



Technical Memorandum

Date: June 23, 2010

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Subject: **Phase III Upland Work Plan
Everett Shipyard
1016 14th Street
Everett, Washington**

INTRODUCTION

In late May and early June 2010, URS conducted a supplemental sediment investigation at the Everett Shipyard Site located at 1016 14th Street in Everett, Washington ("Site"). The work was completed in accordance with Agreed Order No.: DE 5271 and the Supplemental Phase III Remedial Investigation Work Plan dated May 13, 2010 (URS 2010). One of the objectives of the investigation was to assess the quality of intertidal sediments located between two bulkheads near the Port of Everett's (Port's) travel lift in the northeast corner of the North Marina. Field observations during the sediment sampling indicated the presence of petroleum hydrocarbons in sediment.

The purpose of this memorandum is to present preliminary findings including field observations and initial analytical results for the sediment sampling conducted in this area and to present the scope of work for a supplemental Phase III upland investigation that will be conducted to assess whether upland soils near the bulkhead are impacted with petroleum hydrocarbons. A complete summary of the Phase III sediment and upland investigations will be presented in the Remedial Investigation/Feasibility Study (RI/FS) Report.

BULKHEAD SEDIMENT INVESTIGATION AND PRELIMINARY FINDINGS

The bulkhead sediment sampling at locations BC-1 through BC-6 (Figure 1) was initiated on May 21, 2010 and completed on May 24, 2010. Location BC-1 was sampled first and sediment at a depth of approximately 0.5 feet at this location had a strong petroleum hydrocarbon odor and non-aqueous phase liquid (NAPL) was observed from a depth of 0.5 feet to the bottom of the boring at a depth of approximately 3 feet. No measurements were collected in the field to determine whether any measureable quantity of NAPL accumulated in the borehole. The only other location where evidence of petroleum hydrocarbons was observed was sample location BC-4 at a depth of approximately 0.2 feet. Following discussions with Ecology and the Port, samples from the bottom of borings BC-1 and BC-2 and from the shallow sediment at BC-4 were analyzed for NWTPH-HCID. Preliminary analytical results and field observations for the bulkhead sediment samples are summarized in Table 1.



In an effort to further delineate the lateral extent of apparent petroleum hydrocarbon impacts in the bulkhead sediments, four additional locations (BC-7 through BC-10; see Figure 1) were sampled on June 3, 2010. An apparent hydrocarbon odor and sheen were evident in samples collected from all four locations and one sample from each of these borings was submitted for HCID analyses.

HCID analyses detected petroleum hydrocarbons in samples collected from borings BC-1, BC-2, BC-4, BC-7, BC-8, and BC-10 (Table 1). Diesel-range petroleum hydrocarbons were reported in all of these samples and gasoline- and/or oil-range petroleum hydrocarbons were detected in most of the samples. All of the samples with positive HCID results will be analyzed using Ecology Method NWTPH-Dx. The results of these analyses are presented in Table 1.

On June 3, 2010, the catch basin located approximately 80 feet east of and connected to Outfall A (Catch Basin Outfall A-CB) was inspected. The grate was fitted with a filter fabric and both the grate and fabric were removed to inspect the catch basin. The catch basin is shallow (less than one foot deep) and has sloping sides and bottom. An approximately 1/2-inch thick layer of sandy sediment was present in a portion of the basin. No odor was evident and no staining or sheen was observed in the catch basin. The catch basin was previously inspected as part of the dye testing program conducted in February 2009 and no obvious petroleum hydrocarbon impacts were observed at that time.

PROPOSED UPLAND INVESTIGATION

A sampling and analysis plan (SAP) for upland investigations and a site-specific Health and Safety (H&S) Plan were prepared prior to the initial phase of the RI (URS 2008). These plans were included as appendixes to the RI/FS Work Plan (see Appendixes A and E). The H&S Plan was subsequently updated in 2009 (URS 2009). The methods and procedures described in the updated H&S plan and the Upland SAP will be utilized during the investigation described below unless otherwise indicated.

Five direct-push soil borings (SB-93 through SB-97) will be advanced and sampled to assess whether petroleum hydrocarbon impacted soils are present to the east of the bulkhead (Figure 1). The borings will be drilled to a depth of approximately 15 feet below ground surface (bgs) which is estimated to correspond to a depth approximately 5 to 6 feet below the depth where petroleum hydrocarbons were initially observed in the bulkhead sediment samples collected immediately west of the proposed borings.

Soils will be logged in the field as described in the SAP and screened for petroleum hydrocarbons using a photoionization detector and a sheen test. The presence of NAPL, odor, or staining will also be noted. Three soil samples will be collected from each boring. The samples will be collected from intervals exhibiting evidence of petroleum hydrocarbons based on the field screening. The approximate sampling intervals and proposed analyses are presented in Table 2. If field screening does not suggest the presence of petroleum hydrocarbons, samples will be collected directly above the groundwater table within the capillary fringe.

If the presence of petroleum hydrocarbons is suggested by the field screening in boring SB-93 through SB-97, then additional borings will be drilled in an effort to delineate the potential extent of soil impacts. Locations for



potential contingent borings are also shown on Figure 1. These preliminary locations will be used to guide additional investigations as needed. The actual number and location of the contingent borings will be dependent on the results of the field screening in the initial five borings and contingent borings.

If no field evidence of petroleum hydrocarbons is evident in borings located adjacent to the bulkhead, the soil samples will only be analyzed for diesel- and oil-range petroleum hydrocarbons (NWTPH-DX). Samples with elevated PID readings, if any, will also be tested for VOCs including naphthalene (EPA Method 8260B).

If petroleum hydrocarbons are evident in borings adjacent to the bulkhead, extra soil will be collected from at least one such location for archival.

If petroleum is evident in the borings near the bulkhead, groundwater samples will also be collected from up to three of the borings and analyzed for diesel- and oil-range petroleum hydrocarbons (NWTPH-DX). Groundwater sampling will be conducted in accordance with the SAP. Groundwater samples with visible suspended solids will be centrifuged by the analytical laboratory to prevent solids/sediment from potentially biasing the analytical results. If evidence of LNAPL is noted in a boring selected for groundwater sampling, care will be taken to collect the groundwater sample beneath the LNAPL occurrence.

The laboratory analyses will be completed as outlined in the QAPP (see Appendix G of the RI/FS Work Plan).

Prior to drilling the borings, URS will contact the Utility Notification Center to identify underground utilities. A private utility locator will also be retained to clear each boring location. As an added precaution, an attempt will be made at each location to hand auger to a depth of 3 feet bgs in an effort to confirm the absence of utilities or other subsurface features (e.g., an underground storage tank).

SCHEDULE

The soil borings are tentatively scheduled to be drilled on June 24, 2010. If necessary, drilling will continue on June 25, 2010. Analytical results for the samples collected from the borings should be available approximately 3 or 4 working days following completion of the sampling. Following receipt of the data, a data quality review memorandum will be prepared, and the RI/FS Report will be updated to incorporate the new information.

REFERENCES

URS Corporation 2008. (URS) *Remedial Investigation Feasibility Study Work Plan, Everett Shipyard, 1016 14th Street, Everett, Washington*. October 31, 2008.

_____. 2009. *Site-Specific Health and Safety Plan, Everett Shipyard RI/FS*. October 23.

_____. 2010. *Supplemental Phase III Remedial Investigation Work Plan, Everett Shipyard, 1016 14th Street, Everett, Washington*. May 13, 2010.



Attachments:

Figure 1 – Proposed Upland Soil Boring Locations

Table 1 – Summary of Preliminary Bulkhead Sediment HCID Results and Field Observations

Table 2 – Summary of Proposed Soil Sample Analyses

Table 3 – Summary of Proposed Groundwater Sample Analyses

FIGURES

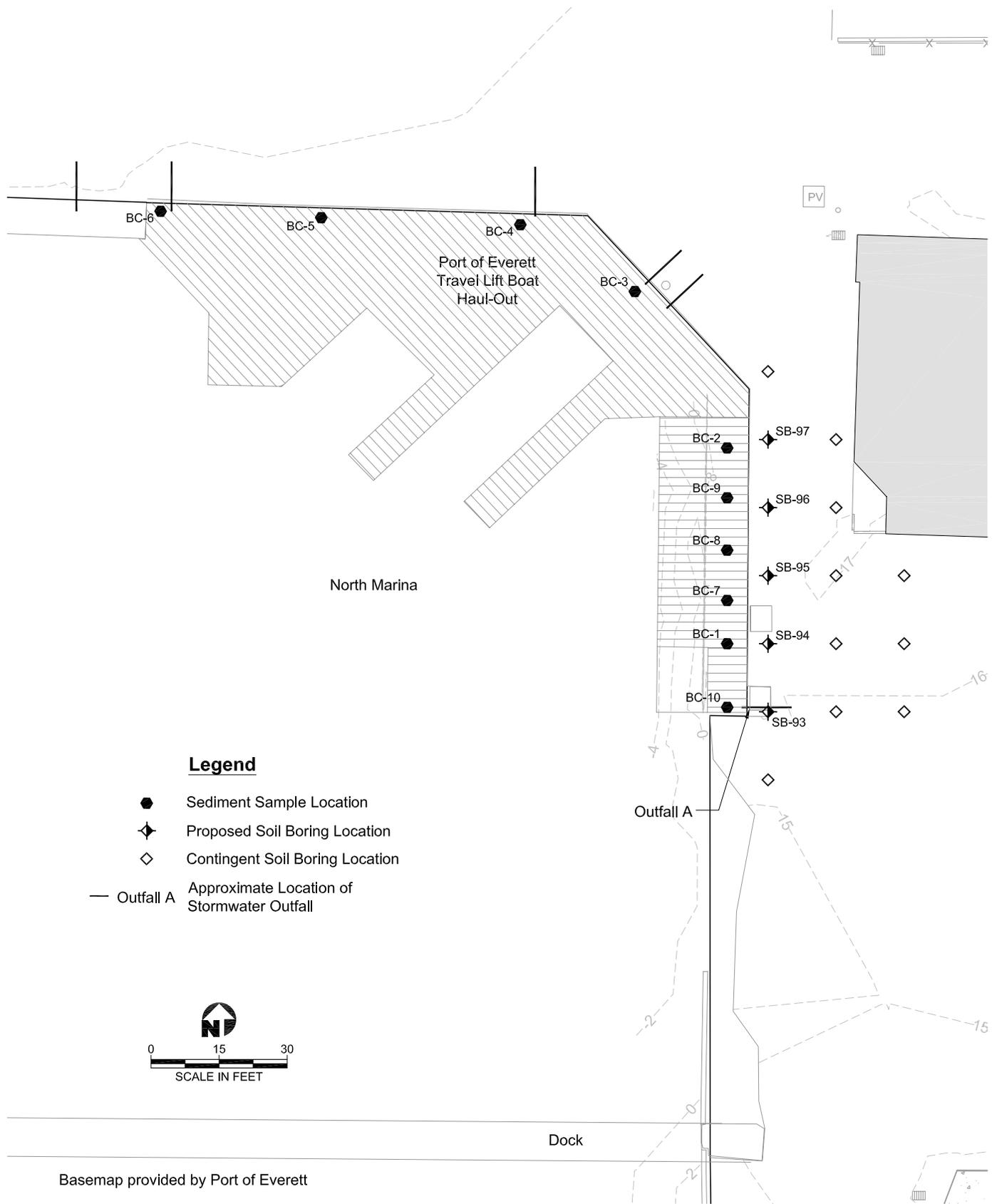


Figure 1
Proposed Upland Soil Boring Locations

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TABLES

Table 1
Summary of Preliminary Bulkhead Sediment HCID Results and Field Observations¹
Everett Shipyard
Everett, Washington

Boring ID	Sample Depth (bgs)	Sample Date	HCID (mg/kg)			NWTPH-Dx (mg/kg)		Field Observations
			Gas	Diesel	Oil	Diesel	Oil	
BC-1	0-10 cm	5/21/10	> 20	> 50	> 100	690	2,300	Hydrocarbon odor from approximately 0.5-3' bgs. Free product encountered at 1.75' bgs.
	2-3 ft		> 20	> 50	> 100	7,400	680	
BC-2	0-10 cm	5/21/10	NA	NA	NA	NA	NA	
	2-3 ft		20 U	> 50	100 U	49	25	
BC-3	0-10 cm	5/21/10	NA	NA	NA	NA	NA	
	2-3 ft	5/24/10	NA	NA	NA	NA	NA	
BC-4	0-10 cm	5/21/10	20 U	> 50	> 100	230	1,500	Hydrocarbon odor noted at approximately 0.2' bgs.
	2-3 ft	5/24/10	NA	NA	NA	NA	NA	
BC-5	0-10 cm	5/21/10	NA	NA	NA	NA	NA	Hydrogen sulfide odor and slight organic sheen from approximately 0-0.3' bgs.
	2-3 ft	5/24/10	NA	NA	NA	NA	NA	
BC-6	0-10 cm	5/21/10	NA	NA	NA	NA	NA	
	2-3 ft	5/24/10	NA	NA	NA	NA	NA	
BC-7	0-10 cm	6/3/10	NA	NA	NA	NA	NA	Hydrocarbon odor noted at approximately 0.5' bgs and from 1.5 to 4' bgs.
	1.5-4 ft		> 120	> 310	> 620	4,700	260	
BC-8	0.5-0.75 ft	6/3/10	NA	NA	NA	NA	NA	Hydrocarbon odor and sheen from approximately 0-1.5' bgs. PID did not detect volatile organic compounds.
	3-4 ft		> 120	> 310	620 U	2,700	1,100	
BC-9	0-1.5 ft	6/3/10	NA	NA	NA	NA	NA	Hydrocarbon odor noted from 1.5-2.5' bgs. PID did not detect volatile organic compounds.
	1.5-2.5 ft		20 U	50 U	100 U	NA	NA	
BC-10	0.3-0.5 ft	6/3/10	NA	NA	NA	NA	NA	Hydrocarbon odor noted from approximately 0.5-2.8' bgs. PID did not detect volatile organic compounds.
	0.5-1.5 ft		> 120	> 290	> 580	7,800	380	

Notes:

bgs - below ground surface

cm - centimeters

ft - feet

NA - Not analyzed

PID - Photoionization device

U - Parameter was analyzed for but not detected above the reporting limit shown

> 20 - Parameter was detected above the reporting limit shown

¹ Data validation pending.



**Table 2
Summary of Proposed Soil Sample Analyses**

Area of Concern/Rationale	Boring IDs	Sample Type	Approximate Sample Depth Interval (feet bgs)	Diesel- and Oil-Range Petroleum Hydrocarbons	VOCs
Assess the presence of impacted soil on the east side of the bulkhead near the area where NAPL and petroleum hydrocarbon odors were observed in bulkhead sediment samples.	SB-93 through SB-97	Boring	4.0 – 5.0	X	If elevated PID readings are measured, up to five (5) soil samples will also be submitted for VOC analyses.
			9.0 – 10.0	X	
			14.0 – 15.0	X	
Assess the lateral extent of impacted soil if field screening suggests the presence of petroleum hydrocarbons in borings SB 93 through SB-97.	Contingent borings	Boring	4.0 – 5.0	X	
			9.0 – 10.0	X	
			14.0 – 15.0	X	

Notes:

NA - Sample will not be analyzed for these constituents.

X - Analyze soil samples from designated interval from all borings at area of concern for indicated analytes

bgs - below ground surface; Sample depth intervals are below ground surface or below asphalt/concrete and base course, if present

Diesel- and oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx

VOCs - Volatile organic compounds by EPA Method 8260B

See Appendix G of the RI/FS work Plan (URS 2008) for sampling procedures and complete analyte list and detection limits for analyses

Hold - Samples will be frozen and archived at the analytical laboratory pending receipt of results for shallow samples. Deeper samples will then be analyzed for constituents that exceed preliminary cleanup levels in the shallow soil samples



Table 3
Summary of Proposed Groundwater Sample Analyses

Area of Concern/Rationale	Boring IDs	Sample Type	Approximate Sample Depth Interval (feet bgs)	Laboratory Analyses
				Diesel- and Oil-Range Petroleum Hydrocarbons
Assess potential groundwater impacts if field screening suggests the presence of petroleum hydrocarbons in borings SB 93 through SB-97.	SB-93 through SB-97	Direct-push Grab	4.0 – 9.0	Samples will be collected and analyzed from up to three borings based on results of field screening.

Notes:

bgs - below ground surface; Sample depth intervals are below ground surface or below asphalt/concrete and base course, if present
Diesel- and oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx
See Appendix G of the RI/FS work Plan (URS 2008) for sampling procedures and complete analyte list and detection limits for analyses