APPENDIX A. FIELD FORMS, FIELD NOTES, PHOTOS, AND COCS

Reconnaissance

Field Forms

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB, SD, JM, CL

Weather: ~56°F, overcast **Photo no.** 1 — 12

Name of person filling out form: CL

Seep Number: SP05	Easting (x): 1271813.8	Northing (y) 199461.1	Time: 10:54
Calculated flow rate ~7 mL/s BSB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.4	1 19655.2	1 8.14	1 6.72	1 50.4	1
2	2 19755.0	2	2	2	2
3	3	3	3	3	3

Comments:
150 mL 23 sec
270 mL 35 sec
5 gallon funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/15/18 **Crew:** BB, JM, SD, CL

Weather: ~60°F, overcast w/sunbreaks **Photo no.** 73-76

Name of person filling out form: CL

Seep Number: SP06	Easting (x): 1272082.9	Northing (y) 199159.7	Time: 1346

Calculated flow rate 4 mL/s BB

Temp °C	SpC	DO	pH	Turbidity	Salinity
1 19.7	1 150837	1 8.14 mg/L	1 9.01	1 48.87	1
2	2 151060	2	2	2	2
3	3	3	3	3	3

Comments:
300 mL / min 15 sec
turbid -
funnel method - need to use bigger funnel

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SD, JM, CL

Weather: ~63 **Photo no.** 108-120

Name of person filling out form: CL

Seep Number: SP24	Easting (x): 1277564.3	Northing (y) 1929 37.8	Time: 1303

Calculated flow rate ~17 mL/S BB

Temp	SpC	DO	pH	Turbidity	Salinity
1 16.0	1 6092.2	1 5.67	1 6.44	1 7.1	1
2	2 6093.5	2	2	2	2
3	3	3	3	3	3

Comments:
300 mL 18 sec
funnel method Sample @ higher than tido (-2.4)

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SD, JH, CL

Weather: ~58°F, overcast **Photo no.** 15-23

Name of person filling out form: CL

Seep Number: 27	Easting (x): 1278730.3	Northing (y) 190041.9	Time: 1036

Calculated flow rate ~60 mL/S BB

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.4	1 12362.5	1 9.40	1 7.16	1 13.2	1
2	2 12370.8	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 5 sec

funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SD, JH, CL

Weather: ~ 60's, **Photo no.** 130 - 136

Name of person filling out form: CL

Seep Number: SP 28	Easting (x): 1278352.3	Northing (y) 190350.2	Time: 1346
Calculated flow rate ~ 11 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 16.0	1 1113.4	1 9.31	1 7.51	1 38.5	1
2	2 1113.1	2	2	2	2
3	3	3	3	3	3

Comments:
350 mg/L 33 sec
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/14/18 **Crew:** BB, SD, JM, CL

Weather: ~63°F, sunny **Photo no.** 137 - 148

Name of person filling out form: CL

Seep Number: SP29	Easting (x): 1278145.1	Northing (y) 190078.8	Time: 1407
Calculated flow rate ~43 mL/S BD			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.7	1 270.26	1 2.35	1 6.44	1 32.0	1
2	2 2704.3	2	2	2	2
3	3	3	3	3	3

Comments:
700 ml 7 sec
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SD, JM, CL

Weather: ~58 °F, overcast sunbreaks **Photo no.** 24 - 28

Name of person filling out form: CL

Seep Number: SP30	Easting (x): 1278509.9	Northing (y) 189897.6	Time: 1048
Calculated flow rate ~ 30 mL/S BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 13.7	1 13809.7	1 6.73	1 6.85	1 2.35	1
2	2 13823.8	2	2	2	2
3	3	3	3	3	3

Comments:

300 ml 10 sec

funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection
Project Task: Seep Reconnaissance Survey
Date: 5/16/18
Crew: BB, SD, JM, CL
Weather: ~58°, cloudy
Photo no. 29 - 37
Name of person filling out form: CL

Seep Number: SP 31	Easting (x): 1277817.41	Northing (y) 190193.56	Time: 1110
Calculated flow rate ~60 mL/S BSB			

Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1 14.4	1 20328.3	1 8.13	1 6.99	1 2.32	1
2	2 20342.15	2	2	2	2
3	3	3	3	3	3

Comments:
300 mL 5 sec

funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SA, JM, CL

Weather: ~56°F, OVERCAST **Photo no.** 1 – 14

Name of person filling out form: CL

Seep Number: SP32	Easting (x): 1277817.41	Northing (y) 190193.56	Time: 1010
Calculated flow rate ~75 mL/S BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.5	1 4209	1 8.73	1 7.13	1 1.47	1
2	2 4233	2	2	2	2
3	3	3	3	3	3

Comments:
300 mL 4 sec
Funnel/method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SD, JM, CL

Weather: ~63°F, Sunny **Photo no.** 121 – 129

Name of person filling out form: CL

Seep Number: SP33	Easting (x): 1277741.8	Northing (y) 190519.5	Time: 1336
Calculated flow rate ~15 mL/S BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.9°C	1 5247	1 4.87	1 6.58	1 17.8	1
2	2 5208.6	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 20 sec
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SD, JM, CL

Weather: ~61°, cloudy w/sunbreaks **Photo no.** 51 + 62

Name of person filling out form: CL

Seep Number: SB35	Easting (x): 1277193.7	Northing (y) 190699.6	Time: 1149
Calculated flow rate 100 mL/5 BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.6	1 7698.1	1 7.98	1 7.03	1 80.71	1
2	2 7697.7	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 3 sec TIDE -2.1
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SD, JM, CL

Weather: ~61°, clouds w/ sunbreaks **Photo no.** 63 - 85

Name of person filling out form: CL

Seep Number: SP36	Easting (x): 1276624.9	Northing (y) 190832.2	Time: 1209
Calculated flow rate ~25 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 13.9	1 9090	1 4.68	1 6.68	1 15.3	1
2	2 9234.9	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 12 sec
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/16/18 **Crew:** BB, SD, JM, CL

Weather: ~62°, sunny, some clouds **Photo no.** 95 - 107

Name of person filling out form: CL

Seep Number: SP38	Easting (x): 1276485.2	Northing (y) 191358.5	Time: 1233
Calculated flow rate ~30 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.1	1 3523.5	1 7.92	1 7.28	1 9.0	1
2	2 3538.2	2	2	2	2
3	3	3	3	3	3

Comments:

300 mL sec 10

funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/15/18 **Crew:** BB, JM, SD, CL

Weather: ~58 °F, overcast **Photo no.** 55 - 62

Name of person filling out form: CL

Seep Number: SP42	Easting (x): 1275908.8	Northing (y) 193791.2	Time: 1224
Calculated flow rate ~ 50 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.5	1 1182.4	1 8.33	1 9.02	1 7.38	1
2	2 1181.4	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 6 sec
funnel method

Bearing 1:	**Object description:**	**Distance:**	**Compass direction**
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection
Project Task: Seep Reconnaissance Survey
Date: 5/15/18
Crew: BB, SD, JM, CL
Weather: ~58, overcast
Photo no. 63 - 70
Name of person filling out form: CL

Seep Number: SP 43	Easting (x): 1275803.1	Northing (y) 94472.8	Time: 1243
Calculated flow rate ~100 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 13.5	1 2802.7	1 7.73	1 7.9	1 1.1	1
2	2 2804.5	2	2	2	2
3	3	3	3	3	3

Comments:
300ml 3 sec
funnel/method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/15/18 **Crew:** BB, JM, SD, CL

Weather: ~58°, overcast **Photo no.** 44 - 54

Name of person filling out form: Christine Lopez

Seep Number: SB45	Easting (x): 1274198.5	Northing (y) 196710.2	Time: 1144
Calculated flow rate ~60 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.8	1 10743	1 6.88	1 8.02	1 19.7	1
2	2 10761	2	2	2	2
3	3	3	3	3	3

Comments:
300 mL 5 sec
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/15/18 **Crew:** BB, SD, JM, CL

Weather: ~57°, overcast **Photo no.** 41 - 43

Name of person filling out form: Christine Lopez

Seep Number: SR46	Easting (x):	Northing (y)	Time: 11:30
Calculated flow rate			

Temp	SpC	DO	pH	Turbidity	Salinity
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments:

NO GO, Deep sinky sediment

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/15/18 **Crew:** ~~BB~~, SD, JM, CL

Weather: ~57°, overcast **Photo no.** 35 – 40

Name of person filling out form: Christine Lopez

Seep Number: ~~SP~~47	Easting (x): 1273619.0	Northing (y) 197232.4	Time: 1110
Calculated flow rate ~ 100 mL/s BB			

Temp °C	SpC	DO	pH	Turbidity	Salinity
1 14.3	1 12977	1 8.02	1 8.3	1 45.4	1
2	2 13043	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 3 sec
Funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/15/18 **Crew:** BB, JM, CL, SD

Weather: ~56°, overcast **Photo no.** 28-34

Name of person filling out form: Christine Lopez

Seep Number: SP49	Easting (x): 1273037.8	Northing (y) 197749.9	Time: 1044
Calculated flow rate ~60 mL/S BB			

Temp °C	SpC	DO	pH	Turbidity	Salinity
1 14.6	1 18170	1 9.88	1 7.75	1 19.4	1
2	2 18183.7	2	2	2	2
3	3	3	3	3	3

Comments:
300 mL 5 sec
funnel method
FYI: Super sinky mud but great flow

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey Christine L.

Date: 5/15/18 **Crew:** Berit B, Suzanne D., Jordan M.,

Weather: ~56°, overcast **Photo no.** 15 - 27

Name of person filling out form: CHRISTINE LODEZ

Seep Number: SR50	Easting (x): 1272888	Northing (y) 197850	Time: 10:21

Calculated flow rate ~25 mL/5 BB

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.8°C	1 16380	1 8.82mg/mL	1 7.77	1 39.2	1
2	2 16404	2	2	2	2
3	3	3	3	3	3

Comments:
300 mL 12 sec.
funnel + tubing method to measure seep

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/15/18 **Crew:** Bent B., Suzanne D., Christy L., Jordan M.

Weather: overcast, cool ~56° **Photo no.** 1-14

Name of person filling out form: Bent Berggquist

Seep Number: SP51	Easting (x): 1272385.97	Northing (y) 198348.0	Time: 10:01
Calculated flow rate ~33 mL/s BB			

Temp °C	SpC	DO	pH	Turbidity	Salinity
1 15.09	1 19456	1 8.55	1 4.27	1 *50 (est)	1
2	2 19629	2	2	2	2
3	3	3	3	3	3

Comments:
300uc .09S * probe not working
Funnel and tubing method to sample seep

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/18/18 **Crew:** BB, SD, JM, CL, KK

Weather: ~58°F **Photo no.** 1 - 17

Name of person filling out form: CL

Seep Number: SP57	Easting (x): 1269542.0	Northing (y) 201147.6	Time: 1902
Calculated flow rate 100 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 ~~12.89~~	1 14021.9	1 9.59	1 7.62	1 5.05	1
2	2 14025.5	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 3 sec
funnel/method walk in

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/18/18 **Crew:** BB, SD, JM, CL, KK

Weather: ~58°F, overcast **Photo no.** 18-28

Name of person filling out form: CL

Seep Number: SP59	Easting (x): 1269554.0	Northing (y) 200786.5	Time: 1210
Calculated flow rate 60mL/5 BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 13.8	1 [illegible]	1 8.51	1 7.03	1 4.59	1
2	2 [illegible]	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 5 sec funnel method
16390.1
16405.8
Hydrosulfide odor

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB, SD, JM, CL

Weather: ~ 58°F, overcast w/ sun breaks **Photo no.** 125 - 135

Name of person filling out form: CL

Seep Number: SP65	Easting (x): 1266764.5	Northing (y) 206183.7	Time: 1330
Calculated flow rate 4 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.5	1 27883.7	1 7.66	1 7.48	1 65.-	1
2	2 27893.1	2	2	2	2
3	3	3	3	3	3

Comments: 180ml 4l/sec

Sume) method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB SD JM CL

Weather: ~60 °F, sunny w/ clouds **Photo no.** 136 – 148

Name of person filling out form: CL

Seep Number: SPLdo	Easting (x): 1266507.44	Northing (y) 206749.36	Time: 1355
Calculated flow rate 5 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 16.1	1 13740.0	1 8.07	1 7.63	1 8.5	1
2	2 13735.2	2	2	2	2
3	3	3	3	3	3

Comments:
200 mL 4/9 sec
funnel method w/ shoveled hole for beaker

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB, SD, JM, CL

Weather: ~63°F, Sunny **Photo no.** 181-190

Name of person filling out form: CL

Seep Number: SP68	Easting (x): 1265896.4	Northing (y) 207434.4	Time: 1449
Calculated flow rate ~13 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 23.98	1 18354.6	1 9.46	1 8.55	1 18.58	1
2	2 18306.2	2	2	2	2
3	3	3	3	3	3

Comments:
700 mL 23 sec
funnel method can sample @ higher tide

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** ~~BB~~, SD, JM, CL

Weather: 63°F, sunny **Photo no.** 175-

Name of person filling out form: CL

Seep Number: SP 70	Easting (x): 1266030.2	Northing (y) 210065.2	Time: 1440

Calculated flow rate 125 mL/s BB

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.4	1 23415.2	1 8.04	1 7.49	1 3.5	1
2	2 23444.4	2	2	2	2
3	3	3	3	3	3

Comments:

250 mL 2 Sec

funnel method - possible pipe

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/18/18 **Crew:** BB, SD, JH, CL, KL

Weather: ~59°F, overcast **Photo no.** 60-72

Name of person filling out form: CL

Seep Number: SP72	Easting (x): 1267079.8	Northing (y) 210721.9	Time: 1340
Calculated flow rate 43 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 13.2	1 18609.1	1 7.93	1 8.11	1 4.1	1
2	2 18619.2	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 7 sec
funnel method
need to sample @ Cow tide

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB, SD, JM, CL

Weather: ~63°F, Sunny **Photo no.** 162 – 174

Name of person filling out form: CL

Seep Number: SP 73	Easting (x): 1267243.7	Northing (y) 208412.0	Time: 1426

Calculated flow rate 23 mL/s

Temp	SpC	DO	pH	Turbidity	Salinity
1 25.4	1 16816.1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments:
300 mL 13 Sec
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	**Object description:**	**Distance:**	**Compass direction**

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB, SD, JM, CL

Weather: ~63°F, scattered clouds/sunny **Photo no.** 148 - 161

Name of person filling out form: CL

Seep Number: SP74	Easting (x): 1267390.0	Northing (y) 208025.2	Time: 1414
Calculated flow rate 3 mL/s SB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 17.2	1 5689.2	1 8.07	1 7.14	1 5.8	1
2	2 5686.2	2	2	2	2
3	3	3	3	3	3

Comments:
200 mL 60 sec
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB, SD, JM, CL

Weather: ~58°F, Overcast w/ sun breaks **Photo no.** 113 - 124

Name of person filling out form: CL

Seep Number: SP 7.7	Easting (x): 1268182.2	Northing (y) 205574.7	Time: 1317
Calculated flow rate 30 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.2	1 17883.7	1 5.50	1 6.81	1 10.4	1
2	2 29364	2	2	2	2
3	3	3	3	3	3

Comments:
300 ml 8 sec

funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/18/18 **Crew:** BB, SD, JM, CL, KK

Weather: ~59°F, overcast **Photo no.** 47-59

Name of person filling out form: CL

Seep Number: SD 78	Easting (x): 1268529.0	Northing (y) 204281.2	Time: 1303
Calculated flow rate 117 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.4	1 16898.3	1 8.45	1 7.7	1 6.0	1
2	2 16907.10	2	2	2	2
3	3	3	3	3	3

Comments:
350 ml 3 sec
funnel method
excellent flow

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/18/18 **Crew:** BB, SD, JM, CL, KK

Weather: ~58°F, overcast **Photo no.** 35 –

Name of person filling out form: CL

Seep Number: SP 79	Easting (x): 1268710.3	Northing (y) 204091.4	Time: 1249
Calculated flow rate 23 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.2	1 19159.5	1 4.4	1 6.95	1 9.1	1
2	2 19152.0	2	2	2	2
3	3	3	3	3	3

Comments:
250 mL 15 sec
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB, SD, JH, CL

Weather: ~56°F, overcast **Photo no.** 34 - 44

Name of person filling out form: CL

Seep Number: SP83	Easting (x): 1270756.5	Northing (y) 201595.4	Time: 1125
Calculated flow rate 33 mL/s SS			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.1	1 8042.8	1 8.97	1 7.23	1 35.0	1
2	2 8043.2	2	2	2	2
3	3	3	3	3	3

Comments:
300 uL 9 sec

Funnel method long tube

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/17/18 **Crew:** BB, SD, JM, CL

Weather: ~58°F, overcast **Photo no.** 80-88

Name of person filling out form: CL

Seep Number: SP87	Easting (x): 1269597.9	Northing (y) 203352.5	Time: 12:29
Calculated flow rate 30 mL/5 BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.4	1 4744.8	1 5.75	1 6.73	1 14.3	1
2	2 4745.9	2	2	2	2
3	3	3	3	3	3

Comments: new seep
300 mL 10 sec
funnel method orange color gravel

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection
Project Task: Seep Reconnaissance Survey
Date: 5/17/18
Crew: BB, SD, JM, CL
Weather: ~60°F, overcast
Photo no. 89 - 104
Name of person filling out form: CL

Seep Number: SP85	Easting (x): 1269588.7	Northing (y) 203201.0	Time: 1251
Calculated flow rate 150 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.1	1 207 46.6	1 7.52	1 6.92	1 4.28	1
2	2 207 30.4	2	2	2	2
3	3	3	3	3	3

Comments: new seep
300ml 2sec
funnel method - awesome flow

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection
Project Task: Seep Reconnaissance Survey
Date: 5/17/18
Crew: ~~BB~~, SD, JM, CL
Weather: ~65°F, overcast
Photo no. 191 – 199
Name of person filling out form: CL

Seep Number: SP86	Easting (x): 1265950.6	Northing (y) 206989.5	Time: 1524
Calculated flow rate ~100 mL/s BB			

Temp	SpC	DO	pH	Turbidity	Salinity
1 16.3	1 18 ~~[illegible]~~	1 7.92	1 7.13	1 8.9	1
2	2 18 194.1	2	2	2	2
3	3	3	3	3	3

Comments: new seep
300 mL 3 sec
funnel method need big board for standing

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5/18/18 **Crew:** BB, SD, JM, CL, KK

Weather: ~58°, overcast **Photo no.** 29-35

Name of person filling out form: CL

Seep Number: SP 87	Easting (x): 1269565.9	Northing (y) 200703.2	Time: 1220
Calculated flow rate	6.3 mL/s BB 6.3 mL/sec JR		

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.31	1 7759.7	1 6.81	1 6.94	1 15.80	1
2	2 7766.7	2	2	2	2
3	3	3	3	3	3

Comments:
40 sec 250 ml new seep
funnel method

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM A

Project Name: LDW Baseline Seep Collection
Project Task: Seep Reconnaissance Survey
Date: 5/18/18
Crew: BB, SD, JM, CL, KK
Weather: ~59°F, overcast
Photo no. 73–81
Name of person filling out form: CL

Seep Number: SP88	Easting (x): 1267097.4	Northing (y) 210695.9	Time: 1344
Calculated flow rate	600 mL/s BB		

Temp	SpC	DO	pH	Turbidity	Salinity
1 12.8	1 20295.2	1 7.98	1 8.16	1 3.3	1
2	2 20300.4	2	2	2	2
3	3	3	3	3	3

Comments:
new seep
300 ml 5sec
funnel method (down from SP72 @ Ashgrove)

Bearing 1:	Object description:	Distance:	Compass direction
Bearing 2:	Object description:	Distance:	Compass direction

Comments/sketch:

SEEP RECONNAISSANCE SURVEY FORM B

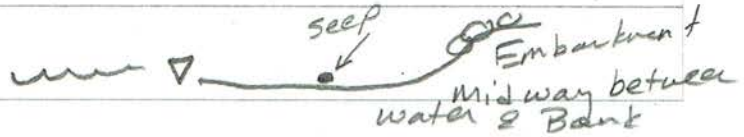
Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

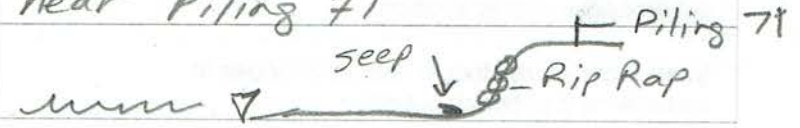
Date: 5-15-18 **Crew:** BB SD CL JM

Weather: Cool Overcast ~56°F **Photo no.** 1-14

Name of person filling out form: S. Dudziak

Tide is @ +0.9 ft

Seep number: SP-51	**Photo number:** 1-14
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Sandy SILT (ML) Med, Gray-Brown firm to soft (Silt Above, Sand Below)
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Sheen No Odor Clear Moderate Flow
Description of embankment that seep flows from and general seep characteristics:	Originates from mudflat below embankment
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-50	**Photo number:** 15-27
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Sandy Silt (ML) Dark Brown to Gray Brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Moderate Flow
Description of embankment that seep flows from and general seep characteristics:	Flowing from base of embankment near Piling 71
Seep location relative to vertical changes in embankment or beach substrate:	

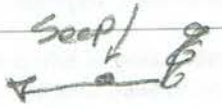
Seep number:	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection
Project Task: Seep Reconnaissance Survey
Date: 5-15-18
Crew: CL SD BB JM
Weather: Cool Overcast
Photo no. 28-34
Name of person filling out form: S Dudenhoefer

Seep number: SP-49	**Photo number:** 28 - 34
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Very Soft med brown SILT (ML) Organics present
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen, green organic Material in sample, Water Clear Moderate flow 16170
Description of embankment that seep flows from and general seep characteristics:	Flowing from mud flat below embankment
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-47	**Photo number:** 35 - 40
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Soft Med to dark brown, organics Silt (ML) Present
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Fast flow from distinct stream No Odor No Sheen, water has organics in it.
Description of embankment that seep flows from and general seep characteristics:	Seep comes out at base of embankment, distinct stream
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-46 - Can't Access	**Photo number:** 41 - 43
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Organic Silt very soft (ML) * Logged fro boat, No acce
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Flowing Fast, Clear
Description of embankment that seep flows from and general seep characteristics:	From mud flat 
Seep location relative to vertical changes in embankment or beach substrate:	Flowing from mud flat below embankment

Sink into mud up to knees

SEEP RECONNAISSANCE SURVEY FORM B

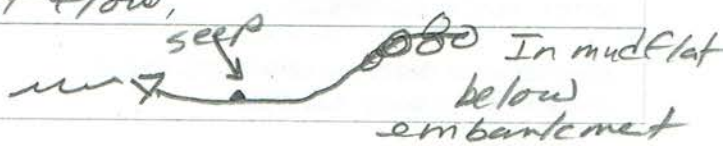
Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

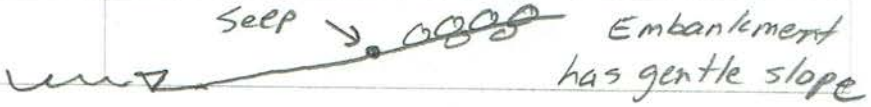
Date: 5-15-18 **Crew:** SD BB JM CL

Weather: Cool, overcast ~59°F **Photo no.** 44-54

Name of person filling out form: S. Dudziak

Seep number: SP-45	**Photo number:** 44-54
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Soft SILT (ML) w/ algae throughout Med Brown w/ some orange oxidized sediment
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor, No Sheen Water is Clear Iron-rich sediments are underneath
Description of embankment that seep flows from and general seep characteristics:	Flowing from mudflat; slightly diffuse flow.
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-42	**Photo number:** 55-62
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Poorly graded medium to fine Sand (SP) with some silt. Dark brown to Gray.
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor, No Sheen. Water is a little cloudy. Bacterial slime on sediments.
Description of embankment that seep flows from and general seep characteristics:	Distinct channel cut into mudflat Fast flow,
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-43	**Photo number:** 63-65
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Primarily gravel (GP) with some Sand poorly sorted, multicolored, orange-brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Fast, clear flow
Description of embankment that seep flows from and general seep characteristics:	Flowing where rocks & rip rap transition to mudflat
Seep location relative to vertical changes in embankment or beach substrate:	

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5-15-18 **Crew:** BB SD CL JM

Weather: Cloudy ~ 61°F **Photo no.** [illegible]

Name of person filling out form: S Dudziak

Seep number: SP-06	**Photo number:** 73 - 76
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silt (ML) w/ minor amounts of Sand (~10%) Gray - Brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor, No Sheen; Bacterial Slime Turbid water
Description of embankment that seep flows from and general seep characteristics:	Diffuse, slow flow. Seep flows from mudflat but is close to rip rap
Seep location relative to vertical changes in embankment or beach substrate:	seep ↓ Rip Rap & Concrete pretty flat

Seep number:	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number:	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

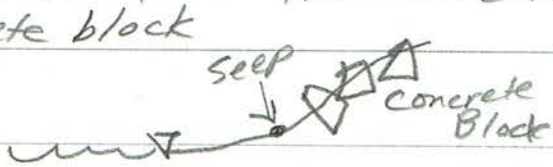
Date: 5-16-18 **Crew:** BB SP CL JM

Weather: Cool, Clouds **Photo no.**

Name of person filling out form: S Dudziak

Seep number: SP-32	**Photo number:** 1-14
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silt (ML) with organics; Sand ~10%, Tan to Gray on Surface; Gray to Black beneath surface,
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Clear (Very mucky sediment)
Description of embankment that seep flows from and general seep characteristics:	Fast flow through channels Flow comes out near base of embankment,
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-27	**Photo number:** 15-23
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Sandy SILT (ML) to Silty Sand (SP) w/some gravel, Med. Brown (oxidized)
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor, No Sheen, Clear Moderate Flow
Description of embankment that seep flows from and general seep characteristics:	Seep comes out from base of concrete
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-30	**Photo number:** 24-28
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Slightly sandy SILT (ML). Very soft, Dark brown.
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Bacterial slime on sediments
Description of embankment that seep flows from and general seep characteristics:	Channelized flow from beneath concrete block
Seep location relative to vertical changes in embankment or beach substrate:	Very mucky 

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5-16-18 **Crew:** BB SP CL TM

Weather: Clouds, Cool **Photo no.**

Name of person filling out form: S. Dudziak

Seep number: SP-31	**Photo number:** 29-37
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Sand (SP) to Sandy Silt (ML) ~50% sand ~50% silt
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Clear but w/ some organic matter (algae)
Description of embankment that seep flows from and general seep characteristics:	Seep comes out beneath concrete and rip rap - channelized flow
Seep location relative to vertical changes in embankment or beach substrate:	Seep → Steep embankment w/ rip rap

Seep number: SP-35	**Photo number:** 51-62
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Sandy Gravel (GP) Dark brown Some cobbles above mudflat
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor, No Sheer. Very turbid water
Description of embankment that seep flows from and general seep characteristics:	Channel flow, Seep comes from Gravel/Cobble area above mudflat
Seep location relative to vertical changes in embankment or beach substrate:	Slight Slope Seep → Gravel-Cobble Beach; Mucky ↑ Very soft; can't access by boat

Seep number: SP-36	**Photo number:** 63-85
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Gravel & Cobbles (60%) & Silt (40%) (GM) Med Gray-Brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Very slight unknown odor, No Sheen Moderate Flow, Clear
Description of embankment that seep flows from and general seep characteristics:	Flow come out of gravelly bank Bank is steep
Seep location relative to vertical changes in embankment or beach substrate:	Seep → Rip Rap; Gravel + Cobbles

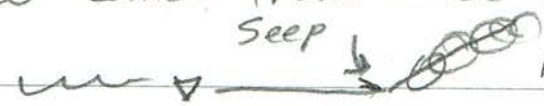
SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

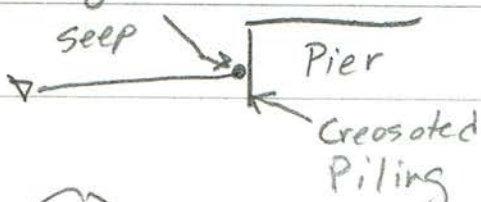
Date: 5-16-18 **Crew:** BB SP JM CL

Weather: Sun + Clouds **Photo no.**

Name of person filling out form: S. Dubzinski

Seep number: SP-38	**Photo number:** 95-107
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Fine Gray Sand (SP) w/ Silt Sand is substrate. Silt is around Sand
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Clear Fast Flow
Description of embankment that seep flows from and general seep characteristics:	Channelized flow, Flow comes from base of rock
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-24 (SLIP 6)	**Photo number:** 108-120
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Reddish-brown silt (ML) with gravel (GP) Gravel at base. Silt overlies gravel. Organic matter & pieces of brick observed.
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Fast Flow
Description of embankment that seep flows from and general seep characteristics:	Seep is both channelized & diffuse like a fan, ~30 ft long area of diffuse seeps, Seeps come out under rip rap
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-33	**Photo number:** 121-129
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Sandy Silt (ML) & Silty Sand (SP) Sand is brown & black, Silt is gray brown Silt overlies sand
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Slightly turbid. Slow flow.
Description of embankment that seep flows from and general seep characteristics:	Seep comes out from base of one creosoted piling.
Seep location relative to vertical changes in embankment or beach substrate:	

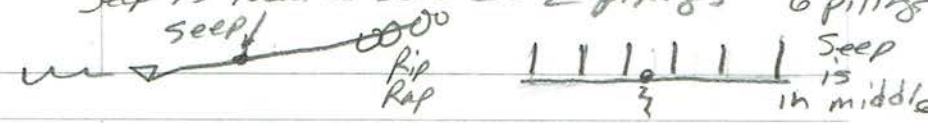
SEEP RECONNAISSANCE SURVEY FORM B

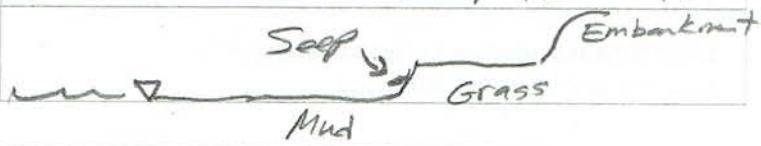
Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5-16-18 **Crew:** BB SD JM CL

Weather: Sun + Clouds Cool **Photo no.**

Name of person filling out form: S. Dudziak

Seep number: SP-28	**Photo number:** 130-136
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Substrate is Sandy Gravel (GP) but it is surrounded by Silt (ML) Substrate: Multi-colored Silt: Gray-Brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Bacterial Slime on silt
Description of embankment that seep flows from and general seep characteristics:	Channelized flow from bank of mudflat. Slight slope,
Seep location relative to vertical changes in embankment or beach substrate:	Seep is located between 2 pilings 6 pilings 

Seep number: SP-29	**Photo number:** 137-148
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Very Fine Sandy Silt (ML) Gray but Very Soft & mucky w/some oxidized orange
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Slight organic odor, No Sheen Clear
Description of embankment that seep flows from and general seep characteristics:	Channelized flow, An area is cut back into the bank, Seep flows from it,
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number:	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

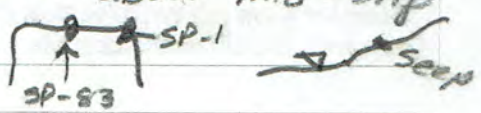
Date: 5-17-18 **Crew:** CL, SD, BB, JM

Weather: Overcast Cool **Photo no.**

Name of person filling out form: S Dudzinski

Seep number: SP-05	**Photo number:** 1-12
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Sandy Gravel (GP) Dark gray brown, Poorly sorted. Some brick pieces
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Turbid Organics in water
Description of embankment that seep flows from and general seep characteristics:	Steep rip rap embankment with wood. Comes out from rip rap
Seep location relative to vertical changes in embankment or beach substrate:	A few small seeps coming from rip rap Not much room 

Near SP-1 New

Seep number: SP-83 (new)	**Photo number:** 34-44
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Gravel/Cobbles & Sand (GP) Angular. Some Slag in area (pieces) Black/Brown Black
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Clear, Some algae Slag pieces within Gravel
Description of embankment that seep flows from and general seep characteristics:	Moderate Flow No Odor No Sheen Area about 10' across. From Rip Rap
Seep location relative to vertical changes in embankment or beach substrate:	135' N of SP-1 about mid-slip in Slip 3 

Seep number: ~~SP-84 (new)~~	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Investigated but determined it was tidal water, Not a groundwater seep,
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	Eastern Side of 1st Ave Bridge Flat mud flat w some rip rap

Not groundwater It's tidal water

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5-17-18 **Crew:** SD BB JM CL

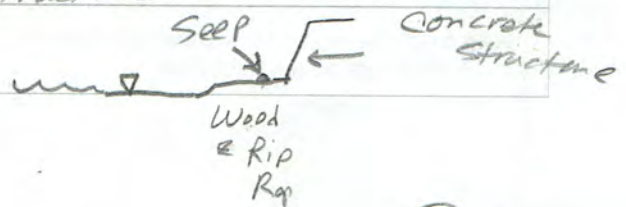
Weather: Cool Overcast **Photo no.**

Name of person filling out form: S. Dudziak

Seep number: SP-84 (new)	**Photo number:** 80-88
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Sandy Gravel 70% Gravel (GP) Orange-Red Color & Brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Large fan-like flow ~ 20 ft across No Odor No Sheen Concrete & anthropogenic material mixed in corroded AA batteries
Description of embankment that seep flows from and general seep characteristics:	Fan-like fast flow
Seep location relative to vertical changes in embankment or beach substrate:	At head of slip seep ~2.5 tide

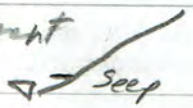
Seep number: SP-85 (new)	**Photo number:** 89-104
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Sandy Gravel (GP) Med to Dk brown w/ orange pieces angular
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Fast flow Clear No Odor No Sheen Concrete blocks, some bricks
Description of embankment that seep flows from and general seep characteristics:	Fan-like flow ~10ft wide
Seep location relative to vertical changes in embankment or beach substrate:	Seep is below steep embankment on a bench of rip rap

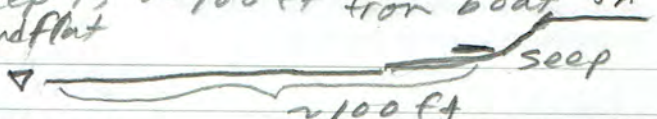
Seep number: SP-77	**Photo number:** 113-124
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Sand (SP) w/ gravel Dk brown/gray
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen on water * Some sheen on sediments, but unsure if its from site or from spill in waterway
Description of embankment that seep flows from and general seep characteristics:	Channel flow, fast near concrete box structure
Seep location relative to vertical changes in embankment or beach substrate:	



SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection
Project Task: Seep Reconnaissance Survey
Date: 5-17-18
Crew: BB SD CL JM
Weather: Cloudy Cool
Photo no.
Name of person filling out form: S Dudziak

Seep number: SP-65	**Photo number:** 125-135
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Sand (SP) w/ minor gravel ~10%, Dark brown/gray
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Slow flow. Seep is very close to low tide (about 1 ft up from tide) Turbid water with organics No Odor No Sheen
Description of embankment that seep flows from and general seep characteristics:	Small channel of flow in rip rap
Seep location relative to vertical changes in embankment or beach substrate:	At bottom of steep embankment About -2 ft tide 

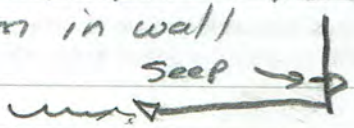
Seep number: SP-66	**Photo number:** 136-147
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Gray-Brown Silty Sandy Gravel (GP) Angular
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Some Algae in water Moderate flow Clear No Odor No Sheen
Description of embankment that seep flows from and general seep characteristics:	Channelized flow from base of embankment
Seep location relative to vertical changes in embankment or beach substrate:	Seep is ~100 ft from boat on mudflat 

Seep number: SP-74	**Photo number:** 148-161
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Fine to Med Gr. Sand (SW) Well sorted some gravel ~10% Medium Gray-Brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Clear flow No Odor No Sheen Beach sand
Description of embankment that seep flows from and general seep characteristics:	Gently sloping beach - Channelized flow
Seep location relative to vertical changes in embankment or beach substrate:	

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection
Project Task: Seep Reconnaissance Survey
Date: 5-17-18
Crew: SP BB JM CL
Weather: Sun + Clouds
Photo no.
Name of person filling out form: S Dudziak

Seep number: SP-73	**Photo number:** 162-165
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Grg Brown Silt (ML)
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Some algae Clear, Moderate Flow, Slight Organic Odor No Sheen
Description of embankment that seep flows from and general seep characteristics:	Constructed wetland, Seep flows from silty bench
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-70	**Photo number:** 175-180
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Gravey fine Sand (SP) w/ algae
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Clear No Odor No Sheen Fast Flow
Description of embankment that seep flows from and general seep characteristics:	Seep is coming from hole in wall something round is behind hole
Seep location relative to vertical changes in embankment or beach substrate:	2 ft off bottom in wall 

Seep number: SP-68	**Photo number:** 181-190
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Organic Silty Sand ~40% Silt 60% Sand (SP)
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Significant organics in water algae No Odor No Sheen
Description of embankment that seep flows from and general seep characteristics:	Seep comes from mudflat diffuse flow below logs
Seep location relative to vertical changes in embankment or beach substrate:	

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5-17-18 **Crew:** SD BB CL JM

Weather: Cloudy **Photo no.**

Name of person filling out form: D S Dutcher

Seep number: SP-86 (new)	**Photo number:** 191-199
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Gravelly Silt (ML) tan on top gray/black underneath
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Clear fast flow No Odor No Sheen
Description of embankment that seep flows from and general seep characteristics:	Seep comes out through mudflat in a channel
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number:	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number:	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	

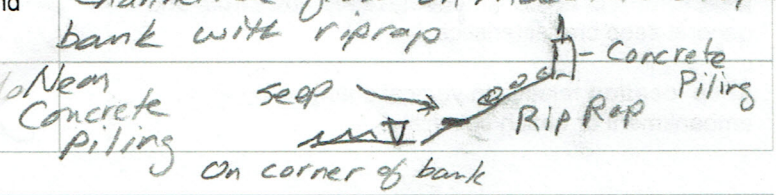
SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5-18-18 **Crew:** BB SD JM CL

Weather: Cool, overcast **Photo no.**

Name of person filling out form: S. Dudzinski

Seep number: SP-57 (under bridge)	**Photo number:** 1-17
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Sandy Gravel (GP) Red Brown some cobbles
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No odor No Sheen
Description of embankment that seep flows from and general seep characteristics:	Channelized flow on moderate sloped bank with riprap
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-59 (under bridge)	**Photo number:** 18-28
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Gravel (GP) Orange Brown to Gray Brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Clear
Description of embankment that seep flows from and general seep characteristics:	Channelized flow fast flow
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-587 (new)	**Photo number:** 29-35
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Gravelly Sand (SP) Orange Brown to Gray
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No Odor No Sheen Clear
Description of embankment that seep flows from and general seep characteristics:	Slow-flowing channel flow
Seep location relative to vertical changes in embankment or beach substrate:	

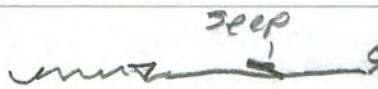
SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

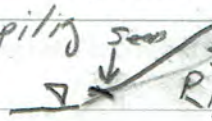
Date: 5-18-18 **Crew:** BB SD CL JM

Weather: Cool Overcast **Photo no.**

Name of person filling out form: S Dudevoir

Seep number: SP-79	**Photo number:** 35-46
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Gravel (GP) Med Brown on Surface, Black underneath some gravel are white Gravel ~80%
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Sulfur odor in area, No Sheen Yellowish tint in water. Some organics in water
Description of embankment that seep flows from and general seep characteristics:	Seep comes from mud bar. Channelized Flow Slight Slope
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-78	**Photo number:** 47-59
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Silty Gravel (GP) Med Gray-Brown ~60% Gravel Very soft mud getting to Seep Some brick pieces
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Mild sulfur odor, No Sheen Clear Fast flowing
Description of embankment that seep flows from and general seep characteristics:	Below steep rip rap. Channelized flow Seep comes out below rip rap
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number: SP-72 (ashgrove)	**Photo number:** (GP) 60-72
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Sandy Gravel Medium Brown ~80% gravel (GP)
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	No odor No Sheen Clear
Description of embankment that seep flows from and general seep characteristics:	Fast Flow. Seep comes out from under Rip Rap
Seep location relative to vertical changes in embankment or beach substrate:	Beneath 148 piling At base 

SEEP RECONNAISSANCE SURVEY FORM B

Project Name: LDW Baseline Seep Collection **Project Task:** Seep Reconnaissance Survey

Date: 5-18-18 **Crew:** BB SD GL JM

Weather: Cool Overcast **Photo no.**

Name of person filling out form: S Dudziak

Seep number: SP-88 (new) Aldrglow	**Photo number:** 73-81
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	Sandy Gravel (GP) Med Brown ~40% Sand 60% Gravel
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Fast Flow, Clear No Odor, No Sheen
Description of embankment that seep flows from and general seep characteristics:	Seep come out from under a concrete slab w/ bricks, Channelized then fan-like flow
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number:	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	

Seep number:	**Photo number:**
Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay):	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
Description of embankment that seep flows from and general seep characteristics:	
Seep location relative to vertical changes in embankment or beach substrate:	

Field Notes

CONTENTS

PAGE	REFERENCE	DATE

LDW Seep Reconnaissance Day 1
May 15, 2018
Crew: Jordan Macke
Suzanne Dudziak
Christine Lopez
Benir Bergquist

Boat: Discovery (Gravity)
Jeff Wilson
Weather: overcast, breezy
8:45 Load gear on boat
Boat Health and Safety - Jeff
Other Health & Safety - Suzanne
9:00 Leave boat ramp
Head for ~~Stop 4~~ Seep 51
9:25 Arrive at SP-51
Jeff calibrates water quality meter
We can barely see the seep. It's just at the water level. Will wait until after calibrating to see if seep appears more clearly.

9:41 Head over to SP-06 and SP-07 to check them out quickly. Tide still going down. Head back over to SP-51.

9:48 Arrive @ SP-51

10:16 Finish at SP-51 and head to SP-50

10:21 Arrive at SP-50 and SP 49 SP-50 is behind a barge

10:39 Finish at SP-50 Head to SP-49

11:00 Finish SP-49 very mucky Head to SP-47

11:18 Finish at 47 Tried mudders because it is mucky. Shaps do not hold boots into mudders.

11:37 Leave SP-46 Too muddy. Sunk in very deep. so we could not get to seep. Try at higher tide? Head to SP-45

11:54 Leave SP-45 Head to SP-40

12:06 Arrive SP-40 Too shallow to get all the way in with the boat. So headed to SP-42.

12:17 Arrive SP-42

12:27 Done at SP-42 Head to SP-43 could sample SP-42 at a fairly high tide. So far, longer tubing has worked - ~~will measure length when~~ ~8 ft long

12:43 Done at SP-43 Head back to SP-40 to see if we can get in now. SP-43 could be sampled at a fairly high tide. Seep is emerging from the bank.

12:52 Arrived at SP-40 No seep present Photos 70-73 Head to SP-44

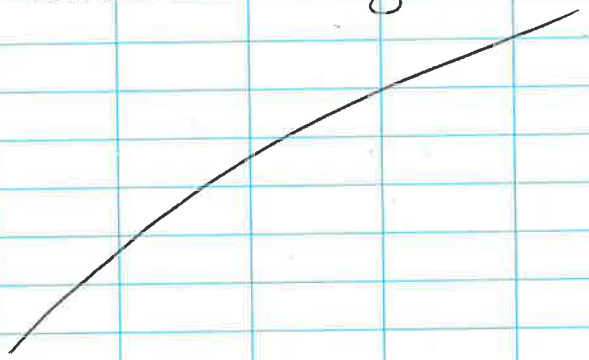
13:14 parked boat at ramp and walked over to seep because of shallow water. No seep present at SP-44

13:15 Head to SP-46
Tide ~~still~~ too high now - seep is covered. Need to shoot for a slightly lower tide. Tide level now is ~-0.1.
Headed to SP-06 and SP-07

13:45 Done at SP-06
Walked down the beach and no seep at SP-07
just a trickle. May be hard to sample in June?

13:54 Heading back, to boat ramp
SP-05 covered with water, as we pass on our way back.

14:05 ~~13:05~~ → Return to boat ramp.
Done for the day.



Day 2 Seep Reconnaissance
May 16, 2018
Crew: Berit Bergquist
Suzanne Budziak
Jordan Macke
Christine Lopez
Boat: Discovery - Jeff Wilson

9:10 Health & Safety briefing
9:15 Leave 1st Ave S. boat ramp and head to upper Turning Basin
9:57 Arrive at seep SP-32
10:17 Finish at seep SP-32
Will need to approach from north side of seep when sampling to avoid muck. Only mucky as we got closer to the seep. Sample at about +0.5.
10:26 Arrive at SP-27
10:40 Finish at SP-27
Tide probably not critical for sampling.
11:00 Finish at SP-30

11:15 Finish at SP-31
Access from shoreline if needed for sampling. -1.4 tide
Difficulty w/ boat because of low tide. Jeff cautions about hitting bottom. So we are headed to SP-33 and will come back to SP-28 and SP-29.
River is also flowing quite fast.

11:27 Arrive near SP-33, but are not able to access shoreline because of high river flow. But from the boat we do not see any water flowing from about 20 ft away.
Head to SP-34.

11:37 Too mucky to sample. SP-34 -1.9 tide
Sank in easily to mid-calf. Long flat mudflat

11:52 Finish at SP-35.
Very mucky. We were able to pull right up to the seep, place a board down in the mud and sample.

12:15 Finish at SP-36
Slight odor. Lowest DO so far.

12:22 Seep SP-37
Too mucky, but may be able to get closer to seep source from bank at a higher tide.
Tide is at the lowest -2.1.

12:36 SP-38 done.
Slightly mucky but able to access.

12:58 Arrive at SP-24 tide -2.1

13:05 Finish at SP-24
This is a good tide level to sample at, could be a foot higher. Seeps all along the

13:20 Head back to SP-33, 28, and 29.

13:38 Done at SP-33
We were able to access and there was a small seep emerging from the base of a piling.

13:51 -1.1 tide finish at SP-28
Got here at -1.4. Probably need to sample at this level.
No stake at seep.
Seep covered w/ water by the time we left.

14:15 Finish at SP-29 -0.3
Very mucky. Will be very difficult to sample because of muck.

14:23 Checked back at SP-34 tide 0.0
Closer to source of seep but still too mucky to sample. Could be accessed from shore?

14:28 Checked out SP-37 again but now tide appears to be too high. Seep not visible; actually barely visible but muck prevents access to seep.

14:35 Head back to boat ramp.

14:48 Stopped at SP-46 1.0 tide again. Tide still too high.

15:00 Return to boat ramp.
Done for today.

Day 3 Seep Reconnaissance
May 17, 2018
Crew: Berit Bergquist
Suzanne Budziak
Jordan Macke
Christine Lopez
Boat captain: Jeff Wilson - Discovery

10:29 Leave 1st Ave S. Boat Ramp
Health and safety briefing on board.
11:01 Done at SP-05
Seep emerging at edge of rip rap.
11:12 Arrive near SP-63, but barge is in front. No access from the north of the barge or from the south.

Before sampling at SP-05 we noticed a sheen (liquid) on the water surface and called the coast guard oil spill hot line. Sheen was closer to the 1st Ave

S. Bridge than SP-05.

11:26 SP-01 not accessable; barge in the way. We see another seep we will sample.

11:33 Collected sample at SP-83
Need to head boat to other Gravity boat because they are having an electrical issue.

11:44 Headed back down river to SP-58 and 59.

12:04 On wrong side of bank for SP-58 and 59, but we see a new seep so will sample it. Upon further investigation, this is not a seep because it is flow emerging from a large mudflat area relatively far from the bank. Will check w/ Kathy & Susie to see if we should sample.

12:34 Arrive at SP-81, but covered w/ new rip-rap. Found new seep, ID'd as SP-84.

12:41 Finish at SP-84
Easy access -2.6

Head to new seep at SP-85

12:50 Finish at SP-85
Easy access higher tide OK for sampling

13:03 Arrive at SP-79 but sheen and odor. Would have to walk through spilled oil. Will check back tomorrow. Will also check on SP-78 tomorrow - both 78 & 79 are in behind a barge.

13:21 Finish at SP-77.
Easy access.

13:36 Finish at SP-65. -2.6 tide
Need to be done sampling at least at this tide level.

14:02 Finish at SP-66
Shallow gradient but otherwise should be easy to access.

14:18 Finish at SP-74
easy access and higher tide OK for sampling

14:31 Finish at SP-73
easy access and higher tide OK for sampling

14:45 Finish at SP-70
Seep originating from hole in bulkhead.

15:40 Finish at SP-68 and SP-86.
Could not find SP-67 - no longer there but found new seep at SP-86. Tide +1.1
Mucky right next to SP-86, bring long board for actual sampling. Able to sample at this tide or slightly higher.
Head back to boat ramp

Day 4 Seep Reconnaissance
May 18, 2018

Crew: Benit Bergquist
Suzanne Dudziak
Jordan Macke
Christine Lopez

Oversight: Kristen Kerns USACE

Boat: Jeff Wilson, Discovery

11:30 Health & Safety Briefing
11:40 Leave 1st Ave S. boat ramp
12:05 Done at SP-57
12:13 Finish at SP-59
12:24 SP-58 not at the exact same location.
Collected at slightly different location.
May need to change seep ID? Yes - changed to SP-87
12:36 Head to SP-79
12:44 At SP-79
A few other seeps to the north
12:55 Finish at SP-79
Short tubing (2-3 ft) OK at all seeps today

Rite in the Rain.

13:13 Done at SP-78
High flow, short tubing OK
13:40 Done at SP-72
13:50 Another seep to the south was also sampled - SP-88 (new seep)

Headed back to boat ramp.
Will need to collect SP-72 at a very low tide because it is right at the water's edge at -2.6 ft.
14:10 Arrive back at boat ramp.
Finished w/ seep reconnaissance.

Done for day
BB

Photos

Photo No.:	1
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-05

Photo No.:	2
Date:	05-15-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-06

Photo No.:	3
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-24

Photo No.:	4
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-27

Photo No.:	5
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-28

Photo No.:	6
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-29

Photo No.:	7
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-30

Photo No.:	8
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-31

Photo No.:	9
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-32

Photo No.:	10
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-33

Photo No.:	11
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-35

Photo No.:	12
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-36

Photo No.:	13
Date:	05-16-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-38

Photo No.:	14
Date:	05-15-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-42

Photo No.:	15
Date:	05-15-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-43

Photo No.:	16
Date:	05-15-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-45

Photo No.:	17
Date:	05-15-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-47

Photo No.:	18
Date:	05-15-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-49

Photo No.:	19
Date:	05-15-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-50

Photo No.:	20
Date:	05-15-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-51

Photo No.:	21
Date:	05-18-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-57

Photo No.:	22
Date:	05-18-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-59

Photo No.:	23
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-65

Photo No.:	24
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-66

Photo No.:	25
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-68

Photo No.:	26
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-70

Photo No.:	27
Date:	05-18-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-72

Photo No.:	28
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-73

Photo No.:	29
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-74

Photo No.:	30
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-77

Photo No.:	31
Date:	05-18-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-78

Photo No.:	32
Date:	05-18-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-79

Photo No.:	33
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-83

Photo No.:	34
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-84

Photo No.:	35
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-85

Photo No.:	36
Date:	05-17-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-86

Photo No.:	37
Date:	05-18-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-87

Photo No.:	38
Date:	05-18-18

Description:
Duwamish AOC3
Reconnaissance at seep SP-88

Seep Sampling

Field Forms

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/15/18 **Crew:** BB, JH, CL, Allison

Weather: ~72°, Sunny **Photo no.**

Location ID: SP-01	**Easting (x):**	**Northing (y):**	**Time:** 1133
Sample collection method:	funnel method with tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 17.7	1 24631	1 5.61	1 6.95	1 7.01	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments:

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	gravel covered with silt
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Lots of waste material and debris, pipes, metal, concrete, orange-colored rocks
Description of embankment that seep flows from and general seep characteristics:	relatively steep, debris, wide, fan-like seep, ~40-ft across the slope face
Seep location relative to vertical changes in embankment or beach substrate:	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-14-18 **Crew:** BB AH JM SP

Weather: Sun + Clouds Cool **Photo no.** 164-170

Location ID: SP-05	**Easting (x):** 1271817	**Northing (y):** 199460	**Time:** 1408
Sample collection method:	Funnel with tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.55	1 27295	1 4.14	1 7.25	1 1.59	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments: ✓ = Same as recon. No change in condition.

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	✓
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Same as recon except clear seep; No organics in water
Description of embankment that seep flows from and general seep characteristics:	✓
Seep location relative to vertical changes in embankment or beach substrate:	✓

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-13-18 **Crew:** JM AV SD

Weather: Cool Cloudy **Photo no.** 67-76

Location ID: SP-06	**Easting (x):** 1272090	**Northing (y):** 199466	**Time:** 953
Sample collection method:	Funnel + tubing		
Flow rate collection method:	stop watch		
Volume of container:	300mL		
Time to fill container:	1min 23 sec		
Calculated flow rate:			

Temp °F	SpC	DO %	pH	Turbidity	Salinity
1 59.3	1 24569	1 97.1	1 7.99	1 11.51	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments: 1 min 23 sec 300 mL

✓ = see sheet from recon. No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	Water not as turbid as recon
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	Seep comes from base of rip rap
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/13/18 **Crew:** AH, SW, CL

Weather: ~63°, Sun **Photo no.** 19-24

Location ID: SP 24	**Easting (x):** 1277566	**Northing (y):** 192937	**Time:** 12:35	
Sample collection method:	Funnel & tubing			
Flow rate collection method:				
Volume of container:				
Time to fill container:				
Calculated flow rate:				

Temp	SpC	DO	pH	Turbidity	Salinity
1 16.22	1 16895	1 7.10	1 7.68	1 3.57	1
2	2 16920	2	2	2	2
3	3	3	3	3	3

Comments:
Great flow, clear looking + FIELD DUPLICATE
✓ = see sheet from recon – no change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-12-18/938 **Crew:** SD JM AH

Weather: Some Clouds & Sun Cool **Photo no.** 01-11

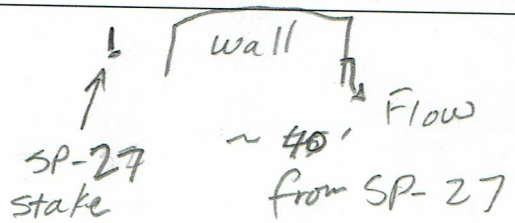
SP-27/SP-89

Location ID: SP-27/SP-89	**Easting (x):** 1278761.18	**Northing (y):** 190024.64	**Time:** 938
Sample collection method:	Funnel & Tubing		
Flow rate collection method:	Stop Watch		
Volume of container:	300 mL		
Time to fill container:	1 min 54 s 300 mL		
Calculated flow rate:			

Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1 ~~25~~ 14.5	1 25609	1 8.76	1 7.63	1 7.88	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments: No flow at SP-27, Observed flow ~40' South of Stake from SP-27
Measurements are 300 mL/1 min 54 sec

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	Gravel + Silt Gray Brown
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Clear Slow Flow No Sheen No Odor
Description of embankment that seep flows from and general seep characteristics:	Flow from behind a concrete sheet pile about 40's of SP-27
Seep location relative to vertical changes in embankment or beach substrate:	Seep comes out behind sheet pile wall



SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-12-18 / 1206 **Crew:** JM AH SD

Weather: Overcast Warm **Photo no.** 44-46

Location ID: SP-30	**Easting (x):** 1278513	**Northing (y):** 189896	**Time:** 1206
Sample collection method:	Funnel & tubing		
Flow rate collection method:	-		
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp C	SpC	DO	pH	Turbidity	Salinity
1 17.0	1 19463	1 3.74	1 6.79	1 5.3	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments:

✓ = same moderate flow

✓ = see sheet from recon - No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	Moderate flow
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/12/18 **Crew:** BB, CL, SW

Weather: ~59°, scattered clouds & sun **Photo no.** 1 - 9

Location ID: SP32	Easting (x): 1277821	Northing (y): 190190	Time: 09:19
Sample collection method:	Funnel Method (long tubing)		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 16.649	1 22493	1 69.5	1 2.62	1 4.46	1
2	2 22487	2	2	2	2
3	3	3	3	3	3

Comments: Sample clear, seep flow closer to water, still mucky;

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	√ = same as recon - no change in condition
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-13-18 **Crew:** AV JM K

Weather: Clouds & some sun cool **Photo no.** 80-83

Location ID: SP-33	**Easting (x):** 1277742	**Northing (y):** 190519	**Time:** 1217
Sample collection method:	Funnel tubing & SS bowl, Let water sit		
Flow rate collection method:	for 5 mins before sampling. Used ladel		
Volume of container:	into bottles		
Time to fill container:			
Calculated flow rate:			

Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1 19.49	1 18842	1 8.29	1 7.85	1 35.29	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments: Measurements collected @ 1120 near piling. Will use bowl. Sample collected @ 1217

✓ = see sheet from recon, No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	✓
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Very diffuse flow Not a distinct stream like recon Slight unidentifiable sheen
Description of embankment that seep flows from and general seep characteristics:	✓
Seep location relative to vertical changes in embankment or beach substrate:	 flow is diffuse on mudflat

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/12/18 **Crew:** BB, CL, SW

Weather: ~57°, clear Sunny **Photo no.** 10 - 12, 13 - 23 comeback

Location ID: SP35	Easting (x): 1277196	Northing (y): 190699	Time: 1056
Sample collection method:	Funnel method w/ bowl for settling		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 17.554	1 12050.2	1 7.78	1 7.51	1 63.5	1
2	2 11954	2	2	2	2
3	3	3	3	3	3

Comments: Super mucky coming back to later
Sampling from the boat, twice for enough water w/ 5 min settle

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	√ = same as recon - no change in condition
✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	
✓	
Description of embankment that seep flows from and general seep characteristics:	
✓	
Seep location relative to vertical changes in embankment or beach substrate:	
✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-12-18 / 1027 **Crew:** BB JM AH

Weather: Sun + Clouds, Cool **Photo no.** 24-28

Location ID: SP-38	**Easting (x):** 1276484	**Northing (y):** 191359	**Time:** 1027
Sample collection method:	SP-38 funnel & tubing		
Flow rate collection method:	—		
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 17.48	1 .9548	1 5.93	1 7.7	1 2.16	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments:

✓ = same as recon except flow is slower ↗ see sheet from recon.

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	Moderate Flow
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

1209 F
30MT 1234

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/12/18 **Crew:** BB, CL, SW, Allison

Weather: ~67°, Clear & Sunny **Photo no.** 27 - 38

Location ID: SP42	Easting (x): 1275910	Northing (y): 193788	Time: 1205
Sample collection method:	Funnel method (long tubing)		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 66.65F	1 4969	1 89.6	1 4.76	1 3.88	1
2	2 4970	2	2	2	2
3	3	3	3	3	3

Comments: Clear looking sample, good flow
+PCB Congeners

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	V= same as recon - no change in condition
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Very clear looking other things same as Recon
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-12-18 / 1300 **Crew:** AH JM SD

Weather: Overcast cool **Photo no.** 48-52

Location ID: SP-43	**Easting (x):** 1275804	**Northing (y):** 194471	**Time:** 1300
Sample collection method:	Funnel & Tubing		
Flow rate collection method:	—		
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.29	1 18852	1 5.97	1 6.99	1 2.76	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments: ✓ = See sheet from recon - No change in condition
Same as recon
Collected QC sample: 1306

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW
Project Task: Seep Sampling
Date/Time: 6/15/18
Crew: BB, JM, CL
Weather: ~68°, sunny
Photo no.

Location ID: SP45	Easting (x): 1274199	Northing (y): 196708	Time: 1345
Sample collection method:	Funnel method w tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 21.74	1 23907	1 9.89	1 7.18	1 16.05	1
2	2 23881	2	2	2	2
3	3	3	3	3	3

Comments: slow but steady flow, dug trench below seep collection point for funnel, [illegible]

✓ = see sheets from recon - no change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW
Date/Time: 6/15/18
Weather: ~69°F, Sunny
Project Task: Seep Sampling
Crew: BB, JM, CL
Photo no.

Location ID: SP47	Easting (x): 1273621	Northing (y): 197230	Time: 1316
Sample collection method:			
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 18.7	1 28184	1 9.34	1 7.40	1 8.70	1
2	2 28140.	2	2	2	2
3	3	3	3	3	3

Comments: great flow,
✓ = see sheet from recon. No change in condition.

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/13/18 **Crew:** AH, SW, CL

Weather: ~62°F, Overcast, Sunny CL **Photo no.** 6-18

Location ID: SP49	Easting (x): 1273036	Northing (y): 197744	Time: 1025
Sample collection method:	—		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC ~~48350~~	DO	pH	Turbidity	Salinity
1 17.4	1 ~~41149~~ MH	1 8.6	1 7.07	1 3.61	1
2	2 ~~41288~~ MH	2	2	2	2
3	3	3	3	3	3

Comments: ultra mucky - boards sinking cond. too high to sample

1/ = see sheet from recon - No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-15-18 / 1245 **Crew:** BB JM CL

Weather: Sunny w Clouds **Photo no.**

Location ID: SP51	**Easting (x):** 1272387	**Northing (y):** 198346	**Time:** 1245
Sample collection method:	No Sample Collected		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

	Temp	SpC	DO	pH	Turbidity	Salinity
1	24.34°C	134826	6.94	7.64	710.6	1
2		234823	2	2	2	2
3		3	3	3	3	3

Comments: unable to sample - cond. too high

✓ = see recon sheet - No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-14-18 / 1041 **Crew:** SD AH CL

Weather: Cool, Cloudy **Photo no.** 13-19

Location ID: SP-57	**Easting (x):** 1269541	**Northing (y):** 201139	**Time:** 1041
Sample collection method:	Funnel + tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1 14.75	1 26544	1 8.78	1 7.96	1 2.68	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments: Under 1st Ave Bridge

✓ = See sheet from recon - No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	✓
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Fast Flow ✓
Description of embankment that seep flows from and general seep characteristics:	✓
Seep location relative to vertical changes in embankment or beach substrate:	✓

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-15-18; 1325 **Crew:** AH, SD, SW

Weather: Sunny w/ Clouds; Warm **Photo no.** 22-26

Location ID: SP-66	**Easting (x):** 1266514	**Northing (y):** 206252	**Time:** 1325
Sample collection method:	Funnel & tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp °C	SpC	DO	pH	Turbidity	Salinity
1 18.7	1 27145	1 8.44	1 *, 54	1 2.54	1
2	2 27161	2	2 8.3**	2	2
3	3	3	3	3	3

Comments:

✓ = same as recon
No change in condition

* pH sensor not working
** used 2nd probe off boat

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	✓
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	✓ Except Slow Flow
Description of embankment that seep flows from and general seep characteristics:	✓
Seep location relative to vertical changes in embankment or beach substrate:	✓

SEEP COLLECTION FORM

Project Name: LDW AOC 3 **Project Task:** Seep Sampling

Date/Time: 6-15-18 ; 1113 **Crew:** AH SD SW

Weather: Sunny, Warm **Photo no.** 09-14

Location ID: SP-70	**Easting (x):** 1266029	**Northing (y):** 210059	**Time:** 1113
Sample collection method:	Sampled directly from seep into beaker		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1 15.55	1 29258	1 8.86	1 *	1 2.18	1
2	2 27561	2	2 ** 5.9	2	2
3	3	3	3	3	3

Comments: * pH sensor failed
** used 2nd probe on
✓ = Same as recon boat
no change in condition
No tubing or funnel needed

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	✓ ✓
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	✓
Description of embankment that seep flows from and general seep characteristics:	✓
Seep location relative to vertical changes in embankment or beach substrate:	✓

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/14/18 **Crew:** BB, SW, CL

Weather: ~63°, overcast **Photo no.**

Location ID: SP73	**Easting (x):** 1267245	**Northing (y):** 208409	**Time:** 1308
Sample collection method:	Funnel w/ tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 20.875	1 25991.2	1 9.37	1 -6.02	1 13.73	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments: good flow

✓ = see sheets from recon - no change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-14-18 / 1314 **Crew:** SD, AH, JM

Weather: High Clouds, Warm **Photo no.**

Location ID: SP-74	**Easting (x):**	**Northing (y):**	**Time:** 1314
Sample collection method:	Funnel & tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1 18.7	1 14805	1 9.23	1 7.53	1 8.59	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments:
✓ = same as recon
No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6-14-18 **Crew:** AH SD JM

Weather: Clouds, Cool **Photo no.** 14-26

Location ID: SP-77	**Easting (x):** 1268446	**Northing (y):** 205972	**Time:** 1210
Sample collection method:	Funnel & tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.53	1 20693	1 2.71	1 7.52	1 1.49	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments: Slight sheen on sediments in area around seep ~15 ft S of stake from recon
V = See recon sheet - No change in condition.

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	✓
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Slight yellow color Fast Flow
Description of embankment that seep flows from and general seep characteristics:	✓
Seep location relative to vertical changes in embankment or beach substrate:	✓

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/14/18 **Crew:** SW, BB

Weather: ~61°, overcast w/ sunbreaks **Photo no.**

Location ID: SP-78	**Easting (x):** 1268629	**Northing (y):** 204281	**Time:** 1204
Sample collection method:	funnel with tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 15.47	1 27658	1 8.19	1 7.61	1 3.3	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments:

High flow, sulfur odor very noticable

✓ = see recon sheets, No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	distinct sulfur odor
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

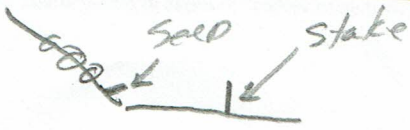
Date/Time: 6/14/18/950 **Crew:** AH, JM, SO

Weather: Cool Clouds **Photo no.** 01-12

Location ID: SP-79	**Easting (x):** 1268713	**Northing (y):** 204089	**Time:** 950
Sample collection method:	Funnel and tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

	Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1	14.42	23390	4.89	3.44*	12.34	
2						
3						

Comments:
✓ = same as recon, No change in condition,
* at 1040 we noted meter measuring pH too low. Recalibrated at that time, pH was off by ~4; so pH should be ~7.44

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	✓
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	Same as recon; Sulfur odor Very slight yellow tint
Description of embankment that seep flows from and general seep characteristics:	Sampling location is upslope from stake at the base of rip rap
Seep location relative to vertical changes in embankment or beach substrate:	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/15/18 **Crew:** JM, BB, AS

Weather: sunny, mild **Photo no.**

Location ID: SP-83	**Easting (x):** 1270757	**Northing (y):** 201593	**Time:** 1208
Sample collection method:	funnel w/ tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 17.24	1 23028	1 7.98	1 7.43	1 4.02	1
2	2	2	2	2	2
3	3	3	3	3	3

Comments:

✓ = See sheet from recon - No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/14/18 **Crew:** BB, SW, CL

Weather: ~62°, overcast **Photo no.** 2 –

Location ID: SP 84	**Easting (x):** 1269599	**Northing (y):** 203350	**Time:** 09:53	
Sample collection method:	Funnel with tubing			
Flow rate collection method:				
Volume of container:				
Time to fill container:				
Calculated flow rate:				

	Temp	SpC	DO	pH	Turbidity	Salinity
0950	1	1 26296.2	1	1	1	1
1015	2 16.263	2 26285.9	2 8.13	2 7.79	2 .93	2
	3	3	3	3	3	3

Comments:
Clear sample, good flow

✓ = see sheet from recon – no change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	no batteries but debris present & looks like thrown from above
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC 3 **Project Task:** Seep Sampling

Date/Time: 6-15-18 ; 1219 **Crew:** AH SD SW

Weather: Sunny; some clouds warm **Photo no.** 15-21

Location ID: SP-86	Easting (x): 1265956	Northing (y): 206989	Time: 1219
Sample collection method:	Funnel & tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1 17.58	1 29878	1 7.23	1 *	1 2.25	1
2	2 29942	2	2 **6.93	2	2
3	3	3	3	3	3

Comments: * pH sensor not working ** Used 2nd probe on boat for pH

✓ = See sheet from recon - No change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	Gravelly silt to Silty Sandy Gravel is at base of seep Gray-Brown with black underneath
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	✓
Description of embankment that seep flows from and general seep characteristics:	✓ Seep comes out in an area with several bricks
Seep location relative to vertical changes in embankment or beach substrate:	✓

SEEP COLLECTION FORM

Project Name: LDW AOC3 **Project Task:** Seep Sampling

Date/Time: 6/14/18 **Crew:** SW, BB, JM

Weather: cool, overcast **Photo no.** (4)

Location ID: SP-87	Easting (x): 1269562	Northing (y): 208704	Time: 11:11
Sample collection method:	Funnel w/ tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp	SpC	DO	pH	Turbidity	Salinity
1 14.7	1 ~~46638~~	1 4.96	1 7.21	1 6.63	1
2	2 20686.8 BB	2	2	2	2
3	3	3	3	3	3

Comments:

very slow flow, clear sample

✓ = see sheets from recon - no change in condition

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay) ✓	
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation): ✓	
Description of embankment that seep flows from and general seep characteristics: ✓	
Seep location relative to vertical changes in embankment or beach substrate: ✓	

SEEP COLLECTION FORM

Project Name: LDW AOC3
Date/Time: 6-15-18 / 1052
Weather: Sunny, Cool
Project Task: Seep Samplirg
Crew: AH, SD, SW
Photo no. 01 - 08

Location ID: SP-88	Easting (x): 1267098	Northing (y): 210691	Time: 1052
Sample collection method:	Funnel & tubing		
Flow rate collection method:			
Volume of container:			
Time to fill container:			
Calculated flow rate:			

Temp °C	SpC	DO mg/L	pH	Turbidity	Salinity
1 15.14	1 35139	1 7.89	1 *	1 1.20	1
** 2 15.10	2 27987	2 7.91	2 *	2 0.65	2
3	3	3	3	3	3

Comments:
✓ = same as recon *pH sensor not working
** = Second measurement with new seep water

Substrate description (e.g., rock, soil, cobble, gravel, sand, silt, clay)	✓
Seep observations (e.g., sheen, bacterial slime, staining, odor, waste material, colored discharge, precipitates, vegetation):	✓
Description of embankment that seep flows from and general seep characteristics:	~10 ft upstream from stake
Seep location relative to vertical changes in embankment or beach substrate:	✓

Field Notes

LDW AOC3 Task 4 June 12, 2018
Seep sampling

50s °F, sunny
0730 meet at 1st Ave Bridge boat launch
Gravity: Jeff Wilson
Windward: Berit Bergquist
Abby Hawley
Greylock: Suzanne Dudziak
Christine Lopez
Fain: Jordan Madu
Shirley Wu
USACE: Allison Sivess
0735 introductions
0740 ~~Safety~~ Health and Safety meeting (SD leads)
0745 review sampling procedure and clean hands Dirty hands
load boat
0800 boat Health and Safety - Jeff
head up river
drop off Berit's team

0903 arrive SP-27

NO flow at SP-27 or in the immediate vicinity.

nearby stream of water from behind bulkhead/sheet pile wall. possible seep?
took photos, readings, flow rate recorded as SP-89 in GPS but unsure if seep.

0938 leave SP-27

0946 arrive SP-33
no visible flow

0950 leave SP-33

0955 arrive SP-35
1000 leave SP-35
1006 arrive SP-38
1030 leave SP-38
1038 arrive SP-35
high turbidity so fill bowl and let settle for 5 min. Repeat process to get enough water.

1113 leave SP-35

1125 arrive SP-30

1209 leave SP-30

1243 arrive SP-43

1310 leave SP-43
collected a set of QC bottles at SP-43

looked at accessibility of SP-63 and SP-01 on our way back to the 1st Ave Bridge boat launch.

1345 arrived at boat launch and then unloaded boat

QC bottles and load coolers, COC

1435 head to ARI

6/12/18

A Harvey

LDW Seep Sampling
~~May~~ June 12, 2018

Crew: Suzanne Dudziak
Shirley Wu
Christine Lopez
Berit Bergquist
Alison Suess
Jordan Macke

~~Boat~~: Abby Hawley
Boat: Jeff Wilson (Mazama)

07:35 Health and Safety onshore - Suzanne

07:45 Clean-hands dirty-hands demo and review sampling procedures

08:00 Health & safety on-board (Jeff)

08:10 Leave boat ramp

08:52 Arrive at SP-32

09:19 collected last bottle of sample

09:40 tide ~~-0.05~~ -1.3

09:49 Arrive at SP-33
No visible flow

10:00 SP-35
Too muddy to sample
Will return to sample from

boat - directly from back of boat so we don't need to step off. But the seep became turbid so we will return later.

10:08 Arrive at SP-38

10:27 Collect last sample at SP-38. Not muckey - good access.

10:45 Arrive at SP-35. Collected sample directly from the boat. We let the sample settle for 5 min in bowl. Had to go back and collect about 1 L more because not enough sample in bowl from first collection.

10:52 Sample collection time

11:13 Finish at SP-35

11:25 Arrive at SP-28 But tide is too high

11:28 Arrive at SP-30 and drop off the other crew.

11:32 -1.5 tide

11:45 Arrive at SP-42

12:05 Collect sample at SP-42 and wait for boat to

come back and pick us up.

12:25 Boat returned and we needed to collect a PCB sample because we did not have a bottle. Collected PCB sample, after letting sample settle in bowl because water appeared turbid after re-setting the funnel in the seep.

12:40 Arrived at SP-43

13:00 Sample collection time. Collected QC samples here.

13:10 Start heading back to the boat ramp. Stopped at SP-63 and SP-01 on the way back to evaluate access. Barges still present.

13:46 Arrive at boat ramp. Unload and QC samples, fill out COCs.

14:32 Done at boat ramp. Head to lab

BJB

6/13/18 ~~6/12/18~~ AH

LDW AOC3 Task 4
Seep Sampling

0815 meet at 1st Ave Bridge
boat launch
WW: Abby Hawley
Amara Vandervort
Greylock: Suzanne Dudziak
Christine Lopez
Fam: Shirley Wu
USACE: Kristen Kerns
50s°F, cloudy

0835 board boat and head to SP-47

0905 pick up Jordan Macke (Fam) from South Park Marina

0915 arrive ~~SP-05~~ AH SP-06
drop off AV, KK, JM, SD

0917 arrive SP-05
drop off AH, SW, CL

0950 leave SP-05

no flow at SP-05.
Nearby trickle - ~~SW~~ AH unsure if river water ~~or~~ seep. collect water for measurements.
conductivity > 30, so do not collect sample (not a seep?)

0957 leave SP-06
head to SP-51
crew drug hose and canyon for tubing at SP-06

1005 drop off @ SP-51
AV, KK, SD, JM

1008 arrive SP-49
drop off AH, SW, CL

1025 leave SP-51

1030 try to pick up crew at SP-49 but cannot get boat ~~to~~ AH close enough so head up river

1045 try to get to SP-27 (and SP-28) but too shallow for boat to get under the bridge

1105 ~~Sarah~~ arrive SP-33
~~drew~~ took measurements, dropped off AV, KK, JM
slightly lower vol. in bottles for metals + TOC/DOC

1125 leave crew at SP-33 and go to pick up crew at SP-49

1150 (approx) leave SP-49 and head to SP-24 in Slip 6

1211 arrive SP-24
leave AH, CL, SW
attempted to go to SP-27
no flow at SP-27 (same as yesterday).
walked to "SP-89" — assessed flow situation — it was barely flowing (dripping) and B runoff from debris behind sheet pile wall.

approx 1310 leave SP-24

1329 leave 2nd SP-28
no stake at SP-28 but easy to identify using notes

After visiting "SP-89", went to SP-28. Flow was good, so boat left to pick up crew from SP-24.

1310 Tide B rising too quickly — cannot sample SP-28.

1350 drove by SP-45. Tide B too high (covering) for SP-45 and SP-47.

1407 drop AV, KK, JM ~~at~~ 2nd near SP-87 to walk back

1415 arrive SP-83. cannot sample — no flow. May be sampleable at lower tide. can see top of seep but no flow. leave SP-83.

1423 Arrive near ~~SP-83~~ AH SP-87 so AH can bring GPS to crew. ~~SP-87 stake AH~~ Cannot find stake for SP-87

Attempted to get sample but tide came in too fast. Could not get sample.

1510 leave SP-87

1530 off water organize samples, fill out COCs

1605 leave for AR1

6/13/18

AH

Seep Sampling 6/14/18

Windward: Benir Bergquist
Abby Hawley
Greylock: Suzanne Dudziak
Christine Lopez
Farr: Shirley Wu
Jordan Macke
Gravity: Jeff Wilson (Mazama)

0850 Meet up at boat ramp/load
0900 Health & safety meeting
0910 Head to first seep - SP-84
0915 Tide still too high (+1.7)
so head to SP-79
09:25 Dropped off crew at SP-79
0950 SP-79 sample collected
Meanwhile boat dropped off
other crew at SP-84
0953 Sample collected at SP-84
1015 Stopped to fix battery on
YSI meter
Head to SP-87 and SP-57
One crew headed to SP-87,
the other to SP-57.

1041 Collect sample at SP-57
1111 collect sample at SP-87.
There are some issues with the pH meter readings on one of the YSI probes.
We had to walk north past SP-57 with samples to get to the boat because the tide was going down.
1130 Head to SP-78
Drop off one crew at SP-78.
Sampled at 1209.
1228 Pick up crew at SP-77
SP-77 sampled at 12:10
12:45 Drop off crew at SP-74
12:57 Drop off 2nd crew at SP-73
SP-73 flowing ~~dirt~~ off "shelf" so sample was collected directly into the beaker - no funnel needed.
1308 Collected sample at SP-73 and head back to pick up crew at SP-74.
Sample collected at 1314

1322 Head back upriver to pick up more bottles
1345 Checked out SP-63 which is blocked by barge. Were able to get within ~35 ft of seep coordinates by sneaking in along side of barge - tight squeeze. Looks like area may have been covered w/ newer riprap since last recon in 2004. No seep visible but were not really close enough to see.
Heading to SP-05.
1408 Collected sample at SP-05.
Tide was coming up but were able to sample just before tide was too high.
Head to SP-47
1418 Tide too high at SP-47
1428 Arrive at boat ramp.
Unload.
QC sample bottles and fill out COC.
1530 Head to ARI

Done for day
BCB

Rite in the Rain

LDW AOC3 Task 4 6/15/2018
Seep sampling

0950 meet @ Harbor Island Marina
WW: Abby Hawley
Berit Bergquist
Geosyntec: Suzanne Dudziak
Christine Lopez
Farn: Shirley Wu
Jordan Macke

1000 load boats
Health and safety

1028 Gravity boat with Jeff
leaves with AH, SD, SW.
Head to SP-88

1034 Arrive SP-88
pH meter is off (not correct)

1052 Collect sample @ SP-88

1059 leave SP-88
Head to SP-70

1104 Arrive SP-70

1113 Collect sample at SP-70

1117 leave SP-70
head to SP-86
Jeff parked boat north of Kellogg Island and crew walked in.

1219 collected sample at SP-86

1245 left SP-86 and arrived at ~~still~~ boat on south side of Kellogg Island

Reposition boat while crew labels bottles

1259 Arrive SP-66

1325 collect sample at SP-66

1330 leave SP-66

Contact Berit's team - they

are on their last sleep and do not need help so we head to Harbor Island Marina.

1350 dock at Harbor Island Marina and unload boat

1400 boat unloaded, load truck, wait for other team so we can QC bottles/labels and fill out COC.

1425 second boat arrives - unload boat
QC labels/bottles, fill out COC, load rest of equipment/coolers into truck.

1545 leave for ARI.

Heather Lee 6/15/18

Seep Sampling 6/15/18

Windward: Brett Bergquist
Fain: Jordan Macke
Greylock: Christine Lopez
ACOE: Allison Suess
Craving: Ryan McEliece (Discovery)

9:50 Arrive at Harbor Island Marina. Load up boats after separating equipment for two crews.
1015 Health and Safety
1030 Leave marina and head for Slip 3
11:00 Arrive at Slip 3. AS, JM and BB rowed skiff to SP-01. Sampled at 1133.
1140 Rowed to SP-83 and sampled there. Collected at 1208.
1230 Head to SP-51
1250 Conductivity too high at SP-51 so heading to SP47.
Tide level is -3.5 ft

1316 Collect sample at ~~SP-45~~ SP-47
Head to SP-45
1345 Collect sample at SP-45
1354 Head back to marina
14:25 Arrived back at marina. Unloaded and QC'd sample jars and filled out COCs.

Done with ~~Seep~~ Sleep sampling

BJB

Photos

Photo No.:	1
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-01

Photo No.:	2
Date:	06-14-18

Description:
Duwamish AOC3
Sampling at seep SP-05

Photo No.:	3
Date:	06-13-18

Description:
Duwamish AOC3
Sampling at seep SP-06

Photo No.:	4
Date:	06-13-18

Description:
Duwamish AOC3
Sampling at seep SP-24

Photo No.:	5
Date:	06-12-18

Description:
Duwamish AOC3
Sampling at seep SP-30

Photo No.:	6
Date:	06-12-18

Description:
Duwamish AOC3
Sampling at seep SP-32

Photo No.:	7
Date:	06-13-18

Description:
Duwamish AOC3
Sampling at seep SP-33

Photo No.:	8
Date:	06-12-18

Description:
Duwamish AOC3
Sampling at seep SP-35

Photo No.:	9
Date:	06-12-18

Description:
Duwamish AOC3
Sampling at seep SP-38

Photo No.:	10
Date:	06-12-18

Description:
Duwamish AOC3
Sampling at seep SP-42

Photo No.:	11
Date:	06-12-18

Description:
Duwamish AOC3
Sampling at seep SP-43

Photo No.:	12
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-45

Photo No.:	13
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-47

Photo No.:	14
Date:	06-14-18

Description:
Duwamish AOC3
Sampling at seep SP-57

Photo No.:	15
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-66

Photo No.:	16
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-70

Photo No.:	17
Date:	06-14-18

Description:
Duwamish AOC3
Sampling at seep SP-73

Photo No.:	18
Date:	06-14-18

Description:
Duwamish AOC3
Sampling at seep SP-74

no photo available

Photo No.:	19
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-77

Photo No.:	20
Date:	06-14-18

Description:
Duwamish AOC3
Sampling at seep SP-78

Photo No.:	21
Date:	06-14-18

Description:
Duwamish AOC3
Sampling at seep SP-79

Photo No.:	22
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-83

Photo No.:	23
Date:	06-14-18

Description:
Duwamish AOC3
Sampling at seep SP-84

Photo No.:	24
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-86

Photo No.:	25
Date:	06-14-18

Description:
Duwamish AOC3
Sampling at seep SP-87

Photo No.:	26
Date:	06-15-18

Description:
Duwamish AOC3
Sampling at seep SP-88

COCs

1 of 1

CHAIN-OF-CUSTODY/TEST REQUEST FORM

10 3082

Project/Client Name: Windward
Project Number: AOC3 Task 4
Contact Name: Amara Vandervort
Sampled By: BB, AS, AH, SD, CL, SW, JM

Ship to: ARI Labs
Attn: Sue Dunnihoo
Shipper: Hand deliver
Form filled out by: Bent Bergquist

Shipping Date: 6/12/18
Airbill Number: NA
Turnaround requested: Std

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	Test(s) Requested (check test(s) required)								Comments / Instructions [Jar tag number(s)]
					TOC / DOC	TSS	PAHs	PCB Aroclors	SVOCs	Metals / mercury	Dioxins / furans (hold)	PCBs congeners (hold)	
6/11/18	1612	LDW18-SP-RB1	8	W	X	X	X	X	X	X	X	X	
6/11/18	1637	LDW18-SP-RB2	8	W	X	X	X	X	X	X	X	X	Hold
6/12/18	1206	LDW18-SP-30	7	W	X	X	X	X	X	X	X		
6/12/18	0919	LDW18-SP-32	7	W	X	X	X	X	X	X	X		
6/12/18	1056	LDW18-SP-35	7	W	X	X	X	X	X	X	X		
6/12/18	1027	LDW18-SP-38	7	W	X	X	X	X	X	X	X		
6/12/18	1205	LDW18-SP-42	9	W	X	X	X	X	X	X	X	X	
6/12/18	1302	LDW18-SP-43	14	W	X	X	X	X	X	X	X		extra volume for QC
		Total Number of Containers	66	Purchase Order / Statement of Work #									

1) Released by: B. Bergquist	1) Rec'd by: Jarrod Gillie	2) Released by:	2) Rec'd by:
Print name: Bent Bergquist		Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 6/12/18 1455	Date/Time: 06/12/18 1455	Date/Time:	Date/Time:

* Distribution: White copies accompany shipment; yellow retained by consignor.

Wind Ward environmental LLC
200 West Mercer Street
Suite 401
Seattle, WA 98119
Tel: (206) 378-1364
Fax: (206) 217-9343

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Date of receipt::	Laboratory W.O. #:
Condition upon receipt:	Time of receipt:
Cooler temperature:	Received by:

1 of 1

CHAIN-OF-CUSTODY/TEST REQUEST FORM

Page 3.83

Project/Client Name: Windward
Project Number: AOC3 Task 4
Contact Name: Amara vandervort
Sampled By: AH, AV, SD, CL, JM, SW, KK

Ship to: ARI Labs
Attn: Sue Dunniway
Shipper: Hand deliver
Form filled out by: A Hawley

Shipping Date: 6/13/18
Airbill Number: NA
Turnaround requested: Std

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	Test(s) Requested (check test(s) required)								Comments / Instructions [Jar tag number(s)]
					TOC / DOC	TSS	PHHs	PCB Aroclors	SVOCs	Metals / Mercury	Dioxins / Furans (HOLD)	PCB Congeners (HOLD)	
6/13/18	0953	LDW18-SP-06	7	W	X	X	X	X	X	X	X		
6/13/18	1217	LDW18-SP-33	7	W	X	X	X	X	X	X	X		
6/13/18	1235	LDW18-SP-24	8	W	X	X	X	X	X	X	X	X	
6/13/18	1242	LDW18-SP-24-FD	8	W	X	X	X	X	X	X	X	X	
		Total Number of Containers	30	Purchase Order / Statement of Work #									

1) Released by: A Hawley	1) Rec'd by: Brandon Fisk	2) Released by:	2) Rec'd by:
Print name: Abby Hawley		Print name:	
Signature: A Hawley	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 6/13/18 1626	Date/Time: 6/13/18 1626	Date/Time:	Date/Time:

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Date of receipt::	Laboratory W.O. #:
Condition upon receipt:	Time of receipt:
Cooler temperature:	Received by:

1 of 1

CHAIN-OF-CUSTODY/TEST REQUEST FORM

Project/Client Name: Windward
Project Number: AOC3 Task 4
Contact Name: Amara Vandervort
Sampled By: BB AH Windward

Ship to: ARI Labs
Attn: Sue Dumindo
Shipper: Hand deliver
Form filled out by: Benit Bergquist

Shipping Date: 6/14/18
Airbill Number: NA
Turnaround requested: Std.

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	Test(s) Requested (check test(s) required)								Comments / Instructions [Jar tag number(s)]
					TOC/DOC	TSS	PAHs	PCBs Aroclors	SVOCs	Metals/ Mercury	Dioxins/ furans (HOLD)	PCB Congeners (HOLD)	
6/14/18	1408	LDW18-SP-05	7	water	X	X	X	X	X	X	X		
	1041	LDW18-SP-57	38 ~~8~~ 15		X	X	X	X	X	X	X	X	extra volume for QC
	1308	LDW18-SP-73	7		X	X	X	X	X	X	X		
	1314	LDW18-SP-74	7		X	X	X	X	X	X	X		
	1210	LDW18-SP-77	9		X	X	X	X	X	X	X	X	
	1204	LDW18-SP-78	8		X	X	X	X	X	X	X	X	
	0950	LDW18-SP-79	8		X	X	X	X	X	X	X	X	
	0953	LDW18-SP-84	7		X	X	X	X	X	X	X		
↓	1111	LDW18-SP-87	9	↓	X	X	X	X	X	X	X	X	
		Total Number of Containers	75	Purchase Order / Statement of Work #									

1) Released by: A. Hanley	1) Rec'd by: Stephanie Fisher	2) Released by:	2) Rec'd by:
Print name: Abby Hanley	Company: ARI	Print name:	Company:
Signature: AHanley		Signature:	
Company: Windward		Company:	
Date/Time: 6/14/18 1545	Date/Time: 6/14/18 1545	Date/Time:	Date/Time:

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To be completed by Laboratory upon sample receipt:

Date of receipt::	Laboratory W.O. #:
Condition upon receipt:	Time of receipt:
Cooler temperature:	Received by:

1 of 1

CHAIN-OF-CUSTODY/TEST REQUEST FORM

No. 3085

Project/Client Name: Windward
Project Number: A003 Task 4
Contact Name: Amara Vanderhoef
Sampled By: Windward - BB AH

Ship to: ARI Labs
Attn: Sue Dunninoo
Shipper: Hand deliver
Form filled out by: Bent Berggquist

Shipping Date: 6/15/18
Airbill Number: NA
Turnaround requested: Std.

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	Test(s) Requested (check test(s) required)								Comments / Instructions [Jar tag number(s)]
					TOC / DOC	TSS	PAHs	PCB Aroclors	SVOCs	Metals (mercury)	Dioxins/ furans (HOLD)	PCB congeners (HOLD)	
6/15/18	1133	LDW18-SP-01	8	Water	X	X	X	X	X	X	X	X	
	1345	LDW18-SP-95	7		X	X	X	X	X	X	X		
	1316	LDW18-SP-97	7		X	X	X	X	X	X	X		
	1325	LDW18-SP-66	8		X	X	X	X	X	X	X	X	
	1113	LDW18-SP-70	8		X	X	X	X	X	X	X	X	
	1208	LDW18-SP-83	7		X	X	X	X	X	X	X		
	1219	LDW18-SP-86	8		X	X	X	X	X	X	X	X	
↓	1052	LDW18-SP-88	9	↓	X	X	X	X	X	X	X	X	
		Total Number of Containers	61	Purchase Order / Statement of Work #									

1) Released by: B. Berggquist	1) Rec'd by: Stephanie Fisher	2) Released by:	2) Rec'd by:
Print name: Bent Berggquist	Company: ARI	Print name:	Company:
Signature:		Signature:	
Company: Windward		Company:	
Date/Time: 6/15/18 16:10	Date/Time: 6/15/18 1610	Date/Time:	Date/Time:

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Date of receipt::	Laboratory W.O. #:
Condition upon receipt:	Time of receipt:
Cooler temperature:	Received by: