

APPENDIX A. RECONNAISSANCE SURVEY DATA TABLES

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Table A-1. GPS coordinates^a for seeps identified during the reconnaissance survey

SEEP LOCATION	X	Y
LDW-SP-01	1270793.01	201469.88
LDW-SP-02	1270718.36	200595.73
LDW-SP-03	1271273.28	200335.64
LDW-SP-04	1271265.05	200335.80
LDW-SP-05	1271788.09	199492.61
LDW-SP-06	1272073.50	199134.40
LDW-SP-07	1272106.43	199133.76
LDW-SP-08	1272299.77	198911.12
LDW-SP-09	1273373.64	198866.03
LDW-SP-10	1273465.73	198943.30
LDW-SP-11	1272413.73	198842.03
LDW-SP-12	1272645.54	198691.61
LDW-SP-13	1273439.55	197800.66
LDW-SP-14	1273905.09	197384.28
LDW-SP-15	1275453.00	196071.50
LDW-SP-16	1275505.00	195991.46
LDW-SP-17	1275610.18	195892.15
LDW-SP-18	1275748.29	195792.21
LDW-SP-19	1275848.18	195632.20
LDW-SP-20	1276000.70	195209.72
LDW-SP-21	1276039.42	195081.29
LDW-SP-22	1276451.33	193577.59
LDW-SP-23	1276791.24	192829.26
LDW-SP-24	1277551.77	192966.74
LDW-SP-25	1277247.19	192978.64
LDW-SP-26	1276960.77	191354.53
LDW-SP-27	1278735.89	190037.69
LDW-SP-28	1278342.10	190343.13
LDW-SP-29	1278280.28	190125.41
LDW-SP-30	1278532.94	189980.75
LDW-SP-31	1278411.13	190074.27
LDW-SP-32	1277871.48	190291.29
LDW-SP-33	1277731.28	190500.70
LDW-SP-34	1276854.77	190335.03
LDW-SP-35	1277113.40	190719.24
LDW-SP-36	1276629.69	190844.02
LDW-SP-37	1276958.38	191014.07
LDW-SP-38	1276541.21	191386.88
LDW-SP-39	1276376.66	192259.54
LDW-SP-40	1275872.83	193266.40
LDW-SP-41	1275992.20	193476.93
LDW-SP-42	1275903.44	193788.74
LDW-SP-43	1275851.20	194501.17
LDW-SP-44	1274677.72	196232.34

SEEP LOCATION	X	Y
LDW-SP-45	1274212.84	196685.17
LDW-SP-46	1273887.25	196886.02
LDW-SP-47	1273588.48	197195.81
LDW-SP-48	1273337.83	197437.79
LDW-SP-49	1273021.90	197711.44
LDW-SP-50	1272864.41	197872.58
LDW-SP-51	1272375.50	198356.32
LDW-SP-52	1270170.21	200357.09
LDW-SP-53	1269984.28	200324.23
LDW-SP-54	1269881.50	200332.32
LDW-SP-55	1269791.19	200346.24
LDW-SP-56	1270104.48	200364.46
LDW-SP-57	1269572.83	201183.54
LDW-SP-58	1269572.40	200739.67
LDW-SP-59	1269565.00	200782.37
LDW-SP-60	1269482.68	201416.36
LDW-SP-61	1267807.73	203765.83
LDW-SP-62	1267956.05	203981.82
LDW-SP-63	1270572.79	200732.33
LDW-SP-64	1266933.96	206227.38
LDW-SP-65	1266743.37	206164.24
LDW-SP-66	1266531.68	206283.94
LDW-SP-67	1266020.37	206865.58
LDW-SP-68	1265899.97	207439.53
LDW-SP-69	1265966.48	208307.75
LDW-SP-70	1266050.35	210057.30
LDW-SP-71	1265949.14	210351.17
LDW-SP-72	1267080.21	210736.30
LDW-SP-73	1267240.52	208422.53
LDW-SP-74	1267361.01	208061.41
LDW-SP-75	1267535.30	207504.65
LDW-SP-76	1268446.11	206513.90
LDW-SP-77	1268127.04	205985.06
LDW-SP-78	1268534.71	204311.00
LDW-SP-79	1268658.24	204101.84
LDW-SP-80	1268800.51	203588.29
LDW-SP-81	1269544.82	203123.79
LDW-SP-82	1269343.33	202714.24

^a NAD 1983 State Plane Washington North

Table A-2. Water quality data from seeps sampled during the reconnaissance survey

SEEP NUMBER	DATE OF WATER QUALITY MEASUREMENTS	TIME	TEMPERATURE (° C)	SPECIFIC CONDUCTIVITY (µmhos/cm)	DISSOLVED OXYGEN ^a (mg/L)	pH	OXIDATION-REDUCTION POTENTIAL ^a (mV)	SALINITY ^b (ppt)
1	5/5/04	10:05	13.5	19,780	5.4	na	199	15.5
1 (duplicate)	5/5/04	10:05	13.2	19,590	5.4	na	182	15.5
2	5/5/04	10:48	12.3	26,890	6.5	na	298	22.3
2 (duplicate)	5/5/04	10:48	12.1	26,070	7.1	na	296	21.7
3	5/5/04	11:10	12.5	12,860	5.5	na	155	10.0
4	5/5/04	11:17	13.1	11,500	6.2	na	202	8.70
5	5/5/04	11:38	12.5	13,040	4.1	na	235	10.1
6	5/5/04	11:44	17.1	28,390	7.8	na	216	21.0
7	5/5/04	11:50	15.9	30,870	6.8	na	245	23.7
8	5/5/04	11:58	17.3	11,550	6.2	na	107	7.80
9	5/5/04	12:28	13.4	13530	6.1	na	234	10.3
10	5/5/04	12:36	14.7	15,040	7.8	na	93	11.1
11	5/5/04	12:07	14.1	16,670	7.0	na	147	12.7
12	5/5/04	12:15	12.2	31,260	4.8	na	250	26.5
13	5/5/04	12:47	17.8	19,540	6.1	na	84	13.7
14	5/5/04	12:56	15.7	20,360	5.8	na	80	15.1
15	5/5/04	13:10	13.1	23,780	4.2	na	166	19.1
16	5/6/04	14:20	15.4	22,900	2.0	6.7	164	17.3
17	5/5/04	13:25	13.5	14,680	3.6	na	160	11.2
18	5/5/04	13:35	13.2	19,570	6.3	na	201	15.2
19	5/7/04	12:17	12.0	25,850	2.6	6.6	193	21.6
20	5/5/04	13:45	15.6	14,680	5.5	na	176	10.6
21	5/5/04	13:55	13.6	22,620	5.4	na	179	17.9
22	5/5/04	14:05	14.4	13,930	6.1	na	211	10.3
23	5/6/04	10:42	13.0	12,120	2.5	6.7	199	9.20
23 (duplicate)	5/6/04	10:42	13.0	12,170	2.5	6.6	200	9.30
24	5/5/04	14:25	16.0	20,920	7.3	na	724	15.4
25	5/5/04	14:35	18.9	4,647	6.4	na	387	2.80
26	5/6/04	10:15	13.6	11,610	3.8	6.8	194	8.70
26 (duplicate)	5/6/04	10:15	13.7	11,700	3.4	6.8	195	8.70
27	5/6/04	11:08	12.8	20,170	2.8	6.9	193	16.1
28	5/6/04	10:51	13.7	20,250	1.7	6.2	191	15.8
28	5/6/04	10:51	13.7	20,350	1.8	6.1	188	15.9
29	5/6/04	11:35	12.7	25,990	1.9	6.4	195	21.3
30	5/6/04	11:16	12.4	27,940	2.6	6.8	196	23.2
31	5/6/04	11:21	12.4	30,030	2.4	6.7	198	25.2
32	5/6/04	11:47	14.4	15,480	2.6	6.9	196	11.6
33	5/6/04	12:10	13.3	30,890	2.3	6.6	195	25.4
34	5/6/04	12:17	19.1	3,801	2.6	7.3	182	2.30

SEEP NUMBER	DATE OF WATER QUALITY MEASUREMENTS	TIME	TEMPERATURE (° C)	SPECIFIC CONDUCTIVITY (µmhos/cm)	DISSOLVED OXYGEN ^a (mg/L)	pH	OXIDATION-REDUCTION POTENTIAL ^a (mV)	SALINITY ^b (ppt)
35	5/6/04	12:30	16.1	10,290	2.3	6.6	158	7.10
36	5/6/04	13:10	15.9	21,940	2.1	6.7	180	16.3
37	5/6/04	12:45	15.7	20,500	2.3	6.5	163	15.2
38	5/6/04	13:15	15.7	10,870	2.6	7.2	183	7.60
39	5/6/04	13:23	15.7	8,304	2.0	6.9	159	5.70
40	5/6/04	13:35	14.4	25,030	1.8	5.8	188	19.6
41	5/6/04	13:41	19.4	18,550	1.9	6.7	89	12.5
42	5/6/04	13:56	15.1	2,341	2.8	7.3	131	1.50
43	5/6/04	14:08	15.9	14,070	2.8	7.1	151	10.1
44	5/7/04	12:10	11.4	32,600	2.4	6.1	200	28.3
45	5/7/04	12:03	12.1	26,630	2.2	6.3	194	22.2
46	5/6/04	14:36	13.4	24,440	2.7	7.1	174	19.6
47	5/6/04	14:46	12.4	24,550	2.4	6.7	181	20.2
48	5/6/04	14:52	13.9	20,530	2.9	7.9	181	16.0
49	5/6/04	14:59	13.0	15,830	2.3	6.5	187	12.3
50	5/7/04	11:54	11.9	37,640	2.5	5.9	190	32.8
51	5/6/04	15:08	17.7	34,580	2.5	7.7	187	25.7
52	5/7/04	11:30	13.0	15,030	2.2	7.3	60	11.6
53	5/7/04	11:20	12.6	20,490	1.9	7.0	34	16.5
54	5/7/04	11:12	12.8	9,814	2.2	6.7	138	7.40
55	5/7/04	11:00	13.1	8,190	3.0	7.0	204	6.00
56	5/6/04	15:50	14.0	11,990	2.3	6.2	197	8.90
57	5/7/04	12:40	12.4	21,980	2.8	6.6	208	17.9
58	5/7/04	13:00	14.2	20,210	2.6	6.4	205	15.6
59	5/7/04	13:10	13.3	27,190	2.7	6.7	212	22.1
60	5/7/04	13:17	12.6	26,570	1.9	6.2	193	21.9
61	5/7/04	14:00	13.0	11,390	1.4	6.9	96	8.60
62	5/7/04	13:44	12.9	15,390	2.4	7.0	212	12.0
63	5/7/04	13:25	11.8	27,200	1.6	6.4	203	23.0
64	5/7/04	14:07	12.2	18,400	1.7	6.5	154	14.8
65	5/7/04	14:20	12.0	26,490	2.7	6.7	163	22.2
66	5/7/04	14:28	12.8	16,190	2.5	6.8	172	12.7
67	5/7/04	14:41	12.1	24,150	2.8	6.9	178	20.0
68	5/7/04	14:51	17.2	21,030	3.8	8.3	174	15.1
69	5/7/04	15:00	17.1	26,850	3.4	8.3	176	19.7
70	5/7/04	15:12	12.3	30,650	2.9	6.7	186	25.9
71	5/7/04	15:18	13.8	21,030	2.7	6.8	187	16.5
72	5/10/04	16:10	13.0	26,610	3.0	7.4	164	21.9
73	5/7/04	15:35	19.1	19,330	3.1	8.7	184	13.1
74	5/7/04	15:40	21.4	17,460	3.0	7.8	183	11.1
75	5/10/04	15:45	12.7	14,950	1.7	6.5	140	11.7
76	5/7/04	16:00	13.7	16,130	2.0	6.1	174	12.3

SEEP NUMBER	DATE OF WATER QUALITY MEASUREMENTS	TIME	TEMPERATURE (° C)	SPECIFIC CONDUCTIVITY (µmhos/cm)	DISSOLVED OXYGEN ^a (mg/L)	pH	OXIDATION-REDUCTION POTENTIAL ^a (mV)	SALINITY ^b (ppt)
77	5/10/04	15:30	11.8	27,730	2.2	6.1	133	23.5
78	5/10/04	15:15	12.2	25,910	2.8	6.5	123	21.5
79	5/7/04	16:20	13.4	21,770	1.5	6.1	44	17.2
80	5/7/04	16:27	14.9	13,410	3.0	6.8	86	9.80
81	5/7/04	16:34	12.7	21,460	2.8	6.7	114	17.3
82	5/7/04	16:40	13.3	14,480	2.9	6.8	124	11.1

na – not available; although the pH probe calibrated correctly the morning of 5/5/04, it did not function properly in the field on that day

^a Data should be considered qualitative because DO values were unusually low on 5/6/04 and 5/7/04, and do not consistently correlate with the oxidation-reduction potential values

^b Calculated from temperature and conductivity

Table A-3. Water quality data from seeps and associated LDW locations sampled during the reconnaissance survey

SEEP NUMBER	LOCATION	DATE	TIME	TEMPERATURE (° C)	SPECIFIC CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)	pH	OXIDATION-REDUCTION POTENTIAL (mV)	SALINITY ^a (ppt)
19	seep	5/7/04	12:17	12.02	25,850	2.57	6.55	193	21.6
	LDW - surface	5/7/04	12:20	11.89	32,650 ^b	3.06	6.85	191	28.0
	LDW – 1 m	5/7/04	12:25	11.90	35,850 ^b	3.02	6.91	187	31.1
26	seep	5/6/04	10:15	13.60	11,610	3.80	6.84	194	8.7
	seep (duplicate)	5/6/04	10:15	13.65	11,700	3.36	6.75	195	8.7
	LDW - surface	5/6/04	10:20	11.75	22,780	3.08	7.14	197	18.9
	LDW – 1 m	5/6/04	10:25	11.75	24,860	3.13	7.06	196	20.8
56	seep	5/6/04	15:50	13.97	11,990	2.27	6.22	197	8.9
	LDW - surface	5/6/04	16:00	13.79	12,320	2.82	6.80	185	9.2
	LDW – 1 m	5/6/04	16:10	12.56	17,210	2.94	6.87	184	13.6
62	seep	5/7/04	13:44	12.87	15,390	2.39	6.95	212	12.0
	LDW - surface	5/7/04	13:50	12.87	15,890	2.99	6.84	208	12.4
	LDW – 1 m	5/7/04	13:55	11.89	17,000	2.97	6.95	210	13.7
73	seep	5/7/04	15:35	19.09	19,330	3.14	8.73	184	13.1
	LDW - surface	5/7/04	15:25	12.30	19,260	3.33	7.17	189	16.4
	LDW – 1 m	5/7/04	15:30	12.11	20,150	3.27	7.21	190	15.5

^a Calculated from temperature and conductivity

^b Value in field notes was one order of magnitude less. It was assumed to be a transcription error.

Table A-4. Transcribed field notes of seep observations made during the reconnaissance survey

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-01	
Flow rate	Low
Substrate description	(GP) gravel; dark gray brown; 95% gravel fill, w/riprap & debris steel; 5% muck (silt & clay); loose; wet; no odor
Seep observations	No sheen, no odor; light brown cloudy; trace of sediment
Description	Steep; riprap w/rounded gravel; construction debris to 20 ft, iron, wood, brick; pavement
Seep location	Mid-bank, about 10 ft below vegetation; angle/corner bank; near dock
LDW-SP-02	
Flow rate	Low-medium
Substrate description	(SM/GP); silty sand w/gravel, dark gray to brown; 60% fine-to-medium sand; 25% rounded gravel to 2 in; 15% silty (muck); loose, wet, overlain w/riprap (concrete) w/construction debris, cable, and pipe
Seep observations	No sheen, no odor; slime and vegetation cover surfaces, water clear to translucent yellow brown, sediment trace
Description	(below parking area), low bank seep ~15 ft (estimated) below high water; straight bank behind barge
Seep location	Broad linear seep line along toe of riprap, at low-low tide contact w/riprap (base of bank)/toe
LDW-SP-03	
Flow rate	Medium-high
Substrate description	(ML-SM); silt w/sand and gravel; dark gray to rust brown; 50% fine silt, clay, organic (muck), w/20% sand, 30% rounded gravel, very loose, wet, (base of riprap)
Seep observations	No sheen, no odor, clear to translucent trace fine sediment, rust precipitate surfaces at seep
Description	Steep riprap w/metal debris (collapsed boat rail?), broad seep area at toe/base of riprap
Seep location	Toe of riprap, about 15 ft from high water line/fence liner to broad seep area of about 10 small seeps
LDW-SP-04	
Flow rate	Medium-high
Substrate description	(ML) silt, dark brownish gray, 95% silt w/black organics fine, very soft, wet, below steep concrete blocks to 10 ft, trace of fine sand
Seep observations	Clear to trace gray sediment, no odor, no sheen, slimy surface
Description	Below dock/piling remains, steep bank of large concrete blocks, very mucky area underlain by large concrete block
Seep location	About mid-bank, below concrete blocks (north of scrap yard)
LDW-SP-05	
Flow rate	Medium-high
Substrate description	(GP) gravel and riprap, with sand and silty muck, 90% rounded gravel w/crushed concrete to 10 in, 10% sand, trace of silt muck on surface, medium to dense, wet
Seep observations	No odor, no sheen, no color or trace of sediment, slime on surface rock
Description	Step bank, south of metal scrap yard/crane
Seep location	Mid-low bank, within riprap zone

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-06	
Flow rate	High
Substrate description	(ML) silt dark grayish brown, 95% fine silt, clay, organic, trace of sand gravel, soft, wet
Seep observations	No odor/no sheen, clear to trace gray sediment, slime on surface area of seep, barnacles on piling, seep in 4-in channel, meander over broad beach ~50 ft
Description	Flat alluvial beach/bar, sand and fine silt, seep near former piling/stud
Seep location	Channelized across broad beach
LDW-SP-07	
Flow rate	High
Substrate description	(SM/ML) dark brownish gray w/some rust brown gravel, silty sand w/gravel, 80% coarse to fine sand, 15% silty, 5% gravel to 2 in, medium dense, wet
Seep observations	From channel about 20 ft across beach from stake, silty muck over beach sand w/gravel/riprap, no odor, no sheen, trace of fine sediment (muck)
Description	Channel seep from broad beach
Seep location	Stake at riprap toe, seep lower channel below semi tractor-trailer parking
LDW-SP-08	
Flow rate	Medium-High
Substrate description	(ML) silt, 95% silt, dark grayish brown, 5% fine sand, medium to soft, wet, 40-50 ft from retaining wall at bank, 6-in wide channel across bank
Seep observations	No odor/no sheen, clear; trace of gray silt
Description	Amongst former pier pilings (+20)
Seep location	Channel across broad beach
LDW-SP-09	
Flow rate	Medium-Low
Substrate description	(GP) gravel, 90% rounded gravel to 3 in, 10% fine sand and silty muck, very dense, wet, below pavement riprap
Seep observations	No odor/no sheen, clear, slime on area of seep
Description	Gravel w/broken asphalt, (below tanks)-above ground storage
Seep location	Mid-bank, moderate slope, point seep
LDW-SP-10	
Flow rate	Medium-High
Substrate description	(ML/GP) silt w/gravel, 85% silty muck, 15% round gravel, dark grayish to brown, soft, wet
Seep observations	No odor/no sheen, trace of brown sediment to clear
Description	Channel to 10 in wide, from broad seep to 20 ft, weeping from retaining wall
Seep location	Channel about 40 ft from wall, meanders across broad mucky/silty beach
LDW-SP-11	
Flow rate	High
Substrate description	(ML) silt, 95% silty muck, dark gray to brownish, soft, wet, 5% fine-medium sand, broad flat beach, w/retaining wall and building
Seep observations	No odor/no sheen, trace to cloudy w/sediment (fine)
Description	10-in wide channel, strong flow, meanders across 50-70 ft of beach
Seep location	Channel from toe of retaining wall (100+) below building/public access point

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-12	
Flow rate	High
Substrate description	(ML/SP) silt w/sand, 80% silty muck, 10% sand, 10% gravel fill, soft, wet
Seep observations	No odor/no sheen, trace of fine sediment, slimy surface
Description	Strong channel flow from toe of riprap and sheet pile, concrete surface (pallets and drums)
Seep location	Base of riprap, channel (flow) over short beach at lower low tide water
LDW-SP-13	
Flow rate	High
Substrate description	(ML) silt, dark grayish brown, 90% silty muck, 10% fine sand, soft, wet, (channel across wide low tide beach)
Seep observations	No odor/no sheen, translucent gray brown sediment
Description	Wide weeping gravel and riprap at bank, channelize to sample point
Seep location	~50 ft from toe of riprap bank, below Boeing fence vegetated area
LDW-SP-14	
Flow rate	High
Substrate description	(ML) silt, dark gray brown, 95% silty muck, soft, wet, broad flat beach/alluvium, trace of sand, gravel
Seep observations	No odor/no sheen, gray sediment
Description	Strong channel flow to 12 in wide
Seep location	Collects from broad area at toe of riprap below Boeing building; channelizes and meanders across broad ~50 ft beach alluvium w/pilings (old)
LDW-SP-15	
Flow rate	High
Substrate description	(ML) dark gray brown silty muck w/rust-color gravel, 80% silty muck, 10% fine-to-medium sand, 10% round gravel to 2 in, soft, wet, green seaweed
Seep observations	No odor/no sheen, trace of gray sediment-rust precipitate on gravel surfaces in seep channel
Description	10-in strong flowing channel from toe of riprap to narrow beach/alluvium (20 ft)
Seep location	Channel from riprap base, w/broken brick wall debris, south end of Boeing building/gravel boat ramp
LDW-SP-16	
Flow rate	Medium
Substrate description	(GP) 90% riprap fill w/5% fine-to-medium sand, 5% muck/silt, dense, wet, dark gray to brown
Seep observations	No odor/no sheen, trace of sediment
Description	Steep riprap below Boeing fence, vegetation, trickle seep sample above stake location
Seep location	Mid to lower on steep riprap bank, stake submerge ~2 ft below rising tide

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-17	
Flow rate	Medium-high
Substrate description	(GP) gravel and riprap, 90% gravel rounded to 2 in, 10% fine sand and muck, dense, wet, barnacles
Seep observations	No odor, no sheen, clear, slimy on surfaces near seep
Description	Steep bank, waterfall from riprap cover
Seep location	Mid-bank, at collapsed wooden wall, below Boeing fence and vegetation
LDW-SP-18	
Flow rate	Medium-high
Substrate description	(GP/SM) gravel w/silty sand, 70% gravel to 2 in, 20% firm to medium sand, 10% silty muck, medium, wet
Seep observations	No odor, no sheen, clear to trace sediment (suspect outfall behind lumber/pipe debris)
Description	10-in channel from toe of riprap, stacked concrete, and collapsed pilings
Seep location	Base of riprap, below Boeing fence/vegetation
LDW-SP-19	
Flow rate	Medium
Substrate description	(GP/SM) 80% [crushed] to rounded gravel w/brick, 10% sand, 10% silty (muck), dark gray to brown, firm, wet
Seep observations	No odor/no sheen, trace of gray sediment
Description	Steep riprap broken brick, concrete slabs, topped w/steel mill? Furnace slag lobes
Seep location	Very low bank, toe of brick riprap, moderate-to-strong seep, broad shallow channel to 3 ft
LDW-SP-20	
Flow rate	Medium-low
Substrate description	(GP/SM) dark gray brown, gravel w/silty sand, 70% rounded to [crushed] gravel w/brick and concrete, 20% fine sand, 10% silty muck, medium dense, wet (small channel at base of concrete wall)
Seep observations	No odor, no sheen, clear w/trace of sediment
Description	From toe of wall; narrow, flat gravelly beach visible only at low tide
Seep location	Base of 15-ft wall (concrete and steel), small channel to 4 in
LDW-SP-21	
Flow rate	High
Substrate description	(GP/SM) dark gray brown, gravel w/silty sand, 80% gravel crushed fill to 10 in, 10% coarse to fine sand, 10% silty muck, dense, wet, barnacles
Seep observations	No odor/no sheen, trace sediment to clear
Description	Steel I-beam wall to 12 ft over low sloping riprap
Seep location	Point seep, mid-bank in riprap
LDW-SP-22	
Flow rate	Medium-low
Substrate description	(GP) gravel, w/sand, 90% round gravel to 3 in, 10% fine-to-medium sand, trace, silt, dense, wet
Seep observations	No odor, no sheen
Description	Riprap; steep slope
Seep location	Seep from toe of riprap, begins channel to 12 in across

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-23	
Flow rate	Medium
Substrate description	(GP/ML) 80% riprap gravel over silty (river alluvium) bank dark gray to brown, very soft silt bank, wet, organic muck
Seep observations	No odor, no sheen, clear
Description	Steep riprap above silty river bank-beach, below vegetation and aboveground tank
Seep location	Multiple seeps from toe of riprap join rapid 4 to 6-in channel, meander/cutting silty riverbank below
LDW-SP-24	
Flow rate	Medium-low
Substrate description	(GP) dark gray brown, 95% gravel rounded to crushed rock w/riprap, 5% fine sand, dense, wet, trace of muck w/green slime
Seep observations	Clear, trace of floating white dust, (pollen?) no odor, no sheen
Description	Steep riprap slope, over gravelly sand, small channel flow
Seep location	High bank several feet below higher high water line, below fence
LDW-SP-25	
Flow rate	Medium
Substrate description	(SP/GP) dark brown, 80% coarse to fine sand, 20% crushed gravel to riprap, dense, wet, green vegetation over riprap
Seep observations	No odor, no sheen, clear to trace of fine brown sediment, green slime/vegetation in area of seep
Description	Shelf bank (collapse?), riprap and sand, steep to water line
Seep location	Mid-bank at shelf, tree trunk fallen from fence line
LDW-SP-26	
Flow rate	Medium
Substrate description	(GP) gravel, dark gray brown, 95% rounded to 3 in and large angular riprap, 5% medium-coarse sand, trace of silt, medium-dense, wet, (strong channel flow)
Seep observations	No odor, no sheen, clear w/trace of fine sediment, [little] slime/growth
Description	Gravel to riprap, moderate slope to alluvium shore beach, below vegetation/Boeing fence
Seep location	Mid-bank-gravels/riprap develop strong flowing channel carving into mud bank
LDW-SP-27	
Flow rate	Medium
Substrate description	(SM) silty sand, 80% medium to coarse sand, 15% silty, 5% pebbles to gravel (base of riprap), loose, wet (fill w/alluvium)
Seep observations	No odor/no sheen, clear to trace sediment
Description	Adjacent to concrete/steel pile wall, seep below very large (concrete to 10 ft) block of riprap
Seep location	Mid-bank at toe of riprap channel to 6 in wide

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-28	
Flow rate	Medium
Substrate description	(SM) silty sand, dark gray to brown, 80% fine-to-medium sand, 20% silty river alluvium, medium sand dense, wet, (collapsed river bank w/pilings)
Seep observations	Silty sediment translucent gray brown, no odor/no sheen
Description	Recent? Collapsed river bank along colonnade of pilings, mid-bank seep cutting steep channel
Seep location	Mid-bank multiple small seep channeling to steeply cutting 10-in channel
LDW-SP-29	
Flow rate	Medium-high
Substrate description	(ML) silt w/organics, 95% silty muck, 5% sand (fine) very soft, wet, log jam in river bank/bar, large old cedars to 30-40 ft, set in mud
Seep observations	No odor/no sheen, clear w/trace of fine sediment
Description	Wide steep mud bank w/~half dozen large stumps and logs on and in mud, no riprap below vegetated fence line
Seep location	Mid-bank below log within log jam
LDW-SP-30	
Flow rate	Medium
Substrate description	(SM) silty sand, dark gray brown, 70% fine-to-medium sand, 30% silty muck, trace of pebbles to gravel, below riprap, loose, wet, seep at large log wedged in riprap
Seep observations	Clear, no odor/no sheen, trace of sediment
Description	Lower mid-bank, river sand and silt, overlain by riprap, tree stump and log snag
Seep location	Toe of riprap at river bank, moderate channel to 5 in wide
LDW-SP-31	
Flow rate	Medium
Substrate description	(SM/ML) very silty sand, 60% fine-to-coarse sand, 40% silty alluvium (muck), trace of gravel fill, loose/soft, wet, below (concrete blocks) riprap
Seep observations	No odor/no sheen, clear
Description	Steep riprap blocks adjacent to natural bank, no riprap, seep at toe
Seep location	Low bank at riprap contact w/shoreline, below willows/fence
LDW-SP-32	
Flow rate	High
Substrate description	(ML/GP) silt w/riprap, 75% silt, 25% riprap and debris (pipe, wood), soft, wet (broad mud bank)
Seep observations	No odor/no sheen, trace of fine sediment
Description	Broad low slope mud bank w/log snags, just south of Boeing bridge
Seep location	Mid-bank at rubble/riprap outcrop in mud bank, low sloping mud bank w/snags

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-33	
Flow rate	Medium-low
Substrate description	(ML/GP) silty muck w/riprap gravel, dark gray w/rusty brown surfaces, soft, wet, river bank sediments below short pier
Seep observations	No odor/no sheen, trace of fine sediment
Description	Upper river bank muds at toe of riprap, seep channels to 4 in width down bank
Seep location	Moderate slope upper mid-bank, toe of riprap beneath existing pier structure/building
LDW-SP-34	
Flow rate	High
Substrate description	(SM/ML) dark gray brown, very silty sand, 60% very fine sand, 40% silty muck, loose/soft, wet, (river bank/bar), long seep channel from riprap
Seep observations	No odor, no sheen, trace of sediment
Description	Steep riprap along roadway above wide (~100 ft?) river bank
Seep location	Seep channels across wide bank
LDW-SP-35	
Flow rate	na
Substrate description	(ML) silt, 100% mucky silt (river bank), dark gray brown, very soft, wet
Seep observations	Clear to trace of gray sediment, no odor, no sheen
Description	Low bank, seep spring on low sloping river bank low tide zone
Seep location	Low bank, very soft muck/silt, few tree branches
LDW-SP-36	
Flow rate	Medium
Substrate description	(ML/GP) 100% silt below riprap and gravel, dark gray brown, soft, wet
Seep observations	No odor/no sheen, trace of sediment, gray
Description	Very steep riprap to low tide water, (marker submerged) small seep adjacent to large channel
Seep location	Toe of riprap below foundation/"electric substation?"
LDW-SP-37	
Flow rate	High
Substrate description	(GP/ML) dark gray to brown cobbles to 6 in, over silty river bank/muck, very soft, wet, broad river bank (low tide ~75 ft)
Seep observations	No odor/no sheen
Description	Moderate steep cobbles, base overlain w/riprap
Seep location	Broad seep zone at toe of riprap ~100 ft, 3 main channels combine to one cut channel, strong flow 2 ft across
LDW-SP-38	
Flow rate	Medium-high
Substrate description	(ML/GP)silt with gravel, dark gray brown, 70% silt (below riprap), 30% crushed gravel, (below riprap), soft, wet
Seep observations	No odor/no sheen, trace of sediment
Description	Low tide river bank w/channel seep, from toe of riprap
Seep location	Mid-bank at base of riprap, across exposed low tide bank (~30 ft)

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-39	
Flow rate	High
Substrate description	(SM/GP) silty sand and gravel, 50% fine-to-medium sand, 25% silty, 25% rounded gravel, firm, wet
Seep observations	No odor/no sheen/trace of sediment
Description	Low sloping bank to industrial yard, seep at sand/gravel contact and low tide bank
Seep location	Below Delta Marine pier, mid-bank, low/moderate slope, sand/gravel contact
LDW-SP-40	
Flow rate	Medium
Substrate description	(ML/GP) silt (95%), below steep riprap, soft, wet, dark brown gray, construction debris (wood, plastic, leaves)
Seep observations	No odor, no sheen
Description	Steep riprap below gray house
Seep location	Toe of riprap, stake submerged
LDW-SP-41	
Flow rate	High
Substrate description	(SM/GP) silty sand 60%, 40% rounded cobble fill, firm, wet (dark gray brown)
Seep observations	Slow/weeping seep along 100 ft of bank between mooring piles, sheen at seep, (light; not observed in river)
Description	Low to moderate grade cobbles and sand to high level of riprap and vegetation
Seep location	From cobble/sand, silt (mid-bank) contact, south of work pier/barge repair
LDW-SP-42	
Flow rate	Medium-high
Substrate description	(SM/GP) 60% silty sand, 40% rounded cobbles and small riprap; firm, wet (dark gray to brown)
Seep observations	No odor/no sheen, trace of sediment
Description	Low to moderate slope cobbles to small riprap top, seep forms small channel to 6 in
Seep location	Mid-bank at cobble/riprap contact w/river silty sand, vegetation/white building (set back), (grounded barges to south)
LDW-SP-43	
Flow rate	High
Substrate description	(GP/ML) 80% angular dark gray gravel fill, 20% silty muck river bank, soft/firm, wet
Seep observations	No odor/no sheen, trace of sediment
Description	Low-grade mud bank grading to fill rock and large riprap levee/vegetated (Boeing fence)
Seep location	Low bank broad head forms channel across silty (muck) to 6-in, good flow
LDW-SP-44	
Flow rate	Medium-high
Substrate description	(ML/SM) very silty sand, dark gray brown, 50% fine-to-coarse sand/trace of gravel, 50% silty, soft, wet
Seep observations	No odor/no sheen, trace of gray sediment
Description	Steep riprap topped with about 6 ft of concrete blocks
Seep location	Very low bank, strong seep from base of riprap, below Marina parting, channels 10 in wide

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-45	
Flow rate	Low
Substrate description	(ML/SM) very silty sand, dark gray to brown, 60% firm to coarse sand, 40% silty muck, soft-firm, wet, trace of riprap from above
Seep observations	No sheen/no odor, trace of gray sediment
Description	Moderate to steep riprap w/tires, seep at riverbank contact
Seep location	Very low bank, seep at base of rubble brick; weeping seep to short channel
LDW-SP-46	
Flow rate	Medium-high
Substrate description	(SM/GP) 60% fine-to-medium sand, 20% silty muck, 20% crushed brick fill, debris (tires, wood) and small riprap, firm, wet
Seep observations	No odor/no sheen, trace of sediment
Description	Steep brick concrete riprap over river bank, mud with sand, broad seep to 10 ft forming small channels
Seep location	Low bank, base of riprap on low tide river bank
LDW-SP-47	
Flow rate	Medium-high
Substrate description	(SM/GP) silty sand with gravel and riprap, dark grayish brown, soft/loose, wet
Seep observations	No odor/no sheen, trace of sediment
Description	Steep riprap below vegetated fence line
Seep location	Low bank, base of riprap at start/contact over mud bank/river's edge
LDW-SP-48	
Flow rate	High
Substrate description	(SM/GP) 60% fine-to-medium sand, 20% rounded pebbles to occasional riprap, 20% silty muck, firm, wet
Seep observations	No odor/no sheen, clear w/trace of sediment
Description	Low-to-moderate beach/shore access area
Seep location	Low-to-mid-bank channel steep from broad beach sand/access point
LDW-SP-49	
Flow rate	Medium
Substrate description	(SM/GP) silty sand, dark grayish brown, 40% silt muck, 60% fine-to-coarse sand, firm, wet
Seep observations	No odor/no sheen, clear w/trace of sediment
Description	20-ft wide mud bank with seep, 10 ft below steep riprap bank and vegetation
Seep location	"Spring" seep, low river bank, forming channel to 10-in width
LDW-SP-50	
Flow rate	Medium
Substrate description	(ML/SM) 80% dark gray to brown silty muck, 10% fine sand, 10% riprap concrete debris, very soft, wet
Seep observations	No odor/no sheen, trace of sediment (gray)
Description	Construction debris w/concrete pour? ledge over river bank muds w/seep
Seep location	Low bank, point/spring seep; low slope, river bank behind barge, vegetated levee

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-51	
Flow rate	Medium-low
Substrate description	(SM) silty sand, dark grayish brown, 60% fine-to-coarse sand, 40% silt muck river bank, firm to soft, wet
Seep observations	No odor/no sheen, trace of gray sediment
Description	Steep riprap above seep, seep weeps across 20-ft length forming small channels
Seep location	Low bank, base of brick riprap bank, below tractor trailer parking
LDW-SP-52	
Flow rate	Low
Substrate description	(GP-SM) 90% rounded gravel (to 2-in), 10% fine sand w/silt, medium dense, wet, dark grayish-brown
Seep observations	No sheen/sulfide odor, light gray w/gray to black sediment
Description	From base of wood wall, seep small w/white slime
Seep location	Low bank, below wood retaining wall, w/concrete pour, seep at contact w/river bed, muck/grass
LDW-SP-53	
Flow rate	Low
Substrate description	(SM/GP) silty sand with pebbles, 60% sand, 25% pebbles, 15% silts, firm, wet
Seep observations	Black ooze (NAPL?), little flow, no sheen, TPH odor
Description	NAPL? seep at bottom of channel, steep sloping bank, with wood terrace below; asphaltic blob topped with vegetated levee
Seep location	Low low bank adjacent to horizontal timber/ties within channel inlet
LDW-SP-54	
Flow rate	Low
Substrate description	(GP) 90% rounded pebbles, 5% sandy, 5% silty, firm, wet
Seep observations	Trace sheen, trace odor, "gray water" sulfide and trace petroleum odor, clear to trace gray sediment
Description	moderate slope of pebbles , sand and silt
Seep location	Upper bank , small trickle seep, below dock with structure and metal debris levee
LDW-SP-55	
Flow rate	na
Substrate description	(GP) Anthropogenic fill, with silt, dark grayish brown, firm-dense, wet, in terminus of inlet
Seep observations	No odor/no sheen; trace of fine brown sediment
Description	Steep, riprap and construction debris bank adjacent to pier/dock with structure
Seep location	Mid-bank at base of former cement truck tumbler? in asphalt concrete rubble w/gravel
LDW-SP-56	
Flow rate	na
Substrate description	(GP/SM) gravel with silty sand, 50% rounded pebbles to large concrete riprap, 40% fine-to-medium sand, 10% silty muck surface, firm, wet
Seep observations	No odor/no sheen
Description	Steep riprap bank in inlet channel, gravelly channel seep
Seep location	Mid-bank in steep riprap below vegetation and stacked drums

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-57	
Flow rate	High
Substrate description	(GP) 95% gravel rounded and crushed to 2 in, riprap, medium, wet
Seep observations	No odor/no sheen trace of brown sediment
Description	Moderate sloping riprap at 1st Ave bridge pilings over river bank sediment; strong seep from toe of riprap
Seep location	Mid-bank, among bridge caisson/pilings, vegetated levee with roadside guardrail
LDW-SP-58	
Flow rate	Medium-low
Substrate description	(SM) 75% fine-to-coarse sand, 25% silty, firm-loose, wet, broken pilings along bank
Seep observations	No sheen/no odor, trace of gray sediment
Description	Sand berm fencing with geotextile collapse above slump at seep, broad and shallow with narrow channels
Seep location	Low bank above tributary stream, below sand ledge at roadway/guardrail, former pilings to the right and left
LDW-SP-59	
Flow rate	Medium-low
Substrate description	(SM/GP) silty sand with gravel, 60% fine-to-medium sand, 20% silty, 20% round angular gravel (fill), loose, wet
Seep observations	No sheen/no odor, trace of gray sediment
Description	Beneath roadway bridge, slump of fill sand and gravel; seep weeps from broad 15-ft slump, forms multiple channels
Seep location	Low bank above tributary stream, below sand ledge at roadway/guardrail, former pilings to the right and left
LDW-SP-60	
Flow rate	Medium-low
Substrate description	(SM) silty sand, dark grayish brown, 70% fine-to-medium sand, 40% silty muck, soft-loose, wet, below small brick riprap and pier debris
Seep observations	No sheen/no odor, trace of gray sediment
Description	Low sloping riverbed with sand below riprap and pilings, collapsing decking overhead
Seep location	Mid-bank at riprap toe over silty beach sand below decrepit dock/pilings, little flow to multiple channels
LDW-SP-61	
Flow rate	Medium-high
Substrate description	(ML) 100% dark gray w/brown river muck, trace of fine sand, very soft, wet, below gravel/riprap and debris
Seep observations	Water dark yellow w/black sediment and floating black organic silt/clay (muck), sulfide odor
Description	Low flat riverbank below steep riprap w/log snags, drum and rebar in riprap
Seep location	Very low bank, in river bed, spring-like flow, dark organic fines, strong flow from broad area of seeps w/multiple channels in soft muck

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-62	
Flow rate	Low
Substrate description	(GP/ML) gravel and silt, 50% gravel grading to riprap in matrix of muck with trace of sand, dark gray to brown, stiff, wet
Seep observations	No odor/ no sheen, trace of brown sediment
Description	Low sloping river bank sediments below riprap, concrete and rock, vegetated levee
Seep location	Mid-bank at base of riprap over riverbank, very slow flow, one narrow channel
LDW-SP-63	
Flow rate	Medium
Substrate description	(ML/SM) silty with sand, 60% silty muck, 40% firm to medium sand, trace of gravel to 1 in, soft-firm, wet, some rust-color slime over gravel
Seep observations	No odor/no sheen, slime, trace of floating orange organics
Description	Steep riprap over bank
Seep location	Low bank, toe of large concrete riprap over river bank sediments, between piles
LDW-SP-64	
Flow rate	Medium
Substrate description	(SM/GP) silty sand w/gravel, 60% fine-to-coarse sand, 20% rounded pebbles to crushed rock in riprap, 20% silty muck; firm, wet; trace of shells/barnacle detritus
Seep observations	No odor/no sheen, light brownish yellow
Description	Steep riprap rock overlain by crushed rock top w/vegetation and fence at silos
Seep location	Low bank at toe of riprap, contact w/riverbank silts and sand (slow/small seep)
LDW-SP-65	
Flow rate	Low
Substrate description	(GP/SM) silty sand w/gravel, dark gray to brown, 60% sand fine-to-coarse, 20% silty muck w/20% crushed gravel to fine; firm, wet
Seep observations	No odor/ no sheen, clear to trace of brown sediment
Description	Top of low tide riverbank, base of riprap, small low flow seep to single channel, about 4 in wide
Seep location	Low bank at toe of crushed rock riprap topped with lobe of concrete, vegetation, and fence
LDW-SP-66	
Flow rate	Medium-high
Substrate description	(SP/GM) gravelly sand with silt, 50% fine-to-coarse sand, 25% pebbles to large riprap rock, 25% silty river sediment, dark to medium brown, firm to loose, wet
Seep observations	No odor/ no sheen, trace of brown sediment
Description	Low sloping gravelly beach over river low tide mud flat, strong seep from 20 ft wide weepy area, forms 10-in wide cutting channel
Seep location	Lower beach strand at river bar low tide muck

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-67	
Flow rate	High
Substrate description	(GP) gravel (brick riprap) w/ 5% sand, 5% muck, dense, wet (seep strong from brick pile)
Seep observations	No sheen/no odor, trace of gray sediment
Description	Steep brick riprap over flat tidal flat to Kellogg Island
Seep location	Very low bank, top of tidal flat, base of brick riprap, strong flowing channelized, meanders 100 ft to river
LDW-SP-68	
Flow rate	Medium-low
Substrate description	(SM/GP) shelly silty sand w/crushed brick, 60% fine-to-medium sand, 20% red brick, 10% silty black muck, 10% white broken shells, firm/medium, wet
Seep observations	No odor/no sheen, clear to trace of brown sediment
Description	Low sloping sands mix w/ brick collapse from above log snags topped w/steep brick and log wall with trees and canes
Seep location	Mid-bank at base of brick riprap and log wall, broad weep zone to 50 ft wide, forms several shallow low flow channels
LDW-SP-69	
Flow rate	Medium-low
Substrate description	(ML) 100% silty muck, w/drift logs, trace of shells, very soft, dark gray w/brown surface, wet
Seep observations	No sheen/no odor, trace of gray sediment
Description	100 ft of natural low-lying mud and drift log bank to lowland vegetation/trees
Seep location	Very low bank, about 100 ft from vegetation/fence; springs from below log jam in muck
LDW-SP-70	
Flow rate	Medium-high
Substrate description	(GP) 95% rounded gravel w/brick, 5% sand, gray to brown, loose, wet (fill behind wall)
Seep observations	No odor/no sheen, clear
Description	Low sloping sands to steel wall w/pilings; strong "waterfall" seep onto beach sands
Seep location	Mid-bank from hole in steel plate wall below deck w/structure
LDW-SP-71	
Flow rate	Medium-low
Substrate description	(SM) silty sand at riprap pile, 80% firm medium sand, 20% silty, firm/medium dense, wet
Seep observations	No odor/no sheen, trace of fine gray silt, <i>Fucus</i> algae at pilings
Description	Low sloping beach over broad river bank
Seep location	Mid-bank at riprap outcrop in beach sands, with multiple pilings, medium flow seep, channels to 6 in
LDW-SP-72	
Flow rate	Medium
Substrate description	85% riprap covered partially with concrete flows, 5% gravel, 10% coarse to medium sand
Seep observations	No odor/no sheen, slight yellow color
Description	Steep concrete covered riprap, small trees and vegetation at top of bank, <i>Fucus</i> and green on riprap
Seep location	Seep flows from toe of riprap bank

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-73	
Flow rate	Medium-low
Substrate description	(SP) 95% medium to fine sand, dark gray, loose, wet, cover peat ledge to 2-ft thick
Seep observations	No odor/no sheen, clear to trace of gray sediment, trace of foamy bubbles
Description	Low sloping broad beach w/peat, construction debris and fill gravel at low bank
Seep location	Mid- to upper bank above peat ledge, large area of weeping seep (about 100 ft linear) above peat shelf
LDW-SP-74	
Flow rate	Medium
Substrate description	(SM) dark gray to brown silty sand, 60% fine-to-medium sand, 30% silty w/10% crushed gravel at riprap, loose, wet
Seep observations	No odor/no sheen, yellowish color, trace of gray sediment
Description	Low sloping natural bank topped with gravel and riprap to road
Seep location	Very low bank, channel from broad weeping area to 100 ft in former slip?/cove below public access park
LDW-SP-75	
Flow rate	Medium-low
Substrate description	Riprap (90%), silty medium sand (10%)`
Seep observations	No odor, no sheen, pale yellowish color, some suspended fines (minimal)
Description	Moderately sloped riprap w/Fucus
Seep location	Seep flows from base of riprap
LDW-SP-76	
Flow rate	Low
Substrate description	(GP/SM) gravel w/silty sand, 70% rounded gravel to 2 in., 20% fine-to-medium sand, 10% silty, loose, wet
Seep observations	No odor/no sheen, light yellow color, trace of sediment
Description	Low sloping gravel below wooden broken shoreline
Seep location	Low bank at pilings below collapsed decking; low flow from small weeping area about 10 ft across
LDW-SP-77	
Flow rate	Medium
Substrate description	Pipes, wood planks, metal debris, cut-off piling; medium sand, gravel (fill gravel 2-3 in), cobble and riprap
Seep observations	No odor/no sheen, clear sample
Description	Large (8 x 10 ft) concrete structure w/moderate slope riprap/concrete/gravel surrounding
Seep location	Seep flows from base of concrete structure from which a large metal pipe extends into waterway
LDW-SP-78	
Flow rate	Medium
Substrate description	(GP/SM) 15% silty sand, some gravel (5%), riprap bank (80%)
Seep observations	No odor/no sheen, clear sample
Description	Moderate slope, riprap, concrete chunks w/ <i>Fucus</i> and green algae
Seep location	Seep located lower mid-bank in concrete/riprap w/trace of gravel

SEEP LOCATION ID	OBSERVATIONS ^{a, b}
LDW-SP-79	
Flow rate	Medium
Substrate description	(GP/ML) 80% gravel rounded to 2 in, 20% dark gray silt (muck), loose, wet
Seep observations	No sheen/no odor, trace of gray sediment
Description	Moderate to steep riprap slope w/multiple cut-off pilings, vegetated top w/tractor trailer parking
Seep location	Low bank, toe of riprap at cutoff piling w/ <i>Fucus</i> algae (low flowing small seep)
LDW-SP-80	
Flow rate	Medium
Substrate description	(GP/SM) gravel w/silty sand, dark gray-brown, 50% gravel riprap, 25% silt, 25% fine-to-medium sand, loose, wet
Seep observations	No odor/no sheen, clear
Description	Steep bank, cut edge of peat to 5 ft overlain w/large riprap topped w/industrial yard (concrete? gypsum?)
Seep location	Mid-bank above peat shelf to 5 ft, seep at toe of riprap
LDW-SP-81	
Flow rate	Medium
Substrate description	(GP w/SM) 90% concrete and brick riprap, with 10% silty sand (dark gray to brown, loose, wet)
Seep observations	No sheen/no odor, trace of gray sediment
Description	Steep riprap bank, gravel and brick
Seep location	Mid-bank, small steady seep in concrete-brick riprap
LDW-SP-82	
Flow rate	Medium-high
Substrate description	(GP/SM) 60% pebbles to cobbles to 2 in, 20% fine-to-medium sand, 20% silty loose, wet with <i>Fucus</i> algae
Seep observations	No odor/no sheen; trace of gray sediment
Description	Broad bank of sand/gravel to 25 ft overlain (steeply) by pavement slabs as riprap
Seep location	Mid-bank, moderate spring-like from 5-ft-wide area in sand and gravel

Note: Observations were made by Tim Fitzgerald in the second boat, except for flow rate observations, which were made by Windward personnel in the first boat

^a All percentages are field-estimated

^b Flow rate is defined as low if seep could be sampled, but had a very low flow, whereas flow rate was defined as high if the flow resulted in a significant rivulet and flow was strong

GP – poorly sorted gravel

ML -- silt

SP – poorly sorted sand

SM – silty sand

GM – silty gravel

muck – organic-rich silt and clay