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July 2, 2012

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Toxics Cleanup Program

Department of Ecology

Northwest Regional Office

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**Re: Whatcom Waterway Site – Consent Decree No. 07-2-02257-7 – Pre-Remedial Design Investigation Work Plan Addendum  
Central Waterfront Site – Agreed Order No. DE 3441- RI/FS Work Plan Addendum No. 3  
Supplemental Investigation – Environmental Conditions along the Shoreline of the Central Waterfront Site**

Dear Lucy and Brian:

Anchor QEA, LLC, is currently conducting remedial design and permitting activities in support of the Whatcom Waterway Site Cleanup project. This work is being performed in accordance with the First Amendment to Consent Decree No. 07-2-02257-7, which was filed in Whatcom County Court on August 19, 2011. The design and permitting work is being performed on behalf of the Port of Bellingham and other signatories to the Consent Decree. In addition, ongoing Remedial Investigation and Feasibility Study (RI/FS) activities are being performed at the Central Waterfront site in accordance with Agreed Order No. DE 3441.

## **1. PURPOSE AND BACKGROUND**

During development of the Whatcom Waterway Engineering Design Report and review of existing Central Waterfront RI/FS documents, Ecology identified information needs relating to shoreline soil and groundwater quality in certain areas along the northern shoreline of the

Whatcom Waterway site. This shoreline area is located within both the Whatcom Waterway site (due to the presence of mercury in impacted subsurface sediments), and the Central Waterfront site (due to the presence of petroleum impacted soils and groundwater, as well as sediments contaminated with boatyard-associated contaminants). Ecology specifically identified the need for supplemental data to document current groundwater and porewater quality in portions of this shoreline area, and to evaluate soil quality in an area where capping/stabilization of the shoreline may include limited areas of shoreline cut-back.

This work plan identifies the methods to be used to collect the information requested by Ecology to address the above-described data gaps. The work described in this document will inform the ongoing Whatcom Waterway design effort, and the results will be incorporated into the Phase 1 Engineering Design Report. Additionally, this work will be incorporated into the anticipated revisions to the Central Waterfront RI/FS, which is currently undergoing Ecology review.

## **2. INVESTIGATION METHODS**

Figure 1 shows the locations of the proposed porewater, seep, groundwater, and soil testing. These locations were identified during on-site inspections conducted jointly with Ecology.

### **Health and Safety**

All site investigation activities will be performed in compliance with the site-specific Health and Safety Plan prepared for this investigation entitled *Central Waterfront Site RI/Whatcom Waterway Site Cleanup Health and Safety Plan* (Anchor QEA, June 2012). Utility locates will be performed prior to test pit sampling.

### **Porewater Sampling**

Porewater samples will be collected at multiple locations along the Central Waterfront shoreline to document the presence/absence of petroleum (gasoline, diesel and motor-oil range hydrocarbons) and related constituents (benzene, toluene, ethylbenzene, and xylenes [BTEX]) in porewater below the current mudline. The six locations identified in Figure 1 are all located within proposed sediment capping areas. The porewater data will provide information regarding the nature and extent of petroleum contamination in groundwater at

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the Central Waterfront site and will provide inputs for contaminant mobility modeling during design of the sediment caps.

In order to access sample stations in the Waterway, porewater samples will be collected during low-tide conditions. Some stations may require the assistance of a small boat for access. Porewater samples will be collected by Anchor QEA field personnel using a temporary stainless steel shielded drive point piezometer (Solinst Model 615 S) with a 12 cm-long screen. The drive point piezometer will be manually driven until the drive point tip is fully inserted below the mudline, and the filter screen is fully submerged. Once installed, the shield of the drive point will be removed (the shield helps prevent clogging and smearing of the screen by fine sediments during installation), dedicated LDPE or Teflon sample tubing will be inserted into the piezometer, and porewater will be extracted using a peristaltic pump. Porewater quality parameters will be continuously monitored using a water quality meter; porewater collection will begin only after parameters (e.g., conductivity) stabilize. Porewater samples will be analyzed for TPH-Dx, TPH-G, and BTEX. Target method reporting limits are documented in Table 1. In order to distinguish between petroleum hydrocarbons and potential biogenic organic matter, the TPH-Dx analyses will be performed twice—once with silica-gel cleanup and once without the cleanup step.

Quality assurance samples will include one field duplicate of each method, one equipment blank (all analyses) and one trip blank (TPH-G and BTEX). Laboratory analyses will be performed at Analytical Resources, Inc. (Seattle).

### **Seep Sampling**

During low-tide inspections conducted jointly with Ecology, two small groundwater seeps were identified that appeared suitable for seep water sampling. These seep locations are shown in Figure 1. The first location was within the face of the wooden bulkhead beneath the Chevron dock structure, and the second was located at the base of the existing Colony Wharf concrete bulkhead just north of Maple Street.

Seep samples will be collected by Anchor QEA field personnel. Seep water will be collected into sample bottles directly from the point of discharge if possible. If necessary, a peristaltic pump may be used to collect the seep water samples. Based on station access, seep samples

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will be collected during low-tide conditions. Seep samples will be analyzed for TPH-Dx, TPH-G, and BTEX. The TPHDx analyses will be performed once with and once without silica gel cleanup to allow differentiation of polar (i.e., biogenic) and non-polar (i.e., petroleum) extractable hydrocarbons.

### **Groundwater Sampling**

Groundwater sampling will be performed by a field geologist at three existing site monitoring wells (CWMW-18, CWMW-2, MW-1(B); Figure 1). The groundwater samples from the first two locations will provide information on groundwater quality in the area immediately upgradient of the seep and porewater sampling locations proposed at the former Chevron property. The sampling of the third well (MW-1B) will document the current water quality in the well located immediately upgradient of the Maple Street barge ramp.

Depth to water and groundwater quality parameters will be measured using a water quality field meter and recorded prior to sampling. Groundwater will be sampled using low-flow methods (peristaltic pump with dedicated tubing) during low-tide conditions. Prior to sampling, monitoring wells will be purged and groundwater will be allowed to equilibrate (recharge). Once field-measured groundwater quality parameters become stable, groundwater will be sampled. Groundwater samples will be analyzed for TPH-Dx, TPH-G, and BTEX. The TPH-Dx analyses will be performed once with and once without silica gel cleanup to allow differentiation of polar (i.e., biogenic) and non-polar (i.e., petroleum) extractable hydrocarbons.

### **Test Pits**

The southwestern shoreline of the former Chevron property is irregularly shaped. To optimize capping and shoreline stabilization design in this area, modification of this shoreline geometry is being considered. These modifications may include limited cut-backs in portions of this shoreline. Additional information is desired regarding the nature and extent of potential petroleum contamination in this area to inform the final design for capping and stabilization in this area.

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Soil data will be obtained using a test pit investigation. Anchor QEA will subcontract a backhoe operator to excavate 9 test pits at the approximate locations shown in Figure 1. These locations may be adjusted during sampling based on access considerations, the presence of concrete debris, or other factors. No test pits are to be conducted below the high-water line. Test pits will be used for observation of soil conditions and for collection of soil samples. Excavated soil will be backfilled into the original test pits, and compacted using the backhoe bucket.

Test pit locations will be field-verified using DGPS. Test pits will be excavated to a maximum depth of 10 feet bgs. Soils observed in each test pit will be logged by the field geologist, including the soil type, presence of debris, hydrocarbon sheens, stained soil, or odors. Soil grab samples will be field screened for potential hydrocarbon contamination using photo-ionization detector (PID) headspace screening and sheen-tests.

Up to two soil grab samples will be collected from each test pit for archiving for potential chemical analysis. Soil samples archived for potential chemical analysis will be collected from the soil horizon showing evidence of petroleum contamination. If no evidence of petroleum contamination is present, then the samples will be collected from approximately 5 to 6 feet below ground surface, or at the apparent groundwater smear zone. Up to 14 soil samples will be selected for chemical analysis. Soil samples selected for analysis will be analyzed for TPH-Dx (with and without silica-gel cleanup), TPH-G, and BTEX (Table 1). Quality assurance samples will include analysis of one field duplicate for each analytical method.

### **3. DATA ANALYSIS & REPORTING**

The investigation findings will be summarized in a data memorandum. That memorandum will be prepared as an attachment to the Whatcom Waterway Phase 1 EDR, and will also be incorporated in the pending revisions to the Central Waterfront RI/FS. The memorandum will include the following:

- Summary of investigation methods and findings
  - Figures and tables summarizing test pit observations and compiled analytical data
  - Copies of test pit logs, data validation findings, and analytical laboratory reports
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Following completion, electronic data will be submitted to Ecology consistent with EIM data transmittal requirements.

#### **4. MANAGEMENT OF INVESTIGATION DERIVED WASTE**

All rinse water and groundwater obtained during sampling and decontamination activities will be disposed of in 55-gallon drums and consolidated. The 55-gallon drums will be located in a secure on-site area and appropriately labeled, pending waste characterization and disposal.

All disposable sampling materials and personal protective equipment used in sample processing, such as sample tubing, vinyl gloves and paper towels, will be placed in heavy duty garbage bags or other appropriate containers. Disposable supplies will be placed in a normal refuse container for disposal as solid waste.

#### **5. SCHEDULE**

Field activities are scheduled for the weeks of June 25 and July 2. Station clearance of on-site utilities by both public and private locates will be performed the week of June 25. Field personnel and subcontractors will mobilize to the site on Monday, July 2. Test pit sampling will be performed on Tuesday July 3 and Wednesday July 4 in the morning and late afternoon, outside of the mid-day low-tide window. Groundwater, porewater, and seep sampling are tentatively scheduled during (mid-day) low-tide conditions Tuesday, July 3 – Thursday, July 5.

Sincerely,



Tom Wang, P.E.

Anchor QEA, LLC

cc: Michael Stoner, Port of Bellingham

Brian Gouran, Port of Bellingham

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John Hergesheimer, Port of Bellingham

Amy Kraham, City of Bellingham

Halah Voges, Anchor QEA

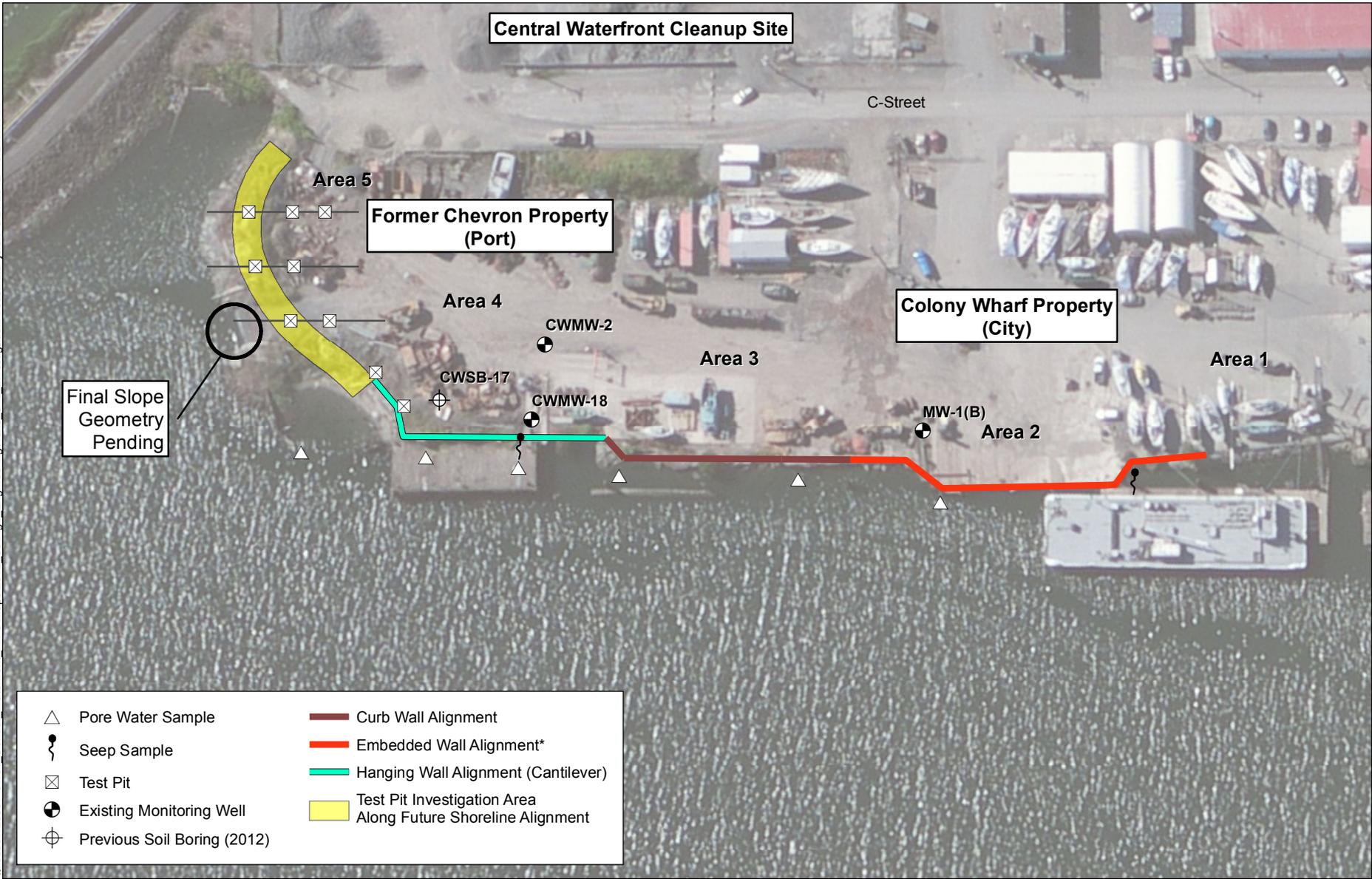
Attachments:

Figure 1 – Supplemental Pre-Design Testing Locations and Central Waterfront Shoreline Features

Table 1 – Target Method Reporting Limits

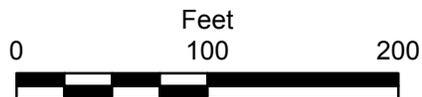
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**Note** \* Embedded wall to be keyed into drift layer and to include tiebacks/soil anchor system.

**Figure 1**  
Supplemental Pre-Design Testing Locations and  
Central Waterfront Shoreline Features  
Whatcom Waterway Cleanup Project



**Table 1**  
**Analytical Methods and Reporting Limits**

Parameter	Analytical Method for Porewaters and Groundwaters	Units	Standard Volume	Standard Reporting Limit	Limited Volume 1 (Minimum Sample for Best Results)	Reporting Limits for Limited Volume 1	Limited Volume 2	Reporting Limits for Limited Volume 2
<b>Total Petroleum Hydrocarbons</b>								
Gasoline Range	NWTPH-Gx	mg/L	2 X 40 mL	0.03	1 x 40mL	0.03	1 x 20 mL	0.03 *
Diesel Range	NWTPH-Dx	mg/L	2 x 500 mL	0.1	1 X 500 mL	0.1	1 x 250 mL (modified extraction)	0.1
Motor Oil Range	NWTPH-Dx	mg/L		0.2		0.2		0.2
<b>BTEX</b>								
Benzene	8021B	µg/L	2 X 40 mL	0.08	1 x 40mL	0.08	1 x 20 mL	0.08 *
Toluene	8021B	µg/L		0.08		0.08		0.08 *
Ethylbenzene	8021B	µg/L		0.08		0.08		0.08 *
Xylenes	8021B	µg/L		0.16		0.16		0.16 *

Parameter	Analytical Method for Soils	Units	Standard Volume	Standard RL	Minimum Sample Needed
<b>Total Petroleum Hydrocarbons</b>					
Gasoline Range	NWTPH-Gx	mg/kg	2 oz or 5 g in 5 mL MeOH	5 mg/kg	5 g in MeOH
Diesel Range	NWTPH-Dx	mg/kg	8 oz	5 mg/kg	30 g
<b>BTEX</b>					
Benzene	8260	ug/kg	2 oz or two 5g in 5 mL NaBis	1 ug/kg	5 g in sodium bisulfate (need dry wt from diesel)
Toluene	8260	ug/kg		1 ug/kg	
Ethylbenzene	8260	ug/kg		1 ug/kg	
m,p-Xylenes	8260	ug/kg		2 ug/kg	
o-Xylene	8260	ug/kg		1 ug/kg	