection Date	WB-18-C1-3 2/25/08	WB-20-C0-1 2/25/08	WB-20-C1-3 2/25/08	WB-28-C0-1 2/25/08	WB-31-C0-1 2/25/08	WB-31-C1-3 2/25/08	WB-38-C0-1 2/25/08	WB-38-C1-3 2/25/08	WB-43-C0-1 2/25/08	WB-44-C0-1 2/25/08	WB-44-C1-3 2/25/08
Conventionals											
Total Organic Carbon (% DW)	16.8	5.06	0.37	11.7	14.4	13.9	12.1	20.5	0.67	6.42	2.2
TVS (%DW)	28.9	10.7	3.59	29.3	33.5	29.8	28.1	43.5	2.33	8.19	3.56
Total Solids (% WW)	33.6	54.1	72	34.2	34	37	45.4	37.3	73.1	58.2	76.6
Ammonia (mg-N/kg DW)	40.5	8.2	9.5	33.3	33.5	45.6	41.6	47.1	6.5	11.6	6.7
Total Sulfides (mg/kg DW)	729	203	16	458	463	402	103	75.3	169	254	11.4
Fraction											
Gravel	21	5.56	4.99	13.01	12.9	14.7	22.3	18.6	4.19	13.1	2.31
Sand, Very Coarse	8.25	2.59	1.56	6.53	6.64	4.62	9.77	14.1	2.37	5.38	1.27
Sand, Coarse	5.32	2.51	1.99	5.52	5.03	3.74	6.99	9.99	3.54	3.32	5.04
Sand, Medium	7.6	10.6	6.9	5.65	8.37	4.04	11.4	10.4	25.6	17.6	24.9
Sand, Fine	10.8	32.6	28.7	6.58	8.97	5.52	11.7	11.6	30.2	29.8	40.7
Sand, Very Fine	2.07	18.4	25.1	6.33	7.5	6.14	9.03	5.87	16.6	9.83	10.1
Silt	25.9	15.8	19.3	36.22	33.7	39.4	22.8	20.7	12.6	14.5	9.6
Clay	14.6	7.76	7.15	17.53	16.1	17.5	8.33	9.93	2.72	5.19	3.83

Table 3. Summary of Sediment Chemistry Results

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-03-S 2/27/08	Q	WB-06-S 2/26/08	Q	WB-09-S 2/26/08	Q	WB-12-S 2/26/08	Q	WB-16-S 2/26/08	Q	WB-17-S 2/26/08	Q	WB-21-S 2/26/08	Q	WB-22-S 2/26/08	Q
Metals in mg/kg DW																		
Arsenic	57	93	4.44		6.08		9.11		9.42		9.54		4.05		10.9		2.17	
Cadmium	5.1	6.7	0.806		0.798		0.794		0.805		0.799		0.453		1.3		0.165	
Chromium	260	270	17.6		23.1		32.1		33		34.1		12		33.5		9.55	
Copper	390	390	12.2		21.4		34.2		35.6		36		6.29		36.5		5.09	
Lead	450	530	8.6		9.97		18.8		19.9		21.3		2.56		19.5		2.16	
Mercury	0.41	0.59	0.053		0.077		0.122		0.116		0.108		0.034		0.127		0.021	
Silver	6.1	6.1	0.09		0.15		0.24		0.26		0.23		0.04		0.28		0.03	
Zinc	410	960	28.1		59.2		70.3		73.9		74.1		20.2		76.4		15.8	
LPAH in mg/kg TOC																		
Naphthalene	99	170	0.5	U	2.1	U	0.3	T	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Acenaphthylene	66	66	0.5	U	2.1	U	0.1	T	0.6	U	0.1	T	0.5	T	0.1	T	2.6	U
Acenaphthene	16	57	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.3	T	0.4	U	2.6	U
Fluorene	23	79	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.4	T	0.1	T	2.6	U
Phenanthrene	100	480	0.2	T	1.5	TD	0.2	T	0.2	T	0.4	T	3.2		0.3	T	0.5	T
Anthracene	220	1200	0.2	T	2.1	U	0.1	T	0.1	T	0.1	T	1.7		0.3	T	2.6	U
2-Methylnaphthalene	38	64	0.5	U	2.1	U	0.2	T	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Total LPAH[2]	370	780	0.3	T	1.5	TD	0.9	T	0.4	T	0.6	T	6.1	T	0.8	T	0.5	T
HPAH in mg/kg TOC																		
Fluoranthene	160	1200	0.6		3.7	D	0.6		0.5	T	0.9		10.1		1.2		2.5	T
Pyrene	1000	1400	0.7		3.1	D	0.6		0.6		0.8		13.8		1.5		2.0	T
Benzo(a)anthracene	110	270	0.2	T	0.7	TD	0.2	T	0.3	T	0.3	T	3.7		0.6		0.8	T
Chrysene	110	460	0.5		1.1	TD	0.5	T	0.6		0.5		8.3		1.5		1.3	T
Benzofluoranthenes*	230	450	0.6	T	1.3	TD	0.6	T	0.6	T	0.7	T	10.2		1.6		1.8	T
Benzo(a)pyrene	99	210	0.5	U	0.4	TD	0.2	T	0.3	T	0.2	T	3.4		0.5		0.6	T
Indeno(1,2,3-cd)pyrene	34	88	0.5	U	2.1	U	0.2	T	0.2	T	0.2	T	2.3		0.4		2.6	U
Dibenz(a,h)anthracene	12	33	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Benzo(g,h,i)perylene	31	78	0.2	T	2.1	U	0.2	T	0.2	T	0.2	T	1.7		0.4	T	2.6	U
Total HPAH[3]	960	5300	3.5	T	11.5	TD	3.8	T	4.1	T	4.4	T	63.6		9.3	T	10.8	T
Chlorinated Aromatics in mg/kg TOC																		
1,4-Dichlorobenzene	3.1	9	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
1,2-Dichlorobenzene	2.3	2.3	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
1,2,4-Trichlorobenzene	0.81	1.8	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Hexachlorobenzene	0.38	2.3	0.0	U	0.0	U	0.0	U	0.0	U	0.0	U	0.0	U	0.0	U	0.3	U

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-26-S 2/26/08	Q	WB-30-S 2/27/08	Q	WB-35-S 2/26/08	Q	WB-36-S 2/27/08	Q	WB-37-S 2/26/08	Q	WB-42-S 2/27/08	Q	WB-03-D[1] 2/27/08	Q	WB-16-D[1] 2/26/08	Q
Metals in mg/kg DW																		
Arsenic	57	93	4.71		3.79		10.3		8.62		5.19		2.58		4.67		9.17	
Cadmium	5.1	6.7	0.866		1.12		2.16		1.48		1.37		0.352		0.936		0.814	
Chromium	260	270	12.2		10.2		23.6		35.8		15.4		11.4		18.7		33.2	
Copper	390	390	10.1		13		27.9		33.3		15.1		6.84		13.3		35.4	
Lead	450	530	4.06		10.7		10.4		21.6		5.76		6.97		10		20.6	
Mercury	0.41	0.59	0.049		0.029		0.107		0.096		0.054		0.01	B	0.054		0.118	
Silver	6.1	6.1	0.08		0.07		0.2		0.24		0.1		0.03		0.09		0.25	
Zinc	410	960	27.1		24.9		65.3		68.2		38.6		20.2		30.9		72.7	
LPAH in mg/kg TOC																		
Naphthalene	99	170	0.6	U	0.4	U	0.3	U	0.5	U	0.1	T	0.7	U	1.4	U	0.5	U
Acenaphthylene	66	66	0.1	T	0.5	D	0.1	TD	0.1	T	0.1	T	0.9		1.4	U	0.1	T
Acenaphthene	16	57	0.6	U	0.3	TD	0.3	U	0.5	U	0.5	U	0.3	T	1.4	U	0.5	U
Fluorene	23	79	0.6	U	0.5	D	0.1	TD	0.1	T	0.5	T	0.4	T	1.4	U	0.5	U
Phenanthrene	100	480	0.3	T	3.7	D	0.3	TD	0.4	T	1.7		10.9		0.3	TD	0.2	T
Anthracene	220	1200	0.3	T	1.6	D	0.3	D	0.2	T	1.5		1.5		0.2	TD	0.1	T
2-Methylnaphthalene	38	64	0.6	U	0.2	TD	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
Total LPAH[2]	370	780	0.6	T	6.8	TD	0.8	TD	0.8	T	3.8	T	14.1	T	0.5	TD	0.4	T
HPAH in mg/kg TOC																		
Fluoranthene	160	1200	0.9		12.0	D	0.9	D	1.3		1.7		43.8		1.0	TD	0.7	
Pyrene	1000	1400	1.2		10.6	D	1.5	D	1.3		1.9		31.4		1.2	TD	0.8	
Benzo(a)anthracene	110	270	0.4	T	3.2	D	0.6	D	0.4	T	1.1		6.1		0.3	TD	0.2	T
Chrysene	110	460	0.9		7.9	D	1.3	D	1.0		2.8		21.2		0.6	TD	0.5	T
Benzofluoranthenes*	230	450	1.2	T	6.9	D	1.6	D	1.0	T	1.7	T	10.7		0.9	TD	0.7	T
Benzo(a)pyrene	99	210	0.3	T	2.0	D	0.6	D	0.4	T	0.6		2.3		1.4	U	0.2	T
Indeno(1,2,3-cd)pyrene	34	88	0.3	T	1.2	D	0.4	D	0.3	T	0.3	T	1.5		0.2	TD	0.3	T
Dibenz(a,h)anthracene	12	33	0.6	U	0.3	TD	0.3	U	0.5	U	0.1	T	0.4	T	1.4	U	0.5	U
Benzo(g,h,i)perylene	31	78	0.2	T	0.9	D	0.3	D	0.3	T	0.3	T	1.2		0.3	TD	0.2	T
Total HPAH[3]	960	5300	6.7	T	51.8	TD	8.7	D	7.0	T	12.1	T	129.0	T	5.4	TD	4.2	T
Chlorinated Aromatics in mg/kg TOC																		
1,4-Dichlorobenzene	3.1	9	0.6	U	0.4	U	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
1,2-Dichlorobenzene	2.3	2.3	0.6	U	0.4	U	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
1,2,4-Trichlorobenzene	0.81	1.8	0.6	U	0.4	U	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
Hexachlorobenzene	0.38	2.3	0.1	U	0.0	U	0.0	U	0.0	U	0.1	U	0.1	U	0.1	U	0.0	U

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-04-C0-1 2/25/08	Q	WB-04-C1-3 2/25/08	Q	WB-08-C0-1 2/25/08	Q	WB-08-C1-3 2/25/08	Q	WB-13-C0-1 2/25/08	Q	WB-13-C1-3 2/25/08	Q	WB-18-C0-1 2/25/08	Q
Metals in mg/kg DW																
Arsenic	57	93	4.92		4.08		7.02		5.86		5.5		5.22		8.65	
Cadmium	5.1	6.7	0.518		0.491		0.924		0.736		0.666		0.363		1.31	
Chromium	260	270	17		18.5		30.2		28.5		20.8		17.7		26.7	
Copper	390	390	13.3		11.3		29.8		23.4		15.5		7.49		27.7	
Lead	450	530	6.7		4.86		18.9		12.2		6.57		1.7		15.2	
Mercury	0.41	0.59	0.057		0.036		0.105		0.067		0.051		0.019	B	0.106	
Silver	6.1	6.1	0.1		0.06		0.23		0.14		0.1		0.05		0.23	
Zinc	410	960	32.1		27.3		64.4		46.3		33.7		18.9		63.1	
LPAH in mg/kg TOC																
Naphthalene	99	170	0.6	U	0.8	U	0.2	U	0.3		0.6	U	1.2	U	0.2	U
Acenaphthylene	66	66	0.6	U	0.8	U	0.0	T	0.0	T	0.6	U	1.2	U	0.1	T
Acenaphthene	16	57	0.6	U	0.8	U	0.2	U	0.1	T	0.6	U	1.2	U	0.2	U
Fluorene	23	79	0.6	U	0.8	U	0.0	T	0.1	T	0.6	U	1.2	U	0.2	U
Phenanthrene	100	480	0.3	T	0.3	T	0.2	T	0.2		0.3	T	0.2	T	0.2	T
Anthracene	220	1200	0.2	T	0.2	T	0.1	T	0.1	T	0.2	T	1.2	U	0.1	T
2-Methylnaphthalene	38	64	0.6	U	0.8	U	0.2	U	0.2		0.6	U	1.2	U	0.2	U
Total LPAH[2]	370	780	0.4	T	0.5	T	0.3	T	1.0	T	0.5	T	0.2	T	0.4	T
HPAH in mg/kg TOC																
Fluoranthene	160	1200	1.0		0.9		0.3		0.4		0.6		1.2	U	0.5	
Pyrene	1000	1400	1.7		1.2		0.9		0.4		1.2		1.2	U	0.7	
Benzo(a)anthracene	110	270	0.3	T	0.3	T	0.2	T	0.1	T	0.3	T	1.2	U	0.3	
Chrysene	110	460	0.7		0.5	T	0.5		0.2	T	0.8		1.2	U	1.4	
Benzofluoranthenes*	230	450	1.0	T	0.7	T	0.4	T	0.2		0.8	T	1.2	U	0.7	T
Benzo(a)pyrene	99	210	0.4	T	0.3	T	0.2	T	0.1	T	0.6	U	1.2	U	0.2	T
Indeno(1,2,3-cd)pyrene	34	88	0.3	T	0.2	T	0.1	T	0.2	U	0.2	T	1.2	U	0.2	T
Dibenz(a,h)anthracene	12	33	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Benzo(g,h,i)perylene	31	78	0.3	T	0.2	T	0.1	T	0.2	U	0.3	T	1.2	U	0.1	T
Total HPAH[3]	960	5300	5.6	T	4.2	T	2.6	T	1.3	T	4.2		1.2	U	4.1	T
Chlorinated Aromatics in mg/kg TOC																
1,4-Dichlorobenzene	3.1	9	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
1,2-Dichlorobenzene	2.3	2.3	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
1,2,4-Trichlorobenzene	0.81	1.8	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Hexachlorobenzene	0.38	2.3	0.1	U	0.1	U	0.0	Ui	0.2	U	0.0	T	0.1	U	0.2	U

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-18-C1-3 2/25/08	Q	WB-20-C0-1 2/25/08	Q	WB-20-C1-3 2/25/08	Q	WB-28-C0-1 2/25/08	Q	WB-31-C0-1 2/25/08	Q	WB-31-C1-3 2/25/08	Q	WB-38-C0-1 2/25/08	Q
Metals in mg/kg DW																
Arsenic	57	93	4.72		6.24		3.42		9.64		7.23		3.63		11	
Cadmium	5.1	6.7	1.18		1.04		0.428		1.68		1.31		0.92		1.56	
Chromium	260	270	20.8		16.2		17.3		28.2		21		28.9		18.7	
Copper	390	390	23.8		14.5		8.97		38		33.8		38.2		26.4	
Lead	450	530	10.1		6.04		1.94		15.1		9.41		11.5		9.73	
Mercury	0.41	0.59	0.071		0.068		0.024		0.127		0.072		0.08		0.071	
Silver	6.1	6.1	0.14		0.11		0.04		0.23		0.12		0.12		0.16	
Zinc	410	960	48.1		34.9		20		76.3		65.1		65.9		65.5	
LPAH in mg/kg TOC																
Naphthalene	99	170	0.0	T	0.2	U	2.7	U	0.0	T	0.5	U	0.5	U	0.1	U
Acenaphthylene	66	66	0.0	T	0.0	T	2.7	U	0.1	T	0.1	TD	0.1	TD	0.1	T
Acenaphthene	16	57	0.1	U	0.2	U	2.7	U	0.1	U	0.1	TD	0.2	TD	0.0	T
Fluorene	23	79	0.0	T	0.0	T	2.7	U	0.0	T	0.1	TD	0.1	TD	0.1	T
Phenanthrene	100	480	0.1		0.2		2.7	U	0.2		0.4	TD	0.4	TD	0.2	
Anthracene	220	1200	0.1	T	0.1	T	2.7	U	0.2		0.8	D	0.5	D	0.3	
2-Methylnaphthalene	38	64	0.1	U	0.2	U	2.7	U	0.0	T	0.5	U	0.5	U	0.1	U
Total LPAH[2]	370	780	0.2	T	0.4	T	2.7	U	0.6	T	1.5	TD	1.4		0.7	T
HPAH in mg/kg TOC																
Fluoranthene	160	1200	0.4		0.6		0.6	T	0.9		3.4	D	2.9	D	0.4	
Pyrene	1000	1400	0.7		1.4		1.5	T	1.6		3.7	D	2.2	D	0.7	
Benzo(a)anthracene	110	270	0.1		0.2		2.7	U	0.6		1.1	D	0.8	D	0.4	
Chrysene	110	460	0.3		0.6		2.7	U	1.0		1.7	D	1.2	D	1.2	
Benzofluoranthenes*	230	450	0.3	T	0.7	T	0.5	T	0.9		1.0	D	1.4	D	0.6	
Benzo(a)pyrene	99	210	0.1	T	0.2	T	2.7	U	0.3		0.6	D	0.6	D	0.2	
Indeno(1,2,3-cd)pyrene	34	88	0.1	T	0.1	T	2.7	U	0.2		0.4	TD	0.4	TD	0.1	
Dibenz(a,h)anthracene	12	33	0.1	U	0.2	U	2.7	U	0.0	T	0.1	TD	0.5	U	0.0	T
Benzo(g,h,i)perylene	31	78	0.0	T	0.1	T	2.7	U	0.1	T	0.3	TD	0.3	TD	0.1	U
Total HPAH[3]	960	5300	1.9		3.9		2.6	T	5.6	T	12.4	TD	9.6	TD	3.7	T
Chlorinated Aromatics in mg/kg TOC																
1,4-Dichlorobenzene	3.1	9	0.1	U	0.2	U	2.7	U	0.1	U	0.5	U	0.5	U	0.1	U
1,2-Dichlorobenzene	2.3	2.3	0.1	U	0.2	U	2.7	U	0.1	U	0.5	U	0.5	U	0.1	U
1,2,4-Trichlorobenzene	0.81	1.8	0.1	U	0.2	U	2.7	U	0.1	U	0.5	U	0.5	U	0.1	U
Hexachlorobenzene	0.38	2.3	0.1	U	0.2	U	0.3	U	0.1	U	0.0	Ui	0.0	U	0.1	U

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-38-C1-3 2/25/08	Q	WB-43-C0-1 2/25/08	Q	WB-44-C0-1 2/25/08	Q	WB-44-C1-3 2/25/08	Q	WB-18-R 2/25/08	Q	WB-18-RB 2/25/08	Q
Metals in mg/kg DW														
Arsenic	57	93	2.3		3.65		3.27		2.73		0.5	U	0.5	U
Cadmium	5.1	6.7	0.286		0.388		0.423		0.338		0.02	U	0.02	U
Chromium	260	270	14.3		17.2		10.7		14		0.22		0.26	
Copper	390	390	33.4		7.91		7.43		6.71		0.13		0.04	B
Lead	450	530	7.35		2.98		3.11		2.19		0.025	B	0.05	U
Mercury	0.41	0.59	0.075		0.026		0.046		0.021		0.2	U	0.2	U
Silver	6.1	6.1	0.09		0.05		0.05		0.03		0.151		0.063	
Zinc	410	960	53.9		24.1		18.6		18.5		1.6		0.5	
LPAH in mg/kg TOC														
Naphthalene	99	170	0.7	U	1.5	U	0.2	U	0.5	U				
Acenaphthylene	66	66	0.7	U	1.5	U	0.1	T	0.5	U				
Acenaphthene	16	57	0.2	TD	1.5	U	0.2	U	0.5	U				
Fluorene	23	79	0.7	U	1.5	U	0.2	U	0.5	U				
Phenanthrene	100	480	0.3	TD	0.5	T	0.3		0.1	T				
Anthracene	220	1200	0.2	TD	1.5	U	0.1	T	0.5	U				
2-Methylnaphthalene	38	64	0.7	U	1.5	U	0.2	U	0.5	U				
Total LPAH[2]	370	780	0.7	TD	0.5	T	0.4	T	0.1	T				
HPAH in mg/kg TOC														
Fluoranthene	160	1200	0.8	D	1.1	T	0.5		0.2	T				
Pyrene	1000	1400	0.5	TD	1.1	T	0.5		0.2	T				
Benzo(a)anthracene	110	270	0.2	TD	0.4	T	0.2	T	0.5	U				
Chrysene	110	460	0.2	TD	0.9	T	0.3		0.1	T				
Benzofluoranthenes*	230	450	0.7	U	1.0	T	0.3	T	0.5	U				
Benzo(a)pyrene	99	210	0.7	U	0.5	T	0.2	T	0.5	U				
Indeno(1,2,3-cd)pyrene	34	88	0.7	U	0.4	T	0.1	T	0.5	U				
Dibenz(a,h)anthracene	12	33	0.7	U	1.5	U	0.2	U	0.5	U				
Benzo(g,h,i)perylene	31	78	0.7	U	0.4	T	0.1	T	0.5	U				
Total HPAH[3]	960	5300	1.8	TD	5.8	T	2.1	T	0.5	T				
Chlorinated Aromatics in mg/kg TOC														
1,4-Dichlorobenzene	3.1	9	0.7	U	1.5	U	0.2	U	0.5	U				
1,2-Dichlorobenzene	2.3	2.3	0.7	U	1.5	U	0.2	U	0.5	U				
1,2,4-Trichlorobenzene	0.81	1.8	0.7	U	1.5	U	0.2	U	0.5	U				
Hexachlorobenzene	0.38	2.3	0.0	Ui	0.1	Ui	0.2	U	0.0	U				

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-03-S 2/27/08	Q	WB-06-S 2/26/08	Q	WB-09-S 2/26/08	Q	WB-12-S 2/26/08	Q	WB-16-S 2/26/08	Q	WB-17-S 2/26/08	Q	WB-21-S 2/26/08	Q	WB-22-S 2/26/08	Q
Phthalate Esters in mg/kg TOC																		
Dimethylphthalate	53	53	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Diethylphthalate	61	110	0.1	T	2.1	U	0.5	U	0.1	T	0.5	U	0.3	T	0.4	U	2.6	U
Di-n-Butylphthalate	220	1700	0.6	T	4.2	U	1.1	U	1.1	U	1.1	U	1.8	U	0.7	U	5.3	U
Butylbenzylphthalate	4.9	64	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
bis(2-Ethylhexyl)phthalate	47	78	0.7	T	21.2	U	0.6	T	0.7	T	0.7	T	9.2	U	0.3	T	4.5	T
Di-n-Octylphthalate	58	4500	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Ionizable Organic Compounds in mg/kg DW																		
Phenol (8270)	420	1200	53.0		330.0	U	43.0	U	56.0		100.0		38.0		89.0		32.0	
Phenol (8270SIM)	420	1200	280.0		14.0		780.0		1400.0		880.0		150.0		110.0		87.0	
2-Methylphenol	63	63	20.0	U	27.0	U	28.0	U	29.0	U	28.0	U	19.0	U	26.0	U	20.0	U
4-Methylphenol	670	670	10.0	U	110.0	U	6.0	T	15.0	U	14.0	U	10.0	U	15.0	U	9.8	U
2,4-Dimethylphenol	29	29	20.0	U	27.0	U	28.0	U	29.0	U	28.0	U	19.0	U	26.0	U	20.0	U
Pentachlorophenol	360	690	8.8	U	11.0	U	1.1	T	3.5	T	13.0	Ui	6.7	U	2.9	T	6.4	U
Benzyl Alcohol	57	73	20.0	U	220.0	U	4.6	T	29.0	U	28.0	U	20.0	U	29.0	U	3.9	T
Benzoic Acid	650	650	190.0	T	2200.0	U	180.0	T	230.0	T	210.0	T	140.0	T	260.0	T	130.0	T
Miscellaneous Extractables in mg/kg TOC																		
Dibenzofuran	15	58	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.2	T	0.4	U	2.6	U
Hexachlorobutadiene	3.9	6.2	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
N-Nitrosodiphenylamine	11	11	0.5	U	2.1	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
PCBs in mg/kg TOC																		
Aroclor-1016	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	Ui
Aroclor-1221	–	–	1.0	U	0.4	U	1.1	U	1.1	U	1.1	U	1.8	U	0.7	U	5.3	Ui
Aroclor-1232	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	Ui
Aroclor-1242	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.9	Ui
Aroclor-1248	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Aroclor-1254	–	–	0.5	U	0.2	U	0.4	T	0.6	U	0.5	U	0.9	U	0.4	Ui	2.6	U
Aroclor-1260	–	–	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U
Total PCBs[4]	12	65	0.5	U	0.2	U	0.5	U	0.6	U	0.5	U	0.9	U	0.4	U	2.6	U

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-26-S 2/26/08	Q	WB-30-S 2/27/08	Q	WB-35-S 2/26/08	Q	WB-36-S 2/27/08	Q	WB-37-S 2/26/08	Q	WB-42-S 2/27/08	Q	WB-03-D[1] 2/27/08	Q	WB-16-D[1] 2/26/08	Q
Phthalate Esters in mg/kg TOC																		
Dimethylphthalate	53	53	0.6	U	0.4	U	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
Diethylphthalate	61	110	0.6	U	0.4	U	0.3	U	0.1	T	0.5	U	0.7	U	0.2	TD	0.5	U
Di-n-Butylphthalate	220	1700	1.3	U	0.9	U	0.6	U	0.7	T	1.0	U	1.5	U	2.8	U	1.1	U
Butylbenzylphthalate	4.9	64	0.6	U	0.4	U	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
bis(2-Ethylhexyl)phthalate	47	78	6.3	U	4.5	U	0.3	TD	5.1	U	5.0	U	0.9	T	14.0	U	0.5	T
Di-n-Octylphthalate	58	4500	0.6	U	0.4	U	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
Ionizable Organic Compounds in mg/kg DW																		
Phenol (8270)	420	1200	40.0		130.0	TD	140.0	D	43.0	U	70.0		110.0		530.0	D	51.0	
Phenol (8270SIM)	420	1200	45.0		710.0		130.0		660.0		52.0		260.0		26.0		430.0	
2-Methylphenol	63	63	20.0	U	20.0	U	29.0	U	28.0	U	19.0	U	18.0	U	19.0	U	22.0	U
4-Methylphenol	670	670	10.0	U	41.0	U	26.0	U	15.0	U	3.6	T	10.0	U	58.0	D	14.0	U
2,4-Dimethylphenol	29	29	20.0	U	20.0	U	29.0	U	28.0	U	19.0	U	18.0	U	19.0	U	22.0	U
Pentachlorophenol	360	690	7.3	U	2.8	T	12.0	U	1.8	T	8.0	U	1.7	T	8.7	U	1.1	T
Benzyl Alcohol	57	73	20.0	U	82.0	U	51.0	U	29.0	U	4.8	T	20.0	U	40.0	U	28.0	U
Benzoic Acid	650	650	160.0	T	820.0	U	530.0	D	290.0	U	190.0	T	97.0	T	260.0	TD	180.0	T
Miscellaneous Extractables in mg/kg TOC																		
Dibenzofuran	15	58	0.6	U	0.3	TD	0.0	TD	0.1	T	0.1	T	0.2	T	1.4	U	0.5	U
Hexachlorobutadiene	3.9	6.2	0.6	U	0.4	U	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
N-Nitrosodiphenylamine	11	11	0.6	U	0.4	U	0.3	U	0.5	U	0.5	U	0.7	U	1.4	U	0.5	U
PCBs in mg/kg TOC																		
Aroclor-1016	–	–	0.6	U	0.1	U	0.2	U	0.5	U	0.5	U	0.7	U	0.7	U	0.5	U
Aroclor-1221	–	–	1.3	U	0.2	U	0.3	U	1.0	U	1.0	U	1.5	U	1.4	U	1.1	U
Aroclor-1232	–	–	0.6	U	0.1	U	0.2	U	0.5	U	0.5	U	0.7	U	0.7	U	0.5	U
Aroclor-1242	–	–	0.6	U	0.1	U	0.2	U	0.5	U	0.5	U	0.7	U	0.7	U	0.5	U
Aroclor-1248	–	–	0.6	U	0.1	U	0.2	U	0.5	U	0.5	U	0.7	U	0.7	U	0.5	U
Aroclor-1254	–	–	0.6	U	0.1	U	0.2	Ui	0.5	U	0.5	U	0.7	U	0.7	U	0.5	U
Aroclor-1260	–	–	0.6	U	0.1	U	0.2	U	0.5	U	0.5	U	0.7	U	0.7	U	0.5	U
Total PCBs[4]	12	65	0.6	U	0.1	U	0.2	U	0.5	U	0.5	U	0.7	U	0.7	U	0.5	U

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-04-C0-1 2/25/08	Q	WB-04-C1-3 2/25/08	Q	WB-08-C0-1 2/25/08	Q	WB-08-C1-3 2/25/08	Q	WB-13-C0-1 2/25/08	Q	WB-13-C1-3 2/25/08	Q	WB-18-C0-1 2/25/08	Q
Phthalate Esters in mg/kg TOC																
Dimethylphthalate	53	53	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Diethylphthalate	61	110	0.6	U	0.8	U	0.0	T	0.1	T	0.6	U	0.3	T	0.0	T
Di-n-Butylphthalate	220	1700	1.2	U	1.6	U	0.2	T	0.3	T	1.3	U	2.4	U	0.4	U
Butylbenzylphthalate	4.9	64	0.6	U	0.8	U	0.2	U	0.2	U	1.4		1.2	U	0.2	U
bis(2-Ethylhexyl)phthalate	47	78	6.2	U	7.7	U	2.3	U	1.8	U	6.5	U	11.9	U	0.2	T
Di-n-Octylphthalate	58	4500	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Ionizable Organic Compounds in mg/kg DW																
Phenol (8270)	420	1200	30.0	U	30.0	U	40.0	U	37.0	U	9.2	T	30.0	U	46.0	U
Phenol (8270SIM)	420	1200	300.0		37.0		410.0		92.0		81.0		48.0		170.0	
2-Methylphenol	63	63	20.0	U	21.0	U	31.0	U	27.0	U	20.0	U	19.0	U	29.0	U
4-Methylphenol	670	670	2.4	T	9.8	U	14.0	U	13.0	U	3.2	T	10.0	U	16.0	U
2,4-Dimethylphenol	29	29	20.0	U	21.0	U	31.0	U	27.0	U	20.0	U	19.0	U	29.0	U
Pentachlorophenol	360	690	0.5	T	6.7	U	2.7	T	0.7	T	1.8	T	6.1	U	0.5	T
Benzyl Alcohol	57	73	20.0	U	20.0	U	27.0	U	25.0	U	20.0	U	20.0	U	31.0	U
Benzoic Acid	650	650	200.0	U	200.0	U	130.0	T	200.0	T	200.0	U	200.0	U	310.0	U
Miscellaneous Extractables in mg/kg TOC																
Dibenzofuran	15	58	0.6	U	0.8	U	0.2	U	0.1	T	0.6	U	1.2	U	0.2	U
Hexachlorobutadiene	3.9	6.2	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
N-Nitrosodiphenylamine	11	11	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
PCBs in mg/kg TOC																
Aroclor-1016	–	–	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Aroclor-1221	–	–	1.2	U	1.6	U	0.5	U	0.4	U	1.3	U	2.4	U	0.4	U
Aroclor-1232	–	–	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Aroclor-1242	–	–	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Aroclor-1248	–	–	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Aroclor-1254	–	–	0.6	U	0.8	U	0.2	Ui	0.2	U	0.6	U	1.2	U	0.1	T
Aroclor-1260	–	–	0.6	U	0.8	U	0.2	U	0.2	U	0.6	U	1.2	U	0.2	U
Total PCBs[4]	12	65	1.2	U	1.6	U	0.5	U	0.4	U	1.3	U	2.4	U	0.1	T

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-18-C1-3 2/25/08	Q	WB-20-C0-1 2/25/08	Q	WB-20-C1-3 2/25/08	Q	WB-28-C0-1 2/25/08	Q	WB-31-C0-1 2/25/08	Q	WB-31-C1-3 2/25/08	Q	WB-38-C0-1 2/25/08	Q
Phthalate Esters in mg/kg TOC																
Dimethylphthalate	53	53	0.1	U	0.2	U	2.7	U	0.1	U	0.5	U	0.5	U	0.1	U
Diethylphthalate	61	110	0.0	T	0.1	T	2.7	U	0.0	T	0.5	U	0.5	U	0.0	T
Di-n-Butylphthalate	220	1700	0.1	T	0.2	T	5.4	U	0.2	T	1.0	U	1.0	U	0.2	U
Butylbenzylphthalate	4.9	64	0.1	U	0.2	U	2.7	U	0.1	U	0.5	U	0.5	U	0.1	U
bis(2-Ethylhexyl)phthalate	47	78	0.9	U	0.8	T	27.0	U	1.3	U	5.1	U	4.9	U	1.0	U
Di-n-Octylphthalate	58	4500	0.1	U	0.2	U	2.7	U	0.1	U	0.5	U	0.5	U	0.1	U
Ionizable Organic Compounds in mg/kg DW																
Phenol (8270)	420	1200	45.0	U	30.0	U	30.0	U	44.0	U	230.0	U	210.0	U	34.0	U
Phenol (8270SIM)	420	1200	54.0		120.0		68.0		150.0		120.0		110.0		70.0	
2-Methylphenol	63	63	31.0	U	26.0	U	20.0	U	30.0	U	29.0	U	27.0	U	23.0	U
4-Methylphenol	670	670	15.0	U	10.0	U	10.0	U	15.0	U	74.0	U	68.0	U	8.5	T
2,4-Dimethylphenol	29	29	31.0	U	26.0	U	20.0	U	30.0	U	29.0	U	27.0	U	23.0	U
Pentachlorophenol	360	690	2.4	T	9.1	U	6.8	U	15.0	U	14.0	U	13.0	U	11.0	U
Benzyl Alcohol	57	73	30.0	U	20.0	U	20.0	U	30.0	U	150.0	U	140.0	U	23.0	U
Benzoic Acid	650	650	300.0	U	200.0	U	200.0	U	300.0	U	1500.0	U	1400.0	U	110.0	T
Miscellaneous Extractables in mg/kg TOC																
Dibenzofuran	15	58	0.1	U	0.2	U	2.7	U	0.0	T	0.1	TD	0.2	TD	0.0	T
Hexachlorobutadiene	3.9	6.2	0.1	U	0.2	U	2.7	U	0.1	U	0.5	U	0.5	U	0.1	U
N-Nitrosodiphenylamine	11	11	0.1	U	0.2	U	2.7	U	0.1	U	0.3	TD	0.3	TD	0.1	U
PCBs in mg/kg TOC																
Aroclor-1016	–	–	0.1	U	0.2	U	2.7	U	0.1	U	0.1	U	0.1	Ui	0.1	U
Aroclor-1221	–	–	0.2	U	0.4	U	5.4	U	0.3	U	0.2	U	0.2	Ui	0.2	U
Aroclor-1232	–	–	0.1	U	0.2	U	2.7	U	0.1	U	0.1	U	0.1	Ui	0.1	U
Aroclor-1242	–	–	0.1	U	0.2	U	2.7	U	0.1	U	0.1	U	0.1	Ui	0.1	U
Aroclor-1248	–	–	0.1	U	0.2	U	2.7	U	0.1	U	0.1	U	0.1	U	0.1	U
Aroclor-1254	–	–	0.1	Ui	0.2	U	2.7	U	0.1	T	0.1	U	0.1	Ui	0.1	U
Aroclor-1260	–	–	0.1	U	0.2	U	2.7	U	0.1	U	0.1	U	0.1	U	0.1	U
Total PCBs[4]	12	65	0.2	U	0.4	U	5.4	U	0.1	T	0.2	U	0.2	Ui	0.2	U

Table 3. Summary of Sediment Chemistry Results (continued)

Station Number Collection Date	WA SMS SQS	WA SMS CSL	WB-38-C1-3 2/25/08	Q	WB-43-C0-1 2/25/08	Q	WB-44-C0-1 2/25/08	Q	WB-44-C1-3 2/25/08	Q	WB-18-R 2/25/08	Q	WB-18-RB 2/25/08	Q
Phthalate Esters in mg/kg TOC														
Dimethylphthalate	53	53	0.7	U	1.5	U	0.2	U	0.5	U				
Diethylphthalate	61	110	0.7	U	1.5	U	0.0	T	0.1	T				
Di-n-Butylphthalate	220	1700	1.3	U	3.0	U	0.3	U	0.9	U				
Butylbenzylphthalate	4.9	64	0.7	U	1.5	U	0.2	U	0.5	U				
bis(2-Ethylhexyl)phthalate	47	78	6.8	U	14.6	U	1.6	U	4.5	U				
Di-n-Octylphthalate	58	4500	0.7	U	1.5	U	0.2	U	0.5	U				
Ionizable Organic Compounds in mg/kg DW														
Phenol (8270)	420	1200	410.0	U	30.0	U	30.0	U	30.0	U	0.5	U	0.5	U
Phenol (8270SIM)	420	1200	90.0		71.0		150.0		45.0					
2-Methylphenol	63	63	28.0	U	20.0	U	20.0	U	20.0	U	0.5	U	0.5	U
4-Methylphenol	670	670	140.0	U	9.8	U	10.0	U	9.9	U	0.5	U	0.5	U
2,4-Dimethylphenol	29	29	28.0	U	20.0	U	20.0	U	20.0	U	3.9	U	3.9	U
Pentachlorophenol	360	690	13.0	U	6.8	U	8.6	U	0.8	T	1.0	U	1.0	U
Benzyl Alcohol	57	73	270.0	U	20.0	U	20.0	U	20.0	U	0.1	T	0.1	T
Benzoic Acid	650	650	2700.0	U	200.0	U	200.0	U	200.0	U	4.8	U	4.8	U
Miscellaneous Extractables in mg/kg TOC														
Dibenzofuran	15	58	0.7	U	1.5	U	0.2	U	0.5	U				
Hexachlorobutadiene	3.9	6.2	0.7	U	1.5	U	0.2	U	0.5	U				
N-Nitrosodiphenylamine	11	11	0.3	TD	1.5	U	0.2	U	0.5	U				
PCBs in mg/kg TOC														
Aroclor-1016	–	–	0.1	U	1.5	U	0.2	U	0.5	U				
Aroclor-1221	–	–	0.1	U	3.0	U	0.3	U	0.9	U				
Aroclor-1232	–	–	0.1	U	1.5	U	0.2	U	0.5	U				
Aroclor-1242	–	–	0.1	U	1.5	U	0.2	U	0.5	U				
Aroclor-1248	–	–	0.1	U	1.5	U	0.2	U	0.5	U				
Aroclor-1254	–	–	0.1	U	1.5	U	0.2	U	0.5	U				
Aroclor-1260	–	–	0.1	U	1.5	U	0.2	U	0.5	U				
Total PCBs[4]	12	65	0.1	U	3.0	U	0.3	U	0.9	U				

Data Qualifiers

B - The analyte was found in the associated method blank at a level that is significant relative to the sample result.
D - The reported result is from a dilution
T - The result is an estimated concentration that is less than the MRL but greater than or eqaul to the MDL
i - the MRL/MDL is elevated due to matrix or chromatographic interference
U - The compound was analyzed for, but was not detected ("non-detect") at or above the MRL/MDL.

Notes

[1] - Duplicate sample
[2] - Sum of low molecular weight PAH results for naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
[3] - Sum of high molecular weight PAH results for fluoranthene, pyrene, benz(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeneo(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene
[4] - Sum of Arochlors 1016, 1221, 1232, 1242, 1248, 1254, 1260

4.1.1 Conventional Sediment Parameters

Precision QA/QC objectives for RPD are 20% or less. The RPDs for TOC, total sulfides, ammonia, total solids and total volatile solids (TVS) were all below 20%, meeting precision goals. Of these analyses, total volatile solids had the greatest RPD (8%).

The RPDs for grain size were calculated for each of the gravel, very coarse sand, coarse sand, medium sand, fine sand, very fine sand, silt, and clay fractions for sample WB-36-S. RPDs for all size fractions were under 20%, with the exception of the gravel fraction. RPD for gravel was 39.2%. Given that the triplicate for this sample met the RPD objective, the overall precision is acceptable.

4.1.2 Metals

Precision of the metals was determined by analytical replicates. Precision QA/QC objectives for the RPD between replicates are 20% or less. Five samples were analyzed with duplicates: WB-13-C0-1, WB-31-C1-3, WB-44-C0-1, WB-03-S, and WB-36-S. None of the metals in samples WB-31-C1-3, WB-44-C0-1, WB-03-S, and WB-36-S exceeded 20% RPD. In sample WB-13-C0-1, only mercury exceeded 20%.

4.1.3 Semi-Volatile Organic Compounds

Precision of the SVOCs were determined by the analysis of the RPD between the matrix spike and the matrix spike duplicate (MS and MSD) and the laboratory control sample and duplicate laboratory control sample. Precision QA/QC objectives for the RPD are 35% or less. The compounds 1,4-dichlorobenzene, 1,2,4-trichlorobenzene, and 2,4-dimethylphenol all exceeded the objective in at least one duplicate. The other compounds were under the 35% criteria for other duplicates within each batch, indicating the discrepancies are sample-specific.

4.1.4 Polychlorinated Biphenyls

Precision of the PCBs were determined by the analysis of the RPD between the matrix spike and the matrix spike duplicate (MS and MSD) for samples WB-44-C1-3, WB-03-S, and WB-36-S. Precision QA/QC objectives for the RPD are 35% or less. All PCB duplicates met this objective.

4.2 Accuracy

The following sections (4.2.1 through 4.2.4) describe the accuracy results by analytical group and comparison to QA/QC objectives provided in Table 1.

4.2.1 Conventional Sediment Parameters

Accuracy of the sediment conventionals was determined by the percent recoveries of matrix spikes and laboratory control samples (LCS) for total sulfides, ammonia, and TOC. Accuracy was considered acceptable if the percent recovery was between 75% and 125%. The matrix spike percent recoveries and the LCS percent recoveries for total sulfides, ammonia, TOC met the data quality objectives. Accuracy was not determined for grain size distribution, total solids, or TVS.

4.2.2 Metals

Accuracy of the metals data was determined by the percent recoveries of MS and LCS. Accuracy was considered acceptable if the percent recovery was between 75% and 125%. All MS and LCS samples met the data quality objectives.

4.2.3 Semi-Volatile Organic Compounds

Accuracy of the SVOC data was determined by percent recoveries of MS, MSD, LCS, and surrogates. The data quality objective for accuracy was a percent recovery between 50% and 150%. Many of the SVOCs had recoveries lower than the data quality objectives, however the recoveries of these SVOCs exceeded the laboratory control limits. Due to the frequency of low recoveries, a low bias in the SVOC data may be possible. Given that most results are substantially below the SQS criteria, a potential bias would not affect the interpretation of these data.

The advisory criteria was exceeded for several LCS and DLCS samples for benzo(k)fluoranthene. Per the CAS standard operating procedure for this method, this compound is not included in the subset of analytes used to control the analysis. No further corrective action was required.

4.2.4 Polychlorinated Biphenyls

The MRL was elevated for Aroclors 1016, 1221, 1232, and 1242 in method blanks and numerous samples due to the presence of non-target components which were apparently introduced as laboratory artifacts.

Accuracy of the PCB data was determined by the percent recoveries of MS, MSD, LCS, and surrogates. Accuracy was considered acceptable if the percent recovery was between 50% and 150%. Percent recoveries were between 50% and 150% and the QA/QC objectives for accuracy of the PCB analysis was considered acceptable.

4.3 Representativeness

The sediment samples provided representativeness of site conditions through multiple samples, including duplicates and triplicates. Grain size triplicate samples were analyzed for WB-36-S. RSDs for coarser fractions were greater than finer fractions, with a maximum RSD of 25.9% for the gravel fraction. Conventional parameter representativeness for samples WB-31-C1-3, WB-44-C0-1, WB-03-S, and WB-36-S and their respective replicates was acceptable.

Metals in duplicates were within the precision guidelines and considered representative.

Field duplicates for the SVOCs and PCBs were also analyzed along with the field samples. The RPD between WB-03-S and WB-16-S and their respective field duplicates are relatively low (averaging 28% for detected compounds). Although individual RPDs vary greatly between specific compounds, the overall low RPDs suggest representativeness.

The analytical representativeness was also determined through the analysis of method and rinseate blanks. Chromium and copper were detected in at least one method blank, each at levels less than the method reporting limit (MRL). Diethylphthalate, phenanthrene, di-n-butylphthalate, fluoranthene, pyrene were detected in one of the three blanks at levels greater than the MDL. In accordance with CAS policy, all sample results less than 20 times the level found in the method blank were flagged with a "B". The concentrations measured in the blanks were well below the SQS guidelines and are not considered to be of concern at the study location.

In the equipment and rinseate blanks, nine analytes were detected above the MDL: Chromium, copper, lead, silver, zinc, naphthalene, diethylphthalate, di-n-butylphthalate, and benzyl

alcohol. None of these analytes were detected above the MRL. However, all of these analytes were detected in at least one sediment sample.

Though not detected, concentrations of 2-methylphenol, benzyl alcohol, and benzoic acid in numerous samples, and 2,4-dimethylphenol in every sample, exceeded the SQS guidelines. Though not detected, TOC normalized concentrations of 1,2-dichlorobenzene and 1,2,4-trichlorobenzene in numerous samples, also exceeded the SQS guidelines. The exceedences are due to high MRLs and not low concentrations of TOC. The MRL for numerous samples were elevated due to less than optimal sample mass extracted for analysis. These samples contained low percent solids which prevented extraction of the sample mass necessary to achieve target MRLs.

The only detected analyte present in exceedance of SQS guidelines was phenol in sample WB-03-D. It should be noted that this sample is a field duplicate and the phenol was undetected in sediment sample WB-03-S.

4.4 Completeness

The following sections (4.4.1 through 4.4.4) describe the completeness results by analytical group and comparison to QA/QC objectives provided in Table 1 and Section 2.4. The completeness measurements evaluated include contract, analytical, technical, and field sampling completeness. The minimum goals for completeness are as follows: (1) Contract = 100%, (2) Analytical = 90% or greater, (3) Technical = 95% or greater, and (4) Field = 100% or greater. The goal for holding times is 100%. Estimate results are treated as usable results for technical completeness. Table 4 presents the completeness summary for the sediment chemistry analyses.

4.4.1 Contract Completeness

The contract compliance completeness met the goal of 100% for all samples and analyses (Table 4).

4.4.2 Analytical Completeness

The analytical completeness goal of 90% was achieved by 14 of the 57 analytes. All of the sediment conventionals and metals analyses met the analytical completeness goal. Numerous organic analytes were qualified by the laboratory in all of the sediment samples analyzed, resulting in less than 90% completeness (Tables 4).

Qualifiers that resulted in reduced completeness included: All analytes flagged as "U" for non-detect, "T" for estimated concentration less than the MRL, "B" for detected in the method blank at a significant level, "D" for dilution, and "i" for matrix interference causing higher MDL/MRL.

4.4.3 Technical Completeness

Technical completeness met the goal of 95% for all samples and analyses.

4.4.4 Field Completeness

The field sample completeness met the goal of 100% for all samples and analyses.

Table 4. Sediment Chemistry Analytes and Completeness Determinations

	Total Samples Collected	Total Samples Analyzed	Total Samples Qualified	Contract Compliance Completeness (%)	Analytical Completeness (%)	Technical Completeness (%)	Field Sampling Completeness (%)
Completeness Goals				**100**	**90**	**95**	**100**
Conventional Parameters							
Total Solids	34	34	0	100%	100%	100%	100%
Total Volatile Solids	34	34	0	100%	100%	100%	100%
Total Organic Carbon	34	34	0	100%	100%	100%	100%
Total Sulfides	34	34	3	100%	91%	100%	100%
Ammonia	34	34	0	100%	100%	100%	100%
Grain Size	34	34	0	100%	100%	100%	100%
Metals							
Arsenic	34	34	0	100%	100%	100%	100%
Cadmium	34	34	0	100%	100%	100%	100%
Chromium	34	34	0	100%	100%	100%	100%
Copper	34	34	0	100%	100%	100%	100%
Lead	34	34	0	100%	100%	100%	100%
Mercury	34	34	0	100%	100%	100%	100%
Silver	34	34	0	100%	100%	100%	100%
Zinc	34	34	0	100%	100%	100%	100%
PAHs							
Naphthalene	34	34	33	100%	3%	100%	100%
Acenaphthylene	34	34	33	100%	3%	100%	100%
Acenaphthene	34	34	34	100%	0%	100%	100%
Fluorene	34	34	34	100%	0%	100%	100%
Phenanthrene	34	34	26	100%	24%	100%	100%
Anthracene	34	34	29	100%	15%	100%	100%
2-Methylnaphthalene	34	34	33	100%	3%	100%	100%
Fluoranthene	34	34	13	100%	62%	100%	100%
Pyrene	34	34	12	100%	65%	100%	100%
Benzo(a)anthracene	34	34	25	100%	26%	100%	100%
Chrysene	34	34	16	100%	53%	100%	100%
Benzofluoranthenes	34	34	28	100%	18%	100%	100%
Benzo(a)pyrene	34	34	28	100%	18%	100%	100%
Indeno(1,2,3-c,d)pyrene	34	34	29	100%	15%	100%	100%
Dibenzo(a,h)anthracene	34	34	34	100%	0%	100%	100%
Benzo(g,h,i)perylene	34	34	32	100%	6%	100%	100%

Table 4. Sediment Chemistry Analytes and Completeness Determinations (continued)

	Total Samples Collected	Total Samples Analyzed	Total Samples Qualified	Contract Compliance Completeness (%)	Analytical Completeness (%)	Technical Completeness (%)	Field Sampling Completeness (%)
Completeness Goals				**100**	**90**	**95**	**100**
1,2-Dichlorobenzene	34	34	34	100%	0%	100%	100%
1,4-Dichlorobenzene	34	34	34	100%	0%	100%	100%
1,2,4-Trichlorobenzene	34	34	34	100%	0%	100%	100%
Hexachlorobenzene	34	34	34	100%	0%	100%	100%
Phthalate Esters							
Dimethyl phthalate	34	34	34	100%	0%	100%	100%
Diethyl phthalate	34	34	34	100%	0%	100%	100%
Di-n-butyl phthalate	34	34	34	100%	0%	100%	100%
Butyl benzyl phthalate	34	34	33	100%	3%	100%	100%
Bis(2-ethylhexyl)phthalate	34	34	34	100%	0%	100%	100%
Di-n-octyl phthalate	34	34	34	100%	0%	100%	100%
Ionizable Organic Compounds							
Phenol	34	34	6	100%	82%	100%	100%
2-Methylphenol	34	34	34	100%	0%	100%	100%
4-Methylphenol	34	34	34	100%	0%	100%	100%
2,4-Dimethylphenol	34	34	34	100%	0%	100%	100%
Pentachlorophenol	34	34	34	100%	0%	100%	100%
Benzyl alcohol	34	34	34	100%	0%	100%	100%
Benzoic acid	34	34	34	100%	0%	100%	100%
Miscellaneous Compounds							
Dibenzofuran	34	34	34	100%	0%	100%	100%
Hexachlorobutadiene	34	34	34	100%	0%	100%	100%
N-Nitrosodiphenylamine	34	34	34	100%	0%	100%	100%
PCBs							
Aroclor-1016	34	34	34	100%	0%	100%	100%
Aroclor-1221	34	34	34	100%	0%	100%	100%
Aroclor-1232	34	34	34	100%	0%	100%	100%
Aroclor-1242	34	34	34	100%	0%	100%	100%
Aroclor-1248	34	34	34	100%	0%	100%	100%
Aroclor-1254	34	34	34	100%	0%	100%	100%
Aroclor-1260	34	34	34	100%	0%	100%	100%

4.5 Comparability

Comparability was assured through the use of standardized sampling and analysis methodology, the use of certified analytical standards, and internal lab quality assurance measures and evaluation as specified in the project QAPP (SAIC 2008). In addition, the use of analytical laboratories certified through the Washington State Department of Ecology Laboratory Accreditation Program assures data compatibility. These procedures ensured that methodology and performance evaluations used for this investigation are consistent with nationally accepted standards.

5.0 Conclusions

Based on the QA/QC review of the sediment chemistry and associated QA/QC samples collected, all results are deemed acceptable and usable for objectives of the *2008 Woodard Bay Sediment Characterization*.

6.0 References

Anchor. 2005. Environmental site assessment for the proposed conservation lease area, Woodard Bay oyster restoration project. Prepared for the Nature Conservancy of Washington, Seattle, WA. Prepared by Anchor Environmental, L.L.C., Seattle, WA. July 2005.

Hart Crowser. 2007. Draft historical characterization report, Woodard Bay Aquatic Restoration Project, Henderson Inlet, Olympia, WA. October 18, 2007. 17416-00. Prepared for the Washington State Department of Natural Resources. Prepared by Hart Crowser, Inc.

Jacky, H. 2008. Project Chemist, Columbia Analytical Services, Kelso, WA. Personal communication with J. Nakayama. June 2008.

SAIC. 2008. Woodard Bay Sediment Characterization, Henderson Inlet, Olympia, Washington; Combined Sampling and Analysis Plan and Quality Assurance Project Plan. Prepared for U.S. Army Corps of Engineers, Seattle District, Seattle, WA. Prepared by Science Applications International Corporation, Bothell, WA. February 14, 2008.

APPENDIX E: CALCULATION OF CONFIDENCE INTERVALS BETWEEN VIDEO PROBE AND SEDIMENT CORE DATA

Appendix E

Calculation of Confidence Intervals between Video Probe and Core Processing

Processing sediment cores provides an accurate quantitative description of percent woody debris over the entire length of the core. However, obtaining and processing cores is more time consuming, expensive, and labor intensive than video probing. Understanding the differences between the results of video probing compared to those of core processing is an important metric to know when interpreting the results of the 48 video probes.

Confidence intervals for the percent woody debris for the video probe were calculated by comparing the sediment core logs and the video probe results at ten collocated sites. Percent woody debris was determined every six inches of depth for the video probe. For each of the ten cores, the percent woody debris of the video probe was subtracted from the percent woody debris determined during core processing. For confidence intervals to be calculated, these differences should form an approximately normal distribution centered on 0%.

There were 126 six inch intervals that could be compared between the video probe and sediment core analysis. These 126 intervals form the distribution shown in Figure E-1. The 95% confidence intervals were calculated using the following equation:

$$\frac{SD}{\sqrt{N}} \times 1.96$$

Where *SD* is the standard deviation of the percent differences, *N* is 126, and in a normal distribution, 1.96 standard deviations include 95% of the distribution. From this data, a confidence interval of 3.4% was calculated. Ideally, this would mean that any measure of woody debris determined from the video probe would be within ±3.4% of the core determination 95% of the time.

However, several assumptions went into this calculation that may result in a different value for the confidence interval:

1. Evaluating the video probe was dependent upon having a standard measurement to compare to. Namely, we had to assume that the percent woody debris determined from the core processing is correct.

2. Each method was interpreted by a different operator. The descriptions of the cores during processing were recorded by a different individual than the one who viewed and logged the video probe footage.

3. The cores were not collected from the exact same location as the one where the video probe was pushed into the sediment. While this difference was small, on the order of a few feet, deposits of woody debris in sediment can be highly localized, resulting in further differences between the methods.

4. Lastly, the cores were frequently compacted during collection, whereas the video probe provided an in situ measurement of woody debris. The degree of compaction varied by location, and was adjusted for in during processing by use of a recovery factor. However, it is possible that the intervals compared between the core and the video probe was not a perfect match.

Taking these factors into consideration, confidence interval between the core and the video probe is at best an approximation of the differences between the two methods. There is one additional factor that is responsible for more error. Cases where 0% woody debris was present in both methods make up many of the frequency counts at the center of the histogram in Figure E-1.

Both methods do a better job at determining 0%, or close to 0%, amounts of woody debris than they do at agreeing upon the amount of woody debris when present. Because of this, the video probe was measured against the core processing to determine the how frequently both methods agreed about the absence or presence of woody debris.

For both the video probe and the cores, absence was considered to be less than 5% woody debris and presence was greater than 5%. The two methods agreed 61% of the time.

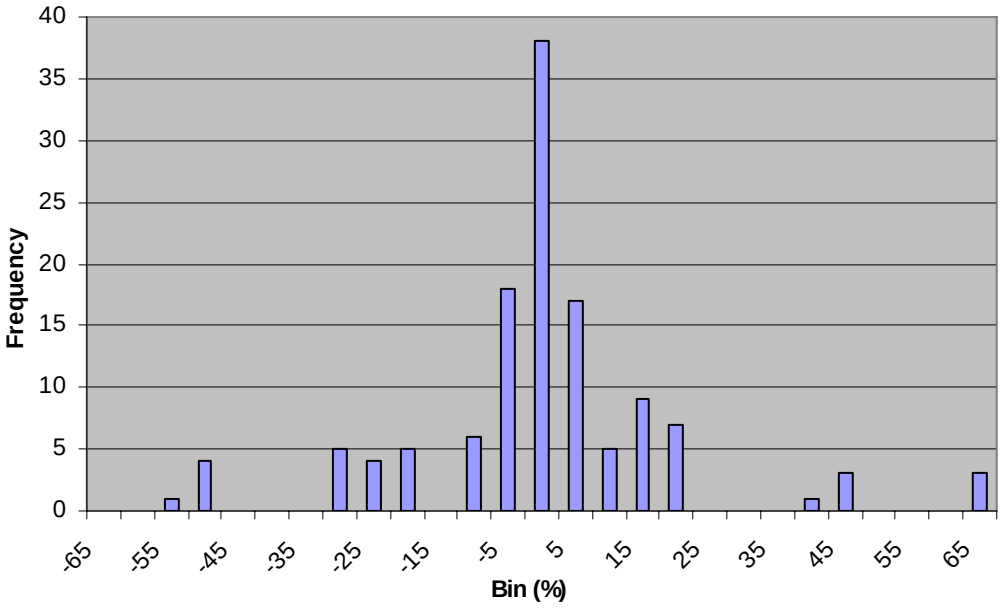


Figure E-1: Percent difference in woody debris between video probe and sediment core processing. N = 126