November 26, 2013

ECI Project Number: 0483-01

Mr. Michael Marchetti
C/o John Spencer
Spencer Law Firm
1326 Tacoma Ave. S.
Tacoma, WA 98402

Re: **Focused Subsurface Investigation / Underground Storage Tank Site Assessment**

Breakwater Marina
5603 North Waterfront Drive
Tacoma, WA 98407

Mr. Marchetti:

EcoCon, Inc. (ECI) is pleased to provide you with the following Focused Subsurface Investigation (FSI) Report detailing the site characterization activities that included the completion of eleven (11) direct push and two (2) hand-augured borings. Soil and groundwater samples were collected from of the borings and chemical analysis was preformed from select areas of concern at the Breakwater Marina site located at 5603 North Waterfront Drive, Tacoma, Washington (Subject Site / Site). This FSI was completed to assess the environmental conditions surrounding the five USTs; two-8000 gallon, two-3,000 gallon and one-1,000 gallon.

Additionally site activities were also conducted to facilitate in determining subsequent underground storage tank (UST) decommissioning/closure activities and for potential remedial actions. This letter report provides a summary of site activities, field logs, groundwater and soil sampling details, chemical analysis, and our conclusions and recommendations.

Attached to this report are the following:

- Attachment A: Project Figures: Site Location Map, Topographic Map and Sample Location Map
- Attachment B: Sample Analytical Results
- Attachment C: Project Boring Logs
- Attachment D: Analytical Tables

SITE LOCATION/DESCRIPTION

The Site consists of one irregular shaped parcel, a 29.30 acre parcel of land with a Pierce County identified by tax parcel number of 8950100010. The Site is located within Section 23, Township 21 North, and Range 02 East of the Willamette Meridian, adjacent to the Washington State Department of Transportation Ferry Dock (Pt. Defiance – Vashon Island Ferry Run) to the northwest and Tacoma Yacht Club to the southeast (Figures 1 & 2, Attachment A).

CONTAMINANTS OF CONCERN (COCs)

Contaminants of concern (COCs) have been identified as gasoline range organics (GRO), diesel range organics (DRO) and select volatile organic compounds benzene, toluene, ethylbenzene and xylenes. Cleanup levels have been derived from the Washington State Department of Ecology (Ecology) Model Toxics Control Act's Method-A (MTCA-A) Cleanup Levels (CUL) for Unrestricted Land Use. In addition to the aforementioned MTCA-A COCs, additional COCs are provided in WAC 173-340: Table 830-1 – Required Testing for Petroleum Releases if GRO was identified. These COCs are listed below.

Table 1: Contaminates Of Concern & Applicable Cleanup Levels – Soil & Groundwater

Method-A Soil Cleanup Levels for Unrestricted Land Use			
Primary Contaminant of Concern	**Analytical Method**	**Cleanup Levels (CUL) Soil - mg/kg**	**Cleanup Levels (CUL) Water - µg/L**
Diesel Range Organics	NWTPH-Dx	2,000	500
Gasoline Range Organics	NWTPH-Gx	100/30*	1000/800*
Benzene	EPA 8021B	0.03	5
Toluene	EPA 8021B	7	1000
Ethylbenzene	EPA 8021B	6	700
Xylenes	EPA 8021B	9	1000
Secondary Contaminates of Concern			
Dibromoethane, 1-2 (EDB)	EPA 8260C	0.005	0.01
Dichloroethane, 1-2 (EDC)	EPA 8260C	0.005	0.01
Methyl Tertiary-Butyl Ether (MTBE)	EPA 8260C	0.1	20
Total Lead	EPA 6000/7000	250	15

MTCA Cleanup Regulation 173-340-900: Table 740-1.
Required Testing for Petroleum Releases: Table 830-1.
**Gasoline Range Organics Benzene present in groundwater 800 µg/liter- No detectable benzene in groundwater 1,000 µg/liter.*

SCOPE OF WORK

The scope of work for this FSI included:

- Development of a site work plan
- Development of a site health and safety plan
- Subsurface utility location
- Placement of direct push and hand-augured borings adjacent to the noted USTs for the collection of soil and groundwater samples
- Laboratory analysis of soil and groundwater samples
- Preparation of this letter report

PRE-SITE WORK ACTIVITIES

Utility Location

Prior to subsurface work the "call before you dig service (811) was contacted 48-hours in advance of site activities. Mountain View Locating Inc. (Mt View) was utilized to determine if any private utilities were located in the vicinity of the project area. They located a power conduit and water line in the project area, marked them with the industry designated colors of paint, and located the product and vents lines for the USTs and marked them with paint. Additionally, they conducted a limited ground penetrating radar (GPR) survey of the area to determine the location of the USTs. After locating the tanks with GPR, Mt. View marked their locations with silver paint. Subsequent to the underground utility locating and GPR survey, the boring locations were adjusted appropriately to avoid damaging utilities/USTs without severely compromising the investigation.

Boring Locations/Soil Conditions

Eleven direct push (ECIB1 – ECIB11) and two hand-augured borings (ECIB12 and ECIB13) were advanced at the Site by Environmental Services Network (ESN) on Monday November 1st, 2013. The borings were advanced adjacent to the five USTs, as indicated by Figure 3: Attachment A. Soils throughout the site consisted of sand and gravels with some wood debris, extending from the surface to ten feet below the ground surface (bgs). Groundwater depth ranged from five to six feet bgs. Borings ECIB1 – ECIB11 were drilled to ten feet bgs with borings ECIB12 and ECIB13 advanced to eight feet bgs. The following table summarizes the above noted boring data.

Table 2: Summary of Borings

Boring ID	Total Depth BGS	Depth to GW	Drilling Method	Description/Location
ECIB1	10’	6’	Direct Push	Adjacent to NW end of 8,000 gallon tank (Tank 1)
ECIB2	10’	6’	Direct Push	Adjacent to NE side of 8,000 gallon tank (Tank 1)
ECIB3	10’	5.5’	Direct Push	Adjacent to NE side of 8,000 gallon tank (Tank 2)
ECIB4	10’	5’	Direct Push	Adjacent to SW side of 8,000 gallon tank (Tank 1)
ECIB5	10’	5.5’	Direct Push	Adjacent to SW side of 8,000 gallon tank (Tank 2)
ECIB6	10’	6’	Direct Push	Adjacent to SW side of 1,000 gallon tank (Tank 5)
ECIB7	10’	6’	Direct Push	Adjacent to SW side of 3,000 gallon tank (Tank 3)
ECIB8	10’	6’	Direct Push	Adjacent to SW side of 3,000 gallon tank (Tank 4)
ECIB9	10’	6’	Direct Push	Adjacent to SE end of 3,000 gallon tank (Tank 4)
ECIB10	10’	6’	Direct Push	Adjacent to Se end of 1,000 gallon tank (Tank 5)
ECIB11	10’	6’	Direct Push	Adjacent to NW end of 3,000 gallon tank (Tank 3)
ECIB12	8’	6’	Direct Push	Adjacent to NE side of 3,000 gallon tank (Tank 3)
ECIB13	8’	6’	Direct Push	Adjacent to NE side of 3,000 gallon tank (Tank 4)

SAMPLE COLLECTION

Soil Samples

Direct push drilling techniques were utilized to advance borings ECIB1 – ECIB11. A Macro-Core® (MC) sampler was used to collected continuous subsurface soil samples. The hand-augured sampling of borings ECIB12 and ECIB13 were advanced utilized an electric roto-hammer and 1-inch sample attachment. Prior to advancing each soil boring and between each sampling attempt, the sampling equipment was decontaminated by washing in an aqueous detergent solution consisting of a non-phosphate detergent and potable water, then rinsing with potable water.

Each sample (core) was field-screened utilizing olfactory, visual observations for soil staining and sheen testing prior to sample collection. Field screening indicated the possible presence of petroleum hydrocarbons in the following borings: ECIB1, ECIB3, ECIB11, ECIB12 and ECIB13.

All soil samples were collected in accordance with industry standard sampling techniques. Soil samples were placed in new, laboratory provided containers and provided a unique sample identification number. Soil samples collected for analysis of VOCs were collected using the Ecology-required EPA

Collection Method 5035. As part of this method, samples were collected utilizing a Power Stop Handle and Easy Draw Syringe. The syringe was pushed into the collected soil core to obtain an approximately 5 gram sample of soil. The soil sample was then placed into a 40 ml glass vial with a Teflon® lined lid with septum for each sample. Soil samples for non-volatile samples were collected and placed into a laboratory supplied 4 ounce glass jar with Teflon® lined lid. Samples were then placed into a container maintained at 4° Celsius until delivered to the laboratory under industry standard chain of custody. Soil samples were collected from three to four feet bgs (below the UST piping elevation) and from the groundwater interface, which ranged from five to six feet bgs.

Groundwater Samples

Groundwater samples were collected from borings that field screenings indicated possible presence of contamination and to delineate groundwater underlying the site. Groundwater samples were collected from borings ECIB1, ECIB3, ECIB4, ECIB7, ECIB9, ECIB10, ECIB12, ECIB13. Groundwater samples were collected utilizing a stainless steel sampling screen advanced in each borehole. The outer casing was retracted to expose the screen to allow collection of a groundwater sample using a low-flow peristaltic pump. A dedicated, disposable piece of polyethylene tubing was lowered into each screen through the drill string to collect the groundwater sample. Samples were collected directly into two, laboratory supplied, 40-milliliter glass vials and one 1-liter amber glass containers, and placed into a cooler maintained at 4° Celsius and delivered to an accredited laboratory under industry standard chain of custody.

Following the groundwater sampling, the sampling rods and screen were removed, decontaminated between borings, and the borehole was properly abandoned by filling with granular bentonite, and capping the surface with like material (soil, gravel, asphalt or concrete patch).

Investigative Derived Waste

All soil cuttings and decontamination fluids were drummed in Department of Transportation (DOT) approved drums. The drums were sealed, properly labeled and placed onsite at a location that will not cause harm to human health or the environment. After the completion of onsite remedial actions, the disposition of these contained wastes will be determined.

ANALYTICAL RESULTS

Soil Samples

Two soil samples submitted to the laboratory were reported with concentrations of COCs above the laboratory minimum reporting limit. Sample ECIB1-5 had a concentration of DRO at 556 mg/kg and sample ECIB11-3 had a concentration of DRO at 45 mg/kg. These concentrations do not exceed the applicable MTCA-A CUL of 2,000 mg/kg for DRO in soil (See Attachment D: Analytical Tables).

Groundwater Samples

Only two groundwater samples reflected concentrations of COCs above the laboratory minimum reporting limit. Sample ECIB1-W was reported with a concentration of DRO at 34,300 µg/L and sample ECIB13-W was reported with a concentration of xylenes at 2.3 µg/L. The concentration of xylenes in sample ECIB13-W does not exceed the applicable MTCA-A CUL of 1,000 µg/L; however the concentration of DRO in sample ECIB1-W does exceed the MTCA-A CUL of 500 µg/L for DRO in groundwater (See Attachment D: Analytical Tables).

CONCLUSION/RECOMMENDATIONS

Thirteen borings were advanced as part of this focused subsurface investigation. Areas investigated included adjacent soils and groundwater to the five underground storage tanks. Depth of the borings ranged from eight to ten feet bgs and depth to groundwater ranged from five to six bgs. Soil samples were collected from three to four feet bgs and from the groundwater interface at five to six feet bgs. Field screening indicated the potential presence of petroleum contamination in borings B1, B3, B11, B12 and B13. No concentrations of contaminants of concern were either found above the laboratory detection limits or above applicable MTCA-A cleanup limits.

Groundwater samples were collected from borings B1, B3, B4, B7, B10, B12, and B13. Groundwater collected from boring B1 was found to have concentrations of DRO (34,300 µg/L) that exceeded the applicable MTCA-A cleanup limit of 500 µg/L. No other concentrations of contaminants of concern were either found above the laboratory detection limits or applicable state cleanup limits in the other samples.

These results, utilized with the previous investigations, would indicate that in the areas investigated there is impact from the contaminants of concern (DRO) above the applicable MTCA Method A CUL in groundwater. Therefore based on the analytical results obtained from this investigation, ECI does recommend further investigation in the area of ECI boring B1 to further delineate groundwater contamination.

QUALIFICATIONS OF THIS LETTER REPORT

Although this study has been a reasonably thorough attempt to investigate potential sources of contamination for the subject, there is always the possibility that potential sources of contamination have escaped detection due to the limitations of this Study, the inaccuracy of governmental records, and the presence of undetected and unreported environmental incidents. ECI reserves the right to alter our findings based on our review of any information obtained and reviewed after the date of this report.

Our professional services have been performed using the degree of care and skill ordinarily exercised, under similar conditions, by reputable environmental consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional information included in this

report. Should you have any questions regarding this report, please contact our office at (253) 238-9270.

Respectfully submitted,
EcoCon, Inc. | Environmental Consulting

Thomas W. Smith
Sr. Environmental Scientist

AAI Qualified Environmental Professional
Ecology Registered Site Assessor, ICC 4132009730

Stephen Spencer
Principal Environmental Scientist

Enclosures:

Attachment A: Project Figures

- Figures 1: Subject Site Location Map
- Figures 2: Subject Site Topographic Map
- Figures 3: Sample Location Map

Attachment B: Sample Analytical Results

Attachment C: Project Boring Logs

Attachment D: Project Tables

Attachment A

Project Figures

Figure 1-General Vicinity map - Sheet 1 of 3
Figure 2-Site Topographic Map - Sheet 2 of 3
Figure 3-Sample Location Map - Sheet 3 of 3

N
Not To Scale

Subject Site Location Map
5603 North Waterfront Drive
Tacoma, Washington

Date:	November 4, 2013
Completed By:	S. Spencer
Reviewed By.:	S.Spencer
Version:	ECI-001
Project No.:	0483-01

Figure No.: 01
Sheet 01 of 03

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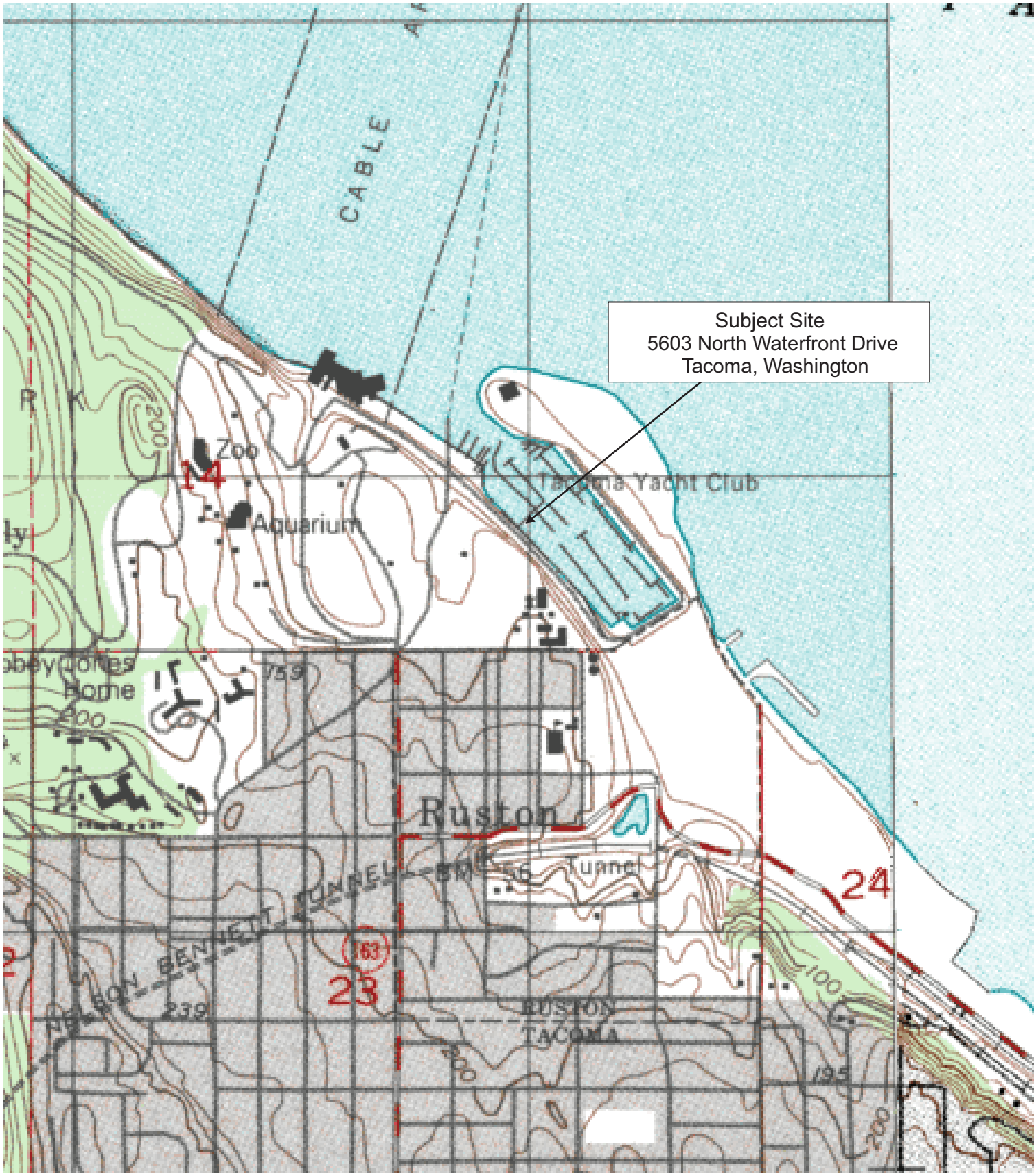

N
Not To Scale

Subject Site Topographic Map
5603 North Waterfront Drive
Tacoma, Washington

Date:	November 4, 2013
Completed By:	S. Spencer
Reviewed By.:	S.Spencer
Version:	ECI-001
Project No.:	0483-01

Figure No.: 02
Sheet 02 of 03

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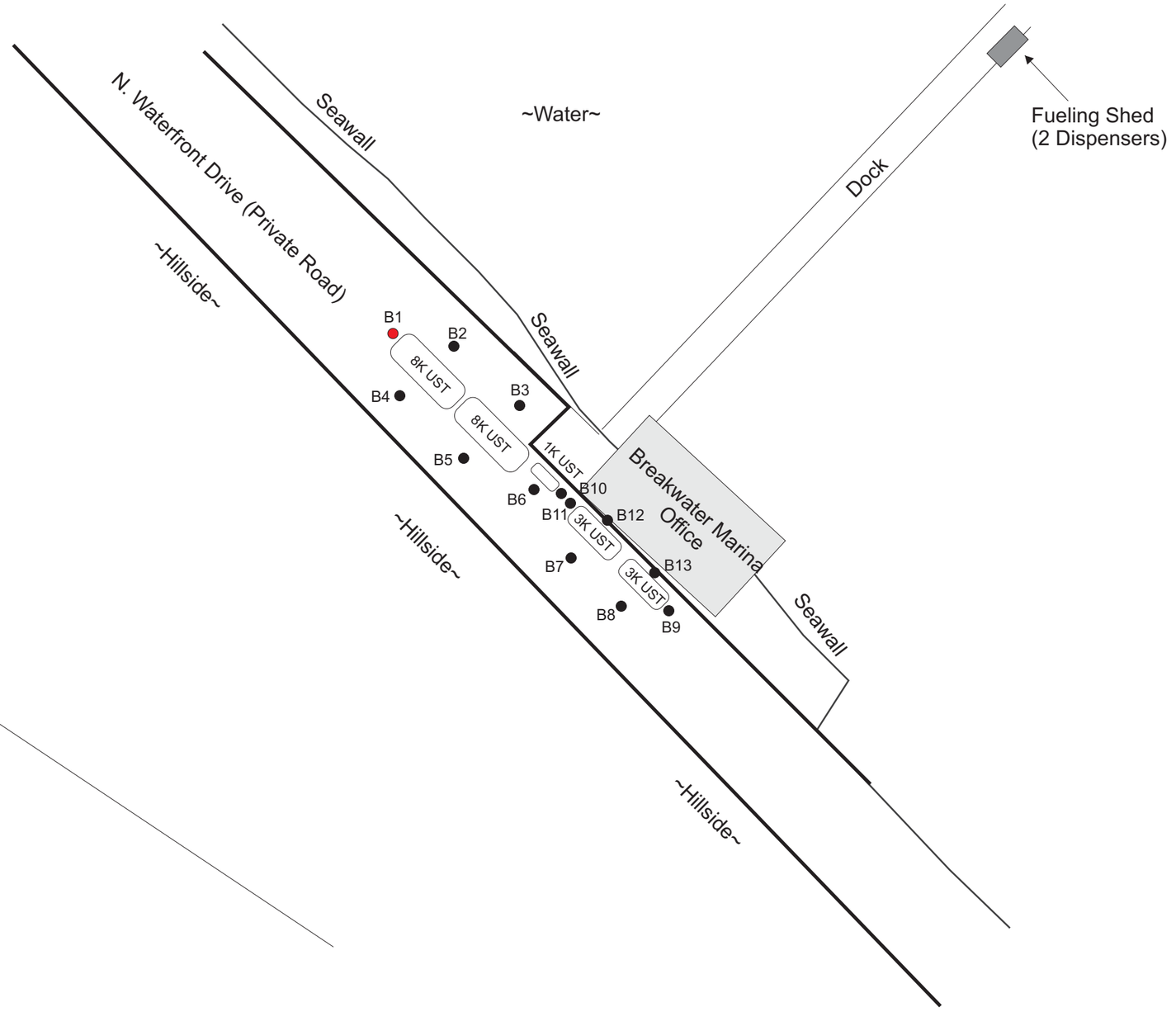

0 20 40 80

Approximate Scale In Feet

N

Not To Scale

Explanation

- Boring Locations
- Groundwater Sample Exceeds MTCA Method A CUL for DRO (DRO Concentration 34,600 ug/L)

Boring Locations
5603 North Waterfront Drive
Tacoma, Washington

Date:	November 4, 2013
Completed By:	S. Spencer
Reviewed By.:	S.Spencer
Version:	ECI-001
Project No.:	0156-02

Figure No.: 03

Sheet 03 of 03

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Attachment B

Analytical Summary Tables

Table 1 - Soil Sample Analytical Results
Table 2 - Groundwater Sample Analytical Restuls

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Table 1 Soil - DRO, DRO and BTEX

Breakwater Marina Environmental Site Assessment
5603 North Waterfront Drive
Tacoma, Washington

November 4, 2013

Sample Number	Sample Location		Sample Depth (ft)	Sample Date	NWTPH-Dx Ext.	NWTPH-Gx	BTEX 8260			
					Diesel Range Organics	Gasoline Range Organics	Benzene	Toluene	Ethylbenzene	Xylenes
	Longitude	Latitude			mg/kg					
B1-4	47°18'15.15"N	122°30'44.20"W	4	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B1-5	47°18'15.15"N	122°30'44.20"W	5	11/4/2013	**556**	<10	<0..02	<0.1	<0.05	<0.15
B2-3.5	47°18'12.11"N	122°30'44.03"W	3.5	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B2-6	47°18'12.11"N	122°30'44.03"W	6	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B3-4	47°18'15.07"N	122°30'43.95"W	4	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B3-6	47°18'15.07"N	122°30'43.95"W	6	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B4-4	47°18'15.05"N	122°30'44.03"W	4	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B4-6.5	47°18'15.05"N	122°30'44.03"W	6.5	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B5-4	47°18'14.93"N	122°30'43.97"W	4	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B5-6.5	47°18'14.93"N	122°30'43.97"W	6.5	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B6-4	47°18'14.89"N	122°30'43.90"W	4	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B6-6	47°18'14.89"N	122°30'43.90"W	6	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B7-4	47°18'14.78"N	122°30'43.76"W	4	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B7-6	47°18'14.78"N	122°30'43.76"W	6	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B8-3	47°18'14.62"N	122°30'43.57"W	3	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B8-5	47°18'14.62"N	122°30'43.57"W	5	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B9-3.5	47°18'14.57"N	122°30'43.39"W	3.5	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B9-6	47°18'14.57"N	122°30'43.39"W	6	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15

Table 1 Soil - DRO, DRO and BTEX

Breakwater Marina Environmental Site Assessment
5603 North Waterfront Drive
Tacoma, Washington

November 4, 2013

Sample Number	Sample Location		Sample Depth (ft)	Sample Date	NWTPH-Dx Ext.	NWTPH-Gx	BTEX 8260			
					Diesel Range Organics	Gasoline Range Organics	Benzene	Toluene	Ethylbenzene	Xylenes
	Longitude	Latitude			mg/kg					
B10-3.5	47°18'14.96"N	122°30'43.83"W	3.5	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B10-5.5	47°18'14.96"N	122°30'43.83"W	5.5	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B11--3	47°18'14.93"N	122°30'43.78"W	3	11/4/2013	**45**	<10	<0..02	<0.1	<0.05	<0.15
B11-5	47°18'14.93"N	122°30'43.78"W	5	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B12-6	47°18'14.95"N	122°30'43.63"W	6	11/4/2013	<25	<10	<0..02	<0.1	<0.05	<0.15
B13-6	47°18'14.95"N	122°30'43.63"W	6	11/4/2013	<25	<10	<0.02	<0.1	<0.05	<0.15
Minimum Method Reporting Level (MRL)					25	10	0.02	0.1	0.05	0.15
Model Toxic Control Act - Method A Soil Cleanup Level					2,000	30	0.03	7	6	9

Bold / Shaded: Analysis reported exceeding the MTCA Method A cleanup level
Bold: Analysis reported exceeding laboratory method reporting levels
MTCA 2007 Method A Cleanup Levels for Soil from the Model Toxics Control Act (MTCA) amendment Table 740-1 WAC 173-340 -900 Tables
Samples reported in millagrams per killigrams (mg/kg)
Longitude & Latitude cooridinates are estimated
bgs: below ground surface
NT: Not Tested

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Table 2 GW- DRO, DRO and BTEX

Breakwater Marina Environmental Site Assessment
5603 North Waterfron Drive
Tacoma, Washington

November 4, 2013

Sample Number	Sample Location		GW Depth (ft)	Sample Date	NWTPH-Dx Ext.	NWTPH-Gx	BTEX 8260			
					Diesel Range Organics	Gasoline Range Organics	Benzene	Toluene	Ethylbenzene	Xylenes
	Longitude	Latitude			µg/L					
B1-W	47°18'15.15"N	122°30'44.20"W	5	11/4/2013	**34300**	<100	<0.35	<1	<1	<1
B3-W	47°18'15.07"N	122°30'43.95"W	6	11/4/2013	<50	<100	<0.35	<1	<1	<1
B4-W	47°18'15.05"N	122°30'44.03"W	6	11/4/2013	<50	<100	<0.35	<1	<1	<1
B7-W	47°18'14.78"N	122°30'43.76"W	6	11/4/2013	<50	<100	<0.35	<1	<1	<1
B9-W	47°18'14.57"N	122°30'43.39"W	6	11/4/2013	<50	<100	<0.35	<1	<1	<1
B10-W	47°18'14.96"N	122°30'43.83"W	6	11/4/2013	<50	<100	<0.35	<1	<1	<1
B12-W	47°18'14.95"N	122°30'43.63"W	6	11/4/2013	<50	<100	<0.35	<1	<1	<1
B13-W	47°18'14.95"N	122°30'43.63"W	6	11/4/2013	<50	<100	<0.35	<1	<1	2.3
Minimum Method Reporting Level (MRL)					50	100	0.35	1	1	1
Model Toxic Control Act - Method A Soil Cleanup Level					500	800	5	1,000	700	1,000

Bold / Shaded: Analysis reported exceeding the MTCA Method A cleanup level
Bold: Analysis reported exceeding laboratory method reporting levels
MTCA 2007 Method A Cleanup Levels for Groundwater from the Model Toxics Control Act (MTCA) amendment Table 740-1 WAC 173-340 -900 Tables
Samples reported in micrograms per killigrams (µg/L)
Longitude & Latitude cooridinates are estimated
bgs: below ground surface
NT: Not Tested

Attachment C

Boring Logs

ECI environmental services www.ecocononline.com					Boring No.:	ECIB1	Sheet:	1	of	13	
					Location:	5603 North Waterfron Drive, Tacoma, WA					
Date:	November 4, 2013				Client:	Breakwater Marina					
Drilling Type:	Direct Push / Macro Sampler						Water Level:	6'bgs			
Well Screen Size:	NA				Surface Conditions:	ASPHALT	Surface Elevation:	~13' ASL			
Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Longitude:	47°18'15.15"N	Time:	Start	Finish
							Latitude:	122°30'44.20"W		8:16	8:20
							Comments:	Driller uses 5' sampler w/ liners			
							Soil Description				
						0	0-4': Asphalt				
						1					
						2					
						3					
						4					
						5					
						6					
						7					
						8					
						9					
						10	2'-10': Sand and Gravel with some wood debris				
						11					
						12					
						13					
						14					
						15					
						16					
						17					
						18					
						19					
						20					

ECI environmental services www.ecocononline.com					Boring No.:	ECIB2		Sheet:	2	of	13
					Location:	5603 North Waterfron Drive, Tacoma, WA					
Date:	November 4, 2013				Client:	Breakwater Marina					
Drilling Type:	Direct Push / Macro Sampler							Water Level:	6'bgs		
Well Screen Size:	NA				Surface Conditions:	ASPHALT		Surface Elevation:	~13' ASL		
Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Longitude:	47°18'12.11"N	Time:	Start	Finish
							Latitude:	122°30'44.07"W		8:55	9:15
							Comments:	Driller uses 5' sampler w/ liners			
							Soil Description				

0-4': Asphalt

2'-10': Sand and Gravel with some wood debris

ECI environmental services www.ecocononline.com					Boring No.:	ECIB3	Sheet:	3	of	13	
					Location:	5603 North Waterfron Drive, Tacoma, WA					
Date:	November 4, 2013				Client:	Breakwater Marina					
Drilling Type:	Direct Push / Macro Sampler						Water Level:	5.5'bgs			
Well Screen Size:	NA				Surface Conditions:	ASPHALT	Surface Elevation:	~13' ASL			
Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Longitude:	47°18'15.07"N	Time:	Start	Finish
							Latitude:	122°30'43.95"W		9:15	9:30
							Comments:	Driller uses 5' sampler w/ liners			
							Soil Description				

0-4': Asphalt

2'-10': Sand and Gravel with some wood debris

ECI environmental services www.ecocononline.com				Boring No.:	ECIB4		Sheet:	4	of	13	
				Location:	5603 North Waterfron Drive, Tacoma, WA						
Date:	November 4, 2013			Client:	Breakwater Marina						
Drilling Type:	Direct Push / Macro Sampler						Water Level:	5'bgs			
Well Screen Size:	NA			Surface Conditions:	ASPHALT		Surface Elevation:	~13' ASL			
Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Longitude:	47°18'15.05"N	Time:	Start	Finish
							Latitude:	122°30'44.08"W		9:30	10:15
							Comments:	Driller uses 5' sampler w/ liners			
							Soil Description				
						0	0-4': Asphalt				
						1					
						2					
						3					
						4					
						5					
						6					
						7					
						8					
						9					
						10	2'-10': Sand and Gravel with some wood debris				
						11					
						12					
						13					
						14					
						15					
						16					
						17					
						18					
						19					
						20					

ECI environmental services www.ecocononline.com					Boring No.:	ECIB5		Sheet:	5	of	13
					Location:	5603 North Waterfron Drive, Tacoma, WA					
Date:	November 4, 2013				Client:	Breakwater Marina					
Drilling Type:	Direct Push / Macro Sampler							Water Level:	5.5'bgs		
Well Screen Size:	NA				Surface Conditions:	ASPHALT		Surface Elevation:	~13' ASL		
					Longitude:	47°18'14.93"N		Time:	Start	Finish	
					Latitude:	122°30'43.97"W			10:15	10:30	
					Comments:	Driller uses 5' sampler w/ liners					

Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Soil Description
						0	0-4': Asphalt
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	2'-10': Sand and Gravel with some wood debris
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	
						20	

ECI environmental services www.ecocononline.com				Boring No.:	ECIB6		Sheet:	6	of	13	
				Location:	5603 North Waterfron Drive, Tacoma, WA						
Date:	November 4, 2013			Client:	Breakwater Marina						
Drilling Type:	Direct Push / Macro Sampler						Water Level:	6'bgs			
Well Screen Size:	NA			Surface Conditions:	ASPHALT		Surface Elevation:	~13' ASL			
Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Longitude:	47°18'14.89"N	Time:	Start	Finish
							Latitude:	122°30'43.90"W		10:30	10:40
							Comments:	Driller uses 5' sampler w/ liners			
							Soil Description				
						0	0-4': Asphalt				
						1					
						2					
						3					
						4					
						5					
						6					
						7					
						8					
						9					
						10	2'-10': Sand and Gravel with some wood debris				
						11					
						12					
						13					
						14					
						15					
						16					
						17					
						18					
						19					
						20					

ECI environmental services www.ecocononline.com			Boring No.:	ECIB7		Sheet:	7	of	13		
			Location:	5603 North Waterfron Drive, Tacoma, WA							
Date:	November 4, 2013		Client:	Breakwater Marina							
Drilling Type:	Direct Push / Macro Sampler					Water Level:	6'bgs				
Well Screen Size:	NA			Surface Conditions:	ASPHALT	Surface Elevation:	~13' ASL				
				Longitude:	47°18'14.78"N	Time:	Start	Finish			
				Latitude:	122°30'43.76"W		10:40	11:00			
				Comments:	Driller uses 5' sampler w/ liners						

Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Soil Description
						0 -	0-4': Asphalt
						-	
						1 -	
						-	
						2 -	
						-	
						3 -	
						-	
						4 -	
						-	
						5 -	
						-	
						6 -	
						-	
						7 -	
						-	
						8 -	
						-	
						9 -	
						-	2'-10': Sand and Gravel with some wood debris
						10 -	
						-	
						11 -	
						-	
						12 -	
						-	
						13 -	
						-	
						14 -	
						-	
						15 -	
						-	
						16 -	
						-	
						17 -	
						-	
						18 -	
						-	
						19 -	
						-	
						20 -	

ECI environmental services www.ecocononline.com	Boring No.:	ECIB8	Sheet:	8	of	13
	Location:	5603 North Waterfron Drive, Tacoma, WA				
Date: November 4, 2013	Client:	Breakwater Marina				
Drilling Type: Direct Push / Macro Sampler			Water Level:	6'bgs		
Well Screen Size: NA	Surface Conditions:	ASPHALT	Surface Elevation:	~13' ASL		
	Longitude:	47°18'14.62"N	Time:	Start	Finish	
	Latitude:	122°30'43.57"W		11:00	11:20	
	Comments:	Driller uses 5' sampler w/ liners				

Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Soil Description
						0 -	0-4': Asphalt
						-	
						1 -	
						-	
						2 -	
						-	
						3 -	
						-	
						4 -	
						-	
						5 -	
						-	
						6 -	
						-	
						7 -	
						-	
						8 -	
						-	
						9 -	
						-	2'-10': Sand and Gravel with some wood debris
						10 -	
						-	
						11 -	
						-	
						12 -	
						-	
						13 -	
						-	
						14 -	
						-	
						15 -	
						-	
						16 -	
						-	
						17 -	
						-	
						18 -	
						-	
						19 -	
						-	
						20 -	

ECI environmental services www.ecocononline.com	Boring No.:	ECIB9	Sheet:	9	of	13
	Location:	5603 North Waterfron Drive, Tacoma, WA				
Date: November 4, 2013	Client:	Breakwater Marina				
Drilling Type: Direct Push / Macro Sampler			Water Level:	6'bgs		
Well Screen Size: NA	Surface Conditions:	ASPHALT	Surface Elevation:	~13' ASL		
	Longitude:	47°18'14.57"N	Time:	Start	Finish	
	Latitude:	122°30'43.39"W		11:20	11:40	
	Comments:	Driller uses 5' sampler w/ liners				

Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Soil Description
						0	0-4': Asphalt
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	2'-10': Sand and Gravel with some wood debris
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	
						20	

ECI environmental services www.ecocononline.com				Boring No.:	ECIB10	Sheet:	10	of	13		
				Location:	5603 North Waterfron Drive, Tacoma, WA						
Date:	November 4, 2013			Client:	Breakwater Marina						
Drilling Type:	Direct Push / Macro Sampler					Water Level:	6'bgs				
Well Screen Size:	NA			Surface Conditions:	ASPHALT	Surface Elevation:	~13' ASL				
Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Longitude:	47°18'14.96"N	Time:	Start	Finish
							Latitude:	122°30'43.83"W		11:40	12:00
							Comments:	Driller uses 5' sampler w/ liners			
							Soil Description				
						0	0-4': Asphalt				
						1					
						2					
						3					
						4					
						5					
						6					
						7					
						8					
						9					
						10	2'-10': Sand and Gravel with some wood debris				
						11					
						12					
						13					
						14					
						15					
						16					
						17					
						18					
						19					
						20					

ECI environmental services www.ecocononline.com				Boring No.:	ECIB11	Sheet:	11	of	13		
				Location:	5603 North Waterfron Drive, Tacoma, WA						
Date:	November 4, 2013			Client:	Breakwater Marina						
Drilling Type:	Direct Push / Macro Sampler					Water Level:	6'bgs				
Well Screen Size:	NA			Surface Conditions:	ASPHALT	Surface Elevation:	~13' ASL				
				Longitude:	47°18'14.93"N	Time:	Start	Finish			
				Latitude:	122°30'43.78"W		12:00	12:35			
				Comments:	Driller uses 5' sampler w/ liners						

Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Soil Description
						0	0-4': Asphalt
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	2'-10': Sand and Gravel with some wood debris
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	
						20	

ECI environmental services www.ecocononline.com	Boring No.:	ECIB12	Sheet:	12	of	13
	Location:	5603 North Waterfron Drive, Tacoma, WA				
Date: November 4, 2013	Client:	Breakwater Marina				
Drilling Type: Hand-Augured			Water Level:	6'bgs		
Well Screen Size: NA		Surface Conditions: Concrete	Surface Elevation:	~13' ASL		
	Longitude:	47°18'14.95"N	Time:	Start	Finish	
	Latitude:	122°30'43.63"W		12:35	1::00 PM	
	Comments:	Driller uses 5' sampler w/ liners				

Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Soil Description
						0	0-4': Asphalt
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	2'-8': Sand and Gravel with some wood debris
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	
						20	

ECI environmental services www.ecoononline.com	Boring No.:	ECIB13	Sheet:	13	of	13
	Location:	5603 North Waterfron Drive, Tacoma, WA				
Date: November 4, 2013	Client:	Breakwater Marina				
Drilling Type: Hand-Augured			Water Level:	6'bgs		
Well Screen Size: NA		Surface Conditions: Concrete	Surface Elevation:	~13' ASL		
	Longitude:	47°18'14.72"N	Time:	Start	Finish	
	Latitude:	122°30'43.44"W		13:00	1::35 PM	
	Comments:	Driller uses 5' sampler w/ liners				

Feet Driven	Feet Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth (Ft.)	Soil Description
						0	0-4': Asphalt
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	2'-8': Sand and Gravel with some wood debris
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	
						20	

Attachment E

Laboratory Analytical Results

Attachment E
Laboratory Analytical Results

Libby Environmental, Inc.

Chain of Custody Record

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Date: 11/4/13 Page: 1 of 2

Client: ECI

Project Manager: Tom Smith

Address: PO Box 153 Fox Island, WA 98333

Project Name: Breakwater Marina

Phone: (253) 365-7647 Fax:

Location: Breakwater Marina City: Tacoma

Client Project # 0483-01

Collector: T. Smith Date of Collection: 11/4/13

	Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	VOA 8260	SEMI VOL 8270	NWTPH-HCID	NWTPH-Gx	NWTPH-Dx	NWTPH-Dx Ext.	PAH 8270	PCB's 8082	~~MTCA 5 Metals~~ Lead			Field Notes
1	B1 - 4	4'	8:20	Soil	3		X				X	X							Lead only if GRO hit
2	B1 - 5'	5'	8:30	Soil	3														
3	B1 - W	NA	8:35	water	4														
4	B2 - 3.5	3'	9:02	Soil	3														
5	B2 - 6	6'	9:15	Soil	3														
6	B3 - ~~3-5~~ 4	~~3-5~~ 4	9:20	Soil	3														
7	B3 - ~~4-5~~ 6	~~4-5~~ 6	9:25	Soil	3														
8	B3 - W	NA	9:30	WATER	4														
9	B4 - 4	4	10:00	Soil	3														
10	B4 - 6.5	6.5	10:05	Soil	3														
11	B4 - W	N/A	10:15	water	4														
12	B5 - 4	4	10:25	Soil	3														
13	B5 - 6.5	6.5	10:30		3														
14	B6 - 4	4	10:35		3														
15	B6 - 6	6	10:40		3														
16	B7 - 4	4	10:50		3														
17	B7 - 6	6	10:55		3														
18	B7 - W	NA	1:00	WATER	4														

Relinquished by:	Date / Time	Received by:	Date / Time
	11/4/13 3:35 PM		11/4/13 3:35pm
Relinquished by:	Date / Time	Received by:	Date / Time
Relinquished by:	Date / Time	Received by:	Date / Time

Sample Receipt:

Good Condition?	
Cold?	
Seals Intact?	
Total Number of Containers	

Remarks:
Stamed TAT
EIM

Distribution: White - Lab, Yellow - File, Pink - Originator

Libby Environmental, Inc.

Chain of Custody Record

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Date: 11/4/13 Page: 2 of 2

Client: ECI

Project Manager: Tom Smith

Address:

Project Name: Breakwater Marina

Phone: Fax:

Location: City:

Client Project #

Collector: Date of Collection:

	Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	VOA 8260	SEMI VOL 8270	NWTPH-HCID	NWTPH-Gx	NWTPH-Dx	NWTPH-Dx Ext.	PAH 8270	PCB's 8082	~~MTCA 5~~ Metals Lead			Field Notes
1	B8-3	3	11:15	Soil	3		X				X	X				X			Lead only if gas hit
2	B8-5	5	11:20	↓	3														
3	B9-3.5	3.5	11:30	↓	3														
4	B9-6	6	11:35	Soil	3														
5	B9-W	N/A	11:40	water	4														
6	B10-3.5	3.5	11:50	Soil	3														
7	B10-5.5	5.5	11:55	Soil	3														
8	B10 W	W	12:00	water	4														
9	B11-3	3	12:30	Soil	3														
10	B11-5	5	12:35	Soil	3														
11	B12-6	6	1:00	Soil	3														
12	B12-W	W	1:15	water	4														
13	B13-6	6	1:20	Soil	3														
14	B13 W	W	1:30	water	4														
15																			
16																			
17																			
18																			

Relinquished by:	Date / Time	Received by:	Date / Time
	11/4/13 3:35PM		11/4/13 3:35PM
Relinquished by:	Date / Time	Received by:	Date / Time
Relinquished by:	Date / Time	Received by:	Date / Time

Sample Receipt:

Good Condition?	
Cold?	
Seals Intact?	
Total Number of Containers	

Remarks:

EIM

Standard TAT

Distribution: White - Lab, Yellow - File, Pink - Originator

Libby Environmental, Inc.

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BREAKWATER MARINA PROJECT
ECI
Tacoma, Washington
Libby Project # L131104-2
Client Project # 0483-01

Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8260C) in Soil

Sample Number	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Gasoline (mg/kg)	Surrogate Recovery (%)
Method Blank	11/5/13	nd	nd	nd	nd	nd	95
LCS	11/5/13	94%	93%				99
B1-4	11/5/13	nd	nd	nd	nd	nd	101
B1-4 Dup	11/5/13	nd	nd	nd	nd	nd	98
B1-5	11/5/13	nd	nd	nd	nd	nd	98
B2-3.5	11/5/13	nd	nd	nd	nd	nd	95
B2-6	11/5/13	nd	nd	nd	nd	nd	100
B3-4	11/5/13	nd	nd	nd	nd	nd	96
B3-6	11/5/13	nd	nd	nd	nd	nd	96
B4-4	11/5/13	nd	nd	nd	nd	nd	102
B4-6.5	11/5/13	nd	nd	nd	nd	nd	93
B5-4	11/5/13	nd	nd	nd	nd	nd	98
B5-6.5	11/5/13	nd	nd	nd	nd	nd	104
B6-4	11/5/13	nd	nd	nd	nd	nd	99
B6-6	11/5/13	nd	nd	nd	nd	nd	101
B7-4	11/5/13	nd	nd	nd	nd	nd	99
B7-4 Dup	11/5/13	nd	nd	nd	nd	nd	101
B7-6	11/5/13	nd	nd	nd	nd	nd	100
B2-3.5 MS	11/5/13	101%	91%				96
B2-3.5 MSD	11/5/13	95%	100%				104
Practical Quantitation Limit		0.02	0.10	0.05	0.15	10	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Toluene-d8): 65% TO 135%

ANALYSES PERFORMED BY: Kyle Williams & Paul Burke

Libby Environmental, Inc.

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BREAKWATER MARINA PROJECT
ECI
Tacoma, Washington
Libby Project # L131104-2
Client Project # 0483-01

Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8260C) in Water

Sample Number	Date Analyzed	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	Gasoline (µg/l)	Surrogate Recovery (%)
Method Blank	11/5/13	nd	nd	nd	nd	nd	100
LCS	11/5/13	98%	95%				99
B1-W	11/5/13	nd	nd	nd	nd	nd	98
B1-W Dup	11/5/13	nd	nd	nd	nd	nd	100
B3-W	11/5/13	nd	nd	nd	nd	nd	99
B4-W	11/5/13	nd	nd	nd	nd	nd	99
B7-W	11/5/13	nd	nd	nd	nd	nd	94
B9-W	11/5/13	nd	nd	nd	nd	nd	99
B10-W	11/5/13	nd	nd	nd	nd	nd	90
B12-W	11/5/13	nd	nd	nd	nd	nd	99
B13-W	11/5/13	nd	nd	nd	2.3	nd	99
B3-W MS	11/5/13	116%	116%				100
B3-W MSD	11/5/13	121%	122%				87
Practical Quantitation Limit		1	2	1	2	100	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Toluene-d8): 65% TO 135%

ANALYSES PERFORMED BY: Kyle Williams & Paul Burke

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BREAKWATER MARINA PROJECT
ECI
Tacoma, Washington
Libby Project # L131104-2
Client Project # 0483-01

Analyses of Diesel (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)
Method Blank	11/5/13	95	nd
B1-4	11/5/13	87	nd
B1-4 Dup	11/5/13	110	nd
B1-5	11/5/13	99	556
B2-3.5	11/5/13	101	nd
B2-6	11/5/13	84	nd
B3-4	11/5/13	98	nd
B3-6	11/5/13	128	nd
B4-4	11/5/13	109	nd
B4-6.5	11/5/13	82	nd
B5-4	11/5/13	94	nd
B5-6.5	11/5/13	89	nd
B5-6.5 Dup	11/5/13	112	nd
B6-4	11/5/13	98	nd
B6-6	11/5/13	121	nd
B7-4	11/5/13	98	nd
B7-6	11/5/13	121	nd
B8-3	11/5/13	99	nd
B8-5	11/5/13	114	nd
B9-3.5	11/5/13	96	nd
B9-6	11/5/13	123	nd
B10-3.5	11/5/13	95	nd
B10-5.5	11/5/13	118	nd
B10-5.5 Dup	11/5/13	126	nd
B11-3	11/5/13	105	45
B11-5	11/5/13	96	nd
B12-6	11/5/13	95	nd
B13-6	11/5/13	105	nd
B13-6 Dup	11/5/13	105	nd
Practical Quantitation Limit			25

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Kyle Williams & Paul Burke

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BREAKWATER MARINA PROJECT
ECI
Tacoma, Washington
Libby Project # L131104-2
Client Project # 0483-01

Analyses of Diesel (NWTPH-Dx) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (µg/l)
Method Blank	11/6/13	95	nd
B1-W	11/6/13	int	34300
B1-W Dup	11/6/13	int	33200
B3-W	11/6/13	78	nd
B4-W	11/6/13	81	nd
B7-W	11/6/13	79	nd
B9-W	11/6/13	84	nd
B10-W	11/6/13	76	nd
B12-W	11/6/13	76	nd
B13-W	11/6/13	78	nd
Practical Quantitation Limit			200

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Kyle Williams & Paul Burke