Groundwater Monitoring
Columbia Park West Marina
Ecology Site 64244226
Richland, Washington

November 7, 2014

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Submitted To:
Mr. Phil Pinard
City of Richland
Parks and Recreation
P.O. Box 190
2700 Duportail Street, Building 100, MS 6
Richland, Washington 99354

By:
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22-1-11288-001

SHANNON & WILSON, INC.
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November 7, 2014

City of Richland, Parks and Recreation
P.O. Box 190
2700 Duportail Street
Building 100, MS 6
Richland, Washington 99354

Attn: Mr. Phil Pinard

RE: GROUNDWATER MONITORING, COLUMBIA PARK WEST MARINA, ECOLOGY SITE 84244226, RICHLAND, WASHINGTON

The attached report provides the results of the second groundwater sampling event conducted at the Columbia Park West Marina in Richland, Washington. The sampling was performed as a follow-up to Shannon & Wilson's remedial investigation conducted at the site in February and March, 2014.

Thank you for the opportunity to provide these services. Please contact us if you have questions, or would like further explanation of the materials or conclusions presented.

Respectfully submitted,

SHANNON & WILSON, INC.

Donna Parkes

Donna R. Parkes
Principal Environmental Specialist

DRP:SWG/drp

Enclosure: September 2014 Groundwater Monitoring Report

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SEPTEMBER 2014 GROUNDWATER MONITORING
COLUMBIA PARK WEST MARINA
RICHLAND, WASHINGTON

1.0 INTRODUCTION AND BACKGROUND INFORMATION

The City of Richland (City) contracted with Shannon & Wilson, Inc. to collect groundwater samples from monitoring wells at the Columbia Park West Marina (Marina). The site is identified in Washington Department of Ecology's (Ecology) records as Columbia Park Marina, Facility ID #84244226 located at 1776 Columbia Park Trail in Richland, Washington. The Marina is approximately 950 feet east of the Columbia Center Boulevard and Columbia Park Trail intersection. The site's location is shown on a vicinity map on Figure 1, and Figure 2 is a site plan.

Ecology sent letters to the City and Mr. Lynne Koehler dated April 19, 2013 requiring that a remedial investigation (RI) be conducted to characterize potential impacts to subsurface soil and groundwater at the Marina site. The triggering event was the release of gasoline that was discovered during removal of two underground storage tanks (USTs) in 1994.

Shannon & Wilson reviewed previous reports and correspondence regarding the UST closure for background information about the site. The subject site is owned by the United States Army Corps of Engineers (Corps) and is adjacent to the Columbia River. The City leases the property, and previously subleased the Marina to Lynne Koehler. Mr. Koehler owned and operated The Boat Shop, which is no longer present.

According to a tank closure report (White Shield, 1994) two 1,000-gallon leaded gasoline USTs were removed from the site in April 1994. Based on drawings and descriptions in the report, the tanks and dispensers were located approximately 40 feet south of the Columbia River and west of the boat launch ramp. The estimated former UST and The Boat Shop locations are shown on Figure 2.

The 1994 report indicates that the two USTs were removed from a single basin that measured approximately 10 by 23 feet by 8 feet deep. A soil sample collected from approximately 8 feet below the ground surface (bgs) in the excavation had a concentration of 6,300 milligrams per kilogram (mg/kg) of gasoline range total petroleum hydrocarbons (TPH-G), and also had detections of benzene, toluene, ethylbenzene and xylenes (BTEX). A water sample collected from within the tank basin had a TPH-G concentration of 39,000 micrograms per liter (µg/L). These detections exceeded the Model Toxics Control Act (MTCA) Method A cleanup levels.

The report indicates that cleanup actions were performed related to water and soil. Water remediation involved operating an aeration system in the tank basin, followed by pumping the standing water into barrels. A week later after the water recharged, another water sample was collected from the basin. TPH-G and BTEX were not detected in the second sample at greater than the laboratory test detection limits.

Soil remediation consisted of over-excavating approximately 7 cubic yards of soil from the basin base. A follow-up soil sample was collected from the base, and detected concentrations of TPH-G and/or BTEX were less than MTCA Method A cleanup levels that were current in 1994.

2.0 REMEDIAL INVESTIGATION SUMMARY

In February 2014, Shannon & Wilson performed a RI that included installing and collecting soil samples from three groundwater monitoring wells in the vicinity of the former USTs. Relative to the former tank basin, monitoring well MW-1 is located to the south, MW-2 is located northwest and MW-3 is located northeast. The well locations are shown on Figure 2.

We collected the first set of groundwater samples from the wells in March 2014. A description of the RI and the sampling results is included in Shannon & Wilson's RI report dated April 21, 2014.

Shannon & Wilson's representative collected initial groundwater samples from the three wells on March 11, 2014. The procedure included purging and sampling using disposable bailers. Water samples from all of the wells were turbid (460 to >1,000 nephelometric turbidity units [NTU]). The color was light brown, similar to the soil color observed during well installation. The sample from MW-2 had the highest turbidity of the three.

Groundwater samples from the wells were analyzed by the following methods: NWTPH-Gx/BTEX and total lead by EPA Method 200.8. Petroleum constituents (gasoline range TPH and BTEX) were not detected in the samples at greater than the laboratory Practical Quantitation Limits (PQLs). Lead was detected in the samples at concentrations of 7.0, 11 and 71 micrograms per liter (µg/L) in samples from MW-3, MW-1, and MW-2, respectively. The MTCA Method A cleanup level for groundwater is 15 µg/L. Two of the results are less than this level; however, the sample from MW-2 at a concentration of 71 µg/L exceeded the criterion.

3.0 GROUNDWATER SAMPLING

The September 2014 monitoring event included collecting groundwater samples from the three site wells for chemical analysis and obtaining groundwater elevation data to estimate the groundwater flow direction. Shannon & Wilson's representative collected samples on September 24, 2014.

3.1 Groundwater Elevations and Sampling Methodology

Shannon & Wilson's field services included the following:

- Measuring depth to groundwater in each well prior to sampling using an electronic water level indicator.
- Purging water from the wells and collected groundwater samples in general accordance with EPA low-flow sampling procedures (April 1996).
- Shipping samples to OnSite Environmental (OnSite) of Redmond, Washington for laboratory analyses.

Groundwater elevation measurements from the previous and current monitoring events are summarized in the following table. The elevations were calculated using data provided by Stratton Surveying & Mapping.

	Well Identification		
	MW-1	**MW-2**	**MW-3**
Total Well Depth (measured)	14.8	14.15	13.4
Top of Casing Elevation	352.92	349.63	350.26
Depth to Water:			
02/26/2014	9.66	6.86	7.41
03/11/2014	8.93	5.63	6.19
09/24/2014	8.40	6.01	6.48
Groundwater Elevation:			
02/26/2014	343.27	342.77	342.85
03/11/2014	343.99	344.00	344.07
09/24/2014	344.53	343.62	343.78

Measurements and elevations are in feet.

Figure 2 shows approximate groundwater elevation contours and the groundwater flow direction on September 24, 2014, which was toward the north.

The low-flow purging and sampling process included the following steps: 1) Purge water from the well using a stainless steel bladder pump; 2) pass the purge water through a flow-through cell, periodically measuring pH, temperature, conductivity, dissolved oxygen, oxidation/reduction potential (ORP) or redox, and turbidity; and 3) after measurements stabilize, disconnect the flow-through cell and collect a water sample for laboratory analysis. Samples were collected directly in laboratory-furnished bottles, labeled, logged onto a chain-of-custody form, packed with ice in a cooler, and shipped by overnight delivery to OnSite.

To reduce the potential for cross-contamination, reusable equipment was decontaminated prior to first use and between each well. New, single-use disposable materials (tubing and bladder) were used with the pump at each well. Also to reduce potential for cross-contamination, the sampling sequence started with the upgradient well (MW-1), followed by the downgradient wells MW-3 and MW-2. Shannon & Wilson's field and sample handling procedures were in accordance with standard environmental protocols.

3.2 Field Measurements

As indicated in the sampling procedures description, Shannon & Wilson's representative measured parameters in the water pumped from the wells during the purging process. The primary objective was to observe when the parameters stabilized, so that a sample could then be collected for laboratory analyses. The measurements may also be indicative of the absence or presence of contaminants undergoing biological activity. A summary of the field parameters at the completion of well purging is included in Table 1.

Specific conductivity, pH, and temperature are measured to evaluate if groundwater conditions are similar between wells, or if significant variations are present. An increase in water temperature and a decrease in pH may suggest active biodegradation and the generation of organic acids. There were no significant differences between these parameters among the three wells during the sampling event.

ORP is a measure of electron activity and indicates the tendency of a solution to gain or lose electrons. In general, under oxidizing (aerobic) conditions the ORP readings are positive, whereas the readings are negative under reducing (anaerobic) conditions. ORP was positive at all three wells during the sampling event.

As indicated in Section 2.0, the water samples collected in March 2014 using disposable bailers were quite turbid (460 to >1,000 NTUs). Using the low-flow sampling method, turbidities were much lower, ranging from 2.52 to 13.0 NTUs.

4.0 RESULTS OF LABORATORY ANALYSES

Groundwater samples from the three wells were analyzed by the following methods: NWTPH-Gx/BTEX and total and dissolved lead by EPA Method 200.8. Petroleum constituents (gasoline range TPH and BTEX) and lead were not detected in the samples at greater than the laboratory PQLs. Results are summarized in Table 2, and the laboratory report is included in Appendix A.

5.0 FINDINGS AND CONCLUSIONS

Soil and groundwater sampling conducted during the February/March 2014 investigation in the vicinity and downgradient of the former USTs location did not detect residual petroleum product impacts to soil or groundwater. Lead was detected in the March 2014 groundwater samples from all of the wells; the concentration of 71 µg/L in the sample from MW-2 exceeded the MTCA Method A cleanup level of 15 µg/L.

The initial, bailer-collected water samples were very turbid. Because of the potential that lead was detected due to soil particulates in the groundwater samples, we selected an alternative sampling method for the September 2014 monitoring event and had samples analyzed for both total and dissolved lead. Lead (total or dissolved) was not detected in any of the September 2014 samples at greater than the PQL. In our opinion, the initial lead detections were an artifact of soil particulates in the sample.

6.0 CLOSURE

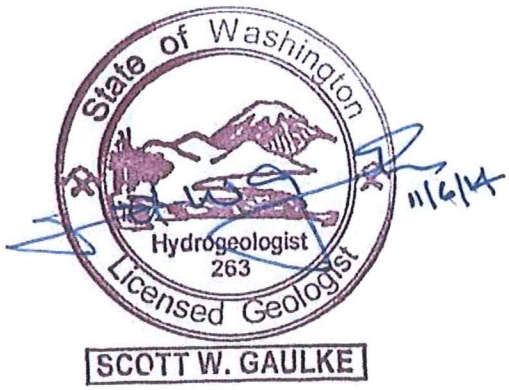
Within the limitations of scope, schedule, and budget, Shannon & Wilson has prepared this report in a professional manner, using that level of skill and care normally exercised for similar projects under similar conditions by reputable and competent environmental consultants currently practicing in this area. The data presented in this report are based on limited research and sampling at the site and should be considered representative at the time of our observations. Shannon & Wilson performed this work within its best judgment to adequately describe site conditions. Changes in the conditions of the site can occur with time from both natural processes and human activities. In addition, changes in governmental codes, regulations, or law may occur. Such changes are beyond our control, and should they occur, our observations and recommendations applicable to this facility may need to be revised wholly or in part.

This report was prepared for the use of the City of Richland, Mr. Lynne Koehler, and their representatives. Shannon & Wilson in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. Shannon & Wilson has prepared the attached

"Important Information about Your Environmental Report" to assist you and others in understanding the use and limitations of our reports (Appendix B).

SHANNON & WILSON, INC.

Donna R. Parkes
Principal Environmental Specialist



Scott W. Gaulke, PE, LHG
Vice President

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U.S. Department of Agriculture, Soil Conservation Service, "Soil Survey Benton County Area, Washington," 1971.

Washington State Department of Ecology, Amended October 12, 2007, Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC, Publication No. 94-06.

Washington State Department of Ecology, Updated June 30, 2009, Dangerous Waste Regulations, Chapter 173-303 WAC, Publication No. 92-91.

Washington State Department of Ecology, May 30, 2000, correspondence to Mr. Lynne Koehler RE: Voluntary Cleanup Review, The Boat Shop, 1238 Columbia Drive, Richland.

Washington State Department of Ecology, November 17, 2009, correspondence to Mr. Lynne Koehler RE: Release of Hazardous Substance at the Columbia Park Marina located at 1776 Columbia Drive SE, Richland, Washington; Facility/Site ID #84244226.

Washington State Department of Ecology, April 19, 2013, correspondence to City of Richland and to Mr. Lynne Koehler RE: A Reported Release of Hazardous Substances and Potential Liability for the Release.

White Shield, Inc., June 27, 1994, *LUST Closure/Interim Cleanup Report, The Boat Shop WSDOE Site #009266, Richland, Washington.*

TABLE 1

SUMMARY OF FIELD PARAMETERS, 9/24/2014

Well ID	DO (mg/L)	ORP (mv)	Conductivity (umhos/cm)	pH	Temperature (^{o}C)	Turbidity (NTU)	Observations
MW-1	4.33	51.1	542	6.83	17.37	3.0	Clear
MW-2	2.68	48.3	614	6.80	18.94	13	Approximately clear
MW-3	3.44	33.9	583	6.83	19.19	2.52	Clear

DO Dissolved oxygen
mg/L milligrams per liter
ORP Oxidation/reduction potential
mv millivolts
umhos/cm micromhos per centimeter
NTU Nephelometric turbidity units

TABLE 2

GROUNDWATER SAMPLE ANALYTICAL RESULTS in µg/L

Well ID	Sample No.	TPH-G	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead	
							Total	Dissolved
Samples collected 3/11/2014								
MW-1	CPWM-MW1-01	<100	<1.0	<1.0	<1.0	<1.0	11	NA
MW-2	CPWM-MW2-01	<100	<1.0	<1.0	<1.0	<1.0	**71**	NA
MW-3	CPWM-MW3-01	<100	<1.0	<1.0	<1.0	<1.0	7.0	NA
Samples collected 9/24/2014								
MW-1	CPWM-MW1-02	<100	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0
MW-2	CPWM-MW2-02	<100	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0
MW-3	CPWM-MW3-02	<100	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0
MTCA Method A Cleanup Level		1,000	5	1,000	700	1,000	15	15

µg/L micrograms per liter
NA not analyzed
MTCA Method A Model Toxics Control Act Method A cleanup levels for groundwater

0 300 600

Approximate Scale in Feet

NOTE

Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth ™ Mapping Service.

Columbia Park West Marina
Richland, Washington

SITE LOCATION MAP

November 2014 22-1-11288-001

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FIG. 1

Filename: J:\22\11288-001\22-1-11288-001 Fig 1.dwg Date: 11-03-2014 Login: sac

0 60 120

Scale in Feet

LEGEND

MW-1 (344.53) — Monitoring Well Designation and Approximate Location (Groundwater Elevation in Feet, 9-24-14)

343.6 — — Approximate Groundwater Elevation

Approximate Groundwater Flow Direction

NOTE

This figure is adapted from *City of Richland Columbia Park West Parking Lot and Landscaping Improvements Site and Utility Plan*, dated June 1998.

Columbia Park West Marina
Richland, Washington

SITE PLAN AND MONITORING WELL LOCATIONS

November 2014 22-1-11288-001

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FIG. 2

Filename: J:\22\11288-001\22-1-11288-001 Fig 2.dwg Date: 11-03-2014 Login: sac

APPENDIX A

LABORATORY REPORT

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 6, 2014

Donna Parkes
Shannon & Wilson, Inc.
2705 Saint Andrews Loop, Suite A
Pasco, WA 99301

Re: Analytical Data for Project 22-1-11288-001
Laboratory Reference No. 1409-246

Dear Donna:

Enclosed are the analytical results and associated quality control data for samples submitted on September 25, 2014.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

Case Narrative

Samples were collected on September 24, 2014 and received by the laboratory on September 25, 2014. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

NWTPH-Gx/BTEX

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**CPWM-MW1-02**					
Laboratory ID:	09-246-01					
Benzene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Toluene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Ethyl Benzene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
m,p-Xylene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
o-Xylene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Gasoline	**ND**	100	NWTPH-Gx	9-25-14	9-25-14	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*71-112*				
Client ID:	**CPWM-MW2-02**					
Laboratory ID:	09-246-02					
Benzene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Toluene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Ethyl Benzene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
m,p-Xylene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
o-Xylene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Gasoline	**ND**	100	NWTPH-Gx	9-25-14	9-25-14	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*92*	*71-112*				
Client ID:	**CPWM-MW3-02**					
Laboratory ID:	09-246-03					
Benzene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Toluene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Ethyl Benzene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
m,p-Xylene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
o-Xylene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Gasoline	**ND**	100	NWTPH-Gx	9-25-14	9-25-14	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*91*	*71-112*				

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

NWTPH-Gx/BTEX
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0925W1					
Benzene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Toluene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Ethyl Benzene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
m,p-Xylene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
o-Xylene	**ND**	1.0	EPA 8021B	9-25-14	9-25-14	
Gasoline	**ND**	100	NWTPH-Gx	9-25-14	9-25-14	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*71-112*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	09-246-01										
	ORIG	DUP									
Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Toluene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Ethyl Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
m,p-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
o-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Gasoline	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*93*	*94*	*71-112*			
MATRIX SPIKES											
Laboratory ID:	09-246-01										
	MS	MSD	MS	MSD		MS	MSD				
Benzene	**56.0**	**53.5**	50.0	50.0	ND	**112**	**107**	78-120	5	12	
Toluene	**56.5**	**53.2**	50.0	50.0	ND	**113**	**106**	80-121	6	12	
Ethyl Benzene	**55.5**	**52.5**	50.0	50.0	ND	**111**	**105**	81-120	6	13	
m,p-Xylene	**55.7**	**52.2**	50.0	50.0	ND	**111**	**104**	81-119	6	13	
o-Xylene	**55.4**	**52.2**	50.0	50.0	ND	**111**	**104**	79-117	6	13	
Surrogate:											
Fluorobenzene						*98*	*100*	*71-112*			

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

TOTAL LEAD
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	09-246-01					
Client ID:	**CPWM-MW1-02**					
Lead	**ND**	1.1	200.8	10-2-14	10-2-14	
Lab ID:	09-246-02					
Client ID:	**CPWM-MW2-02**					
Lead	**ND**	1.1	200.8	10-2-14	10-2-14	
Lab ID:	09-246-03					
Client ID:	**CPWM-MW3-02**					
Lead	**ND**	1.1	200.8	10-2-14	10-2-14	

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

TOTAL LEAD
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Extracted:	10-2-14
Date Analyzed:	10-2-14
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	MB1002WM1

Analyte	Method	Result	PQL
Lead	200.8	**ND**	1.1

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

TOTAL LEAD
EPA 200.8
DUPLICATE QUALITY CONTROL

Date Extracted: 10-2-14
Date Analyzed: 10-2-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: 09-148-02

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Lead	**ND**	**ND**	NA	1.1	

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

TOTAL LEAD
EPA 200.8
MS/MSD QUALITY CONTROL

Date Extracted: 10-2-14
Date Analyzed: 10-2-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: 09-148-02

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Lead	111	**120**	108	**121**	109	0	

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

DISSOLVED LEAD
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	09-246-01					
Client ID:	**CPWM-MW1-02**					
Lead	**ND**	1.0	200.8	9-30-14	9-30-14	
Lab ID:	09-246-02					
Client ID:	**CPWM-MW2-02**					
Lead	**ND**	1.0	200.8	9-30-14	9-30-14	
Lab ID:	09-246-03					
Client ID:	**CPWM-MW3-02**					
Lead	**ND**	1.0	200.8	9-30-14	9-30-14	

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

DISSOLVED LEAD
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Filtered:	9-30-14
Date Analyzed:	9-30-14
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	MB0930F1

Analyte	Method	Result	PQL
Lead	200.8	**ND**	1.0

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

DISSOLVED LEAD
EPA 200.8
DUPLICATE QUALITY CONTROL

Date Filtered: 9-22-14
Date Analyzed: 9-30-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: 09-202-02

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Lead	**ND**	**ND**	NA	1.0	

Date of Report: October 6, 2014
Samples Submitted: September 25, 2014
Laboratory Reference: 1409-246
Project: 22-1-11288-001

DISSOLVED LEAD
EPA 200.8
MS/MSD QUALITY CONTROL

Date Filtered: 9-22-14
Date Analyzed: 9-30-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: 09-202-02

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Lead	200	**176**	88	**182**	91	3	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
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Phone: (425) 883-3881 • www.onsite-env.com

Company: Shannon+Wilson, Pasco
Project Number: 22-1-11288-001
Project Name: Columbia Park West Marina, Richland
Project Manager: D Parkes
Sampled by: D Parkes

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 09-246

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260C	Halogenated Volatiles 8260C	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	Total Lead	Dissolved Lead				% Moisture
1	CPWM-MW1-02	9/24/14	11:55	water			X															X	X				
2	CPWM-MW2-02	↓	2:45	↓			X															X	X				
3	CPWM-MW3-02	↓	1:40	↓			X															X	X				

	Signature	Company	Date	Time
Relinquished	Donna Parkes	Shannon+Wilson	9/24/14	4:00
Received		OSE	9/25/14	1030
Relinquished				
Received				
Relinquished				
Received				

Comments/Special Instructions

Reviewed/Date

Reviewed/Date

Chromatograms with final report ☐

Data Package: Standard ☐ Level III ☐ Level IV ☐

Electronic Data Deliverables (EDDs) ☒ _____

APPENDIX B

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 22-1-11288-001

Date: November 6, 2014
To: City of Richland and Lynne Koehler
Columbia Park West Marina Groundwater Monitoring Report

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland