Integral Consulting Inc.
411 1st Avenue S.
Suite 550
Seattle, WA 98104

telephone: 206.230.9600
facsimile: 206.230.9601
www.integral-corp.com

MEMORANDUM

To:	Jennie Goldberg, Oversight Contract Manager
From:	Eric Pilcher, Field Supervisor
Date:	November 18, 2011
Subject:	Slip 4 EAA, Post-Excavation Bank Slope Sampling
Project No.:	A0006-0014L

Integral performed Post-Excavation Bank Slope Sampling on November 14 and 16, 2011. Samples were collected from 12 discreet and 2 composite locations, described in the SAP as locations PE-1 though PE-14. A total of 17 samples were sent to Analytical Resources, Inc. in Tukwila, WA for analysis. The samples included a field split at location PE-5 (and additional material for laboratory quality assurance and quality control), an equipment blank on bowls and spoons used for homogenization, and a laboratory deionized/distilled water blank.

Sampling began at 10:30 am on November 14th. Low tide occurred at 1:26 pm at an elevation of 6.8 ft mean lower low water. Given the depth at low tide, intertidal locations PE-2, PE-4, PE-5, PE-7, PE-9, and PE-13 were not obtainable from the bank via stainless-steel spoon. Therefore, samples at locations PE-5, PE-7, PE-9, and PE-13 were obtained via power grab. Attempts to sample PE-4 resulted in damage to the power grab, rendering it unable to close properly and obtain samples.

Integral resumed sampling on November 16th at 10:45 am. Samples from locations PE-2 and PE-4 were successfully obtained using a vanVeen grab.

The changes to sampling protocol are noted as items 003 and 004 in the attached field change log. In addition, field notes, sediment/soil collection forms, sample matrix, and chain-of-custody forms are attached.

If you have any questions or concerns, please contact me either by phone at (253) 370-5894 or by email at epilcher@integral-corp.com.

Encl.

CC: (electronic transmittal only)
Karen Keeley (EPA)
Allison Hiltner (EPA)
Amy Dahl (TechLaw)
Amanda Rohrbaugh (TechLaw)
Dave Schuchardt (SPU)
Chris Woelfel (SPU)
Cynthia Blazina (SPU)
Laura Wishik (Seattle)
Carl Bach (Boeing)
Mark Schneider (Perkins Coie)
Reid Carscadden (Integral)
John Lally (Integral)
Jane Sund (Integral)
Kim Magruder-Carlton (Integral)
Bill Lawrence (Integral)

Table 1. Field Change Notification Log

FCN No.	FCN Description	Date	Remarks
001	Surface sample depth measurement	08/24/11	Sample penetration depth for BD-1 was measured via spoon. A plastic ruler was used instead of a stainless steel ruler to measure sample penetration depths for BD-2 through BD-8. Care was taken to ensure that sediments in contact with the ruler were not included in the collected sample.
002	Intertidal sampling methodology	08/24/11	Sample BD-8 was collected with a power grab instead of from the bank with a stainless-steel spoon.
003	Intertidal sampling methodology	11/14/11	Samples PE-5, PE-7, PE-9, and PE-13 were collected with a power grab instead of from the bank with a stainless-steel spoon.
004	Intertidal sampling methodology	11/16/11	Samples PE-2 and PE-4 were collected with a vanVeen grab instead of from the bank with a stainless-steel spoon.

Notes:

FCN = field change notification

11/10/11

1405 at Marina weather 60°F, Calm, clear

Crew: B Lawrence (Integral) S. Sawgeen (Gravity)

Plan Collect Ambient + Compliance station WQ readings

1419 Calibration Check (New) YSI 6920

pH 4 = 4.05 Turb 0 = 0.0

pH 7 = 6.89 @ 33.3°C Turb 100 = 99.9

Conduct (1000 µs/cm) = 1.049

to Slip 4

1445 Collect WQ readings at Ambient station

3.0 & 21.9' (mudline 24.9)

1501 Collect WQ readings at Compliance station

3.0 & 18.6 (mudline 21.6')

- To Lafarge to observe transloading operation

— no transloading occurring

1546 ~~1555~~ Collect WQ readings at Ambient station

3.0 & 23.0 (mudline 26.0')

1555 Collect WQ readings at Compliance station

3.0 & 21.3' (mudline 24.3') - signif amt of debris floating into slip

Calibration Check

pH 4 = 4.03 Turb 0 = 0.1

pH 7 = 6.87 Turb 100 = 100.7

Cond (1000 µS/cm) = 1059 µs/cm

1620 Done for the day

11/14/11

0905 at Marina

weather 50°F, slight breeze, overcast

Crew: B Lawrence, J. Sexton Integral

M. Duffield - Gravity

Plan - collect sediment samples (post-excavation) from (1-10cm) at locations PE-1 through PE-14

0930 H&S meeting - by Bill Lawrence

discuss scope and hazards.

0955 To Slip - call Eric P. regarding access to sample locations

1012 at Slip, setup decon and sampling gear

1037 Collect SL4-1G-PE8

1057 Collect SL4-1G-PE10

1130 Collect SL4-1G-PE1

1209 Collect SL4-1G-PE3 4-part composite

1251 Collect SL4-1G-PE6 4-part composite

1319 Collect SL4-1G-PE12

1330 Collect SL4-1G-PE11

1339 Collect SL4-1G-PE14

1345 To dock to get powergrab sampler.

11/14/11

1450 Power Grab is partially set up. to Slip 4 to complete setup
- position on PE-13, dry run on sampler battery cable is heating up
- calls to Gravity re: battery cable

1550 - decon sampler
attempt sample collection - sample consists of rocks (2-5") and some lumber photo 161

1610 2nd attempt - collect PE13

1640 - collect PE-9 added lab QA to this sample

1654 - collect PE-7
- collect PE-5 1st attempt - no recovery
2nd " - "

1725 - 3rd attempt = sample & replicate collected
- attempt PE-4
6 attempts, boulders encountered, tried repositioning each attempt

1840 - Call E. Pikler - discuss status and equipment failure due to boulders.
- unable to sample PE4 or PE2, will continue on Wednesday AM
- To Dock

1915 - Done for the day

11/14/11

11/16/11

0900 At Marina weather 40°F, overcast, lt rain
Crew: B Lawrence, J. Sexton - Integral
M. Duffield - Gravity
Plan: collect grabs at PE stations 2 & 4
- Mike prepping equipment
- Bill/Jane QC sample Jars & pack cooler

1030 Equipment ready - swith out power grab for VanVeen
- mob to Slip 4
- Complete COC & QC for 11/4/11 samples

1045 Deploy vanVeen at PE-4
1st attempt - log recovered - no sample
2nd " - vanVeen rolled - no sample

1122 collect sample

1145 Deploy vanVeen at PE-2
1st Attempt - no recovery
2nd - rolled - no sample

1211 collect sample PE-2
- decon & demob to dock

1350 - to lab w/ samples

1440 Done for the day

11/16/11

xcavation Bank Sediment Sampling November 2011

Station Number	Sample Identifier	Sample Number	Sample Depth	Date	Time	Sample Type	Sediment Sample Analyses				Field/DI Blank Anayses			
							TOC	Metals	PCB Aroclors	SVOCs	TOC	Metals	PCB Aroclors	SVOCs
							4 oz WMG	4 oz WMG	8 oz WMG	8 oz WMG	250 mL AG	500 mL HDPE	2 x 500 mL AG	2 x 500 mL AG
							4±2°C	4±2°C	4±2°C	4±2°C	H_2SO_4 to pH <2; 4±2°C	HNO_3 to pH <2; 4±2°C	4±2°C	4±2°C
PE-2	SL4-SG-PE2	SD0010	0 - 10 cm	11/16/11	1211	Normal	1119	1120	1121	1122	NA	NA	NA	NA
PE-4	SL4-SG-PE4	SD0011	0 - 10 cm	11/16/11	1122	Normal	1115	1116	1117	1118	NA	NA	NA	NA
PE-5	SL4-SG-PE5	SD0012	0 - 10 cm	11/14/11	1725	Normal	1103	1104	1105	1106	NA	NA	NA	NA
						SD0015 Add'l Vol. for Lab QA/QC	NA	NA	1107	1108	NA	NA	NA	NA
								SD0015	1109	1110	NA	NA	NA	NA
	SL4-SG-PE5-Split	SD0013	0 - 10 cm	11/14/11	1735	Field Split	1111	1112	1113	1114	NA	NA	NA	NA
	SL4-SG-PE5-RB	RB0003	bowls/spoons/ spatulas		1240	Equipment Rinsate Blank	NA	NA	NA	NA	1069	1070	1071	1073
													1072	1074
PE-7	SL4-SG-PE7	SD0014	0 - 10 cm	11/14/11	1654	Normal	1099	1100	1101	1102	NA	NA	NA	NA
PE-9	SL4-SG-PE9	SD0015	0 - 10 cm	11/14/11	1640	Normal	1095	1096	1097	1098	NA	NA	NA	NA
PE-11	SL4-SG-PE11	SD0016	0 - 10 cm	11/14/11	1330	Normal	1083	1084	1085	1086	NA	NA	NA	NA
PE-13	SL4-SG-PE13	SD0017	0 - 10 cm	11/14/11	1610	Normal	1091	1092	1093	1094	NA	NA	NA	NA
PE-1	SL4-IG-PE1	SD0018	0 - 10 cm	11/14/11	1130	Normal	1055	1056	1057	1058	NA	NA	NA	NA
PE-8	SL4-IG-PE8	SD0019	0 - 10 cm	11/14/11	1037	Normal	1047	1048	1049	1050				
PE-10	SL4-IG-PE10	SD0020	0 - 10 cm	11/14/11	1057	Normal	1051	1052	1053	1054				
PE-12	SL4-IG-PE12	SD0021	0 - 10 cm	11/14/11	1319	Normal	1079	1080	1081	1082				
PE-14	SL4-IG-PE14	SD0022	0 - 10 cm	11/14/11	1339	Normal	1087	1088	1089	1090				
PE-3	SL4-IG-PE3	SD0023	0 - 10 cm	11/14/11	1209	Normal - 4 point composite	1059	1060	1061	1062				
PE-6	SL4-IG-PE6	SD0024	0 - 10 cm	11/14/11	1251	Normal - 4 point composite	1075	1076	1077	1078				
DI Blank	SL4-PE-WB	WB0002	NA	11/14/11	1212	DI Water Blank	NA	NA	NA	NA	1063	1064	1065	1067
													1066	1068

Notes:

AG - amber glass
DI - deionized distilled water
HDPE - high-density polyethylene
IG - intertidal grab
PCB - polychlorinated biphenyl
PE - Post-excavation
SG - Subtidal grab
SVOCs - semi-volatile organic compounds
TOC - total organic carbon
WMG - wide mouth glass

integral consulting inc.

SURFACE SEDIMENT/SOIL COLLECTION FORM

Project Name: Slip 4 **Project No.** A0006-14L **Page:** 1 of 6

Date: 11/14/11 **Crew:** B. Lawrence / J. Sexton (Integral), Mike Duffield (Gravity)

Weather: Overcast, 50°F, calm

Sampling Method: Hand Sample SS spoon / bowl

Time: 1037 **Station:** PE-8 **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SL4-IG SD0019

Type: ☐ cobble ☒ gravel ☐ sand C M F ☒ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☒ gray ☒ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: Gravel w/ some silt, firm, trace rootlets photo 145 - bowl 146 - location

collected 1-10 cm - surface debris removed

Time: 1057 **Station:** PE-10 **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0020

Type: ☐ cobble ☒ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☒ wood/shell fragments

Color: ☐ drab olive ☒ gray ☐ black ☒ brown ☐ brown surface

Odor: ☐ none ☐ slight ☒ moderate ☐ strong ☐ sulfidic ☒ petroleum ☐ other

Comments: 0-4 cm sandy gravel, no odor, trace wood fragments photo 147 - location
4-10 cm dk gray silty gravel, mod HC odor

Time: 1130 **Station:** PE-1 **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0018

Type: ☐ cobble ☐ gravel ☒ sand C (M F) ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☒ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: Olive to lt brn fine to med sand w/ trace gravel (to 1") photo 148

Time: 1142 **Station:** PE-3A **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0023

Type: ☐ cobble ☐ gravel ☒ sand C (M F) ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: Olive to lt brn fine to med SAND w/ trace gravel to 1/2" photo 150

photo 149 - deleted

integral consulting inc.

SURFACE SEDIMENT/SOIL COLLECTION FORM

Project Name: Slip 4 **Project No.** A0006-14L **Page:** 2 of 6

Date: 11/14/11 **Crew:** BL/JS/MD

Weather: Overcast, 50°F, calm

Sampling Method: SS spoon / bowl

Time: 1151 **Station:** PE-3B **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0023

Type: ☐ cobble ☐ gravel ☒ sand (C) M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☒ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: Lt olive gray med to coarse sand w/ trace red brick fragments and trace red sand-sized grains photo 151

Time: 1200 **Station:** PE-3C **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0023

Type: ☐ cobble ☒ gravel ☒ sand C (M F) ☒ silt clay ☒ organic matter ☒ wood/shell fragments

Color: ☒ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: olive brn silty SAND w/ trace gravel, trace brick frags, twigs

photo 152

Time: 1209 **Station:** PE-3D **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0023

Type: ☐ cobble ☒ gravel ☒ sand C (M F) ☒ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☒ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: olive brn silty gravelly SAND, trace concrete fragments

photo 153

Time: 1232 **Station:** PE-6A **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0024

Type: ☐ cobble ☐ gravel ☒ sand C (M F) ☒ silt clay ☒ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☒ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: Olive gray silty fine SAND w/ trace organic (rootlets)

photo 154

integral consulting inc.

SURFACE SEDIMENT/SOIL COLLECTION FORM

Project Name: Slip 4 **Project No.** A0006-~~3~~14L **Page:** 3 of 6

Date: 11/14/11 **Crew:** BL/JS/MD

Weather: Overcast, 50°F, calm

Sampling Method: SS spoon / bowl

Time: 1238 **Station:** PE-6B **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0024

Type: ☐ cobble ☒ gravel ☒ sand C (M) F ☐ silt clay ☐ organic matter ☒ wood/shell fragments

Color: ☐ drab olive ☒ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: DK olive gray fine to med sand w/ trace gravel, trace organics (wood chips)

photo 155

Time: 1246 **Station:** PE-6C **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0024

Type: ☐ cobble ☐ gravel ☒ sand C (M) F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☒ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: DK olive brn fine to med sand

photo 156

Time: 1251 **Station:** PE-6D **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0024

Type: ☐ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☒ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: Lt olive silty gravel, gravel fine to 1"

photo 157

Time: 1319 **Station:** PE-12 **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0021

Type: ☐ cobble ☒ gravel ☒ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☒ gray ☐ black ☒ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: 0-4 cm dk gray fine gravel, angular
4-10 cm dk olive brn med sand w/ gravel to 1"

photo 158

integral consulting inc.

SURFACE SEDIMENT/SOIL COLLECTION FORM

Project Name: Slip 4 **Project No.** A0006-14L **Page:** 4 of 6

Date: 11/14/11 **Crew:** BL/JS/MD

Weather: Overcast, 50°F, calm

Sampling Method: SS spoon/bowl

Time: 1330 **Station:** PE-11 **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: ____

Type: ☐ cobble ☒ gravel ☒ sand (C) M F ☒ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface

Odor: ☐ none ☒ slight ☐ moderate ☐ strong ☐ sulfidic ☒ petroleum ☐ other

Comments: Brown sandy gravel w/trace silt, slight HC odor and visible rainbow sheen

photo 159

Time: 1339 **Station:** PE-14 **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 10 cm **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: ____

Type: ☐ cobble ☒ gravel ☒ sand C (M) F ☒ silt clay ☒ organic matter ☐ wood/shell fragments

Color: ☒ drab olive ☐ gray ☐ black ☒ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: Olive gray to brn gravelly sand w/trace silt, trace rootlets

photo 160

Time: ____ **Station:** ____ **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: ____ **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: ____

Type: ☐ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☐ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments:

Time: ____ **Station:** ____ **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: ____ **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: ____

Type: ☐ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☐ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments:

integral consulting inc.

SURFACE SEDIMENT/SOIL COLLECTION FORM

Project Name: Slip 4 Project No. A0006-14L Page: 5 of 6

Date: 11/14/11 Crew: BL/JS/MD

Weather: Overcast, 50°F, calm

Sampling Method: Powergrab

Time: 1610 Station: PE-13 Replicate: ____ Acceptable grab: ☒ Yes ☐ No

Bottom Depth: 3.6' Penetration Depth: 20 cm RPD Depth: 10 cm

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0017

Type: ☐ cobble ☒ gravel ☒ sand (C M F) ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☒ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☒ petroleum ☐ other

Comments: 1st grab - cobbles & lumber - photo 161
2nd grab - DK olive gray fine to med SAND
slight rainbow sheen coming out of sample
photo 162

Time: 1640 Station: PE-9 Replicate: ____ Acceptable grab: ☒ Yes ☐ No

Bottom Depth: 4.1' Penetration Depth: 20 cm RPD Depth: 10 cm

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0015

Type: ☐ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☒ gray ☒ black ☐ brown ☐ brown surface

Odor: ☐ none ☐ slight ☐ moderate ☒ strong ☐ sulfidic ☒ petroleum ☐ other

Comments: gray to black silt w/sand, strong HC odor
photo 163

Time: 1654 Station: PE-7 Replicate: ____ Acceptable grab: ☒ Yes ☐ No

Bottom Depth: 3.9' Penetration Depth: 10 cm RPD Depth: 10 cm

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0014

Type: ☐ cobble ☐ gravel ☐ sand C M F ☒ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☐ none ☒ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: surface was slanted and sample was from top 10 cm only
DK gray silt/clay, possible slight HC odor
photo 164

Time: 1725 Station: PE-5 Replicate: ✓ Acceptable grab: ☒ Yes ☐ No

Bottom Depth: 4.1' Penetration Depth: 20 cm RPD Depth: 10 cm

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0012 and replicate SD0013

Type: ☐ cobble ☐ gravel ☐ sand C M F ☒ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☒ gray ☐ black ☐ brown ☐ brown surface

Odor: ☒ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments: 1st Attempt @ 4.1 - no recovery
2nd " 5.5 "
3rd " 4.1 - dk gray silt, no odor
photo 165

integral consulting inc.

SURFACE SEDIMENT/SOIL COLLECTION FORM

Project Name: Slip 4 **Project No.** A0006-14L **Page:** 6 of 6

Date: 11/16/11 **Crew:** BL/JS/MD

Weather: Overcast, 40°F, calm, light rain

Sampling Method: Van Veen

Time: 1122 **Station:** PE-4 **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 7.0 **Penetration Depth:** 20 **RPD Depth:** 10

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0011

Type: ☐ cobble ☒ gravel ☒ sand (C M F) ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☒ drab olive ☒ gray ☒ black ☒ brown ☐ brown surface

Odor: ☐ none ☐ slight ☒ moderate ☒ strong ☐ sulfidic ☒ petroleum ☐ other

Comments: 0-4 Lt brn sandy gravel w/ cobbles
4-10 DK gray to black sandy SILT w/ strong sheen and HC odor
photo 167

Time: 1211 **Station:** PE-2 **Replicate:** ____ **Acceptable grab:** ☒ Yes ☐ No

Bottom Depth: 5.2 **Penetration Depth:** 20 cm **RPD Depth:** 10 cm

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: SD0010

Type: ☐ cobble ☐ gravel ☐ sand C M F ☒ silt clay ☒ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☐ gray ☒ black ☐ brown ☐ brown surface

Odor: ☐ none ☒ slight ☐ moderate ☐ strong ☐ sulfidic ☒ petroleum ☐ other

Comments: DK gray to black silt w/ organics (leaf litter)
slight rainbow sheen and HC odor
photo 168

Time: ____ **Station:** ____ **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: ____ **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: ____

Type: ☐ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☐ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments:

Time: ____ **Station:** ____ **Replicate:** ____ **Acceptable grab:** ☐ Yes ☐ No

Bottom Depth: ____ **Penetration Depth:** ____ **RPD Depth:** ____

Analyses before homogenization: ☐ VOC ☐ Sulfides ☐ Other

Sample ID: ____

Type: ☐ cobble ☐ gravel ☐ sand C M F ☐ silt clay ☐ organic matter ☐ wood/shell fragments

Color: ☐ drab olive ☐ gray ☐ black ☐ brown ☐ brown surface

Odor: ☐ none ☐ slight ☐ moderate ☐ strong ☐ sulfidic ☐ petroleum ☐ other

Comments:

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested: STANDARD
ARI Client Company: INTEGRAL	Phone:
Client Contact: KIM MAGRUDER CARLTON	
Client Project Name: SLIP 4 EARLY ACTION AREA	
Client Project #: A0006-14L	Samplers: B. LAWRENCE, J. SEXTON

Page: 1 of 2

Date: 11/16/11 | Ice Present? Y

No. of Coolers: 2 | Cooler Temps: ~~4.8~~, 3.8, 4.3

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Tag #	Date	Time	Matrix	No. Containers	TOC	Metals	PCB Aroclors	SVOCs					Notes/Comments
SD0012	1103-1106	11/14/11	1725	SD	4	X	X	X	X					
SD0013	1111-1114	↓	1735	↓	4	↓	↓	↓	↓					
SD0014	1099-1102	↓	1654	↓	4	↓	↓	↓	↓					
SD0015	1095-1098 1107-1110	↓	1640	↓	8	↓	↓	↓	↓					Add'l Vol Lab QA/QC
SD0016	1083-1086	↓	1330	↓	4	↓	↓	↓	↓					
SD0017	1091-1094	↓	1610	↓	4	↓	↓	↓	↓					
SD0018	1055-1058	↓	1130	↓	4	↓	↓	↓	↓					
SD0019	1047-1050	↓	1037	↓	4	↓	↓	↓	↓					
SD0020	1051-1054	↓	1057	↓	4	↓	↓	↓	↓					
SD0021	1079-1082	↓	1319	↓	4	↓	↓	↓	↓					

Comments/Special Instructions
Analyze per work order
#A0006-14L-ARI-01

Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature) Bill Lawrence	(Signature) Lin Mills	(Signature)	(Signature)
Printed Name: Bill Lawrence	Printed Name: Jennifer Millsap	Printed Name:	Printed Name:
Company: Integral	Company: ARI	Company:	Company:
Date & Time: 11/16/11 1350	Date & Time: 11/16/11 1350	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:
ARI Client Company: INTEGRAL	Phone:
Client Contact: KIM MAGRUDER CARLTON	
Client Project Name: SLIP 4 EARLY ACTION AREA	
Client Project #: A0006-14L	Samplers: B. LAWRENCE, J. SEXTON

Page: 2	of 2
Date: 11/16/11	Ice Present? Y
No. of Coolers: 2	Cooler Temps: 4.3, 3.8

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Tag #	Date	Time	Matrix	No. Containers	TOC	Metals	PCB Aroclors	SVOCs					Notes/Comments
SD0022	1087-1090	11/14/11	1339	SD	4	X	X	X	X					
SD0023	1059-1062	↓	1209	↓	4	↓	↓	↓	↓					
SD0024	1075-1078	↓	1251	↓	4	↓	↓	↓	↓					
RB0003	1069-1074	↓	1240	WA	6	↓	↓	↓	↓					TOC = H2SO4 Metals = HNO3
WB0002	1063-1068	↓	1212	↓	6	↓	↓	↓	↓					TOC = H2SO4 Metals = HNO3
SD0011	1115-1118	11/16/11	1122	SD	4	↓	↓	↓	↓					
SD0010	1119-1122	↓	1211	↓	4	↓	↓	↓	↓					
								J. Sexton 11/16/11						

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
Analyze per work order #A0006-14L-ARI-01	(Signature) Bill Lawrence	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: Bill Lawrence	Printed Name: Jennifer Millsap	Printed Name:	Printed Name:
	Company: Integral	Company: ARI	Company:	Company:
	Date & Time: 11/16/11 1350	Date & Time: 11/16/11 1350	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.