

### **Owner:** King County

**Project:** Lower Duwamish Waterway ENR/AC Pilot **Dates:** November 29, 2016 to December 2, 2016

#### Weekly Progress Meeting Summary:

• The first weekly progress meeting is not scheduled to occur until Dec 6<sup>th</sup>.

### **Construction Progress:**

- Schedule (updated weekly by contractor Attached)
  - Note: Scour plot may move up the schedule dependent on Ash Grove maintenance dredging that is to occur in the next 60 days. Schedule for that work is currently unknown and it is anticipated that schedule will be firmed up by weeks end (Dec 9<sup>th</sup>, 2016).
- General progress with respect to schedule
  - The KP-2 barge was flooded to soak the Gravelly Sand + AC and Sand + AC for approximately 24 hours prior to the start of the test placements.
  - Test placement was completed for both the Gravelly Sand + AC and Sand + AC.
     A single pass pattern and a two pass with overlapping bucket pattern, as illustrated in the specifications, were tested. Based on the quantitative data and visual inspection of both test plots it was determined that the 2 pass with overlapping bucket pattern appeared to be better of the two patterns.
  - Work scheduled for this week:
    - Load the KP-3 with Gravelly Sand (12/5/16) at Cal-Portland facility. Soak Gravelly Sand at PPM yard (12/6 – 12/7).
    - Complete Gravelly Sand + AC placement in intertidal plot.
    - Daily hydrographic surveys at end of each shift.
    - Diver confirmation measurements of the Gravelly Sand + AC placement.
    - Start Gravelly Sand placement at intertidal plot.

### Problems Encountered (If Any) & Associated Action Items: 🗌 None 🖂 See Comments below:

Problems Encountered	Date	Required Action	Date Completed
Turbidity plume while pumping	11/30/2016	Replace 25 micron filter in	12/1/2016
out of the barge.		filters with 1 micron filters.	
		Recycle water back into	
		barge before discharging in	
		the river.	

### Water Quality Monitoring:

- Observed non-construction-related events that impacted water quality.
  - A stormwater located ~100 feet downstream of the work area was observed discharging highly turbid water while placement operations were occurring.
- Summary of water quality criteria violations and actions taken.

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- Nov 29, 2016: Compliance point was 23.3 NTU above ambient during the 14:28 monitoring event. Placement had already stopped to relocate from the Sand + AC test plot to the Gravelly Sand + AC test plot when notification of exceedance was received.
- Nov 30, 2016: Compliance point was 8.0 NTU above ambient during the 13:37 monitoring event. Placement operations halted for ~28 minutes. Operations started again after WQM vessel verified that WQ was within allowable tolerances.
- Dec 1, 2016: Compliance point was 5.3 NTU above ambient during the 11:35 monitoring event. Placement operations halted for ~21 minutes. Operations started again after WQM vessel verified that WQ was within allowable tolerances.
- Dec 2, 2017: Compliance point was 10.0 NTU above ambient during the 13:33 monitoring event. Placement operations halted for ~68 minutes. Operations started again after WQM vessel verified that WQ was within allowable tolerances.



Figure 1: Water Quality Monitor Data Summary for Week Ending December 2, 2016

## **QA Inspections:**

- Results:
  - o QA Inspections
  - Surveying (Performed at the end of each shift. Attached is the Dec 2<sup>nd</sup>, 2016 survey)
  - o Monitoring Activities:
    - Visual inspection and stake measurements performed at the end of each day during the low tide during the test plot placement. Field measurement summary for both test plots are attached.

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Date: December 6, 2016

• Out of Spec Conditions (if encountered) & Corrective Actions: 🗌 None 🖂 See Comments below:

Out of Spec condition	Date	Corrective Action	Date Completed		
The Sand + AC test plot had 2	11/30/2016	No action at this time. It is	11/30/2016		
locations that had less than 4		believed that tidal action			
inches of material after the		and river current will level			
completion of the test plot.		the plot out so that no			
		locations are less than 4			
		inches thick.			

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December 6, 2016



**Photo 1-A:** Example of a stake placed in the intertidal plot that will be used to measure the cap thickness. All stakes extended 18 inches above the mudline.



**Photo 1-B:** Activated carbon settled outside of the placement plot. This is approximately 15 feet outside of the placement area.

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December 6, 2016



**Photo 2-A:** The bag filter system used for barge water filtration. The four furthest filters had 25 micron bag filters initially but were replaced with 1 micron filters after a turbidity plume was observed during barge pumping.



**Photo 2-B:** Operators DredgePack screen. The blue marks are tracked locations of bucket placements.

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ID		Tasl	k Task Name	Duration	Start	Finish	2 May 29 Jun 5, '1 Jun 12, Jun 19, Jun 26, Jul 3, '1 Jul 10, ' Jul 17, ' Jul 24, ' Jul 31, ' Aug 7, ' Aug 14, Aug 21, Aug 28, Sep 4, ' Sep 11, Sep 18, Sep 25, Oct 2, '1 Oct 9, '1 Oct 16, Oct 23, Oct 30, Nov 6, ' N
1	0	Mod	de General	179 days	Wed 6/1/16	Mon 2/13/1	SMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFSTTSMWFS
		~	General	175 uays	weu 0/1/10	1011 2/13/1	
2		3	Contract Award	0 days	Wed 6/1/16	Wed 6/1/16	♦ 6/1
3		3	Phase 1 Notice to Proceed	0 days	Wed 6/1/16	Wed 6/1/16	♦ 6/1
4		3	Start In-Water Work	0 days	Tue 11/29/16	5 Tue 11/29/16	
5		3	Phase 2 Substantial Completion	0 days	Thu 1/26/17	Thu 1/26/17	
6		3	Punchlist	2 days	Fri 1/27/17	Mon 1/30/17	
7		3	Closeout	10 days	Tue 1/31/17	Mon 2/13/17	
8		₿	Complete In-Water Work	0 days	Mon 2/13/17	Mon 2/13/17	
9		3	Final Acceptance	0 days	Mon 2/13/17	Mon 2/13/17	
10		₿	Materials Placement	39 days	Tue 11/29/16	6 Thu 1/26/17	
11		3	Test Placement	2 days	Tue 11/29/16	6 Wed 11/30/1	
12		3	Test Placement Area- Sand + AC	1 day	Tue 11/29/16	5 Tue 11/29/16	
13		3	Test Placement Area- Gravelly Sand + AC	1 day	Wed 11/30/1	6Wed 11/30/1	é
14		3	Intertidal Plot	12 days	Thu 12/1/16	Fri 12/16/16	
15		3	Intertidal Plot- Gravelly Sand + AC	6 days	Thu 12/1/16	Thu 12/8/16	
16		3	Intertidal Plot- Gravelly Sand	6 days	Fri 12/9/16	Fri 12/16/16	
17		3	Hydrographic As-Built Survey	0 days	Fri 12/16/16	Fri 12/16/16	
18		*	Subtidal Plot	12 days	Mon 12/19/1	(Thu 1/5/17	
19		3	Subtidal Plot- Sand + AC	6 days	Mon 12/19/1	6Tue 12/27/16	
20		3	Subtidal Plot- Sand	6 days	Wed 12/28/1	6Thu 1/5/17	
21		3	Hydrographic As-Built Survey	0 days	Thu 1/5/17	Thu 1/5/17	
22		3	Scour Plot	12 days	Mon 1/9/17	Thu 1/26/17	
23		₿	Scour Plot- Gravelly Sand + AC	6 days	Mon 1/9/17	Tue 1/17/17	
24		3	Scour Plot- Gravelly Sand	6 days	Wed 1/18/17	Wed 1/25/17	
25		3	Hydrographic As-Built Survey	0 days	Thu 1/26/17	Thu 1/26/17	

Project: Baseline Schedule (11-23	Task	Milestone	<b>♦</b>	Project Summary	Ф————————————————————————————————————	xternal Milestone	\$ Inactive Milestone	\$	Manual Task	C :	Manual Summary Ro	ollup 🚃
Date: Mon 12/5/16	Split	 Summary	<b>~</b>	External Tasks	In In	nactive Task	Inactive Summary	$\overline{\mathbf{b}}$	Duration-only		Manual Summary	-
							Page 1					













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10.905	Z:	10.8









1,276,323.484 Z: 10.905

Z: 10.895

![](_page_9_Picture_4.jpeg)

![](_page_10_Figure_0.jpeg)

![](_page_11_Figure_0.jpeg)

Pacific 📻 Pile&Marine 700 S Riverside Drive | SEATTLE, WA 98108 CISION GEOSPATIAL SOLUTION 801 NW 42nd Street, Suite 215 | Seattle, Washington 98107

#### NOTES

- 1. PRE-PLACEMENT SURVEY FOR THE INTERTIDAL AREA WAS CONDUCTED BY TERRASOND LIMITED ON DECEMBER 02, 2016
- 2. HYDROGRAPHIC DATA WAS COLLECTED USING A RESON 7125 400kHz MULTIBEAM, APPLANIX WAVEMASTER INERITAL NAVIGATION SYSTEM, AML BASE-X SOUND VELOCITY PROBE, AND HYPACK HYSWEEP 2016
- 3. REAL-TIME KINEMATIC (RTK) POSITIONING WAS BASED ON RECORD COORDINATES FOR POINT "SLAG 1"
- 4. PROFILE VERTICAL EXAGGERATION IS x1.0

![](_page_11_Picture_7.jpeg)

JRVEY CONTROL		
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194,112.357	N:	
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----- PRE-SURVEY (NOV 18, 2016)

## SL

194,112.026 ,276,325.646 10.895

![](_page_11_Picture_12.jpeg)

### ENHANCED NATURAL RECOVERY ACTIVATED CARBON PILOT STUDY MULTIBEAM HYDROGRAPHIC SURVEY

INTERTIDAL PROGRESS						
Rev.No.		Revision		Signed	Date	
			SHEET	6 OF 6		
Drawn: MS	К	Checked: LNL	Survey Date: D	DEC 02, 2	2016	
Paper Size:	ANSI B	Project No.: 2016-088	Draft Date: D	DEC 05,	2016	

![](_page_12_Picture_0.jpeg)

### **Owner:** King County

**Project:** Lower Duwamish Waterway ENR/AC Pilot **Dates:** December 5, 2016 to December 9, 2016

#### Weekly Progress Meeting Summary:

Internal (KC, PPM, DOF) meeting occurred on Dec 6<sup>th</sup>.

- Schedule:
  - Intertidal Plot is scheduled to be completed on Dec 15, 2016.
  - Ash Grove maintenance dredging is not scheduled to occur until January or February. Based on PPM's Dec 2 updated schedule the Scour Plot placement was scheduled to occur in January. The new schedule attached has placement within this plot now scheduled to start on Dec 16<sup>th</sup> in order to avoid conflict with Ash Grove's schedule.
  - A visitor day will be scheduled to occur when work is being performed in the Scour Plot.
- Tribal Fishing:
  - There has been no nets or other fishing activities have been observed in the waterway between PPM's yard and the Intertidal Plot area.
  - No work will be performed if the work has the potential to impact Tribal fishing.
- 1<sup>st</sup> weekly meeting with Agency representatives is scheduled to occur on Dec 13<sup>th</sup>.

#### **Construction Progress:**

- Schedule (updated weekly by contractor Attached)
  - Note that the scour plot was moved from early January 2017. It is now scheduled to be started on December 16, 2016.
- General progress with respect to schedule
  - The KP-3 barge was loaded on Dec 5, 2016 with Gravelly Sand ENR.
  - $\circ$  The KP-3 was flooded to soak the Gravelly Sand ENR on Dec 6<sup>th</sup>.
  - The last of the Gravelly Sand + AC in the KP-2 material barge was placed in the Intertidal Gravelly Sand + AC subplot Thursday morning, Dec 8<sup>th</sup>.
  - Placement within the Intertidal Gravelly Sand subplot was started on Thursday afternoon, Dec 8<sup>th</sup>.
  - Work scheduled for this week:
    - Load the KP-2 with Gravelly Sand + AC (12/13/16) at Cal-Portland facility. Soaking of Gravelly Sand + AC will occur either Wed, Dec 14, or Thur, Dec 15<sup>th</sup>, depending if completion Intertidal Gravelly Sand subplot on or ahead of schedule.
    - Complete Gravelly Sand + AC placement in intertidal plot.
    - Daily hydrographic surveys at end of each shift.
    - Confirmation measurements of the Gravelly Sand + AC placement.
    - Start Gravelly Sand+AC placement at scour plot.

### **Problems Encountered (If Any) & Associated Action Items:** None See Comments below:

Problems Encountered	Date	Required Action	Date Completed

![](_page_13_Picture_0.jpeg)

### Water Quality Monitoring:

- Observed non-construction-related events that impacted water quality.
   None
- Summary of water quality criteria violations and actions taken.
  - Dec 5, 2016: Compliance point was 8.1 NTU above ambient during the 14:50 monitoring event. Placement operations halted for ~14 minutes. Operations started again after WQM vessel verified that WQ was within allowable tolerances.
  - Dec 9, 2016: Compliance point was 5.0 NTU above ambient during the 10:38 monitoring event. Placement operations halted for ~13 minutes to move the barge and while waiting for waiting for other marine traffic to clear the area. Operations started again after WQM vessel verified that WQ was within allowable tolerances.
  - Dec 19, 2016: Compliance point was 5.3 NTU above ambient during the 11:43 monitoring event. Placement operations halted for ~48 minutes. Operations started again after WQM vessel verified that WQ was within allowable tolerances.

![](_page_13_Figure_8.jpeg)

Figure 1: Water Quality Monitor Data Summary for Week Ending December 9, 2016

### **QA Inspections:**

- Results:
  - QA Inspections
  - Surveying (Performed at the end of each shift. Attached is the Dec 9<sup>th</sup>, 2016 survey)
  - o Monitoring Activities:
    - None.

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![](_page_14_Picture_0.jpeg)

- Date: December 13, 2016
- Out of Spec Conditions (if encountered) & Corrective Actions: ☐ None ⊠ See Comments below:

Out of Spec condition	Date	Corrective Action	Date Completed
The Intertidal Gravelly Sand +	12/8/2016	A 2 <sup>nd</sup> lift will be placed on	N/A
AC subplot is ~90% complete.		the remaining area after the	
~2000 sq ft of the plot area		2 <sup>nd</sup> load of GS+AC is soaked	
Still requires the planned 2 <sup>nd</sup>		and prior to moving to Scour	
lift.		Plot.	

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![](_page_15_Picture_1.jpeg)

December 13, 2016

![](_page_15_Picture_3.jpeg)

**Photo 1-A:** KC Rep visually inspects remaining Gravelly Sand + AC in the KP-2 barge.

![](_page_15_Picture_5.jpeg)

**Photo 1-B:** KP-2 material barge after all of the Gravelly Sand + AC was placed.

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![](_page_16_Picture_1.jpeg)

December 13, 2016

![](_page_16_Picture_3.jpeg)

**Photo 2-A:** KP-3 material barge arrives on-site with Gravelly Sand. The excavator knocked down the wind rows prior to soaking.

![](_page_16_Picture_5.jpeg)

**Photo 2-B:** Overnight snow covered the exposed gravelly sand in the KP-3 materials barge. Weather conditions did not impact operations.

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eneral	176 days	Wed 6/1/16		S	T	M	F	T	S	W	S	Т	M	F T
			Thu 2/9/1/		_			_						
Contract Award	, O davis	Wed 6/1/16	Wod 6/1/16											
	0 days	wed 6/1/16	wed 6/1/16											
Phase 1 Notice to Proceed	0 days	Wed 6/1/16	Wed 6/1/16											
Start In-Water Work	0 days	Tue 11/29/16	Tue 11/29/16			11/	29							
Phase 2 Substantial Completion	0 days	Mon 1/23/17	Mon 1/23/17											
Punchlist	2 days	Tue 1/24/17	Wed 1/25/17											
Closeout	10 days	Thu 1/26/17	Wed 2/8/17											
Complete In-Water Work	0 days	Thu 2/9/17	Thu 2/9/17											
Final Acceptance	0 days	Thu 2/9/17	Thu 2/9/17											
aterials Placement	37 days	Tue 11/29/16	Mon 1/23/17											
Test Placement	2 days	Tue 11/29/16	Wed 11/30/16			<b></b>								
Test Placement Area- Sand + AC	1 day	Tue 11/29/16	Tue 11/29/16											
Test Placement Area- Gravelly Sand + AC	1 day	Wed 11/30/16	5 Wed 11/30/16											
Intertidal Plot	11 days	Thu 12/1/16	Thu 12/15/16					-						
Intertidal Plot- Gravelly Sand + AC	6 days	Thu 12/1/16	Thu 12/8/16											
Intertidal Plot- Gravelly Sand	5 days	Fri 12/9/16	Thu 12/15/16					-						
Hydrographic As-Built Survey	0 days	Thu 12/15/16	Thu 12/15/16							41	2/15			
Scour Plot	12 days	Fri 12/16/16	Wed 1/4/17											
Scour Plot- Gravelly Sand + AC	6 days	Fri 12/16/16	Fri 12/23/16							-				
Scour Plot- Gravelly Sand	6 days	Tue 12/27/16	Wed 1/4/17											
Hydrographic As-Built Survey	0 days	Wed 1/4/17	Wed 1/4/17											•
Subtidal Plot	12 days	Thu 1/5/17	Mon 1/23/17											
Subtidal Plot- Sand + AC	6 days	Thu 1/5/17	Thu 1/12/17											
Subtidal Plot- Sand	6 days	Fri 1/13/17	Mon 1/23/17											
Hydrographic As-Built Survey	0 days	Mon 1/23/17	Mon 1/23/17											
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 Project: Baseline Schedule-Updat
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 External Tasks
 Inactive Summary
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 Manual Summary

 Date: Fri 12/9/16
 Milestone
 External Milestone
 Manual Task
 Start-only
 Inactive Task

 Summary
 Inactive Task
 Duration-only
 Finish-only
 Inactive Task
 Page 1

![](_page_17_Figure_2.jpeg)

![](_page_18_Figure_0.jpeg)

![](_page_18_Figure_7.jpeg)

![](_page_18_Picture_9.jpeg)

![](_page_18_Picture_11.jpeg)

![](_page_19_Figure_0.jpeg)

![](_page_19_Figure_7.jpeg)

![](_page_19_Picture_9.jpeg)

801 NW 42nd Street, Suite 215 | Seattle, Washington 98107

Paper Size: ANSI B

Project No.: 2016-088 Draft Date: DEC 12, 2016

![](_page_20_Figure_0.jpeg)

![](_page_21_Figure_0.jpeg)

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10.895

![](_page_21_Picture_5.jpeg)

![](_page_22_Figure_0.jpeg)

![](_page_23_Figure_0.jpeg)

![](_page_23_Figure_1.jpeg)

- 2. HYDROGRAPHIC DATA WAS COLLECTED USING A RESON 7125 400kHz MULTIBEAM, APPLANIX WAVEMASTER INERITAL NAVIGATION SYSTEM, AML BASE-X SOUND VELOCITY PROBE, AND HYPACK HYSWEEP 2016
- 3. REAL-TIME KINEMATIC (RTK) POSITIONING WAS BASED ON RECORD COORDINATES FOR POINT "SLAG 1"
- 4. PROFILE VERTICAL EXAGGERATION IS x1.0

![](_page_23_Figure_5.jpeg)

SLAG 2 N: 194,112.026 E: 1,276,325.646 10.895

![](_page_23_Picture_7.jpeg)

![](_page_23_Picture_8.jpeg)

### ENHANCED NATURAL RECOVERY ACTIVATED CARBON PILOT STUDY MULTIBEAM HYDROGRAPHIC SURVEY

		INTERTIDAL PROGI	RESS		
Rev.No.		Revision		Signed	ed Date 6 19, 2016
			SHEET	6 OF 6	
Drawn: MS	ĸ	Checked: LNL	Survey Date: I	DEC 09,	2016
Paper Size:	IO.	Project No.: 2016-088	Draft Date:	DEC 12,	2016

![](_page_24_Picture_0.jpeg)

### **Owner:** King County

**Project:** Lower Duwamish Waterway ENR/AC Pilot **Dates:** December 12, 2016 to December 16, 2016

### Weekly Progress Meeting Summary:

Weekly meeting occurred on Tuesday, Dec 13, 2016 at 08:30.

- Schedule (3 week look ahead):
  - o Intertidal plot is scheduled to be completed by Dec 16, 2016
  - Mob to Scour Plot scheduled for Dec 16, 2016.
  - Gravelly Sand +AC (GS+AC) Scour subplot placement scheduled to start on Dec 19, 2016.
  - Both the Gravelly Sand (GS) and GS+AC subplots are scheduled to be completed the 1<sup>st</sup> week of Jan 2017.
  - Visitor day is scheduled for December 20, 2016 at Harbor Island near the marina where the placement operations in the Scour Plot can be observed.
- Tribal Fishing:
  - No fishing nets or other fishing activities were observed near the work area or downstream between the work area and Harbor Island.
- Issues & Challenges:
  - The excavator was down for approximately half a day when its alternator failed. A new alternator was installed without incident and the damaged alternator will be repaired on brought back onsite as a backup.
- Water Quality Monitoring:
  - It has been determined that there has been no significant difference in water quality when placing gravelly sand + AC and placing gravelly sand.

### **Construction Progress:**

- Schedule (updated weekly by contractor Attached)
  - Note that the scour plot mob was moved was pushed back to December 19, 2016.
- General progress with respect to schedule
  - The KP-2 barge was loaded on Dec 13, 2016 with Gravelly Sand +AC ENR.
  - KP-2 was flooded on Dec 14 to soak the GS+AC the minimum 12 hours prior to placement.
  - The KP-3 barge was loaded on Dec 16, 2016 with Gravelly Sand ENR.
  - All of the Gravelly Sand in the KP-3 that was loaded into the barge the previous week was placed in the Intertidal Gravelly Sand during the week. The subplot was not complete when the KP-3 was empty. See Problems Encountered below.
  - Placement within the Intertidal GS+AC subplot was completed on Thursday, Dec 15<sup>th</sup>.
  - No work was performed on Dec 16, 2016 due to not having enough GS to finish the GS subplot.
  - Work scheduled for this week:
    - Complete Gravelly Sand placement in intertidal plot.
    - Mob to Scour Plot.
    - Start GS+AC at Scour Plot on Dec 20, 2016 and continue to place GS+AC for the remainder of the week.
    - Daily hydrographic surveys at high tide during each shift.

![](_page_24_Picture_33.jpeg)

![](_page_25_Picture_0.jpeg)

### Problems Encountered (If Any) & Associated Action Items: 🛛 None 🗌 See Comments below:

Problems Encountered	Date	Required Action	Date Completed
The excavators alternator failed	12/12/2016	Replaced alternator	12/12/2016
and had to be replaced.			
KP-3 barge leaking turbid water.	12/14/2016,	PPM will continue to monitor	12/14/2016,
Turbid leaks have only been	12/15/2016	for leaks. Leaks were and will	12/15/2016
observed after material at the		will continue to be plugged	
base of the bin wall has been		immediately after being	
removed.		observed.	
Ran out of GS before finishing	12/15/2016	Ordered additional 200 tons	12/15/2016
subplot. This is related to the		material loaded when scour	
out of spec condition detailed		plot GS was loaded.	
below.			

### Water Quality Monitoring:

- Observed non-construction-related events that impacted water quality.
  - o None
- Summary of water quality criteria violations and actions taken.
  - No exceedances observed.

![](_page_25_Figure_9.jpeg)

Figure 1: Water Quality Monitor Data Summary for Week Ending December 16, 2016

Weekly Report LDW ENR/AC Project Page 2 of 5

![](_page_26_Picture_0.jpeg)

### **QA Inspections:**

- Results:
  - QA Inspections:
    - DOF representative was onsite for each to the barge loading events to ensure proper materials were being loaded and to verify the % AC for the GS+AC material. Samples of the GS+AC were collected from the conveyor belt that transported the material to the barge. This material was sent to the lab for analysis.
  - Surveying (Performed at the end of each shift. Attached is the Dec 15, 2016 survey)
  - Monitoring Activities:
    - DOF and AMECFW representatives performed a visual inspection and grade stake measurement during the evening low tides that occurred on Dec 13<sup>th</sup> and Dec 15<sup>th</sup>.

During the visual inspection objects thought to be rocks greater than 2 inches in diameter up to approximately 6 inches in diameter were observed on and upstream of the GS+AC subplot. After further investigation it was determined that these objects were not rock but were comprised of blackish, soft, fine to medium grained material. These objects may be be comprised of AC and fine silts. See Photos 2-A and 2-B showing observed objects.

Average placement thickness over the upstream half of the GS subplot was approximately 12 inches as measured on Dec 13<sup>th</sup>. The average thickness measurements at the stakes that had material placed after modifying the bucket fill factor was approximately 6 inches. The minimum thickness over all of the stakes in areas where material was by end of shift Dec 15 was 4 inches and the maximum was 14 inches. Attached is a figure with stake locations and measurements.

• Out of Spec Conditions (if encountered) & Corrective Actions: ☐ None ⊠ See Comments below:

Out of Spec condition	Date	Corrective Action	Date Completed
Measured material thickness on the upstream portion of the GS sub-plot greater than 12 inches in several locations.	12/13/2016	Modified bucket fill factor to reduce placement thickness.	12/14/2016

![](_page_27_Picture_1.jpeg)

December 19, 2016

![](_page_27_Picture_3.jpeg)

**Photo 1-A:** PPM field engineer performing bucket calibration check.

![](_page_27_Picture_5.jpeg)

**Photo 1-B:** Leak observed mid-barge after the material at the base of the bin wall was removed.

Weekly Report LDW ENR/AC Project Page 4 of 5

![](_page_28_Picture_1.jpeg)

December 19, 2016

![](_page_28_Picture_3.jpeg)

Photo 2-A: Rock shaped object observed in the GS+AC subplot.

![](_page_28_Picture_5.jpeg)

Photo 2-B: Rock shaped object split in half.

Weekly Report LDW ENR/AC Project Page 5 of 5

1       Image: Final Structure       14 days       Mon 12/19/16 Mon 1/9/17         2       Image: Final Structure       0 days       Tue 1/3/17       Tue 1/3/17         3       Image: Final Structure       0 days       Tue 1/3/17       Tue 1/3/17         4       Image: Final Structure       1 day       Mon 12/19/16 Mon 12/19/16         5       Final Placement Activities       1 day       Mon 12/19/16 Mon 12/19/16         6       Sour       12 days       Tue 12/20/16 Fri 1/6/17         7       Final Place Gravelly Sand + AC       6 days       Tue 12/20/16 Fri 1/6/17         9       Subtidal       1 day       Mon 19/17         10       Place Gravelly Sand       6 days       Tue 12/20/16 Fri 1/6/17         11       Survey Activities       7 days       Tue 12/20/16 Tue 12/20/16         12       Image: Subtidal: Survey       0 days       Tue 12/20/16 Tue 12/20/16         13       Subtidal: Pre-Placement Survey       0 days       Fri 12/30/16         14       Subtidal: Pre-Placement Survey       0 days       Fri 12/20/16       Fri 12/20/16         13       Subtidal: Pre-Placement Survey       0 days       Fri 12/20/16       Fri 12/20/16         14       Subtidal: Pre-Placement Survey       0 days	1   Image     2   Image     3   Image   ENR Material Load Barge #5 (KP2) Barge #5 (KP2)	ading ): Sand + AC Activities	<b>14 days</b> O days	Mon 12/19/16	Mon 1/9/17	I	•		•		J	171	
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Project: 3-Week Look Ahead (12-1	Split		External Tasks		Inactive Summary	$\bigtriangledown$	Manual Summary	
Date: Mon 12/19/16	Milestone	<b>♦</b>	External Milestone	<b></b>	Manual Task	[ ]	Start-only	E
	Summary	<b></b>	Inactive Task		Duration-only		Finish-only	3
					Page 1			

![](_page_29_Figure_2.jpeg)

ID	6	Task	Task Name			Duration	Start	Finish	Nov 20, '1	.6	Dec 4, '16	1	Dec 18, '16	N.4	Jar
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4		3	Start In-W	/ater Work		0 days	Tue 11/29/16	Tue 11/29/16		♦ 11/29					
5		3	Phase 2 Su	ubstantial Completion		0 days	Wed 1/25/17	Wed 1/25/17							
6		₽	Punchlist			2 days	Thu 1/26/17	Fri 1/27/17							
7		₽	Closeout			10 days	Mon 1/30/17	Fri 2/10/17							
8		₽	Complete	In-Water Work		0 days	Thu 2/9/17	Thu 2/9/17							
9		₽	Final Acce	ptance		0 days	Thu 2/9/17	Thu 2/9/17							
10		₽	Materials Pla	acement		39 days	Tue 11/29/16	Wed 1/25/17							
11		₽	Test Place	ement		2 days	Tue 11/29/16	Wed 11/30/16							
12		₽	Test Pla	acement Area- Sand + AC		1 day	Tue 11/29/16	Tue 11/29/16							
13		3	Test Pla	acement Area- Gravelly Sa	ind + AC	1 day	Wed 11/30/16	5 Wed 11/30/16							
14		*	Intertidal	Plot		14 days	Thu 12/1/16	Tue 12/20/16							
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16		₽	Intertid	al Plot- Gravelly Sand		7 days	Fri 12/9/16	Mon 12/19/16							
17		3	Hydrog	raphic As-Built Survey		0 days	Tue 12/20/16	Tue 12/20/16					<b>12/20</b>		
18		*	Scour Plot	t		12 days	Tue 12/20/16	Fri 1/6/17							
19		3	Scour P	lot- Gravelly Sand + AC		6 days	Tue 12/20/16	Wed 12/28/16					<b>*</b>		
20		₽	Scour P	lot- Gravelly Sand		6 days	Thu 12/29/16	Fri 1/6/17							
21		₽	Hydrog	raphic As-Built Survey		0 days	Fri 1/6/17	Fri 1/6/17							
22		*	Subtidal P	Plot		12 days	Mon 1/9/17	Wed 1/25/17							
23		₽	Subtida	ll Plot- Sand + AC		6 days	Mon 1/9/17	Tue 1/17/17							
24		₽	Subtida	I Plot- Sand		6 days	Wed 1/18/17	Wed 1/25/17							
25		₽	Hydrog	raphic As-Built Survey		0 days	Wed 1/25/17	Wed 1/25/17							
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				Summary	▼	Inactive Task		Duration	-only			Finish-on	ly	2	
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![](_page_30_Figure_1.jpeg)

![](_page_31_Figure_0.jpeg)

![](_page_31_Figure_7.jpeg)

![](_page_31_Picture_9.jpeg)

![](_page_31_Picture_10.jpeg)

![](_page_31_Picture_11.jpeg)

![](_page_32_Figure_0.jpeg)

- 3. REAL-TIME KINEMATIC (RTK) POSITIONING WAS BASED ON RECORD COORDINATES FOR POINT "SLAG 1"

![](_page_32_Figure_7.jpeg)

![](_page_32_Picture_9.jpeg)

MARK

![](_page_32_Picture_10.jpeg)

PRECISION GEOSPATIAL SOLUTIONS®

801 NW 42nd Street, Suite 215 | Seattle, Washington 98107

SHEET 2 OF 6 Drawn: MSK Checked: LNL Survey Date: DEC 15, 2016 Paper Size: ANSI B Project No.: 2016-088 Draft Date: DEC 16, 2016

![](_page_33_Figure_0.jpeg)

![](_page_34_Figure_0.jpeg)

E: 1,276,323.484 Z: 10.905

E: 1,276,325.646 Z: 10.895 PRECISION GEOSPATIAL SOLUTIONS® 801 NW 42nd Street, Suite 215 | Seattle, Washington 98107

Paper Size: ANSI B Project No.: 2016-088 Draft Date: DEC 16, 2016

![](_page_35_Figure_0.jpeg)

![](_page_36_Figure_0.jpeg)

- 1. SURVEY FOR THE INTERTIDAL AREA WAS CONDUCTED BY TERRASOND LIMITED ON DECEMBER 15, 2016
- 2. HYDROGRAPHIC DATA WAS COLLECTED USING A RESON 7125 400kHz MULTIBEAM, APPLANIX WAVEMASTER INERITAL NAVIGATION SYSTEM, AML BASE-X SOUND VELOCITY PROBE, AND HYPACK HYSWEEP 2016
- 3. REAL-TIME KINEMATIC (RTK) POSITIONING WAS BASED ON RECORD COORDINATES FOR POINT "SLAG 1"
- 4. PROFILE VERTICAL EXAGGERATION IS x1.0

![](_page_36_Figure_5.jpeg)

10.895

Pacific Pile&Marine 700 S Riverside Drive | SEATTLE, WA 98108 PRECISION GEOSPATIAL SOLUTIONS® 801 NW 42nd Street, Suite 215 | Seattle, Washington 98107

![](_page_36_Picture_7.jpeg)

### ENHANCED NATURAL RECOVERY ACTIVATED CARBON PILOT STUDY MULTIBEAM HYDROGRAPHIC SURVEY

INTERTIDAL PROGRESS								
Rev.No.		Revision	Signed	Date				
			SHEET	6 OF 6				
Drawn: MSK		Checked: LNL	DEC 15, 2016					
Paper Size:	ANSI B	Project No.: 2016-088	Draft Date:	DEC 16,	2016			

		(8'')	(14'')	3 (12")	9 4 (11")	<b>€</b> 5(			<del>0</del> 16	5	I
	TEST	PLOT 1 (6'')	<b>9</b> 8 (10") —0 ——	•	• 9 (10'')		Φ 15 (9")	TEST PLOT 2	<b>9</b> 19	• 2 • (4")	0 (8'
taking and Msrmnts.dwg	-5	Gravelly Test Plot	(8") Field Measu y Sand + Activ	urements 12 rated Carbor Stake Length	2/13/2016 n Intertidal Sul Exposed Stake length	bplot Placed ENR			-5		9") Field Gra
2-19 04 KC-ENR SI	-10	Location ID (IT-ENR-AC-xx)	(S-xx)	above Plate (Inches)	(measured) Inches	Thickness (Inches)			-10	Location ID (IT-ENR-AC-xx)	Sta (S
016-12		IT-ENR-AC-01	<u> </u>	18	10	8 14				IT-ENR-16*	S
6-12/2		IT-ENR-AC-03	S-41	18	6	12		- who have a second	2,	IT-ENR-17	9
AD/201		IT-ENR-AC-04	S-37	18	7	11		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		TI-ENR-18	
~		IT-ENR-AC-05	S-70	18	7	11	- s - s - s - s - s - s - s - s - s - s			IT-ENR-19	
ENR		IT-ENR-AC-06	S-69	18	9	9	$\sim \nu$			IT-ENR-21	s
County		IT-ENR-AC-07	S-29	18	12	6	-	DUWAMISH WA	ATERWAY	IT-ENR-22	S
King (		IT-ENR-AC-08	5-56	18	8	10				IT-ENR-23	S
rojects		IT-ENR-AC-09	<u> </u>	18	10	10				IT-ENR-24	
S: D:/P		IT-ENR-AC-11	<u>5 57</u> S-76	18	10	8				ITENR-25	
DMO		IT-ENR-AC-12	S-35	18	10	8		0	40	IT-ENR-27	3
kering		IT-ENR-AC-13	S-45	18	8	10		Scale in Eq.		IT-ENR-28	S
an Pio		IT-ENR-AC-14	S-44	18	7	11				IT-ENR-29	
		IT-ENR-AC-15	S-34	18	9	9				IT-ENR-30	S
19/2016 1:05 PM US				AV MIN MA>	YERAGE THICKNESS NIMUM THICKNESS KIMUM THICKNESS	5 10 5 6 5 14	]			*No Material Placer	nent at
100 I IME: 12/7								Legend			
∠ ∑							🕒 13 (8)	Stake Location (Thickne	ess Measurement)	King County I	Departr /astew:
-OT TIME: 12/19/2016 1:50								Test Plot		Enhanced Staking Loca	Natural tions In

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▲ 18 (12")											
		_ ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	18	3 (12")							
		7 (14")		5							
			D (1/")								
8") 👝			2 (14 )								
	21 (10~)		<b>9</b> 23	(10")							
-23 (10 )											
<b>24 (10'')</b>											
		20 (12")									
• 27 (14")											
● 29 (10")											
eld Measurements 12/15/2016											
ravelly Sa	nd Intertida	Subplot									
Stake Exposed											
take #	Length	Stake length	Placed ENR								
(S-xx)	above	(measured)	Thickness	-10-							
	(Inches)	Inches	(inches)								
S-10	18	18	0								
S-5	18	4	14								
S-11	18	6	12								
S-38	18	14	4								
S-19	18	10	8								
S-20	18	8	10								
S-16	18	4	14								
<u>3-14</u> S_7	18	ð R	10								
<u> </u>	18	14	4								
S-14	18	9	9								
S-6	18	4	14	]							
S-33	18	5	13								
S-1	18	8	10	man ~							
S-18	18	6	12								
at this locati	on at time of me AVI	easurement. ERAGE THICKNESS	10	1							
	MIN	IMUM THICKNESS	0								
	MAX	IMUMTHICKNESS	14								
rtment of N	atural Resourc	es & Parks		DALTON							
ral Recover	ry-Active Carbo	on Study		OLMSTED FUGLEVAND							
s & Thio	ckness Mea	asurements		FIGURE							

ntertidal Plot

![](_page_37_Picture_3.jpeg)